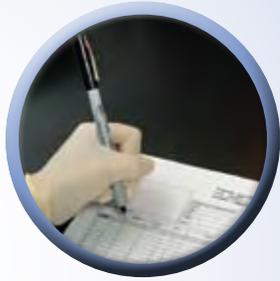


# The African Field Epidemiology Network **OUTBREAK INVESTIGATION LABORATORY GUIDELINES**



# Table of Contents

- Introduction .....2
- I. Outbreak Investigation Laboratory Guideline Checklist .....3
- II. Standard Operating Procedures (SOPs) .....6
  - A. How to Collect Blood..... 7
  - B. How to Collect Bubo Aspirate..... 9
  - C. How to Collect CSF.....10
  - D. How to Collect Serum from Whole Blood.....12
  - E. How to Perform a Skin Snip.....13
  - F. How to Take Rectal Swab and Transfer to Transport Medium.....15
  - G. How to Use Cary Blair Transport Medium.....17
  - H. Labelling Specimens .....18
  - I. Triple Packaging System to Maintain Ambient Temperature .....19
  - J. Triple Packaging System to Maintain Cold Chain .....21
- III. Laboratory Testing Requirements .....23
- IV. Laboratory Rapid Test Kits .....25
- V. References.....25
- Notes.....26

## Introduction

Communicable diseases have remained a serious public health problem in Africa despite continued efforts to prevent and control them. These diseases include malaria, acute respiratory infections, diarrheal diseases, HIV/AIDS and diseases of epidemic potential.

These diseases in turn consume scarce national health resources, affect economic productivity and have the potential for international spread.

In 1998, the World Health Organization (WHO) Regional Committee for Africa adopted the Integrated Disease Surveillance and Response (IDSR) strategy through resolution AFR/RC48/R2. IDSR aims to strengthen communicable disease surveillance and response systems. One of its specific goals is to integrate surveillance with laboratory support. The Regional Committee urged countries to develop laboratory services as a step in strengthening disease surveillance systems. These services include among others laboratory confirmation so as to support the diagnosis of suspected cases of communicable diseases. By using laboratory-confirmed surveillance information, health workers can make evidence-based decisions for case management and treatment, disease prevention and control, and efficient use of scarce resources.

These guidelines developed by the AFENET provide relevant information in a condensed format that is easy to use during outbreak situations of eight commonly occurring disease outbreaks in Africa (i.e. cholera, cerebrospinal meningitis, bacillary dysentery, measles, yellow fever, plague, viral hemorrhagic fever and anthrax).

The guidelines are composed of an assortment of requirements that are necessary both in the field and laboratory during outbreak investigations. They promote standard performance by reminding health workers what laboratory procedures need to be done during outbreaks including tests that need to be performed.

The guidelines provide an elaborate list of items that may be required for isolation and identification of the prioritized diseases of epidemic potential. The guideline is made up of personal protective equipment (PPE), disinfectants and materials for collection, packaging, storage and transportation of specimen to referral laboratories for confirmation. In addition, the guideline contains rapid test kits for meningitis and plague which provide quick and reliable preliminary diagnosis that can guide public health interventions before confirmation of disease outbreaks.

# I. Outbreak Investigation Laboratory Guideline Checklist

CATEGORY/ITEM	
<b>A</b>	<b>DOCUMENTATION</b>
	Specimen label
	Case investigation forms
	Patient register book
	Marker pen
	Writing pens and pencils
	Outbreak investigation guidelines
<b>B</b>	<b>PERSONAL PROTECTIVE EQUIPMENT</b>
	Gowns/coveralls
	Plastic apron
	Masks
	Cups
	Disinfectants- JIK, soap, 70% alcohol, Povidone iodine 10%
	Biohazard bags
	Goggles
	Caps
	Scrub suits
	Gloves – (surgical and disposable)
<b>C</b>	<b>SPECIMEN COLLECTION, PACKAGING TRANSPORTATION AND REFERRAL</b>
	Racks
	Needles (gauge; 21,23)
	Tourniquet
	Cotton wool
	Alcohol swabs
	CSF collection kit
	Leak proof screw capped container
	Vacutainers
	Vacutainer sleeves
	Adhesive tape
	Lancets

CATEGORY/ITEM	
	Stool containers
	Water sampling kits
	Gauze large pack
	Filter Paper
	Slides
	Cover slips
	Skin snip kits
	Formalin + Coplin jar
	Cryotubes
	Plastic Pasteur pipettes
	Absorbent materials
	Parafilm (small rolls)
	Thermometers
	Tongue depressors
	Kit boxes
	Slide boxes
	Staining racks
	Microscopes (light binoculars)
	Immersion oil
	Lens tissue
	Water testing kits
	Transport media
	Triple packing systems
	Colds box
	Cold packs
	Sterile cotton tipped applicator (e.g. for rectal swab)
	Blood culture bottles
	Sputum containers
	Safe box/bio safety bags
	Normal saline

<b>CATEGORY/ITEM</b>	
<b>D</b>	<b>INSTRUCTIONS/GUIDELINES (Pages 4–9)</b>
<b>E</b>	<b>FIELD KITS (RAPID DIAGNOSTIC KITS)</b>
	Rapid malaria diagnostic kit (room temp)
	Rapid latex meningitis kit (room temp)
	Plague diagnostic kit (dip stick)
	Field stain for haemoparasites (Field A, Field B, Azide)
<b>F</b>	<b>LABORATORY TESTING REQUIREMENTS (Refer to page 7–9)</b>

## II. Standard Operating Procedures (SOPs)

- A. How to collect blood (page 7)
- B. How to collect bubo aspirate (page 9)
- C. How to collect CSF (page 10–11)
- D. How to obtain serum from whole blood (page 12)
- E. How to perform a skin snip (pages 13–14)
- F. How to take a rectal swab and transfer to transport medium (page 15–16)
- G. How to use Cary Blair transport medium (page 17)
- H. Labeling specimens (page 18)
- I. Triple packaging system to maintain ambient temperature (page 19)
- J. Triple packaging system to maintain cold chain (page 21)

## A. How to Collect Blood

This provides guidance on how to collect blood by venepuncture. For safety, all of the supplies used to collect the blood are for single use only. **Do not reuse.**

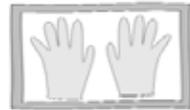
### *When to collect*

- **Measles:** Collect blood between the 3<sup>rd</sup> and 28<sup>th</sup> day after onset of rash from at least 5 to 10 specimens, for confirmation of an outbreak. Measles reaches epidemic level when the threshold (usually >3 cases in a parish in a week) is reached.
- **Plague (septicemia):** Collect from the first suspected plague case. If more than one suspected case, collect until specimens are collected on 5-10 suspected cases.
- **Viral hemorrhagic/yellow fever diseases:** Collect from the first suspected VHF case. If more than one suspected case, collect until specimens collected are 5–10 suspected cases.

SUPPLIES NEEDED	
<ul style="list-style-type: none"><li>• Gloves</li><li>• Tourniquet</li><li>• Sterile gauze pads</li><li>• Alcohol (70%)</li><li>• Sterile needle and vacutainer or sterile needle and syringe</li></ul>	<ul style="list-style-type: none"><li>• Sterile™ test tube (5–10 ml), if a sterile needle and syringe are used</li><li>• Adhesive plaster</li><li>• Safe box for sharps</li></ul>

### **Before beginning the procedure, obtain consent from the patient**

1. Sterile gloves should be worn when performing venepuncture and when handling the specimen.
2. Place a tourniquet above the venepuncture site. Palpate and locate the vein.
3. Disinfect the skin at the puncture site with alcohol (70%). Allow the area to dry.
4. Do not touch the disinfected puncture site with ungloved hands.



5. Perform venepuncture using a sterile vacutainer or sterile needle and syringe. If using a needle and syringe, transfer the blood to sterile test tube.
6. Remove the tourniquet. Apply pressure to site with sterile gauze pad until the bleeding stops. Apply adhesive plaster, if desired.
7. Adhere a specimen label to tube of blood.
8. Safely dispose of all contaminated materials.
9. Do not recap used sharps. Discard directly into a safe box for sharps.

**Volume of blood to collect**

Adults	5–10 ml
Children	2–5 ml
Infants	0.5–2 ml



## B. How to Collect Bubo Aspirate

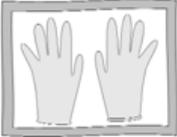
This provides guidance on how to collect aspirate from suspected buboes. It should be performed under sterile conditions by a medical officer or clinician experienced in the procedure. For safety, all of the supplies used to collect the bubo aspirate are for single use only. **Do not reuse.**

### *When to collect*

- Collect from the first suspected plague case. If more than one suspected case, collect until specimens are collected on 5–10 suspected cases. Collect specimens before the administration of antibiotics.
- With buboes, a small amount of sterile saline (1–2 ml) may be injected into the bubo to obtain an adequate specimen.

SUPPLIES NEEDED	
<ul style="list-style-type: none"><li>• Gloves</li><li>• Sterile saline</li><li>• Alcohol (70%)</li></ul>	<ul style="list-style-type: none"><li>• Sterile gauze pads</li><li>• Sterile needle (18–22 G) and syringe</li><li>• Safe box for sharps</li></ul>

### **Before beginning the procedure, obtain consent from the patient**

- 1.** Sterile gloves should be worn when performing the bubo aspiration and when handling the specimen. 
- 2.** Disinfect the skin at the bubo site with alcohol (70%). Allow the area to dry.
- 3.** Do not touch the disinfected bubo site with ungloved hands. 
- 4.** Inject a small amount of (0.1–0.5 ml) of sterile saline into the bubo site using a sterile syringe with a wide bore needle (18–22 G). Aspirate at least 0.2 ml of fluid from the bubo.
- 5.** Safely dispose of all contaminated materials. 
- 6.** Do not recap used sharps. Discard directly into a safe box for sharps.

## C. How to Collect CSF

This provides guidance on how to collect cerebrospinal fluid (CSF) by lumbar puncture. Lumbar puncture is an invasive technique. It should be performed under sterile conditions by a medical officer or clinician experienced in the procedure. For instructions on performing lumbar puncture, consult the *Oxford Handbook of Clinical Medicine*.

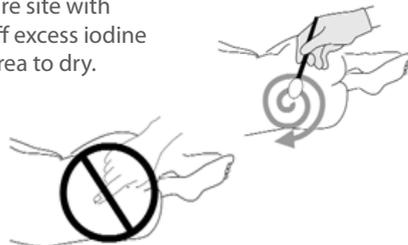
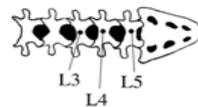
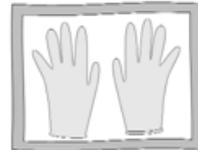
### When to collect

Collect specimens from 5–10 cases once the alert or action outbreak threshold has been reached.

SUPPLIES NEEDED	
<ul style="list-style-type: none"><li>• Sterile gloves</li><li>• Sterile gown</li><li>• Sterile towels</li><li>• Sterile swabs</li><li>• Povidone iodine (10%)</li><li>• Local anesthetic</li></ul>	<ul style="list-style-type: none"><li>• Sterile needle and syringe</li><li>• Alcohol (70%)</li><li>• Sterile lumbar puncture needle</li><li>• Small, sterile, screw-capped tube</li><li>• Adhesive plaster</li><li>• Safe box for sharps</li></ul>

### Before beginning the procedure, obtain consent from the patient

1. Sterile gloves should be worn when performing lumbar puncture and when handling the specimen.
2. Locate the space between L3,4 or L4,5 vertebrae. Follow the practice of your health facility in giving local anesthetic.
3. Disinfect the skin at the puncture site with povidone iodine (10%). Wipe off excess iodine with alcohol (70%). Allow the area to dry.
4. Do not touch the disinfected puncture site with ungloved hands or nonsterile items.



- 5.** Perform lumbar puncture using a sterile spinal needle. Collect CSF by allowing the fluid to flow directly into the sterile tube. *Do not aspire CSF.* Recap the tubes tightly. *If CSF will be used for microscopy, biochemistry, and culture, collect 1 ml for each of these tests in separate tubes.*



- 6.** Aseptically recap the tube tightly.
- 7.** Safely dispose of all contaminated materials.
- 8.** Do not recap used sharps. Discard directly into a safe box for sharps.

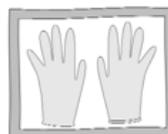


## D. How to Collect Serum from Whole Blood

This provides guidance on how to process whole blood to separate serum from the blood clot.

SUPPLIES NEEDED	ADDITIONAL SUPPLIES <i>(if health facility has a centrifuge)</i>
<ul style="list-style-type: none"><li>• Gloves</li><li>• Sterile pipette</li><li>• Sterile, screw-capped tube (glass or plastic)</li><li>• Specimen label</li></ul>	Centrifuge tubes for balancing

- 1.** Gloves should be worn at all times when handling the specimen.



- 2.** Keep the whole blood at room temperature until there is complete retraction of the clot from the serum.

*If the health facility or district has a centrifuge, spin the whole blood at 1000 xg for 10 minutes to separate the serum. Follow the standard operating procedures for centrifuge.*

- 3.** Remove the serum using a sterile pipette. Avoid extracting red cells.



- 4.** Transfer the serum aseptically to a sterile, screw-capped tube. Secure cap tightly.

- 5.** Adhere a specimen label to the tube of serum.

- 6.** Safely dispose of all contaminated materials and the remaining clot.

- 7.** Keep the tube of serum at 4–8°C.



## E. How to Perform a Skin Snip

This provides guidance on how to perform a skin snip from a deceased patient. It should be performed under sterile conditions by a medical officer or clinician experienced in the procedure. For safety, all of the supplies used to perform the skin snip are for single use only. **Do not reuse.**

SUPPLIES NEEDED	ADDITIONAL SUPPLIES <i>(for personal protection)</i>
<ul style="list-style-type: none"><li>• Bucket for disinfectant</li><li>• 10 litres of water</li><li>• Liquid bleach (3–5% active chlorine)</li><li>• Punch biopsy tool</li><li>• Tweezers</li><li>• Blunt scissors</li><li>• Vial with formalin (20 ml)</li><li>• Plastic bag</li><li>• Hand soap</li></ul>	<ul style="list-style-type: none"><li>• Boots</li><li>• Latex gloves</li><li>• Gown</li><li>• Plastic apron</li><li>• Heavy-duty gloves</li><li>• Mask</li><li>• Goggles</li></ul>

### Before beginning the procedure, obtain consent from the family of the deceased patient

1. Prepare disinfectant solution immediately before starting procedure. Using liquid bleach, make 10 litres of disinfectant solution. The final concentration should be approximately 0.05 to 0.5%.



2. Put on the protective clothing in this order: boots, latex gloves, gown, plastic apron, heavy-duty gloves, mask, and goggles.



3. Arrange the scissors, tweezers, and biopsy tool for use near the cadaver. Open the vial of formalin. Take the cover off the biopsy tool.

4. Gently turn the head of the cadaver to expose the nape of the neck. Place the biopsy tool perpendicular to the neck and press down into the skin up to the guard. Rotate gently. Remove the biopsy tool.



- 5.** With the tweezers, gently lift out the core you cut in the skin and use the scissors to cut the piece away, if necessary.



- 6.** Place the sample in the vial of formalin. Close the cap tightly to prevent leaks.



- 7.** Dip the vial of formalin in the disinfectant for one minute. Set it aside to dry.



- 8.** Place the rest of the equipment in the disinfectant. If you need to move the cadaver, do so while you are still wearing the protective clothing. When you are finished, rinse your exterior gloves in the disinfectant, remove them and drop them in the disinfectant bucket.



- 9.** Still wearing the interior gloves, remove all the disinfected material from the bucket and place in the plastic bag. Burn the bag in the incinerator. Remove your gloves and burn them.



- 10.** Wash your hands with soap and water. The specimen is not infectious after it is placed in the formalin and the outside of the vial is disinfected.



Adapted from the reference manual *Infection Control for Viral Haemorrhagic Fever in the African Health Care Setting* (WHO/EMC/ESR/98.2)

## F. How to Take Rectal Swab and Transfer to Transport Medium

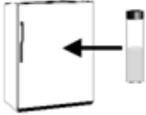
This provides guidance on how to take a rectal swab for diagnosis of acute bacterial diarrheal disease. Rectal swabs must be transported in Cary Blair transport medium. Transport medium is used to preserve specimens for bacteriology testing.

SUPPLIES NEEDED	
<ul style="list-style-type: none"><li>• Gloves</li><li>• Sterile cotton-tipped applicators (swabs)</li><li>• One tube of Cary Blair transport medium</li></ul>	<ul style="list-style-type: none"><li>• Adhesive tape</li><li>• Specimen label</li></ul>

### *When to collect*

Collect stool specimens from the first suspected case. If more than one suspected case, collect specimens from at least 5–10 suspected cases. Collect stool from patients fitting the case definition and onset within last 5 days, and before antibiotics treatment has started.

### **Before beginning the procedure, obtain consent from the patient**

- 1.** Chill the tube of Cary Blair transport medium by placing it on ice packs or in the refrigerator 1 to 2 hours before collecting the specimen.  

- 2.** Gloves should be worn at all times when handling specimen.  

- 3.** Remove the wrapper from the handle end of the sterile swab. Do not touch the tip of the swab.  

- 4.** Moisten the swab in chilled Cary Blair transport medium.
- 5.** Insert the swab through the rectal sphincter 2 to 3 cm and gently rotate.
- 6.** Withdraw and examine the swab to make sure faecal material is visible on the tip.

**7.** Push the swab completely to the bottom of the tube of Cary Blair transport medium.

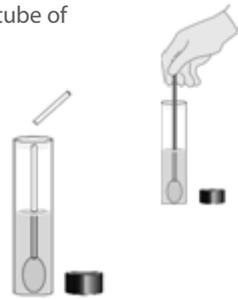
**8.** Break off the top portion of the stick so the cap can be tightly screwed onto the tube.

**9.** After screwing cap tightly onto the Cary Blair tube, seal the tube with tape to prevent leakage.

**10.** Adhere specimen label to the container.

**11.** Keep the tube of serum at 4–8°C.

**12.** Safely dispose of all contaminated materials. Do not reuse.

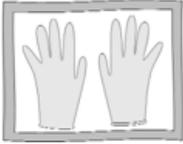


## G. How to Use Cary Blair Transport Medium

This provides guidance on how to transfer a specimen into a tube of Cary Blair transport medium. Transport medium is used to preserve specimens for bacteriology testing. The specimen should be transferred to the transport medium immediately after the specimen has been collected.

SUPPLIES NEEDED	
<ul style="list-style-type: none"><li>• Gloves</li><li>• Sterile cotton-tipped applicators (swabs)</li><li>• One tube of Cary Blair transport medium*</li></ul> <p>*For stool specimens, the Cary Blair tube should be chilled 1–2 hours before using it.</p>	<ul style="list-style-type: none"><li>• Adhesive tape</li><li>• Specimen label</li></ul>

1. Gloves should be worn at all times when handling the specimen.
2. Remove the wrapper from the handle end of the sterile swab. Do not touch the cotton tip of the swab.
3. Insert the cotton tip of the swab into the specimen. Make sure the cotton tip of the swab is completely coated with the specimen. If the specimen is in a syringe, slowly release some of the contents to completely soak the cotton tip of the swab.
4. Push the swab completely to the bottom of the tube of Cary Blair transport medium.
5. Break off the top portion of the stick so the cap can be tightly screwed onto the tube.
6. After screwing cap tightly onto the Cary Blair tube, seal the tube with tape to prevent leakage.
7. Adhere specimen label to the Cary Blair tube.
8. Keep the tube of serum at 4–8°C.
9. Safely dispose of all contaminated materials. Do not reuse.



## H. Labelling Specimens

This provides guidance on labeling specimens. Each specimen should be labeled. The information on the label should correspond with the patient information in the register book and on the case investigation form. Adequate labeling ensures that the laboratory results can be linked to the correct patient.

The label may be a piece of paper attached to the specimen container. Alternatively, the information may be written directly on the specimen container.

1. Using this sample label as a guide, fill in the information on a label for the specimen to be collected. Obtain the patient's information from the patient register book. Make sure your writing is legible.

*Sample label*

<b>Patient name:</b> _____	
<b>Specimen #:</b> _____	
<b>Specimen type:</b> _____	<b>Date:</b> _____ <b>Time:</b> _____
<b>Health facility:</b> _____	<b>District:</b> _____

**Specimen #**  
When filling in the specimen number, use this format:

Region	District	Year (month)	Case #
00	00	00	00

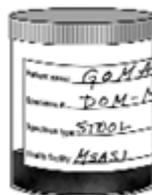
00 Use the standard abbreviations as designated by the ministry of health to indicate the Region (3 letter code), District (3 letter code), and Year of onset (2 digit code)

00 Use the unique case number (3 digit number) designated by the district.

Specify specimen #

<b>ARU</b>	<b>BAB</b>	<b>05</b>	<b>001</b>
Region	District	Year of onset	Region

2. Adhere the label to the specimen container. Do not attach the label to the top of the specimen container.



## I. Triple Packaging System to Maintain Ambient Temperature

This provides guidance for packaging diagnostic specimens in three layers for transport to the referral laboratory. Follow specific national and international regulations for shipping diagnostic specimens. Gloves should be worn at all times when handling the specimen.

### PRIMARY CONTAINER

The primary container contains your specimen.

**Ensure the following:**

- Container cap should be tightly closed and sealed to prevent leakage.
- Container should be labeled with the patient name and identification number, specimen number, and date and time.
- Label should be adhered to the container.

**Steps:**

1. Wrap absorbent material such as cotton wool around the container.
2. Use additional absorbent material to cushion multiple containers.

### SECONDARY CONTAINER

The secondary container holds the primary container.

**Steps:**

1. Use a container that is durable, watertight, and leak proof. If this is not available, use a sealable plastic bag.
2. Seal the case investigation form in a plastic bag
3. Tape the bag to the outside of the secondary container.

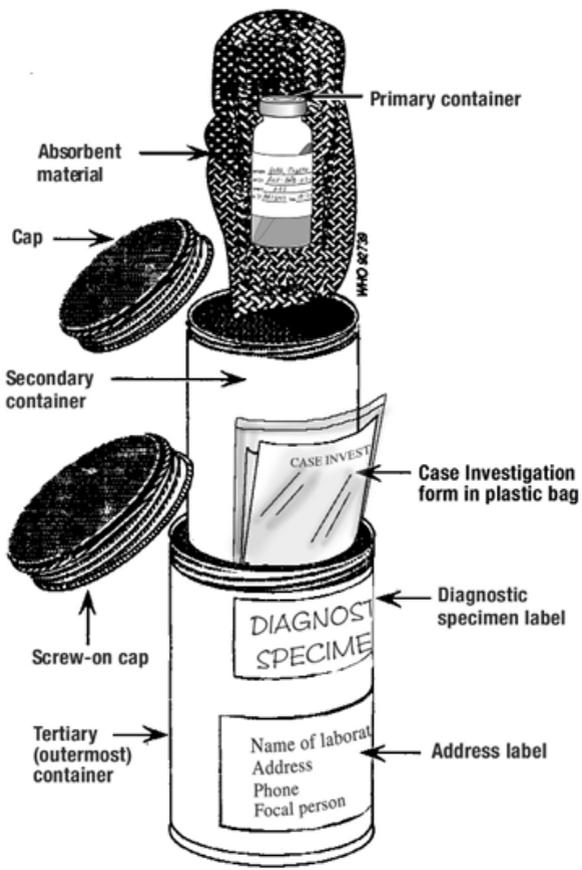
### TERTIARY (OUTERMOST) CONTAINER

The tertiary container holds the secondary container and protects it from physical damage and water. It also serves as the outer shipping container.

**Steps:**

1. Use a container made of corrugated fibreboard, cardboard, wood or other material strong enough to withstand the weight and shock of handling and shipment.
2. Pack tertiary container as shown in diagram.
3. Label the tertiary container "Diagnostic specimen." As appropriate, use additional labels (Do not freeze. Do not expose to heat. This side up).\*

*\*Specimens in formalin require a "Dangerous Goods in Excepted Quantities" label on the tertiary container. Contact the referral laboratory for guidance on labeling container.*



## J. Triple Packaging System to Maintain Cold Chain

This provides guidance for packaging specimens in three layers to maintain cold chain during transport to the referral laboratory. Follow specific national and international regulations for shipping diagnostic specimens.

Gloves should be worn at all times when handling the specimen.

### PRIMARY CONTAINER

The primary container contains your specimen.

#### Ensure the following:

- Container cap should be tightly closed and sealed to prevent leakage.
- Container should be labeled with the patient name and identification number, specimen number, and date and time.
- Label should be adhered to the container.

#### Steps:

1. Wrap absorbent material such as cotton wool around the container.
2. Use additional absorbent material to cushion multiple containers.

### SECONDARY CONTAINER

The secondary container holds the primary container.

#### Step:

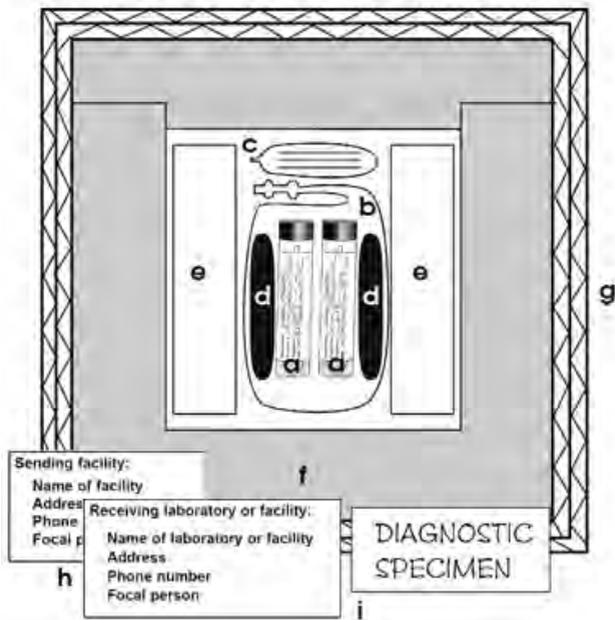
Use a sealable plastic bag that is watertight and leak proof.

### TERTIARY (OUTERMOST) CONTAINER

The tertiary container holds the secondary container and protects it from physical damage and water. The tertiary container also serves as the outer shipping container.

#### Steps:

1. Use an insulated carrier or carton of double-ply corrugated cardboard or plastic. Use insulating material such as high density (30–35 kgs/m<sup>3</sup>) polystyrene (small bubbles and firm when squeezed).
2. Seal the case investigation form in a separate plastic bag.
3. Pack tertiary container as shown in diagram. Four cold packs will maintain cold chain for 2 to 3 days.
4. Label the tertiary container "Diagnostic specimen." As appropriate, use additional labels (Do not freeze. Do not expose to heat. This side up.).



- a. **Primary container**
- b. **Secondary container** (sealed plastic bag holding primary container)
- c. **Sealed plastic bag** holding case investigation form
- d. **Absorbent material** such as cotton wool
- e. **Four ice packs.** Place ice packs at the bottom of the box and along the sides. Then place an ice pack on top of the specimen. If the specimen should remain cold, but not frozen, wrap the specimen in paper or cardboard to prevent direct contact with ice packs.
- f. **Insulating material**
- g. **Tertiary container** (outer carton of double-ply corrugated cardboard or plastic)
- h. **Address labels** on tertiary container
- i. **Diagnostic specimen label** on tertiary container

### III. Laboratory Testing Requirements

No	Suspected Diseases	Requirement for isolation and identification	* Requirement for Confirmation
1	Cholera	<ul style="list-style-type: none"> <li>• <b>Biochemical:</b> *Enterobacteriaceae API biochemical kit and TSI tube, Urea, Oxidase reagent, SIM medium</li> <li>• <b>Primary culture media:</b> MacConkey, XLD or DCA, APW, TCBS, Plates, incubator, wire loop, pipettes</li> <li>• <b>Susceptibility Testing</b> <b>Agar:</b> Mueller Hinton, 0.5 McFarland turbidity standard, forceps, sterile swabs, zone criteria chart, vernier caliper</li> <li>• <b>Discs for Sensitivity tests:</b> Chloramphenicol, Nalidixic acid, Ciprofloxacin, Tetracycline, Furazolidone, Trimethoprim-sulfamethoxazole, Erythromycin</li> </ul>	<ul style="list-style-type: none"> <li>• <b>*Vibrio cholerae typing antisera:</b> Polyvalent O1 and O139</li> <li>• <b>*Monovalent:</b> ogawa, inaba</li> </ul>
2	Dysentery	<ul style="list-style-type: none"> <li>• <b>Biochemical:</b> *Enterobacteriaceae API biochemical kit and TSI tube, Urea, Oxidase</li> <li>• <b>Primary culture media:</b> MacConkey, XLD or DCA, Plates, incubator, wire loop, pipettes, reagent and SIM medium</li> <li>• <b>Susceptibility Testing</b> <b>Agar:</b> Mueller Hinton, 0.5 McFarland turbidity standard, forceps, sterile swabs, zone criteria chart, vernier caliper</li> <li>• <b>Antibiotics:</b> Chloramphenicol, Nalidixic acid, Ciprofloxacin, Tetracycline, Furazolidone, Trimethoprim-sulfamethoxazole</li> </ul>	<ul style="list-style-type: none"> <li>• <b>*Respective polyvalents and monovalents for: <i>Sh. dysenteriae, Sh flexneri, Sh boydii and Sh sonnei</i></b></li> <li>• <b>*Salmonella typing:</b> <ul style="list-style-type: none"> <li>◦ Polyvalent H (phase 1 and 2)</li> <li>◦ Polyvalent O (A-S).</li> <li>◦ Monovalents (O) 4,9</li> <li>◦ Capsular Vi.</li> <li>◦ Monovalents (H) d</li> </ul> </li> </ul>

No	Suspected Diseases	Requirement for isolation and identification	* Requirement for Confirmation
3	Meningitis	<ul style="list-style-type: none"> <li>• <b>Gram stain reagents:</b> Ziehl Neelsen (ZN) stain reagents, Leishman stain, counting chamber, cover slips, slides, protein standards, Turk's solution, salphosalicylic acid (SSA)</li> <li>• <b>Culture media:</b> Chocolate agar (CHOC), *Haemoglobin powder, *E-test strips, blood agar (BA), MacConkey agar</li> <li>• <b>Biochemical:</b> X V, XV factors, and 5-microgram Optochin disc. Oxidase reagent, bile salt (sodium desoxycholate)</li> <li>• <b>Susceptibility Testing:</b> Mueller Hinton agar</li> <li>• <b>Antibiotics:</b> Chloramphenicol, Penicillin, Ampicillin, Ceftriaxone, Tetracycline, Oxacillin, Trimethoprim-sulfamethoxazole, Ciprofloxacin, Vancomycin, Erythromycin, Meropenem</li> <li>• Zone criteria chart and vernier caliper</li> <li>• India ink</li> </ul>	<ul style="list-style-type: none"> <li>• *<i>Neisseria meningitidis</i> typing sera</li> <li>• <i>Haemophilus influenzae</i> typing sera</li> </ul>
4	Plague	<ul style="list-style-type: none"> <li>• Microscope slides</li> <li>• Coplin jar for methanol</li> <li>• Staining rack</li> <li>• Methanol</li> <li>• Wayson stain</li> <li>• Gram stains* Dipstick</li> </ul>	<p><b>*Culture:</b> Refer specimen to Plague Referral Laboratory</p>

No	Suspected Diseases	Requirement for isolation and identification	* Requirement for Confirmation
5	Typhoid	<ul style="list-style-type: none"> <li>• <b>Primary culture media:</b> MacConkey, Blood agar and Chocolate agar, Plates, incubator, wire loop, and burner</li> <li>• <b>Susceptibility testing media:</b> Mueller-Hinton</li> <li>• <b>Antibiotics discs:</b> Chloramphenicol, Ciprofloxacin, Tetracycline, Trimethoprim-sulfamethoxazole, Ampicillin</li> <li>• 0.5 McFarland turbidity standard, forceps, sterile swabs</li> <li>• Zone criteria chart, ruler or vernier caliper</li> </ul>	<ul style="list-style-type: none"> <li>• *<i>Salmonella</i> typing:</li> <li>• Polyvalent H (phase 1 and 2)</li> <li>• Polyvalent O (A-S).</li> <li>• Monovalents (O) 4,9</li> <li>• Capsular Vi.</li> <li>• Monovalents (H) d</li> </ul>
6	Measles/ VHF/yellow fever		<i>Refer specimens to Virus Research institutes</i>

NB: A senior laboratory technician needs to pack the requirements for the kit following the list provided (Page 7–9). It is therefore important that after each investigation, the materials used are replaced immediately.

## IV. Laboratory Rapid Test Kits

These are the tests which will be used at field. For specification and use please see the instructions under each test kit.

## V. References

1. Tanzania Ministry of Health and Social welfare job aids (prepared in partnership with Partners for Health Reformplus [PHRplus], World Health Organization African Regional Office [WHO AFRO], and the Centers for Disease Control and Prevention [CDC]).
2. *Disease Outbreak Management: A Field Manual for Council Health Management Teams for Tanzania*. PHRplus, NIMR, CDC, and the CHANGE project, developed 2003.
3. Technical Guidelines on Integrated Disease Surveillance and Response for Uganda.

