10. Disease-Specific Prevention and Control Guidelines

10.1 Measles

10.1.1 Rationale for Surveillance

The major goals for measles surveillance at the current time are to identify high-risk areas and population groups based on analysis of susceptibility and to predict (in order to prevent) potential outbreaks. Supplementary immunization activities should be used to protect the susceptible sub-populations. Georgia has started moving toward the “measles elimination phase” in which the objective is to achieve and maintain interruption of measles transmission in the country. During this phase a very intensive case-based surveillance to detect, investigate, and confirm every suspected measles case in the community is required.

A preliminary plan for measles elimination has been developed with WHO guidance. According to the plan, elimination can be achieved through strict disease-specific surveillance procedures. Namely, it is necessary to achieve and maintain a high measles immunization coverage level (at least 95 percent) with the first and the second doses of measles vaccine and establish national surveillance of each case. Every suspected case should be investigated and laboratory tested. In the elimination phase, a “suspected” case – defined as any person with fever and maculopapular rash – is treated as a measles case for surveillance purposes.

High immunization coverage with 2 doses of the vaccine can be achieved by following the immunization strategic plan in Table 12, which envisions gradual increase of coverage rates every year.

<table>
<thead>
<tr>
<th>Year / Result</th>
<th>MCV-1 Coverage</th>
<th>MCV-2 Coverage</th>
<th>Measles Control Stages according to WHO Strategic Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>National level</td>
<td>In each region</td>
<td>National level</td>
</tr>
<tr>
<td>2004</td>
<td>88%</td>
<td>at least 70%</td>
<td>76%</td>
</tr>
<tr>
<td></td>
<td>National level</td>
<td>In each region</td>
<td>National level</td>
</tr>
<tr>
<td>2005</td>
<td>90%</td>
<td>at least 75%</td>
<td>80%</td>
</tr>
<tr>
<td>2006</td>
<td>92%</td>
<td>at least 80%</td>
<td>85%</td>
</tr>
<tr>
<td>2007</td>
<td>95%</td>
<td>at least 85%</td>
<td>90%</td>
</tr>
<tr>
<td>2008</td>
<td>95%+</td>
<td>at least 90%</td>
<td>95%</td>
</tr>
</tbody>
</table>
According to WHO recommendations, countries are advised to use the Clinical Classification scheme until the following two criteria are met:

- Low levels of measles incidence
- Access to a proficient measles laboratory

After achieving above criteria or for outbreak investigation, the Laboratory Classification scheme should be used.

### 10.1.2 Recommended Measles Case Definition

**Clinical case definition:**

- Any person in whom a clinician suspects measles infection, or
- Any person with the following symptoms:
  - Fever and,
  - Maculopapular rash (i.e., non-vesicular rash), and
  - Cough, running nose, or conjunctivitis (i.e., red eyes)

**Laboratory criteria for diagnosis**

- Presence of measles-specified IgM antibodies

**Case classification**

- **Clinical classification scheme:**
  - Clinically confirmed: A case that meets the clinical case definition
  - Discarded: A suspect that does not meet the clinical case definition

- **Laboratory classification scheme:**
  - Laboratory-confirmed: A case that meets the clinical case definition and is laboratory confirmed
  - Epidemiologically: A case that meets the clinical case definition and is linked epidemiologically to a laboratory-confirmed case (contact with a case 7-17 days prior to the onset of symptoms.
  - Clinically confirmed: A case that meets the clinical case definition and for which no adequate blood specimen was taken
  - Discarded: A suspect case that does not meet the clinical or laboratory definition

**Epidemiological link is** contact with a case 7-18 days prior to the onset of symptoms.

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3 Measles rash usually begins on the face and neck and over the next three days gradually proceeds downward and outwards, reaching the hands and feet
Table 13. Measles Final Case Classification Table

<table>
<thead>
<tr>
<th>Classification</th>
<th>Case Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical (probable)</td>
<td>Case meets clinical description</td>
</tr>
<tr>
<td>Laboratory-confirmed</td>
<td>Case meets clinical description and is laboratory confirmed</td>
</tr>
<tr>
<td>Confirmed by epidemiological link</td>
<td>Case meets clinical description and has epidemiological link to a lab-confirmed case</td>
</tr>
<tr>
<td>Discarded</td>
<td>Case does not meet clinical description or is not laboratory confirmed</td>
</tr>
</tbody>
</table>

Figure 15. Measles Final Case Classification Algorithm

Clinical case

Adequate specimen*

- IgM negative → Discard
- IgM positive** → Laboratory confirmed

No adequate specimen

- Epidemiological link to laboratory confirmed case → Epidemiologically confirmed
- No epidemiological link to laboratory confirmed case → Clinically confirmed

* While IgM (ELISA) tests are more sensitive between days 4 and 28 after the onset of rash, a single serum sample obtained at the first contact with the health care system within 28 days after onset is considered adequate for measles surveillance.

** If the case was vaccinated within six weeks before serum collection and if an active search in the community does not find evidence of measles transmission and there is no history of traveling to areas where measles virus is known to be circulating, the case should be discarded.

Note: Adequacy of specimens is determined by the NCDC laboratory.

**Laboratory testing** is currently mandated for confirmation of outbreaks when there is a clustering of three or more clinical (probable) cases. Samples can be analyzed at the NCDC. Starting in 2006 every clinical (probable) case must be laboratory investigated, and starting in 2007 laboratory investigation will be required for every clinical (probable) case and group cases manifested with fever and rash.

See Protocol for Laboratory Confirmation of Measles later in this chapter for specific steps to undertake in this respect.

10.1.3 Measles Case Notification Procedures and Forms

Any clinical (probable) case of measles identified by providers or a positive measles lab test requires urgent notification of the CPH within 24 hours by any existing means of communication. Starting in 2007, urgent notification must be made of every group case with fever and rash. General requirements are outlined in more detail earlier in these guidelines.
10.1.4 Measles Case/Outbreak Investigation

Every single reported measles case has to be investigated by a rayon CPH epidemiologist in cooperation with facility health workers within 2 business day of notification. Time is of the essence to prevent further transmission of the disease. When single cases are reported, visit of infection sites (place of residence of the patient) is required for further active revealing of cases.

The following steps are required in an investigation:

1. Verify that all cases meet the clinical description of measles by reviewing medical records.

   Discuss with the physician(s) if some do not. A case incompatible with the clinical description and not confirmed by specific laboratory tests is eliminated from epidemiological surveillance reporting.

2. Collect data as envisioned in the measles investigation card (see Figure 16).

   The collected data should be verified against the information found in the health facility’s infectious disease register. It is entirely possible that the investigation will identify additional cases that have not been registered by the health facility. Facilities should continue filling out the investigation cards for all clinical (probable) cases identified.

3. Identify the source of infection and establish epidemiological links.

   Check if measles patients were in contact with a confirmed case 7-17 days prior to onset of symptoms to determine the existence of an epidemiological link.

4. Collect specimens.

   Serologic specimens should be obtained between days 4 and 28 after rash onset. However, a single serum obtained at the first contact with the health care system, regardless of which day following the rash onset this occurs, is considered adequate.

5. Assess potential for transmission and identify contacts.

   The potential for transmission is usually determined by a number of susceptible contacts. Transmissions are particularly likely in schools and other institutions where population is densely aggregated.

   △ Determine dates of rash onset for each of the cases.
   △ Identify all contacts of the measles patients during their infectious period (4 days before and 4 days after the rash)
   △ Contacts over 9 months year of age that have not documented evidence of receiving at least one dose of measles containing vaccine are considered susceptible

6. Implement control and prevention measures (see next section).

7. Write a report and send it to the regional CPH in two copies (the region CPH will forward one copy to NCDC). This report should include:
△ The first part of the Measles Investigation Card (see Figure 16) completed for each single case (number of cases in the card(s) should correspond to the number of cases indicated in the monthly report form).

△ Outbreak Investigation Card, which is prepared for measles/rubella group cases (see Figure 17)

8. Inform local health administration and other stakeholders about outbreak/group cases verbally or in a written form.
Figure 16. Measles Investigation Card (part one) monthly IV-03 1/Ms

<table>
<thead>
<tr>
<th>#</th>
<th>Patient epidemiological number</th>
<th>Registration # in NCDC</th>
<th>Region</th>
<th>rayon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>GE</td>
<td>GE</td>
<td>GE</td>
</tr>
<tr>
<td>2.</td>
<td>Name (additional info⁴)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Rash onset date</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>4.</td>
<td>Sex</td>
<td>Female, Male</td>
<td>Female, Male</td>
<td>Female, Male</td>
</tr>
<tr>
<td>5.</td>
<td>Date of birth</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>6.</td>
<td>Age at rash onset</td>
<td>Full no. of years_______</td>
<td>Full no. of years_______</td>
<td>Full no. of years_______</td>
</tr>
<tr>
<td>7.</td>
<td>Date of last vaccination</td>
<td>Date month year unknown</td>
<td>Date month year unknown</td>
<td>Date month year unknown</td>
</tr>
<tr>
<td>8.</td>
<td>Date of notification to CPH</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>9.</td>
<td>Clinical description: Fever</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
</tr>
<tr>
<td>10.</td>
<td>Clinical description: (underline) Cough, coryza, conjunctivits, unknown</td>
<td>Cough, coryza, conjunctivits, unknown</td>
<td>Cough, coryza, conjunctivits, unknown</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Rash duration</td>
<td>_____ days unknown</td>
<td>_____ days unknown</td>
<td>_____ days unknown</td>
</tr>
<tr>
<td>12.</td>
<td>Date of investigation</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>13.</td>
<td>Date of notification to CPH</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>14.</td>
<td>Date of investigation</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>15.</td>
<td>Clinical description: Fever</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
</tr>
<tr>
<td>16.</td>
<td>Complications</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
</tr>
<tr>
<td>17.</td>
<td>Hospitalization (indicate)</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
</tr>
<tr>
<td>18.</td>
<td>Group case</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
</tr>
<tr>
<td>19.</td>
<td>Encephalitis</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
</tr>
<tr>
<td>20.</td>
<td>Pneumonia</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
</tr>
<tr>
<td>21.</td>
<td>Diarrhea</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
<td>Yes, No, unknown</td>
</tr>
<tr>
<td>22.</td>
<td>Final Classification (underline one)</td>
<td>1)Discarded; 2) clinical 3) Lab.confirmed; 4) Epid.confirmed</td>
<td>1)Discarded; 2) clinical 3) Lab.confirmed; 4) Epid.confirmed</td>
<td>1)Discarded; 2) clinical 3) Lab.confirmed; 4) Epid.confirmed</td>
</tr>
<tr>
<td>23.</td>
<td>Date of spesimen collection?</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>24.</td>
<td>Date of lab result?</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>25.</td>
<td>Measles IgM</td>
<td>positive; negative; In process; Inconclusive</td>
<td>positive; negative; In process; Inconclusive</td>
<td>positive; negative; In process; Inconclusive</td>
</tr>
</tbody>
</table>

The card should be completed for each case and submitted to the region CPH before day 5 and to NCDC (Tbilisi, 380077, st. M. Asatiani #9, Tel. 37-16-77.39-64-38) before day 7 of the next month.

Responsible Person____________________________ (name, position) Signature____________________

⁴ If the information represents additional data on the case already reported, please indicate this.
⁵ Death is defined as death due to measles or its complications within 2 months of onset of measles.

56 Guidelines for Integrated Surveillance and Control of Vaccine Preventable Diseases in Georgia
26. If not vaccinated, indicate reasons

<table>
<thead>
<tr>
<th></th>
<th>Indigenous; Imported;</th>
<th>Indigenous; Imported;</th>
<th>Indigenous; Imported;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Import-related; Unknown</td>
<td>Import-related; Unknown</td>
<td>Import-related; Unknown</td>
</tr>
<tr>
<td>Name</td>
<td>_________________</td>
<td>_________________</td>
<td>_________________</td>
</tr>
</tbody>
</table>

27. Source of Infection. If known, indicate name

<table>
<thead>
<tr>
<th>Source of Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous; Imported; Import-related; Unknown</td>
</tr>
<tr>
<td>Name _______________</td>
</tr>
</tbody>
</table>

28. Contact with clinical case before 7-18 days of disease onset

<table>
<thead>
<tr>
<th>Response actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation</td>
</tr>
<tr>
<td>○ yes till ________ (date)</td>
</tr>
<tr>
<td>○ case is no longer contagious</td>
</tr>
<tr>
<td>○ no</td>
</tr>
<tr>
<td>○ yes till ________ (date)</td>
</tr>
<tr>
<td>○ case is no longer contagious</td>
</tr>
<tr>
<td>○ no</td>
</tr>
<tr>
<td>○ yes till ________ (date)</td>
</tr>
<tr>
<td>○ case is no longer contagious</td>
</tr>
<tr>
<td>○ no</td>
</tr>
</tbody>
</table>

> 9 months old susceptible contacts (that is contacts without a history of measles vaccination)

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Address</th>
<th>Vaccination performed?</th>
<th>Immunoglobulin given?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>YES-NO</td>
<td>YES-NO</td>
</tr>
</tbody>
</table>

Other outbreak control measures implemented:
1. 
2. 
3. 

Measures performed to promote awareness of measles surveillance:
1. 
2. 
3. 

Comments/Conclusions:
Figure 17. Measles / Rubella Group Outbreak Investigation Card
(circle relevant disease)

region ________________ rayon __________ facility ______________

1. Date of onset of the first case / / / / dd  mm  yy
2. Date of onset of the last case / / / / dd  mm  yy
3. Total number of cases
4. Number of deaths* (due to measles or its complications within 2 months of onset of measles)
5. Number of measles cases that resulted in encephalitis
6. Number of cases hospitalized
7. for Rubella: number of child-bearing age (14-49) women who are cases
8. for Rubella: number of pregnant women who are cases
9. Number of cases with specimens sent for laboratory investigation
10. Number of laboratory-confirmed cases

*Death is defined as death due to measles or its complications within 2 months of onset of measles.

<table>
<thead>
<tr>
<th>Immunization status</th>
<th>&lt;1 y</th>
<th>1–4 y</th>
<th>5–9 y</th>
<th>10–14 y</th>
<th>15-19 y</th>
<th>20-29 y</th>
<th>30+</th>
<th>Age unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2+ doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown number of doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description of the outbreak:

Measures taken:

Responsible person (name, position) __________________________ Signature __________________________
10.1.5 Measles Outbreak Control/Response

A single measles case in Georgia is considered an outbreak and requires the following control actions from the health facility and rayon CPH:

- All exposed susceptible (that is, people older than 9 months without a documented history of measles vaccination) are at risk for infection and further transmission to others. They should be vaccinated with a measles vaccine preferably within 72 hours of exposure to provide some protection. If vaccine supply is limited, priority should be given to young children for whom the risk of death is greatest. In most cases, post-exposure vaccination is preferable to the use of immunoglobulin. However, people contraindicated to measles vaccine (e.g., pregnant women; immuno-suppressed or deficient persons), children aged 9 to 11 months should be given immunoglobulin within 6 days of exposure.

- Exposed susceptible who were not immunized and not given IG, regardless of the reason, should be recommended to be isolated from the affected settings until at least 21 days after the onset of rash in the last case of measles in that setting.

- Children with measles should be kept out of school for 4 days after the appearance of a rash. Measles patients in the hospitals should also be isolated through the fourth day of rash to reduce the exposure of other patients at high risk.

- Imposing quarantine is usually both difficult and disruptive to schools and other institutions. Under special circumstances, such as during outbreaks in schools attended by a large number of persons who refuse vaccination, quarantine measures might be warranted. However such actions are not recommended as a routine measure for control of most outbreaks. Infants should be segregated if measles occurs in an institution.

10.1.6 Recommended Scope of Routine Monthly Analysis of Measles Surveillance Data to Be Performed by CPH

(See Chapter 5 for more detailed information.)

The CPH should perform a monthly analysis of the following data:

1. Measles vaccine coverage (at 24 months and 6 years) by year and subordinated area/setting
2. Incidence rate by month, year, and geographic area
3. Measles cases by age group and immunization status
4. Case “confirmation” rate for the territory
5. Completeness/timeliness of monthly reporting

During the “measles elimination” phase, the following additional performance indicators will be analyzed and assessed:
### Indicator

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of clinical cases of measles or rubella per 100,000 population</td>
<td>&gt;1</td>
</tr>
<tr>
<td>Percent of all clinical cases notified ≤ 7 days of rash onset</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>% of cases having had an adequate epidemiological investigation within 48 hours of notification</td>
<td>&gt; 80%</td>
</tr>
<tr>
<td>% of probable/clinical cases (not epidemiologically linked to a laboratory-confirmed case) with at least one specimen taken within 28 days of onset</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>Proportion of outbreaks/ with specimens taken from all or at least 5 cases</td>
<td>&gt; 90%</td>
</tr>
<tr>
<td>% of confirmed cases with source of infection (imported, import-related, or indigenous) identified</td>
<td>&gt; 80%</td>
</tr>
<tr>
<td>Number of clinical measles or rubella cases without final classification 60 days after rash onset</td>
<td>0</td>
</tr>
</tbody>
</table>

#### 10.1.7 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

1. Monitor incidence and coverage to track progress toward goals, e.g., decreasing incidence and increasing coverage (target 95 percent), and to identify areas of high risk or that have poor program performance

2. Describe the changing epidemiology of measles in terms of age and inter-epidemic period. Identify high-risk population groups.

3. Detect and investigate outbreaks to ensure proper response and determine why the outbreak occurred. Corrective measures will depend on the primary reason. The three major reasons are as follows:
   - Failure to vaccinate – low routine coverage, failure to provide timely post-exposure vaccination
   - Vaccine failure – people who fail to seroconvert initially (at least 5 percent of the population) and those who seroconvert but whose immunity subsequently wanes. Protective vaccine efficacy can be measured (see Section 5.3.8, on vaccine efficacy)
   - Accumulation of susceptibles – unvaccinated people and vaccine failures.

4. Determine when the next outbreak may occur due to a build-up of susceptibles and accelerate prevention activities beforehand: conduct supplementary immunization activities to target high-risk groups, such as children of a certain age group, identified through the analysis of epidemiological data (as indicated above) or sero-surveys.

5. Evaluate and improve the performance of the surveillance system (e.g., reaction time for notification, specimen collection).
# Protocol for Laboratory Conformation of Measles

**Sampling strategy:** Collect specimen from every isolated probable/clinical case. In case of a large outbreak, collect specimens from at least 5 cases from each cluster.

**Confirmation test:** Serological assay. Demonstration of measles-specific IgM antibody.

**Specimen to be collected:** Serum or plasma

**Referral laboratory:** NCDC. Focal person: Nazi Chitadze Phone: 39 89 46

## I. DOCUMENTATION

### Supplies needed:
- Journal 60/A
- Lab investigation request form
- Specimen label

### Steps:
1. Create a specimen label with patient's name, identification number, date, and time.
2. Fill in a copy of a lab investigation request form with patient information (it will accompany specimen to the lab).
3. Make sure patient information has been entered in Journal 60/A and an urgent notification has been sent to CPH.

## II. COLLECTION AND HANDLING

**Note:** Collect a single serum within 4-28 days of rash onset.

### Supplies needed:
- Gloves
- Pipette
- Vacutainer tube with needle
- Adhesive tape
- Tourniquet
- Band aid
- Sterilizing swabs

### Steps:
1. Collect 5ml of blood by venipuncture into a sterile tube (without anticoagulant) labeled with patient identification and collection date, and time.
2. Allow blood to clot.
3. Centrifuge blood at 1000g for 10 minutes to separate the serum.
   - Blood can be stored at 4-8°C for up to 24 hours before the serum is separated. Do not freeze whole blood. If there is no centrifuge, blood should be kept in refrigerator until there is complete retraction of the clot from the serum.
4. Carefully remove the serum with a pipette, avoiding extracting red cells, and transfer it aseptically into a sterile labeled vial.
   - If vacutainer tubes containing a gel (yellow cap) are used, serum does not need to be separated after centrifugation manually. (The gel will provide this function.)
5. Make sure vial is properly labeled (see Section I).

## III. STORAGE

- Whole blood may be held at 4-8°C if it can be transported to arrive at the testing lab within 24 hours. In other cases it should be centrifuged (if there is no centrifuge see Section II).
- Store serum at 4-8°C until it is ready for shipment for up to 7 days. (Sera must be frozen at -20°C for longer periods of storage; in this case, avoid repeated freezing and thawing.)

## IV. TRANSPORTATION

### Supplies needed:
- Ziplock plastic bag
- Box label
- Plastic container
- Cold box with ice packs

### Steps:
1. Tighten the cap, apply waterproof sealing tape over the cap and top of specimen container.
2. Place specimen container in a suitably sized plastic bag (1st layer) together with a small amount of absorbent material, such as cotton wool. The bag must be sealed either using heated bag sealer or waterproof adhesive tape; as an alternative, use ziplock plastic bags. Specimens from different patients should never be sealed in the same bag.
3. Sealed bags containing the specimens should be placed inside plastic containers with screw-cap lids (2nd layer). Provided that specimens have been double-bagged properly in sealed plastic bags, specimens from several patients may be packed inside the same secondary plastic container. Additional absorbent material should be placed inside the container to absorb any leakage that may occur.
4. Sealed plastic containers should be fitted into insulated 3rd layer containers (e.g., a cold box). First, place ice packs at the bottom of the box, and, along the sides, place the plastic container with the specimen in the center, then place more ice packs on top. Make sure that the container is firmly fixed in the outer box.
5. Put the lab investigation request form in a plastic bag and place it in the outer box.
6. Label box with name, address, and telephone number of the referral laboratory and the sender.
7. Label box with the safety precautions (“Do not freeze,” “Do not expose to heat,” “This side up,” “Biological specimen,” etc.).
8. Arrange shipping date.
9. When arrangements are finalized, inform the recipient of time and manner of transport and make sure that package reaches referral laboratory within 2–3 days of specimen collection.

## V. COMMUNICATING TEST RESULTS

Laboratory should communicate results to the clinician within 2 days of receiving the sample. If the result of the test is positive, it should also notify the rayon CPH.

### Steps:
1. Record the results in the case history and Journal 60/A.
10.2 Rubella and Congenital Rubella Syndrome

10.2.1 Rationale for Surveillance

Public health importance of rubella relates to the teratogenic effects of primary rubella infection in pregnant women. The most serious complications of rubella result from infection during the first trimester of pregnancy. Rubella infection can affect all organs of the developing fetus and cause miscarriage, fetal death, and congenital abnormalities. Twenty percent of infants born to women infected during the first 20 weeks of pregnancy will develop a pattern of birth defects called Congenital Rubella Syndrome (CRS). Maternal infection at a very early stage of gestation (prior to week 10) almost inevitably leads to serious complications: up to 90 percent of surviving infants will be born with CRS and it will be manifested with more severe permanent structural malformations (e.g., congenital heart disease, cataracts). Infants infected with rubella late in gestation (after week 20) do not normally exhibit clinical manifestation of CRS. Such a condition, when infants do not have clinical manifestation of CRS but do have rubella IgM antibodies, is defined as Congenital Rubella Infection (CRI). Infants with CRS and CRI are infectious for the first six months of life (possibly up to one year), and they can infect susceptible pregnant women.

Currently rubella infection in Georgia has a cyclic nature. However, after implementation of rubella vaccination, transmission of the infection will decrease and periods between outbreaks will increase.

CRS is subject to registration and reporting. CRS incidence in countries not performing routine immunization (Georgia was among them till 2004) typically ranges between 1.0 to 1.5 per 1000 live births (expected number for Georgia would be 40 to 60 cases annually). Prior to 2004 no cases of CRS were diagnosed in Georgia, indicating inadequate knowledge of CRS clinical manifestations among physicians.

As Georgia has started rubella immunization, surveillance data will be used to evaluate the effectiveness of the prevention program and to identify groups of people or areas where additional disease control efforts are required to reduce disease incidence. The National Health Policy calls for the introduction of rubella immunization to prevent the consequences of rubella during pregnancy and achieve CRS incidence < 0.01 per 1000 live births. Currently rubella routine vaccination is performed according to the National Immunization Calendar with MMR vaccine.

Even after the introduction of rubella vaccinations, CRS cases will continue to register for 20 years or more, until the cohorts of vaccinated children reach childbearing age.

The four major strategies to achieve the improved CRS incidence goal are the following:

- Achieve and maintain high rubella immunization levels for children.
- Ensure protection of women of childbearing age, up to 30 percent of whom in Georgia may be susceptible to rubella, by
  - Routinely immunizing girls 13-14 years old (this protects future mothers directly, although it has little effect on overall transmission of rubella)

6 Introduction of rubella vaccine into the EPI is not recommended for countries that can not sustain high vaccination coverage, because this will slow, but not interrupt rubella transmission, and susceptibility of women of childbearing age will increase. In Georgia, conditions for achieving and maintaining high rubella immunization levels in children are favorable.
Offering immunization to all women of childbearing age during family planning counselling and recommending they avoid becoming pregnant for three months after being vaccinated.

- Conduct accurate surveillance for rubella and CRS and take control measures promptly when a rubella outbreak occurs.

- Establish serological surveillance of susceptibility if resources permit to monitor (in addition to clinical surveillance) the effect of the program on susceptibility of different age groups, particularly among women of childbearing age.

## 10.2.2 Recommended Rubella Case Definition

**Clinical description:** Any patient of any age with:

- fever
- maculopapular rash, and
- suboccipital, cervical or post-auricular lymphadenopathy or arthralgia/arthritis

Rubella is not always manifested clinically.

**Case classification**

- *Clinical (probable)*: A case that meets the clinical description of rubella

- *Confirmed*: A confirmed case has at least one of the following:
  - *By laboratory*: presence of rubella-specific IgM antibodies
  - *Epidemiologically*: Meets the clinical description of rubella and has an epidemiological link to a laboratory-confirmed case

**Laboratory testing** for rubella is currently mandated for group cases (at least one case should be investigated).

**Epidemiological link** is defined as contact with another case 14-21 days prior to disease onset.

Pregnant women exposed to rubella should be advised to seek testing for rubella infection privately to decide if there is a need for early termination of pregnancy. Asymptomatic rubella infection can be diagnosed by a positive rubella-specific IgM antibody test or a significant rise in IgG antibody between acute- and convalescent-phase tests. The acute-phase IgG serum specimen should be collected as soon as possible after exposure, whereas the convalescent-phase IgG specimen should be collected >7 to 14 days (preferably two to three weeks) later.

---

7 Up to one-third of rubella infections may be subclinical (e.g., without elevated temperature or without rash).
10.2.3 Rubella and CRS Case Notification, Procedures, and Forms

Follow the general requirements outlined in Chapter 4 of the guidelines on notification and reporting: any clinical (probable) rubella or CRS case identified by providers or a positive rubella lab test requires submission of an urgent notification to CPH within 24 hours by any existing means of communication.

10.2.4 Rubella Outbreak Investigation

**Note:** Every clinical (probable) or confirmed case requires an investigation by a rayon CPH epidemiologist in cooperation with facility health workers within 2 business days of notification.

The following steps should be taken (please refer to Chapter 6 on outbreak investigation for more details).

- **a)** *Verify that all cases meet the clinical description of rubella by reviewing medical records.*

- **b)** *Collect data as envisioned in the rubella investigation card (see Figure 18).*

  The collected data should be verified against the information found in the health facility’s infectious disease register 60/A. It is entirely possible that the investigation will identify additional cases that have not been registered by the health facility.

- **c)** *Identify the source of infection and establish epidemiological links.*

  Check if rubella patients were in contact with a clinical (probable) or confirmed case 11-24 days prior to the onset of symptoms to determine the existence of an epidemiological link.

- **d)** *Assess potential for transmission and identify contacts.*

  The potential for transmission is usually determined by a number of susceptible contacts. Transmissions are particularly likely in schools and other institutions where population is densely aggregated.

  - Determine dates of rash onset for each of the cases.
  - Identify all contacts (particularly pregnant women) of the rubella patients during their infectious period (7 days before and 7 days after the rash).
  - Consider contacts over 9 months of age that have not documented evidence of receiving at least one dose of rubella containing vaccine as being susceptible.

- **e)** *Prepare a separate list of all women of childbearing age who are either rubella patients or contacts of a rubella case, indicating their pregnancy status, and if pregnant, the gestational age at disease onset.*

- **f)** *Analyze the data about the outbreak* as described in the general part of the guidelines.

  The emphasis should be on identifying areas and population groups at highest risk.

- **g)** *Implement control and prevention measures (see next section).*
h) Write a report and send it to the regional CPH in two copies (the regional CPH will forward one copy to NCDC). The report should include a

- The first part of the Rubella Investigation Card (see Figure 18) filled out for each single case (number of cases in the card should correspond to the number of cases indicated in the monthly report form)
- Outbreak Investigation Card, which is prepared for group cases of Measles/Rubella (see figure 17).

i) Inform local health administration and other stakeholders about outbreak/group cases verbally or in a written form.

10.2.5 Rubella Outbreak Control/Response

The goal of rubella outbreak investigation is to prevent exposure of susceptible pregnant women to rubella, and thereby prevent cases of CRS. The following control actions from the health facility and rayon CPH are required when three or more rubella cases are detected:

- Isolate patients for 5 to 7 days after rash onset and recommend that they restrict contact with pregnant women.
- Identify and vaccinate susceptible persons who have no contraindications to rubella vaccine. Immunoglobulin does not prevent rubella infection after exposure and is not recommended for that purpose.
- Recommend all pregnant women who are exposed to rubella to get serological evaluation for rubella specific IgM and IgG antibodies and immediate medical consultation.

Note: History of rubella infection in the past without serological confirmation is not reliable for assessing one’s immune status.

- Obtain a list of all pregnant women, particularly in the first trimester, and counsel all of them regarding the risks for intrauterine rubella infection and recommend that they restrict their contact with persons who have rubella and not attend activities where they might be exposed to rubella for at least 6 weeks (two incubation periods) after rash onset in the last identified patient to minimize their chances of coming in contact with persons with symptomatic or asymptomatic rubella infection.
- Conduct outreach activities in affected communities (e.g., at workplaces or schools) and facilities that should convey
  - the seriousness of rubella infection;
  - the importance of rubella vaccination; and
  - the importance of persons seeking medical advice for rubella-like illness and of health workers reporting rubella.
- Promote awareness of CRS and establish active CRS surveillance (specific activities are discussed below)
10.2.6  Recommended Congenital Rubella Syndrome Case Definition

CRS is an illness manifesting in infancy, resulting from rubella infection in utero.

**Case classification**

**Clinical (probable):**

An infant for whom a qualified physician detects two of the manifestations listed in a), or one manifestation listed in a) and one or more from b):

a) Cataracts/congenital glaucoma, congenital heart defect, hearing impairment (the most common defect), pigmentary retinopathy

b) Purpura, splenomegaly, microcephaly, mental retardation, meningoencephalitis, radiolucent bone disease, jaundice with onset within 24 hours after birth.

**Confirmed:** A case clinically consistent with rubella-specific immunoglobulin IgM antibody.

IgM will be easily detected in the first six months of life (rarely up to 1 year of age). The persistence of maternally derived rubella-specific IgG beyond 6 months (the age when they would usually have waned) can be detected in 95 percent of infants with CRS. The presence of IgG in a child over 6 months of age together with the clinical picture of CRS will be an indication of a prenatal rather than postnatal infection.

10.2.7  Recommended Congenital Rubella Infection Case Definition

**Case classification**

**Clinical (probable):** A case without clinical manifestations that has a history of rubella exposure during mother’s pregnancy

**Confirmed:** A case with no clinical manifestations in which rubella-specific immunoglobulin M (IgM) antibody was detected

10.2.8  How to Promote Awareness of CRS and Establish Active CRS Surveillance

Cases of CRS may be identified through the following methods:

- **Active surveillance for CRS after a rubella outbreak, initiated early in an outbreak and continued for at least 9 months after it ended.** The CPH should follow up with all the pregnant women infected with rubella during pregnancy. Obstetricians and pediatricians, as well as ophtalmologists, otologists, cardiologists, and cardiac surgeons should be alerted to the occurrence of an outbreak and its implications, informed of the clinical (probable) case definition for CRS, provided with written guidelines or training if necessary, and supplied with appropriate notification forms. Pediatricians should be advised to screen infants attending DPT

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6 The most common defects are: patent ductus arteriosus and peripheral pulmonary artery sclerosis

Guidelines for Integrated Surveillance and Control of Vaccine Preventable Diseases in Georgia
immunization visits for signs of CRS and inquire about the maternal history of rubella in pregnancy.

- Retrospective review of hospital records of CRS-compatible defects in infants
- The integration of CRS studies in general surveys of disability
- Serological studies in the institutions for the deaf and/or blind

**CRS case investigation** should be initiated by the CPH within 24 hours of getting a notification about a single case of CRS. If the NCDC or regional CPH experts are available, they will normally assume leadership in the investigation. Case-based data should be collected as envisioned in the CRS case investigation card (see Figure 19), and blood samples should be collected from the infant.9

<table>
<thead>
<tr>
<th>Infants with CRS are presumed to be infectious during the first year of life, so the following control measures should be instituted:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Infants with CRS should be cared for only by personnel (e.g., caregivers, household contacts, medical personnel, laboratory workers) known to be immune to rubella; otherwise, such personnel should be immunized.</td>
</tr>
<tr>
<td>- Infants with CRS should be managed with contact isolation. Their mothers should be made aware of the potential hazard of their infants to susceptible pregnant contacts.</td>
</tr>
</tbody>
</table>

### 10.2.9 Recommended Scope of Routine Monthly Analysis of Rubella Surveillance Data to Be Performed by CPH

(See Chapter 5 for more detailed information.)

The CPH should perform a routine monthly analysis of the following data:

1. Rubella vaccine coverage in different age groups (at 24 months, at 6 years, in 14 year old girls) by year and subordinated area/setting
2. Rubella incidence rate by month, year, and geographic area
3. Rubella cases by age group and immunization status
4. Rubella and CRS case “confirmation” rate for the territory
5. Completeness/timeliness of monthly reporting
6. Rubella and CRS case investigation rate

When Georgia approaches the “rubella elimination” phase, the following additional **performance indicators** will be analyzed and assessed:

---

9 Laboratory testing is mandatory for every detected CRS case. Serum specimens should be sent to NCDC.
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of clinical cases of measles or rubella per 100,000 population</td>
<td>&gt;1</td>
</tr>
<tr>
<td>Percent of all clinical cases notified ≤ 7 days of rash onset</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>% of cases having had an adequate epidemiological investigation within 48 hours of notification</td>
<td>&gt; 80%</td>
</tr>
<tr>
<td>% of probable/clinical cases (not epidemiologically linked to a laboratory-confirmed case) with at least one specimen taken within 28 days of onset</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>Proportion of outbreaks/ with specimens taken from all or at least 5 cases</td>
<td>&gt; 90%</td>
</tr>
<tr>
<td>% of confirmed cases with source of infection (imported, import-related, or indigenous) identified</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>Number of clinical measles or rubella cases without final classification 60 days after rash onset</td>
<td>0</td>
</tr>
</tbody>
</table>

### 10.2.10 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

1. Monitor incidence and coverage to track progress toward goals, e.g., decreasing incidence and increasing coverage (target 95 percent), and to identify groups of people or areas where additional immunization efforts are required to reduce disease incidence.

2. Where necessary, enhance the existing immunization program by ensuring protection of women of childbearing age (for example, many CRS cases could be prevented through vaccination of women of reproductive age or postpartum vaccination).

3. Determine that the absence of reported CRS cases indicates the need to intensify CRS awareness and active surveillance (see above).

4. Evaluate and improve the performance of the surveillance system (e.g., reaction time for notification, case confirmation rate, outbreak investigation rate).

5. Conduct rubella and CRS education campaigns in high schools and other settings where susceptible females might congregate.
Figure 18. Rubella Investigation Card  (part one)  

<table>
<thead>
<tr>
<th>#</th>
<th>Patient epidemiological number</th>
<th>Registration # in NCDC</th>
<th>Region</th>
<th>rayon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Name (additional info)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Address</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Rash onset date</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>4.</td>
<td>Sex</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>5.</td>
<td>Date of birth</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>6.</td>
<td>Age at rash onset</td>
<td>______ unknown</td>
<td>______ unknown</td>
<td>______ unknown</td>
</tr>
<tr>
<td>7.</td>
<td>No of received doses</td>
<td>______ unknown</td>
<td>______ unknown</td>
<td>______ unknown</td>
</tr>
<tr>
<td>8.</td>
<td>Date of last vaccination</td>
<td>Date month year unknown</td>
<td>Date month year unknown</td>
<td>Date month year unknown</td>
</tr>
<tr>
<td>9.</td>
<td>Date of notification to CPH</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>10.</td>
<td>Date of investigation</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>11.</td>
<td>Clinical description: (underline)</td>
<td>Fever; maculopapular rash; artralgia/arthritis unknown</td>
<td>Fever; maculopapular rash; artralgia/arthritis unknown</td>
<td>Fever; maculopapular rash; artralgia/arthritis unknown</td>
</tr>
<tr>
<td>12.</td>
<td>Pregnancy (if applicable)</td>
<td>1) not pregnant; 2) _____wk pregnant; 3) unknown</td>
<td>1) not pregnant; 2) _____wk pregnant; 3) unknown</td>
<td>1) not pregnant; 2) _____wk pregnant; 3) unknown</td>
</tr>
<tr>
<td>13.</td>
<td>Hospitalization (indicate)</td>
<td>Yes ______ unknown No</td>
<td>Yes ______ unknown No</td>
<td>Yes ______ unknown No</td>
</tr>
<tr>
<td>14.</td>
<td>Group case</td>
<td>Yes No unknown</td>
<td>Yes No unknown</td>
<td>Yes No unknown</td>
</tr>
<tr>
<td>15.</td>
<td>Final Classification (underline one)</td>
<td>1)Discarded; 2) clinical 3) Lab.confirmed; 4) Epid.confirmed</td>
<td>1)Discarded; 2) clinical 3) Lab.confirmed; 4) Epid.confirmed</td>
<td>1)Discarded; 2) clinical 3) Lab.confirmed; 4) Epid.confirmed</td>
</tr>
<tr>
<td>16.</td>
<td>Date of specimen collection?</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>17.</td>
<td>Date of lab result?</td>
<td>Date month year</td>
<td>Date month year</td>
<td>Date month year</td>
</tr>
<tr>
<td>18.</td>
<td>Rubella IgM</td>
<td>positive; negative; In process; Inconclusive</td>
<td>positive; negative; In process; Inconclusive</td>
<td>positive; negative; In process; Inconclusive</td>
</tr>
</tbody>
</table>

Responsible Person __________________________ (name, position)________________________

Signature ____________________________

The card should be completed for each case and submitted to the region CPH before day 5 and to NCDC (Tbilisi, 380077, st. M. Asatiani #9, Tel. 37-16-77.39-64-38) before day 7 of the next month.

*If the information represents additional data on the case already reported, please indicate this.*
### Part two (to be filled and kept at CPH)

<table>
<thead>
<tr>
<th>19. If not vaccinated indicate reasons</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of Infection. If known indicate</td>
<td></td>
</tr>
<tr>
<td>name: Indigenous; Imported; Import-related; Unknown</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>20. Contact with clinical case before 11-24 days of disease onset</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous; Imported; Import-related; Unknown</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>21. Name____________</th>
</tr>
</thead>
</table>

#### Response actions

<table>
<thead>
<tr>
<th>isolation</th>
<th>○ yes till________ (date)</th>
<th>○ is not contagious ○ no</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ yes till________ (date)</td>
<td>○ is not contagious ○ no</td>
<td></td>
</tr>
<tr>
<td>○ yes till________ (date)</td>
<td>○ is not contagious ○ no</td>
<td></td>
</tr>
<tr>
<td>○ yes till________ (date)</td>
<td>○ is not contagious ○ no</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Counselled of the risk for pregnant women</th>
<th>○ Yes, by whom________</th>
<th>○ No</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes, by whom________</td>
<td>○ No</td>
<td></td>
</tr>
<tr>
<td>○ Yes, by whom________</td>
<td>○ No</td>
<td></td>
</tr>
<tr>
<td>○ Yes, by whom________</td>
<td>○ No</td>
<td></td>
</tr>
</tbody>
</table>

#### Susceptible contacts

<table>
<thead>
<tr>
<th>name</th>
<th>age</th>
<th>sex</th>
<th>pregnant status for all 14-49 aged women: 1) not pregnant; 2) _____ wks; 3) unknown</th>
<th>address</th>
<th>measures taken: vaccination, counseling, isolation</th>
</tr>
</thead>
</table>

Other outbreak control measures implemented:

1. 
2. 
3. 

Measures performed to promote awareness of CRS and establish active CRS surveillance:

1. 
2. 
3. 

Comments/Conclusions:

Responsible person ___________________________ ___________________________ (name, position)
Figure 19. Congenital Rubella Syndrome Investigation Card

<table>
<thead>
<tr>
<th># of facility and date</th>
<th>Registration # in NCDC</th>
<th>autonomous rep; region</th>
<th>rayon</th>
<th>monthly IV-03 3/CRS</th>
</tr>
</thead>
</table>

1. Name of child
2. Date of birth
   - Day
   - month
   - year
   - Birth weight ________ (grams)
3. Address
4. Place infant delivered
5. Clinical signs and symptoms
   - **Group A symptoms**
     - Congenital heart disease: Yes / No / Unknown
     - Cataract: Yes / No / Unknown
     - Glaucoma: Yes / No / Unknown
     - Pigmentary retinopathy: Yes / No / Unknown
     - Hearing impairment: Yes / No / Unknown
   - **Group B symptoms**
     - Purpura: Yes / No / Unknown
     - Microcephaly: Yes / No / Unknown
     - Meningoencephalitis: Yes / No / Unknown
     - Jaundice: Yes / No / Unknown
     - Splenomegaly: Yes / No / Unknown
     - Developmental delay: Yes / No / Unknown
     - Radiolucent bone disease: Yes / No / Unknown
   - Other abnormalities (please describe) ____________________________
   - Name and contact information of physician who examined infant _______________________
6. Present status of infant
   - Living
   - Deceased
   - If died, when
   - Date
   - month
   - year
   - Reason: ____________________________
7. Maternal history
   - Vaccinated against rubella?: Yes / No / Unknown
   - **Was rubella lab-confirmed in the mother?** Yes / No / Unknown
   - Any of the following symptoms during pregnancy?
     - Fever?: Yes / No / Unknown
     - Conjunctivitis?: Yes / No / Unknown
     - Coryza?: Yes / No / Unknown
     - Cough?: Yes / No / Unknown
     - Maculopapular rash?: Yes / No / Unknown
     - Lymph nodes swollen?: Yes / No / Unknown
     - Arthralgia/arthritis?: Yes / No / Unknown
   - Exposed during pregnancy to anyone with maculopapular rash and fever?: Yes / No / Unknown
   - Travel during pregnancy?: Yes / No / Unknown
8. Laboratory confirmed
   - Yes (positive test result)
   - Specify (IgM, PCR, virus isolation) ____________________________
   - No
   - Not tested
9. Final classification
   - Clinical (probable) – no laboratory test, but clinically consistent with CRS
   - Laboratory confirmed CRS – positive lab result with clinical manifestations
   - Congenital Rubella Infection – positive test result, but no clinical manifestation of CRS
   - Discarded – clinically inconsistent with CRS, negative lab result.

Responsible Person _________________________ Signature _________________________
(Name, position)
**PROTOCOL FOR LABORATORY CONFIRMATION OF RUBELLA**

**Sampling strategy:** Collect specimens from every isolated probable/clinical CRS case (see case definition above). In case of a large outbreak, collect specimens from at least 5 cases from each cluster.

**Confirmation test:** Serological assay. Demonstration of rubella specific IgM antibody.

**Specimen to be collected:** Serum or plasma.

**Referral laboratory:** NCDC.

<table>
<thead>
<tr>
<th>I. DOCUMENTATION</th>
<th>IV. TRANSPORTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supplies needed:</strong></td>
<td><strong>Supplies needed:</strong></td>
</tr>
<tr>
<td>Register 60/A</td>
<td>Ziplock plastic bag</td>
</tr>
<tr>
<td>Marker (water resistant)</td>
<td>Cold box with ice packs</td>
</tr>
<tr>
<td>Lab investigation request form</td>
<td>Plastic container</td>
</tr>
<tr>
<td>Specimen label</td>
<td>Box label</td>
</tr>
<tr>
<td><strong>Steps:</strong></td>
<td><strong>Steps:</strong></td>
</tr>
<tr>
<td>1. Create a specimen label with patient’s name, identification number, date, and time.</td>
<td>1. Tighten the cap, apply waterproof sealing tape over the cap and top of specimen container.</td>
</tr>
<tr>
<td>2. Fill in a copy of a lab investigation request form with patient information. (It will accompany specimen to the lab.)</td>
<td>2. Place specimen container in a suitably sized plastic bag (1st layer) together with a small amount of absorbent material, such as cotton wool. The bag must be sealed either using heated bag sealer or waterproof adhesive tape; as an alternative, use ziplock plastic bags. Specimens from different patients should never be sealed in the same bag.</td>
</tr>
<tr>
<td>3. Make sure patient information has been entered in register 60/A and an urgent notification has been sent to CPH.</td>
<td>3. Sealed bags containing the specimens should be placed inside plastic containers with screw-cap lids (2nd layer). Provided that specimens have been double-bagged properly in sealed plastic bags, specimens from several patients may be packed inside the same secondary plastic container. Additional absorbent material should be placed inside the container to absorb any leakage that may occur.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. COLLECTION AND HANDLING</th>
<th>V. COMMUNICATING TEST RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Note:</strong> collect a single serum at the first contact with patient</td>
<td>Laboratory should communicate results to the clinician within 2 days of receiving the sample. If the result of the test is positive, it should also notify the rayon CPH.</td>
</tr>
<tr>
<td><strong>Supplies needed:</strong></td>
<td><strong>Steps:</strong></td>
</tr>
<tr>
<td>Gloves</td>
<td>1. Record the results in the case history and Journal 60/A.</td>
</tr>
<tr>
<td>Vacutainer tube with needle</td>
<td></td>
</tr>
<tr>
<td>Tourniquet</td>
<td></td>
</tr>
<tr>
<td>Sterilizing swabs</td>
<td></td>
</tr>
<tr>
<td><strong>Steps:</strong></td>
<td></td>
</tr>
<tr>
<td>1. Collect 5 ml of blood (at least 3 ml from newborns) by venipuncture into a sterile tube (without anticoagulant) labeled with patient identification and collection date and time.</td>
<td></td>
</tr>
<tr>
<td>2. Allow blood to clot.</td>
<td></td>
</tr>
<tr>
<td>3. Centrifuge blood at 1000g for 10 minutes to separate the serum.</td>
<td></td>
</tr>
<tr>
<td>* Blood can be stored at 4-8°C for up to 24 hours before the serum is separated. Do not freeze whole blood. If there is no centrifuge, blood should be kept in refrigerator until there is complete retraction of the clot from the serum.</td>
<td></td>
</tr>
<tr>
<td>4. Carefully remove the serum with a pipette, avoiding extracting red cells, and transfer it aseptically into a sterile labeled vial.</td>
<td></td>
</tr>
<tr>
<td>* If vacutainer tubes containing a gel (yellow cap) are used, serum does not need to be separated after centrifugation manually. (The gel will provide this function.)</td>
<td></td>
</tr>
<tr>
<td>5. Make sure vial is properly labeled (see Section I).</td>
<td></td>
</tr>
</tbody>
</table>

| III. STORAGE |  |
|--------------|  |
| ▲ Whole blood may be held at 4-8°C if it can be transported to arrive at the testing lab within 24 hours. In other cases it should be centrifuged (if there is no centrifuge see Section II). |  |
| ▲ Store serum at 4-8°C until it is ready for shipment for up to 7 days (Sera must be frozen at -20°C for longer periods of storage; in this case, avoid repeated freezing and thawing). |  |
10.3 Mumps

10.3.1 Rationale for Surveillance

Outbreaks of mumps can prevent a large number of people from attending school and work. Although severe complications are rare, mumps can cause acquired sensorineural hearing loss in children (incidence is estimated at 5 per 100,000 cases). Mumps-associated encephalitis occurs in <2 per 100,000 cases, with approximately 1 percent of encephalitis cases being fatal. Some complications of mumps are known to occur more frequently among adults than among children. Adults have a higher risk for mumps meningoencephalitis than children. In addition, orchitis occurs in up to 38 percent of cases in post-pubertal males. Although it is frequently bilateral, it rarely causes sterility. Mastitis has been reported in as many as 31 percent of female mumps patients older than 15 years. Other rare complications of mumps are oophoritis and pancreatitis.

The reported number of mumps cases in Georgia is between 2500 and 5000 annually (or 55-110 per 100,000 population). Routine immunization of children started in 2001; however, coverage achieved in 2001-2002 was very low (<20 percent) due to vaccine shortages. The Georgia National Health Policy envisions reduction of mumps incidence to <0.1 per 100,000 by 2006 by achieving 95 percent coverage of the eligible population with planned immunization and increased effectiveness of epidemiological surveillance to evaluate the prevention program effectiveness and identify high-risk areas and population groups to prevent potential outbreaks.

Strategies to achieve this goal include the following:

▲ Achieve and maintain high mumps immunization coverage among children according to the national immunization calendar (the target is 95 percent).

▲ Conduct supplemental campaigns with a mumps-containing vaccine periodically or during outbreak situations (without regard to vaccination history), providing a second opportunity for vaccination and “catching up” the cohort of susceptibles (since the mumps vaccine is not 100 percent effective). The target age group should be determined according to mumps susceptibility. (e.g., on a basis of epidemiological data).

▲ Establish effective surveillance for mumps to report regularly the number, age, and vaccination status of people contracting mumps, to thoroughly conduct outbreak investigations and to monitor immunization coverage.

10.3.2 Recommended Mumps Case Definition

Clinical description: Mumps is an illness that

▲ is identified by an acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland and

▲ lasts more than two days without any other apparent cause.11

---

11 Not all cases of parotitis, especially sporadic ones, are due to mumps infection. Parotitis can also be caused by obstruction of salivary duct, tumors, drugs, parainfluenza virus types 1 and 3, influenza A virus, Coxsakie A virus, and HIV. However, these agents do not produce parotitis on an epidemic scale.
Case classification

- **Clinical (probable):** A case that meets the clinical description of mumps.

- **Confirmed:**
  - **By laboratory:** A case that meets the clinical description of mumps and has
    - Isolation of mumps virus from an appropriate clinical specimen\(^{12}\) or
    - Seroconversion or significant (at least fourfold) rise in serum mumps IgG titre\(^{13}\) or
    - IgM specific antibodies\(^{14}\).
  - **Epidemiologically:** A case that meets the clinical description of mumps and has an epidemiological link\(^ {14}\) to another laboratory-confirmed case.

Laboratory testing for mumps is currently not required.

### 10.3.3 Mumps Case Notification Procedures and Forms.

Follow the general requirements outlined in Chapter 4: any clinical (probable) mumps case identified by providers requires submission of an urgent notification to the CPH within 48 hours by any existing means of communication.

### 10.3.4 Mumps Case/Outbreak Investigation

Rapid identification of suspected clinical (probable) or confirmed cases of mumps is important in the initiation of control measures to prevent the spread of the disease among susceptible persons.

**Note:** Every clinical (probable) case requires an investigation by a rayon CPH epidemiologist in cooperation with facility health workers within one business day of notification.

The following steps should be undertaken in an investigation (refer to Chapter 6 on outbreak investigation for more detailed information):

- **a) Verify that all cases meet the clinical description of mumps by reviewing medical records.**
- **b) Collect data as envisioned in the mumps outbreak investigation card (see Figure 20).**
  
  The collected data should be verified against the information found in the health facility’s infectious disease register 60/A. It is entirely possible that the investigation will identify additional cases that have not been registered by the health facility.

- **c) Identify the source of infection and establish epidemiological links.**

\(^{12}\) Mumps virus can be isolated from throat swabs, urine and CSF.
\(^{13}\) In the absence of mumps immunization in the preceding six weeks
\(^{14}\) A close contact (household, school, etc.) with a clinical case 11 to 26 days prior to the onset of symptoms.
Check if mumps patients were in contact with a clinical (probable) or confirmed case 11-26 days prior to the onset of symptoms to determine the existence of an epidemiological link.

**d) Assess potential for transmission and identify contacts.**

The potential for transmission is usually determined by a number of susceptible contacts. Transmissions are particularly likely in schools and other institutions where the population is densely aggregated.

All contacts of the mumps case patients during their infectious period (2 days before and 9 days after the onset of parotitis) should be identified. Contacts over 9 months of age that have not documented evidence of receiving at least one dose of mumps-containing vaccine are considered susceptible.

**e) Analyze the data about the outbreak** as described in the general part of the guidelines.

The emphasis should be on identifying areas and population groups at highest risk.

**f) Implement control and prevention measures (see next section).**

**g) Write a report and send it to the regional CPH in two copies (the regional CPH will forward one copy to NCDC).**

The report should include

- The first part of the Mumps Investigation Card (see Figure 20) completed for each single case (number of cases in the card(s) should correspond to the number of cases indicated in the monthly report form)

- Cluster Investigation Report, which is prepared for group cases.

**h) Inform local health administration and other stakeholders about outbreak/group cases verbally or in a written form.**

---

**10.3.5 Mumps Outbreak Control/Response**

Mumps is the only known cause of epidemic parotitis. The main strategy for controlling a mumps outbreak is to define the at-risk population and a transmission setting, and then to rapidly identify and vaccinate susceptible persons, or, if a contraindication exists, to exclude susceptible persons from the setting to prevent exposure and transmission. The following control actions should be taken:

1. Isolate patients and exclude them from school or workplace for nine days from onset of swelling.

2. Disinfect articles soiled with nose or throat secretions of patients.

3. Consider excluding exposed people who lack acceptable evidence of immunity (documented vaccination or a history a physician-diagnosed mumps) from school or work place from the 12th through the 26th days after exposure if other susceptibles are present.

4. Identify contacts and vaccinate susceptible persons. While mumps vaccination may not prevent the disease in persons already exposed, they will be protected against infection from subsequent exposures. However, if susceptible persons are immunized early in the course of an outbreak, they might be protected.
10.3.6 Recommended Scope of Routine Analysis of Mumps Surveillance Data to Be Performed by CPH

(See Chapter 5 for more details.)

The CPH should perform routine monthly analysis of the following data:

- Mumps vaccine coverage (at 24 months) by year and subordinated area/setting
- Mumps incidence rate by month, year, and geographic area
- Mumps cases by age group and immunization status
- Completeness/timeliness of monthly reporting
- Mumps outbreak investigation rate

10.3.7 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

- Monitor incidence and coverage to track progress toward goals, e.g., decreasing incidence and increasing coverage (target 95 percent)
- Identify and characterize population requiring additional disease control measures
- Evaluate and improve the performance of the surveillance system (e.g., reaction time for notification, case confirmation rate, outbreak investigation rate)
### Figure 20. Mumps Investigation Card

<table>
<thead>
<tr>
<th>#</th>
<th>If inform. is additional indicate*</th>
<th>Patient #1</th>
<th>Patient #2</th>
<th>Patient #3</th>
<th>Patient #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Address</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Disease onset date</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Day</td>
<td>month</td>
<td>year</td>
<td>Day</td>
<td>month</td>
</tr>
<tr>
<td>4</td>
<td>Sex</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>5</td>
<td>Date of birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Day</td>
<td>month</td>
<td>year</td>
<td>Day</td>
<td>month</td>
</tr>
<tr>
<td>6</td>
<td>No of received doses</td>
<td>____</td>
<td>unknown</td>
<td>____</td>
<td>unknown</td>
</tr>
<tr>
<td>7</td>
<td>Date of last vaccination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Day</td>
<td>month</td>
<td>year</td>
<td>Day</td>
<td>month</td>
</tr>
<tr>
<td>8</td>
<td>Date of notification to CPH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Day</td>
<td>month</td>
<td>year</td>
<td>Day</td>
<td>month</td>
</tr>
<tr>
<td>9</td>
<td>Date of investigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Day</td>
<td>month</td>
<td>year</td>
<td>Day</td>
<td>month</td>
</tr>
<tr>
<td>10</td>
<td>Clinical description: (underline)</td>
<td>1) tender, self-limited swelling of the parotid or other salivary gland; 2) lasts more than two days</td>
<td>1) tender, self-limited swelling of the parotid or other salivary gland; 2) lasts more than two days</td>
<td>1) tender, self-limited swelling of the parotid or other salivary gland; 2) lasts more than two days</td>
<td>1) tender, self-limited swelling of the parotid or other salivary gland; 2) lasts more than two days</td>
</tr>
<tr>
<td>11</td>
<td>Complications</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>Hospitalization (indicate)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>Outcome</td>
<td>Died; Alive; Unknown</td>
<td>Died; Alive; Unknown</td>
<td>Died; Alive; Unknown</td>
<td>Died; Alive; Unknown</td>
</tr>
<tr>
<td>14</td>
<td>Group case</td>
<td>Yes</td>
<td>No unknown</td>
<td>Yes</td>
<td>No unknown</td>
</tr>
<tr>
<td>15</td>
<td>Final classification (underline one)</td>
<td>1) Discarded; 2) Clinical; 3) Lab.confirmed; 4) Epid.confirmed</td>
<td>1) Discarded; 2) Clinical; 3) Lab.confirmed; 4) Epid.confirmed</td>
<td>1) Discarded; 2) Clinical; 3) Lab.confirmed; 4) Epid.confirmed</td>
<td>1) Discarded; 2) Clinical; 3) Lab.confirmed; 4) Epid.confirmed</td>
</tr>
</tbody>
</table>

*If the information represents additional data on the case already reported, please indicate this.

The card should be completed for each case and submitted to the region CPH before day 5 and to NCDC (Tbilisi, 380077, st. M. Asatiani #9, Tel. 37-16-77.39-64-38) before day 7 of the next month.

Responsible Person ______________________________ (name, position) ______________
Signature ____________________________
<table>
<thead>
<tr>
<th>16</th>
<th>Contact with clinical case before 11-26 days of disease onset</th>
</tr>
</thead>
</table>

**Part II (to be filled and kept at CPH)**

If not vaccinated indicate reasons

<table>
<thead>
<tr>
<th>16</th>
<th>Contact with clinical case before 11-26 days of disease onset</th>
</tr>
</thead>
</table>

**Response actions**

<table>
<thead>
<tr>
<th>Isolation</th>
<th>○ yes till________ (date)</th>
<th>○ yes till________ (date)</th>
<th>○ yes till________ (date)</th>
<th>○ yes till________ (date)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ case no longer infectious</td>
<td>○ case no longer infectious</td>
<td>○ case no longer infectious</td>
<td>○ case no longer infectious</td>
</tr>
<tr>
<td></td>
<td>○ no</td>
<td>○ no</td>
<td>○ no</td>
<td>○ no</td>
</tr>
</tbody>
</table>

**List of susceptible contacts aged > 9 months**

<table>
<thead>
<tr>
<th>name</th>
<th>age</th>
<th>address</th>
<th>measures taken: vaccination, isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other outbreak control measures implemented:

1
2
3

Comments/Conclusions:
10.4 Tetanus and Neonatal Tetanus

10.4.1 Rationale for Surveillance

In spite of the availability of DPT and Td vaccines and recommendations to use tetanus toxoid and tetanus immune globulin as post-exposure prophylaxis in wound management, 4 to 6 cases of this disease continue to be reported in Georgia annually. In 2002, the number of registered cases increased to 13, which is very alarming. With the reported case fatality rate at over 50 to 60\% percent in recent years, tetanus continues to be one of the leading causes of infectious disease mortality in Georgia.

Serologic studies demonstrated an excellent correlation between vaccination coverage and immunity to tetanus.

While most tetanus cases in Georgia occurred in nonimmunized adults, a growing number of cases in the age group 5-14 years reflect problems with routine immunization coverage of children. Because tetanus is a completely preventable disease, every case of tetanus should be considered a failure to vaccinate. Administration of post-exposure prophylaxis, timely diagnosis, and treatment of tetanus cases can significantly reduce the fatality rate. Every tetanus death should be considered a failure to diagnose and treat in a timely manner.

Note: Each case should therefore be used as a case study to determine which factors contributed to the failure and which measures could be taken to prevent such cases in the future.

Information obtained through surveillance can help to characterize population groups or geographic areas in which additional efforts are needed to raise vaccination levels and reduce disease incidence and case fatality. It can be also used to raise awareness of the importance of adult immunization.

Strategies to combat tetanus include the following:

1. Achieve and maintain high (>90 percent) DPT and DT coverage in children, and provide Td booster to all persons > 14 years of age every 10 years.

2. Identify the population groups or geographic areas where tetanus cases are occurring and offer a Td immunization or booster to all adults without documental evidence of immunization.

3. Ensure that emergency reserves of tetanus antitoxin, immune globulin, and toxoid are available in each rayon and can be promptly mobilized for treatment or post-exposure prophylaxis in facilities should the need arise.

4. Establish effective surveillance for tetanus to report detailed case-based information, thoroughly investigate every tetanus case and death, and monitor immunization coverage with tetanus-containing toxoids (vaccines).

Tetanus case fatality rate worldwide is 2 to 18 percent. Higher tetanus case fatality in Georgia is most likely indicative of under-reporting of nonfatal cases.
10.4.2 Recommended Case Definition

**Clinical description**: Any person with acute onset of hypertonia and/or painful muscular contractions (usually of the muscles of the jaw and neck) and generalized muscle spasms without other apparent cause.

**A clinical description of neonatal tetanus is as follows**: Any neonate with a normal ability to suck and cry during the first two days of life, and who between 3 and 28 days of age cannot suck normally, and becomes stiff or has convulsions or both.

**Case classification**

- **Clinical (probable)**: A case that meets the clinical description of tetanus or neonatal tetanus
- **Confirmed**: not applicable

10.4.3 Tetanus and Neonatal Tetanus Case Notification Procedures and Forms

Follow the general requirements outlined in Chapter 4: any clinical (probable) tetanus case identified by providers requires submission of an urgent notification to CPH within 24 hours by any existing means of communication.

Prompt notification may save a patient’s life because this will facilitate:

- receiving faster hospitalization (nasotracheal intubation and mechanically assisted respiration are often required),
- receiving faster administration of tetanus immunoglobulin or antitoxin, and
- obtaining timely expert consultations on clinical management issues

10.4.4 Tetanus and Neonatal Tetanus Case Investigation

A single case of tetanus requires an investigation by a rayon CPH epidemiologist in cooperation with facility health workers within 3 business days of notification. Should there be a case of neonatal tetanus, the investigation should be performed within 2 business days and will be led by NCDC and/or regional CPH experts. The following steps should be undertaken in an investigation:

- **a) Verify that the case meets the clinical description of tetanus by reviewing medical records**
- **b) Collect case-based data as envisioned in the standard tetanus investigation card (see Figure 21)**
- **c) Analyze the case-based data and immunization coverage\(^{16}\) with tetanus-containing vaccines**

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\(^{16}\) Tetanus coverage should be analyzed routinely (monthly) by CPH. Due to there being a small number of cases, other tetanus surveillance indicators will be analyzed at the national level.
Identify all reasons that have or may have contributed to a fatal outcome:

- Failure to immunize
- Vaccine failure
- Patient sought care too
- Medicines not
- Unacceptable delay of specific treatment after first medical
- Inappropriate post-exposure prophylaxis
- Inappropriate case treatment
- Failure to ensure aseptic conditions during delivery

**d) Implement measures to prevent future cases**

- Intensify routine immunization of children with DPT and DT to reach at least 90 percent coverage
- Write a case study and distribute to all practitioners in the country to promote their awareness.
- Intensify health education of population
- Create a reserve of essential medicines for tetanus management
- Enforce adherence to case management standards and enhance provider education
- Conduct a Td booster campaign for adults (appropriate territory and/or population groups to be defined in consultation with NCDC based on epidemiological and serological survey data).
- Evaluate reliability of cold chain for vaccine storage and transportation

**e) Complete the tetanus investigation card and send it to regional CPH in two copies (the CPH will forward one copy to NCDC).** The number of cards should correspond to the number of cases indicated in the monthly report form.
### Figure 21. Tetanus Investigation Card

<table>
<thead>
<tr>
<th># of facility and date</th>
<th>Registration # in NCDC autonomous rep; region rayon</th>
<th>monthly IV-03 5/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Full name of patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Date of birth</td>
<td>Day / Month / Year /</td>
<td></td>
</tr>
<tr>
<td>3 Address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Tetanus toxoid history prior to the disease</td>
<td>Include doses of ALL tetanus-containing toxoids. Exclude doses received after this particular injury. ○ Never ○ 1 dose ○ 2 doses ○ 3 doses ○ 4 doses ○ 5+ doses ○ Unknown Interval since last tetanus toxoid dose __________ (years)</td>
<td></td>
</tr>
<tr>
<td>6 Circumstances of antecedent injury</td>
<td>Date occurred / Month / Year / /Describe the incident Anatomic site Contaminated (dirt, soil, etc)? Y/N Work related? Y/N Signs of infection? Y/N If no acute injury, identify and describe associate condition (e.g., diabetic ulcer) ____________________________________________________________________________________________</td>
<td></td>
</tr>
<tr>
<td>7 Prophylactic care Prior to disease onset</td>
<td>Did the patient seek medical care for this injury? Y/N If yes, was TETANUS TOXOID administered after injury but before disease onset? Yes Not offered Not available If yes, how soon after injury? ○ Within 24hrs ○ 1-4 days ○ More than 5 days Was TETANUS IMMUNOGLOBULIN prophylaxis given before tetanus onset? Yes Not offered Not available If yes, how soon after injury? ○ Within 24hrs ○ 1-4 days ○ More than 5 days Was WOUND DEBRIDED before tetanus onset? Yes No If yes, how soon after injury? ○ Within 24hrs ○ 1-4 days ○ More than 5 days</td>
<td></td>
</tr>
<tr>
<td>8 Course and treatment of tetanus disease</td>
<td>Disease onset Date/ Month / Year / / First contact with health system Date/ Month / Year / / Hospitalized? Date/ Month / Year / /Place of hospitalization ____________________________ Tetanus IMMUNOGLOBULIN or ANTITOXIN therapy given? Yes Not offered Not available Patient refused Initial dose ________ Total dosage ________ How soon after the first contact with health system? ○ Within 24hrs ○ 1-4 days ○ More than 5 days</td>
<td></td>
</tr>
<tr>
<td>9 In case of death</td>
<td>Day / month / year / Reason: ________________________________ Possible contributing factors (check all that apply): ○ Not adequately immunized ○ Vaccination did not protect ○ Did not seek preventive care ○ Absence of TT for prophylaxis ○ Prophylaxis not given ○ Patient sought treatment too late ○ Treatment delayed after 1st consultation ○ Absence of tetanus antitoxin or immune globuline ○ Treatment not offered ○ Patient refused treatment ○ Delivery in non-aseptic conditions ○ Other (specify) __________________</td>
<td></td>
</tr>
<tr>
<td>10 Neonatal patients (less than 28 days old)</td>
<td>Mother’s tetanus toxoid history prior to child’s disease (known doses only) ○ None ○ 1 dose ○ 2 doses ○ 3 doses ○ 4 doses ○ 5+ doses ○ Unknown Interval since last tetanus toxoid dose __________ (years) Patient born in ○ Hospital ○ Home ○ Other (specify) __________________ Birth attended by ○ Physician ○ Nurse/midwife ○ Other (specify) __________________</td>
<td></td>
</tr>
</tbody>
</table>

Responsible Person ______________________________ Signature ____________________

(Name, position)

The card should be submitted to the region CPH before day 5 and to NCDC (Tbilisi, 380077, st. M. Asatiani #9, Tel. 37-16-77.39-64-38) before day 7 of the next month for each case.
10.5 Pertussis

10.5.1 Rationale for Surveillance

Pertussis is a major cause of childhood morbidity. The number of reported cases in Georgia is 80 to 300 annually (1.8-6.0 per 100,000 population). However, this disease is believed to be underreported in Georgia, because pertussis is often overlooked in the differential diagnosis of cough illness.

Pertussis-related deaths (none reported in Georgia in recent years) are mostly caused by secondary bacterial pneumonia. Other complications are rare, but may include neurological complications such as seizures and encephalopathy, otitis media, and conditions resulting from the pressure effects of severe paroxysmal coughing, such as pneumothorax, epistaxis, subdural hematomas, hernias and rectal prolapse. The risk of serious complications is the highest among young children, particularly those under one year of age.

Information obtained through surveillance of this disease should be used to do the following:

▲ Monitor the impact of routine immunization program and identify persons or areas in which additional efforts are required to reduce disease incidence

▲ Promptly identify outbreaks in which vaccination of non- and under-immunized children and anti-microbial prophylaxis of contacts can help limit the spread of the disease

▲ Monitor the effectiveness of outbreak control strategies.

The Georgia National Health Policy envisions reduction of pertussis incidence to < 0.1 per 100,000 by 2006 through the following strategies:

▲ Achieve more than 90 percent coverage of the eligible population with planned immunization and addressing excessively administered contraindications (the target is 95 percent coverage). The priority is to ensure that infants are completely immunized with a primary series of three doses of DPT vaccine at the youngest age possible (4 months of age).

▲ Establish effective surveillance for pertussis to report regularly the number, age, and vaccination status of children contracting pertussis, to thoroughly conduct outbreak investigations with proper case and contact management, and to monitor immunization coverage.

▲ Improve laboratory confirmation of pertussis, particularly standardization of specimen collection, transport, and processing.

10.5.2 Recommended Pertussis Case Definition

Clinical description: Pertussis is evident in a person that has a cough lasting at least two weeks and at least one of the following:

▲ paroxysms of coughing, or

▲ inspiratory “whooping” and
vomiting immediately after cough without other apparent cause.

**Case classification**

- **Clinical (probable):** A case that meets the clinical description of pertussis

- **Confirmed:** A case that meets the clinical description of pertussis and has at least one of the following criteria:
  - **Laboratory-confirmed:**
    - Isolation of *B. pertussis* from a clinical specimen or
    - Positive polymerase chain (PCR) reaction assay for *B. pertussis*
    - Positive paired serology
  - **Epidemiologically confirmed:** an epidemiological link to a lab-confirmed case.

**Epidemiological link** is a close contact with another confirmed cases 2-15 days prior to onset of symptoms.

**Laboratory testing** is currently mandated for confirmation of outbreaks when there is a clustering of 3 or more clinical (probable) cases. Samples can be analyzed at NCDC.

---

**10.5.3 Pertussis Case Notification Procedures and Forms**

Any clinical case of pertussis identified by providers or a positive pertussis lab test requires urgent notification of the CPH within 24 hours by any existing means of communication. General requirements are outlined in more detail in Chapter 4.

---

**10.5.4 Pertussis Case/Outbreak Investigation**

Anti-microbial treatment of promptly identified cases may lessen the severity of symptoms and may limit the period of communicability. In addition, prompt identification of cases will facilitate early identification of un- or under-vaccinated children among contacts. These children, if reached quickly, may be protected with vaccination. Anti-microbial prophylaxis of household and other close contacts may prevent secondary cases. Because pertussis can be very severe among young infants, early anti-microbial prophylaxis is particularly important in this age group.

**Note:** Every single reported pertussis case has to be investigated by a rayon CPH epidemiologist in cooperation with NCDC and regional CPH experts and facility health workers within 1 business day of notification.

The following steps are required in an investigation:

- **a) Verifying that all cases meet the clinical description of pertussis by reviewing medical records.**

- **b) Collect data as envisioned in the pertussis investigation card** (see Figure 22).

The collected data should be verified against the information found in the health facility’s infectious disease register 60/A.
c) Identify the source of infection and establish epidemiological links.

Check if pertussis patients were in close contact with a laboratory-confirmed case 2-15 days prior to onset of symptoms to determine the existence of an epidemiological link.

d) Collect specimens if the outbreak involves three or more pertussis cases from all of the patients.

The standard and preferred laboratory test for diagnosis of pertussis is isolation of *B. pertussis* by bacterial culture. The timing of specimen collection can affect the isolation rate, as can inadequately collected specimens. Isolation of the organism is most successful during the catarrhal stage (i.e., first 1-2 weeks of cough), prior to administration of antibiotics.

e) Assess potential for transmission and identify contacts.

The potential for transmission is usually determined by the number of susceptible contacts. Pertussis is transmitted by direct contact with discharges from respiratory mucous membranes of infected persons by the airborne route. Transmission is particularly likely at home (the disease can be brought in by a sibling) or among other close contacts.

- Identify all close contacts of the pertussis patients during their infectious period (from the early catarrhal stage to three weeks after onset of typical paroxysms; or if treated with antibiotics, the period of infectiousness usually stops five days after onset of therapy). Close contacts are household members and people who had direct contact with respiratory secretions from the case, (e.g., an explosive cough or sneeze in the face, sharing food or eating utensils, kissing or conducting a medical examination).

- Antibodies acquired passively through placenta rapidly fall during the first months of life. All close contacts over 4 months of age without documented evidence of receiving at least three DPT doses are therefore considered susceptible.

f) Implement control and prevention measures (see next section).

g) Write a report and send it to the regional CPH in two copies (the region CPH will forward one copy to NCDC). The report should include

- The first part of the Pertussis Investigation Card (see Figure 22) completed for each single case (number of the cases in the card(s) should correspond to the number of cases indicated in the monthly report form)

- Cluster Investigation Report, which is prepared for group cases

h) Inform local health administration and other stakeholders about outbreak/group cases verbally or in a written form.

10.5.5 Pertussis Outbreak Control/Response

A single pertussis case in Georgia is considered an outbreak and requires the following control actions from the health facility and rayon CPH:

- Respiratory isolation should be enforced for known cases. Exclude contact with young children and infants, especially non-immunized infants, until the patient has received at least 5 days of a minimum 14-day course of antibiotics. Cases that do not receive antibiotics should be isolated for 3 weeks.
Discharges from nose and throat and articles soiled by these cases should be disinfected.

Inadequately immunized household contacts under 7 years of age should be excluded from schools, day care centers, and public gatherings for 21 days after last exposure or until the cases and contacts have received 5 days of appropriate antibiotics.

**Protection of close contacts** to prevent or minimize transmission (household members and people who had direct contact with respiratory secretions from the case, e.g., an explosive cough or sneeze in the face, sharing food or eating utensils, kissing or conducting a medical examination)

- Administer antibiotic prophylaxis for 14 days regardless of age and vaccination status. Initiating chemo-prophylaxis more than 3 weeks after exposure has limited benefit for the contacts.
- All close contacts under 7 years of age who have not received four doses of DPT should complete the series with minimal intervals (30 days between doses 1-2 and 2-3, and 6 months between the third and fourth dose). Close contacts under seven years of age that have received 4 doses of DPT, but have not received a dose within 3 years of exposure should be given a booster dose of DPT.

*Pertussis vaccine is not given to persons 7 years of age or older, since reactions to the vaccine may be increased in older children and adults.*

### 10.5.6 Recommended Scope of Routine Analysis of Pertussis Surveillance Data to Be Performed by CPH

(See Chapter 5 for more details.)

The CPH should perform routine monthly analysis of the following data:

- DPT-3 (at 12 months) and DPT-4 (at 24 months) coverage by year and subordinated area/setting
- Incidence rate by month, year, and geographic area
- Pertussis cases by age group and immunization status
- Case “confirmation” and laboratory confirmation rates for the territory
- Completeness/timeliness of monthly reporting
- Pertussis case/outbreak investigation rate.
### Figure 22. Pertussis Investigation Card

<table>
<thead>
<tr>
<th>#</th>
<th>If inform. is additional indicate*</th>
<th>Patient #1</th>
<th>Patient #2</th>
<th>Patient #3</th>
<th>Patient #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Address</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Disease onset date</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
</tr>
<tr>
<td>4</td>
<td>Sex</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>5</td>
<td>Date of birth</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
</tr>
<tr>
<td>6</td>
<td>No of received doses</td>
<td>_____ unknown</td>
<td>_____ unknown</td>
<td>_____ unknown</td>
<td>_____ unknown</td>
</tr>
<tr>
<td>7</td>
<td>Date of last vaccination</td>
<td>Day month year unknown</td>
<td>Day month year unknown</td>
<td>Day month year unknown</td>
<td>Day month year unknown</td>
</tr>
<tr>
<td>8</td>
<td>Date of notification to CPH</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
</tr>
<tr>
<td>9</td>
<td>Date of investigation</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
</tr>
<tr>
<td>10</td>
<td>Clinical description: (underline)</td>
<td>Cough; paroxysms; inspiratory whooping; vomiting immediately after cough; unknown</td>
<td>Cough; paroxysms; inspiratory whooping; vomiting immediately after cough; unknown</td>
<td>Cough; paroxysms; inspiratory whooping; vomiting immediately after cough; unknown</td>
<td>Cough; paroxysms; inspiratory whooping; vomiting immediately after cough; unknown</td>
</tr>
<tr>
<td>11</td>
<td>Antibiotic therapy</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>Complications</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>Hospitalization (indicate)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>14</td>
<td>Outcome</td>
<td>Dies; Alive Unknown</td>
<td>Dies; Alive Unknown</td>
<td>Dies; Alive Unknown</td>
<td>Dies; Alive Unknown</td>
</tr>
<tr>
<td>15</td>
<td>Group case</td>
<td>Yes</td>
<td>No unknown</td>
<td>Yes</td>
<td>No unknown</td>
</tr>
<tr>
<td>16</td>
<td>Final classification (underline one)</td>
<td>1)Discarded; 2) Clinical</td>
<td>1)Discarded; 2) Clinical</td>
<td>1)Discarded; 2) Clinical</td>
<td>1)Discarded; 2) Clinical</td>
</tr>
<tr>
<td>17</td>
<td>Date of specimen collection?</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
</tr>
<tr>
<td>18</td>
<td>Date of lab result?</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
<td>Day month year</td>
</tr>
</tbody>
</table>

*If the information represents additional data on the case already reported, please indicate this.

Responsible Person ______________________________ (name, position)____________________
Signature_____________________

The card should be completed for each case and submitted to the region CPH before day 5 and to NCDC (Tbilisi, 380077, st. M. Asatiani #9, Tel. 37-16-77.39-64-38) before day 7 of the next month.


### Part II (to be filled and kept at CPH)

<table>
<thead>
<tr>
<th>19. If &lt;3 doses for ≥ 4 months old child, indicate reasons</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>20. Indicate start and end date of antibiotic therapy if performed</th>
<th>/ / / /</th>
<th>/ / / /</th>
<th>/ / / /</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>month</td>
<td>year</td>
<td>Day</td>
</tr>
</tbody>
</table>

| 21. Source of Infection. If known, indicate | unknown; known: |  |  |  |

### Response actions

<table>
<thead>
<tr>
<th>isolation</th>
<th>○ yes till________ (date)</th>
<th>○ yes till________ (date)</th>
<th>○ yes till________ (date)</th>
<th>○ yes till________ (date)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ is not contagious ○ no</td>
<td>○ is not contagious ○ no</td>
<td>○ is not contagious ○ no</td>
<td>○ is not contagious ○ no</td>
<td></td>
</tr>
</tbody>
</table>

> 9 months susceptible contacts

<table>
<thead>
<tr>
<th>name</th>
<th>age</th>
<th>address</th>
<th>measures taken: vaccination, isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other outbreak control measures implemented:

1
2
3
4.

### Comments/Conclusions:

Responsible person ___________________________ _______________________________________

(name, position)
10.5.7 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

▲ Monitor incidence and coverage to track progress toward goals, e.g., decreasing incidence and increasing coverage (target 95 percent), and to identify areas of high risk or with poor program performance.

▲ Promptly identify outbreaks in which vaccination of non- and under-immunized children and anti-microbial prophylaxis of contacts can help limit the spread of the disease.

▲ Determine why the outbreak occurred. The three major reasons are
  ▲ failure to vaccinate (low routine coverage),
  ▲ vaccine failure (low protective efficacy of vaccine), and
  ▲ accumulation of susceptibles (unvaccinated people and vaccine failures)

Corrective measures will depend on the primary reason for the outbreak.

▲ Monitor the effectiveness of outbreak control strategies.

▲ Describe the changing epidemiology of pertussis reflected in increased incidence among adults. Raise awareness of physicians, as pertussis is often overlooked in the differential diagnosis of cough illness in adults.

▲ Evaluate and improve the performance of the surveillance system (e.g., reaction time for notification, specimen collection).
### PROTOCOL FOR LABORATORY CONFORMATION OF PERTUSSIS

**Sampling strategy:** If your facility has registered 3 or more pertussis cases during the past 30 days, collect specimens from the last patient and two more pertussis patients. Collect specimens at any time on request of CPH.

**Confirmation test:** Isolation of *B. pertussis* by bacterial culture

**Specimen to be collected:** Naso-pharyngeal swab or aspirate

**Referral laboratory:** NCDC. Focal person: Tsaro Gomeluri Phone 39 89 46 / 39 64 38

### I. DOCUMENTATION

<table>
<thead>
<tr>
<th>Supplies needed:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Journal 60/A</td>
<td>○ Marker (water resistant)</td>
</tr>
<tr>
<td>○ Lab investigation request form</td>
<td>○ Specimen label</td>
</tr>
</tbody>
</table>

**Steps:**
1. Create a specimen label with patient’s name, identification number, date, and time.
2. Fill in a copy of a lab investigation request form with patient information. (It will accompany specimen to the lab.)
3. Make sure patient information has been entered in Journal 60/A and an urgent notification has been sent to CPH.

### II. COLLECTION AND HANDLING

**Note:** Collect two specimens (at the same time) preferably during the first 1-2 weeks of cough and before administration of antibiotics

<table>
<thead>
<tr>
<th>Supplies needed:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Dacron or calcium alginate swabs (avoid rayon or cotton swabs, because they contain acids toxic to <em>B. pertussis</em>)</td>
<td>○ Sterile saline solution</td>
</tr>
<tr>
<td>○ Regan-Lowe transport medium</td>
<td>○ Regan-Lowe agar or Bordet-Gangou media</td>
</tr>
</tbody>
</table>

**Steps:**
1. Gently elevate the nose with the thumb of one hand.
2. Moisten the tip of a small flexible wire naso-pharyngeal swab with sterile water or saline and gently insert it into one of the nostrils.
3. Guide the swab backward and upward along the nasal septum until a distinct feel of resistance indicates that the posterior pharynx has been reached.
4. Gently remove the swab.
   - If while guiding the swab undue resistance is met, attempt the procedure through the opposite nostril. (Pay attention if a tear drop appears — you are in the right place!)
5. Plate the specimen directly onto selective culture medium (Regan-Lowe agar or Bordet-Gengou medium) or place it in transport medium (half-strength Regan-Lowe).
   - **Note:** If these media are unavailable place the swab in a sterile container and send promptly to the lab. In this case, the specimen should arrive at the laboratory within 2 hours.
6. Make sure the medium is properly labeled (see Section I).

### IV. TRANSPORTATION

<table>
<thead>
<tr>
<th>Supplies needed:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Ziplock plastic bag</td>
<td>○ Shipping box/container</td>
</tr>
<tr>
<td>○ Plastic container</td>
<td>○ Box label</td>
</tr>
</tbody>
</table>

**Steps:**
1. Tighten the cap, apply waterproof sealing tape over the cap and top of specimen container.
2. Place specimen container in a suitably sized plastic bag (1st layer) together with a small amount of absorbent material, such as cotton wool. The bag must be sealed either using heated bag sealer or waterproof adhesive tape; as an alternative, use ziplock plastic bags. Specimens from different patients should never be sealed in the same bag.
3. Sealed bags containing the specimens should be placed inside plastic containers with screw-cap lids (2nd layer). Provided that specimens have been double-bagged properly in sealed plastic bags, specimens from several patients may be packed inside the same secondary plastic container. Additional absorbent material should be placed inside the container to absorb any leakage that may occur.
4. Sealed plastic containers should be fitted into insulated 3rd layer containers — outer shipping container.
5. Put the lab investigation request form in a plastic bag and place it in the outer box.
6. Label box with name, address, and telephone number of the referral laboratory and the sender.
7. Label box with the safety precautions (“Do not freeze,” “Do not expose to heat,” “This side up,” “Biological specimen,” etc.).
8. Arrange shipping date.
9. When arrangements are finalized, inform the recipient of time and manner of transport and make sure that package reaches referral laboratory within 24 hours of specimen collection.
## III. STORAGE

### Steps:
1. Specimen inoculated on the transport media can be stored at room temperature (25°C) for up to 24 hours until shipment.
2. If transportation is delayed, the specimen with the help of an epidemiologist should be inoculated on the Bordet-Gangou media and placed in a thermostat at 37°C (max 3-4 days).
3. In other cases the specimen should be decontaminated. If the facility is not able to decontaminate, the specimen should be sent to the laboratory for this purpose.

## V. COMMUNICATING TEST RESULTS

### Steps:
1. Laboratory should communicate results to the clinician within 2 days of receiving the sample. If the result of the test is positive, it should also notify the rayon CPH.

1. Record the results in the case history and in Journal 60/A
10.6 Acute Viral Hepatitis B (with case definitions for acute viral hepatitis A-E)

10.6.1 Rationale for Surveillance

Hepatitis B virus (HBV) infection is one of the major causes of infectious disease morbidity and mortality in Georgia. Based on the seroprevalence of HBsAg in the population (approximately 3 percent overall, and as high as 20 to 40 percent in certain population groups such as intravenous drug users and health workers), Georgia is considered to be a country with intermediate Hepatitis B endemicity.

Approximately 450 to 600 cases of the clinically manifested acute HBV infection are reported annually (10-13 per 100,000). However, with the sharp reduction in hospital utilization by the population in recent years it is reasonable to assume underreporting of clinically manifested hepatitis B. More than half of acute HBV infections are asymptomatic and are rarely diagnosed and reported. Clinical forms of acute hepatitis B are often associated with a long period of disability and have fatal outcomes in 1 to 2 percent of cases.

A variable proportion of persons with acute HBV infection develop chronic infection. Chronic HBV infection is defined as the presence of HBsAg in serum for at least 6 months, or the presence of HBsAg with a negative test for IgM anti-HBc. The risk of developing chronic infection is age-dependent. It is greatest for infants (90 percent), if they are infected at birth (perinatal transmission). Overall 30 to 50 percent of children and 3 to 6 percent of adults with acute infection will develop chronic infections. Persons with chronic HBV infection are at increased risk of developing liver cirrhosis or primary liver carcinoma. It is estimated that at least 600 people die each year due to HBV-induced chronic liver disease in Georgia. In addition, persons with chronic HBV infection are a major reservoir for transmission of HBV infections to others.

Information obtained through hepatitis B surveillance can be used to perform the following:

- Identify infected persons who need counseling to protect their liver from further harm and referral for medical management
- Identify contacts of cases who require post-exposure prophylaxis
- Detect outbreaks
- Monitor disease incidence in all age groups
- Determine the epidemiologic characteristics of infected persons, including the source of their infection, to assess and reduce the missed opportunities for vaccination.

The Georgia National Health Policy envisions reduction of the current hepatitis B incidence by 80 percent by 2009 through the following strategies:

1. Achieve greater than 90 percent coverage of infants with routine immunization (target 95 percent). A first dose should be given to infants as soon as possible after birth (preferably within 24 hours) to prevent HBV transmission from mother to infant. Perinatal transmission almost always results in a chronic infection.

2. Conduct catch-up vaccination of older persons in addition to routine infant vaccination (this
should not hinder efforts to achieve a high level of completion of the vaccination series among infants). Possible target groups could include young adolescents and persons with risk factors for acquiring HBV infection such as long-term haemodialysis patients, health personnel, intravenous drug users, commercial sex workers, residents of mental institutions, and so forth. The success of this strategy may vary, because persons in these groups usually initiate high-risk behaviors before they get vaccinated.

3. Maintain strict adherence to the post-exposure and perinatal exposure recommendations (described below).

4. Improve safety of medical manipulations including safe utilization of sharps, barrier protective measures, and thorough testing of blood and blood products.

5. Enhance public education about individual protection against blood-borne infections and sexually transmitted diseases (STDs).

10.6.2 Recommended Acute Viral Hepatitis Case Definitions

**Clinical description:** Any person that has an acute illness, typically including acute jaundice, dark urine, anorexia, malaise, fatigue, and right upper quadrant tenderness. Biological signs include increased urine urobilinogen and usually >2.5 times the upper limit of serum alanine aminotransferase (ALT).

**Note:** The proportion of asymptomatic infections is variable.

**Case classification**

- Clinical (probable) (unspecified acute viral hepatitis): A case that meets the clinical description above.

- Confirmed: A case that has at least one of the following.

**For hepatitis B:**

- IgM antibody to hepatitis B core antigen (anti-HBc) positive

**For hepatitis A:**

- IgM antibody to hepatitis A antigen (anti-HAV) positive or

- A case compatible with the clinical description in a person who has an epidemiological link (a close contact with a lab-confirmed case during his/her period of communicability 15 to 50 days prior to the onset of symptoms) with a confirmed hepatitis A case.

For patients negative for hepatitis A or B, further testing for a diagnosis of acute hepatitis C, D, or E is recommended.

---

17 The anti-HBc IgM test is specific for acute infection. HBsAg is less desirable since cannot distinguish acute new infections from exacerbation of chronic hepatitis B. Continued seropositivity (>six months) is an indicator of chronic infection.
For hepatitis C:

- IgM antibody to hepatitis C antigen (anti-HCV) positive

For hepatitis D: (only as co-infection or super-infection of hepatitis B)

- Anti-HDV positive and HBsAg positive
- Anti-HDV positive and IgM anti-HBc positive

For hepatitis E:

IgM antibody to hepatitis E antigen (IgM anti-HEV) positive

Because the clinical picture for all acute viral hepatitis A through E is similar, only laboratory testing can reliably distinguish various etiological agents. Testing for as many markers as possible is therefore very important, because response measures depend on the type of hepatitis identified.

Anti-HBs is present in persons who have resolved from the HBV infection or those who have developed immunity after vaccination. anti-HBc is not present after vaccination.

Laboratory testing is currently mandated for every clinical (probable) case of acute viral hepatitis (except for an outbreak of hepatitis A, where it is required to confirm at least one case, provided that all cases are epidemiologically linked or every case where such link cannot be established). The regional CPH can be contacted to obtain the most current list of NCDC recognized/recommended laboratories in the area.

10.6.3 Case Notification Procedures and Forms

Any clinical (probable) case of acute viral hepatitis identified by providers or a positive lab test for any hepatitis requiring urgent notification of the CPH within 24 hours by any existing means of communication. General requirements are outlined in more detail in Chapter 4.

10.6.4 Hepatitis B Case/Outbreak Investigation

Although outbreaks of hepatitis B are rare, rapid identification and investigation of cases of acute hepatitis B is important because the source could be identified and measures can be taken to prevent further transmission to other persons (e.g., post-exposure prophylaxis). In addition, identification of risk factors for infection provides a means to assess the effectiveness of hepatitis B immunization activities in the community and identify missed opportunities for immunization.

Note: A confirmed acute hepatitis B case requires an investigation by a rayon CPH epidemiologist in cooperation with facility health workers within 3 business days of notification.

The following steps are recommended in an investigation (see also Chapter 6):

a) Verify that all hepatitis B cases are laboratory confirmed by reviewing medical records.

Collect serum specimens to confirm the evidence of acute liver disease (elevated aminotransferase levels) and determine its type if this has not been done previously.
b) Collect data as envisioned in the acute hepatitis B outbreak investigation card (see Figure 23).

The collected data should be verified against the information found in health facility’s infectious disease register 60/A.

c) Identify the source of infection. Verify the following with respect to every patient:

- Was he/she in contact with an acute or chronic hepatitis case?

  Sexual ○   Household ○   Other ○ _________

- Did the person have dental work or surgery?

- Did the person have another type of surgery?

- Did the person have medical injections or vaccinations with nondisposable (i.e., used on multiple occasions) needles or syringes?

- Did the person have invasive diagnostic or endoscopic procedures?

- Did the person use needles for injection of drugs?

- Did the person have an accidental stick or puncture with a needle or other object contaminated with blood?

- Did the person have acupuncture? Tattooing? Ear piercing?

- Was the person employed in a medical, dental, or other field involving contact with human blood?

- Did the person receive blood or blood products? Specify dates _______

- Did the person have multiple sexual partners?

- Was the person associated with a dialysis or kidney transplant unit?

d) Conduct a search for additional cases if two or more cases occur in association with common exposure.

e) Investigate safety of (medical) manipulations and practices by the potential source of infection, such as the following:

  △ Adequacy of sterilization
  △ Safe utilization of sharps and medical waste
  △ Implementation of barrier methods for protection
  △ Sensitivity of tests used for screening of donated blood for HbsAg

f) Identify and prepare a list of contacts for post-exposure prophylaxis (e.g., sexual, household, persons with suspected blood exposure).

g) Implement control and prevention measures (see next section).

h) In case of outbreaks write a report and send to regional CPH in two copies (the region CPH will forward one copy to NCDC). The report should include:
The first part of the **Hepatitis B Investigation Card** (see Figure 23) filled for each single case (number of cases in the card(s) should correspond to the number of cases indicated in the monthly report form)

**Cluster Investigation Report**, which is prepared for group cases

**h) Inform local health administration and other stakeholders about outbreak verbally or in a written form.**

### 10.6.5 Outbreak Control/Response

An outbreak of viral hepatitis requires the following control actions from the health facility and rayon CPH:

1. If the source of infection is identified, implement measures to stop further transmission by addressing the reason; for example:

   - Institute strict aseptic standards, adequate sterilization and safe medical waste disposal in the health facility
   - Withdraw the infected lot of a blood/plasma derivative from use
   - Test all donated blood by a more sensitive test
   - Impose stricter donor selection standards (e.g., only people without a history of viral hepatitis and injecting drug use who have not been received a blood transfusion or tattoo in the past 6 months); and,
   - Enforce aseptic sanitary practices in the tattoo parlor.

2. Ensure that post-exposure and perinatal prophylaxis are carried out.

**Post-exposure prophylaxis**

a. Susceptible18 sexual contacts and persons with suspected blood exposure (e.g., sharing razors) to the index case should be given Hepatitis B Immunoglobulin (5 ml) and begin hepatitis B vaccine on a 0, 1-, and 6-month schedule preferably within 48 hours (maximum 14 days) of the exposure/last sexual contact. Immunoglobulin and vaccine should be administered into different anatomic sites.

b. After percutaneous (e.g., needle stick) or mucous membrane exposures to blood that might contain HBsAg, a decision to provide post-exposure prophylaxis must include consideration of several factors:

   - Whether information on the source of blood is available
   - HBsAg status of the source
   - Hepatitis B status of the exposed person.

c. Immunization of all other household contacts of a person with acute or chronic infection, particularly children and adolescents, is strongly encouraged.

---

18 Testing for susceptibility may be considered if it does not delay the above measures. Persons are not susceptible to HBV infection if they are positive for anti-HBc, which are indicative of acute, resolved, or chronic infection.
d. If the index case is a mother or caretaker of a child <12 months of age, this infant should be given
Hepatitis B Immunoglobulin (0.5ml) and also vaccinated. Immunoglobulin is not needed for
infants who already received at least 2 doses of the vaccine.

**Perinatal exposure prophylaxis**

Infants born to HbsAg-positive women should receive immunoprophylaxis with Hepatitis B
Immunoglobulin (0.5–1ml) and hepatitis B vaccine within 12 hours of birth. Follow-up doses of vaccine
should be given according to the immunization schedule (at 2 and 4 months of age). Immunoglobulin and
vaccine should be administered into different anatomic sites.

10.6.6 **Recommended Scope of Routine Analysis of Hepatitis B
Surveillance Data to Be Performed by CPH**

(See Chapter 5 for more details.)

The CPH should perform routine monthly analysis of the following data:

1. Hepatitis B-3 (at 12 months) coverage by subordinated area/setting
2. Incidence rate by month, year, and geographic area
3. Hepatitis B cases by age group and immunization status
4. Case/laboratory confirmation rates for the territory
5. Completeness/timeliness of monthly reporting
6. Acute hepatitis B outbreak investigation rate

10.6.7 **Principle Uses of Data for Decision Making at the Regional and
Rayon Levels**

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

▲ Monitor Hepatitis B-3 coverage by geographic area to identify areas with weak program
   performance where action needs to be taken to correct the situation.

▲ Promptly identify outbreaks and investigate why they occurred. Implement respective measures
to stop further transmission and monitor the effectiveness of control strategies.

▲ Understand the epidemiology of hepatitis B in terms of distribution over time, by age
group/occupation and by geographical area, typical causes and choose proper strategies for
routine control measures, such as

▲ Providing catch-up immunization;
▲ Improving safe utilization of sharps, use of barrier protective measures, etc.; and
▲ Enhancing public education about individual protection against blood-borne infections and STDs.

▲ Evaluate and improve the performance of the surveillance system (e.g., reaction time for
   notification, specimen collection).
# Acute Hepatitis B Outbreak Investigation Card

<table>
<thead>
<tr>
<th>#</th>
<th>Patient #1</th>
<th>Patient #2</th>
<th>Patient #3</th>
<th>Patient #4</th>
<th>Patient #5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Name</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Date of birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Address</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Group case</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6.</td>
<td>Date of disease onset</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
</tr>
<tr>
<td>7.</td>
<td>Results of laboratory confirmation tests</td>
<td>1. Anti HBc</td>
<td>2. HBs Ag</td>
<td>1. Anti HBc</td>
<td>2. HBs Ag</td>
</tr>
<tr>
<td>8.</td>
<td>Date of lab results</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
</tr>
<tr>
<td>9.</td>
<td>Date of notification to CPH</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
</tr>
<tr>
<td>10.</td>
<td>Date of epid investigation</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
</tr>
<tr>
<td>11.</td>
<td>Hospitalization</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>12.</td>
<td>Outcome</td>
<td>Died</td>
<td>Alive</td>
<td>Unknown</td>
<td>Died</td>
</tr>
<tr>
<td>13.</td>
<td>Number of immunizations received</td>
<td>__________ Unknown</td>
<td>__________ Unknown</td>
<td>__________ Unknown</td>
<td>__________ Unknown</td>
</tr>
<tr>
<td>14.</td>
<td>Last vaccination date</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
<td>/ /Day/ /Mo/ /Yr</td>
</tr>
<tr>
<td>15.</td>
<td>Risk factor and source of infection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Responsible Person: ________________________ (name, position)____________________
Signature: ______________________________

The card should be completed for each case and submitted to the region CPH before day 5 and to NCDC (Tbilisi, 380077, st. M. Asatiani #9, Tel. 37-16-77.39-64-38) before day 7 of the next month.
### Place of work, school or children's setting

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Vaccine</td>
</tr>
<tr>
<td>Refusal</td>
</tr>
<tr>
<td>Contraindication</td>
</tr>
</tbody>
</table>

If not vaccinated specify reasons:

- Refusal
- Contraindication

**SECTION II (POTENTIAL EXPOSURE TO INFECTION 50-180 DAYS PRIOR TO ONSET and SOURCE OF INFECTION)**

- Contact with an acute or chronic hepatitis case?
- Dental work or surgery?
- Other surgery?
- Medical injections or vaccinations with non-disposable needles/syringes?
- Invasive diagnostic or endoscopic procedures?
- Used needles to inject drugs?
- Accidental stick with a needle/object contaminated with blood?
- Cosmetic manipulations?
- Acupuncture?
- Tattooing?
- Ear piercing?
- Employed in a medical, dental or other field involving contact with human blood?
- Received blood or blood products?
- Multiple sexual partners?
- Associated with a dialysis or transplant unit?

**Common exposure with any other case?**

- Yes
- No

**Potential source of infection**

- Yes
- No
### Safety of practices by source

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sterilization adequate?</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Sharps/waste utilization safe?</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Barrier methods implemented?</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Blood screening tests sensitive?</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

### SECTION III (RESPONSE)

#### List of contacts for post-exposure prophylaxis

<table>
<thead>
<tr>
<th>Full name</th>
<th>Age</th>
<th>Address</th>
<th>Place of study/work</th>
<th>Type of contact (household, sexual, suspected blood or perinatal exposure)</th>
<th>Susceptible/Immune?</th>
<th>Date immunization started</th>
<th>Date immune globulin given</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Implemented measures aimed at the source of infection to stop further transmission

1. 
2. 
3. 

#### Other outbreak control measures:

1. 
2. 
3. 

#### Comments/Conclusions:

Responsible person ___________________________ ___________________________ (name, position)
PROTOCOL FOR LABORATORY CONFIRMATION OF ACUTE VIRAL HEPATITIS

**Sampling strategy:** Collect specimens from every probable/clinical case of acute viral hepatitis (except for an outbreak of hepatitis A, where it is required to confirm at least one case, provided that all cases are epidemiologically linked, or every case, where such link can not be established.

**Confirmation test:** Serological assay. Demonstration of IgM antibody to hepatitis B core antigen (anti-HBc) or hepatitis B surface antigen (HBsAg) if the previous test cannot be done.

**Specimen to be collected:** Serum or plasma

**Referral laboratory:** Contact regional CPH for a list of NCDC recognized/recommended labs in your area.

### I. DOCUMENTATION

**Supplies needed:**
- Register 60/A
- Lab investigation request form
- Specimen label

**Steps:**
1. Create a specimen label with patient’s name, identification number, date, and time.
2. Fill in a copy of a lab investigation request form with patient information. (It will accompany specimen to the lab).
3. Make sure patient information has been entered in Journal 60/A and an urgent notification has been sent to CPH.

### II. COLLECTION AND HANDLING

**Note:** Collect a single serum at the first contact with patient.

**Supplies needed:**
- Gloves
- Vacutainer tube with needle
- Tourniquet
- Sterilizing swabs
- Pipette
- Adhesive tape
- Band aid

**Steps:**
1. Collect 5ml of blood by venipuncture into a sterile tube (without anticoagulant) labeled with patient identification and collection date, and time.
2. Allow blood to clot.
3. Centrifuge blood at 1000g for 10 minutes to separate the serum.
   * Blood can be stored at 4-8°C for up to 24 hours before the serum is separated. Do not freeze whole blood. If there is no centrifuge, blood should be kept in refrigerator until there is complete retraction of the clot from the serum.
4. Carefully remove the serum with a pipette, avoiding extracting red cells, and transfer it aseptically into a sterile labeled vial.
   * If vacutainer tubes containing a gel (yellow cap) are used, serum does not need to be separated after centrifugation manually. (The gel will provide this function).
5. Make sure vial is properly labeled (see Section I).

### III. STORAGE

Store serum at 4-8°C until it is ready for shipment for up to 7 days. (Sera must be frozen at -20°C for longer periods of storage; in this case, avoid repeated freezing and thawing.) Whole blood may be held at 4-8°C if it can be transported to arrive at the testing lab within 24 hours.

### IV. TRANSPORTATION

**Supplies needed:**
- Ziplock plastic bag
- Plastic container
- Cold box with ice packs
- Box label

**Steps:**
1. Tighten the cap, apply waterproof sealing tape over the cap and top of specimen container.
2. Place specimen container in a suitably sized plastic bag (1st layer) together with a small amount of absorbent material, such as cotton wool. The bag must be sealed either using heated bag sealer or waterproof adhesive tape; as an alternative, use ziplock plastic bags. Specimens from different patients should never be sealed in the same bag.
3. Sealed bags containing the specimens should be placed inside plastic containers with screw-cap lids (2nd layer). Provided that specimens have been double-agged properly in sealed plastic bags, specimens from several patients may be packed inside the same secondary plastic container. Additional absorbent material should be placed inside the container to absorb any leakage that may occur.
4. Sealed plastic containers should be fitted into insulated 3rd layer containers (e.g., a cold box). First place ice packs at the bottom of the box, and, along the sides, place the plastic container with the specimen in the center, then place more ice packs on top.
5. Put the lab investigation request form in a plastic bag and place it in the outer box.
6. Label box with name, address, and telephone number of the referral laboratory and the sender.
7. Label box with the safety precautions (“Do not freeze,” “Do not expose to heat,” “This side up,” “Biological specimen,” etc.).
8. Arrange shipping date.
9. When arrangements are finalized, inform the recipient of time and manner of transport and make sure that package reaches referral laboratory within 2–3 days of specimen collection.

### V. COMMUNICATING TEST RESULTS

Laboratory should communicate results to the clinician within 2 days of receiving the sample. If the result of the test is positive, it should also notify the rayon CPH.

**Steps:**
1. Record the results in the case history and the Journal 60/A.
10.7 Diphtheria

10.7.1 Rationale for Surveillance

A major epidemic of diphtheria in the 1990s killed more than 150 people in Georgia. Many of those who survived suffered from severe complications of this disease caused by remote effects of the diphtheria toxin, such as myocarditis and nerve paralysis. The epidemic control measures including mass immunization of the country population, laboratory testing, and treatment of 2000 patients and many thousands of contacts required a lot of material and human resources.

It is well known that the epidemic in Georgia, as well as in other countries of the European Region, has been caused primarily by a lack of routine immunization of adults and low coverage in children. The epidemic has highlighted the need for adequate surveillance and epidemic preparedness. Some of the fatalities could have been prevented if the cases had been detected earlier in the course of the disease and diphtheria antitoxin administered at an earlier stage.

Now that the epidemic is fully controlled, surveillance information will be used primarily to monitor the effectiveness of the routine disease prevention and control program and to characterize infected patients and areas so that additional intervention efforts can be focused on assessing and reducing the missed opportunities for vaccination, providing necessary anti-microbial prophylaxis, and enhancing epidemic preparedness activities.

The Georgia National Health Policy envisions reduction of diphtheria incidence < 0.1 per 100,000 population and elimination of diphtheria fatality by 2006 through the following strategies:

- Achieve more than 90 percent coverage of infants and children with routine immunization (target 95 percent). The immunization schedule calls for a five-dose immunization schedule: primary series of three doses of DPT reinforced with a first DPT booster dose in the second year of life and a second booster DT given at the age of five years.
- Achieve more than 85 percent coverage of adolescent and adult population Td boosters, given at 10-year intervals.
- Provide prompt detection, appropriate case management, and availability of adequate supplies of antitoxin and antibiotics.
- Conduct rapid case investigation and management of close contacts.
- Conduct appropriate outbreak management.
- Ensure adequate surveillance and strengthening of laboratory network.

10.7.2 Recommended Diphtheria Case Definition

Clinical description: Diphtheria is an acute illness characterized by

- laryngitis or pharyngitis or tonsillitis and
- an adherent membrane of the tonsils, pharynx, and/or nose.
Case classification

△ **Probable (clinical):** A case that meets the clinical description of diphtheria.

△ **Confirmed:** A case clinically compatible with at least one of the following:

△ Isolation of toxin-producing *Corynebacterium diphtheriae* or *C. ulcerans* from a clinical specimen, or

△ An epidemiological link\(^\text{19}\) to a confirmed case.

**Note:** Nonrespiratory/cutaneous diphtheria cases with isolation of toxigenic strains should be reported, as should asymptomatic carriers (any anatomical site) with toxigenic strains. Cases with nontoxigenic *C. diphtheriae* or *C. ulcerans* should not be reported.

**Laboratory testing** is currently mandated for every clinical (probable) case of diphtheria. The regional CPH can be contacted to obtain the most current list of NCDC recognized/recommended laboratories in the area.

### 10.7.3 Case Notification Procedures and Forms

Any clinical (probable) or confirmed case of diphtheria identified by providers or isolation of *Corynebacterium diphtheriae* or *C. ulcerans* by any laboratory requires urgent notification of the CPH within 24 hours by any existing means of communication. General requirements are outlined in more detail in Chapter 4.

### 10.7.4 Diphtheria Case/Outbreak Investigation

Rapid recognition and investigation of the disease is important to ensure early appropriate treatment with diphtheria antitoxin, obtain necessary laboratory specimens before antibiotic or antitoxin treatment, identify and evaluate contacts, and provide necessary antimicrobial prophylaxis to prevent further spread.

**Note:** Every single reported diphtheria case has to be investigated by a rayon CPH epidemiologist in cooperation with NCDC and regional CPH experts and facility health workers within 2 business day of notification. The following steps are required for investigation (see also Chapter 6):

\begin{itemize}
\item[a)] Verify that all cases meet the clinical description of diphtheria by reviewing medical records.
\item[b)] Collect data as envisioned in the diphtheria investigation card (see Figure 24).
\end{itemize}

The collected data should be verified against the information found in the health facility’s infectious disease register 60/A. All newly identified cases as a result of the investigation should be recorded in this register as well. Facilities should follow up with recent cases of tonsillitis (registered within 7 to 10 days) for signs of diphtheria and continue filling out the investigation card for all new clinical (probable) cases identified.

---

\(^{19}\) Epidemiological link is defined as a close contact (household, work/school setting, etc.) with a confirmed case 2-7 days prior to the onset of symptoms.
c) **Identify the source of infection and establish epidemiological links.**

Check if diphtheria patients were in close contact with a confirmed case two to seven days prior to onset of symptoms to determine the existence of an epidemiological link.

*d) Assess potential for transmission and identify close contacts.*

Risk of contracting diphtheria is directly related to the proximity and the duration of the contact. A close contact is someone having cared for, having lived with, or having had direct contact with respiratory secretions of a clinical (probable) or confirmed case in the past seven days. Those are likely to be in the following groups:

- Household members living in the same house or apartment
- Friends, relatives, or caretakers who visited the patient at home
- Dates or sexual partners
- Classmates in the school or persons working in the same office.

A wider search for carriers is very complicated, expensive, and nonproductive.

e) **Collect specimens from all the patients (if not done yet) and their close contacts.**

All patients and their close contacts should have specimens taken from the nose and throat and from the membrane (i.e., both nasopharyngeal and pharyngeal swabs) for a culture prior to administration of antibiotics. If possible, swabs should be taken from beneath the membrane. Even if treatment with antibiotics has begun, specimens should be taken, but the likelihood of the bacteria isolation will be much smaller.

Serologic testing is recommended prior to the administration of antitoxin for cases only. Measurement of the patient’s serum antibodies may help in assessing the probability and the course of diphtheria. If antibody levels are low (<0.01 iu/ml), diphtheria cannot be ruled out even if the culture is negative, but if levels are high, *C. diphtheria* is less likely to produce serious illness.

f) **Implement control and prevention measures (see next section).**

g) **Write a report and send it to the regional CPH in two copies (the region CPH will forward one copy to NCDC).** The report includes:

- The first part of the Diphtheria Investigation Card (see Figure 24) completed for each single case (number of cases in the card(s) should correspond to the number of cases indicated in the monthly report form)
- Cluster Investigation Report, which is prepared for group cases

h) **Inform local health administration and other stakeholders about outbreak/group cases verbally or in a written form.**
### Figure 24. Diphtheria Investigation Card

<table>
<thead>
<tr>
<th>#</th>
<th>If information is additional indicate*</th>
<th>Patient #1</th>
<th>Patient #2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>City, rayon, address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Institutional setting?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Group case</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>If yes, what?</td>
<td>Kindergarten, School, High school, Office</td>
<td>Kindergarten, School, High school, Office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Contact with sick person or carrier?</td>
<td>Day/ /month / /Year / /</td>
<td>Day/ /month / /Year / /</td>
</tr>
<tr>
<td></td>
<td>If yes, when and with whom?</td>
<td>Name____________________</td>
<td>Name____________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>When did s/he become ill?</td>
<td>Day/ /month / /Year / /</td>
<td>Day/ /month / /Year / /</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name____________________</td>
<td>Name____________________</td>
</tr>
<tr>
<td></td>
<td>Contact with sick person or carrier?</td>
<td>Day/ /month / /Year / /</td>
<td>Day/ /month / /Year / /</td>
</tr>
<tr>
<td></td>
<td>If yes, when and with whom?</td>
<td>Name____________________</td>
<td>Name____________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>When did s/he visit doctor for the first time and at what facility?</td>
<td>Day/ /month / /Year / /</td>
<td>Day/ /month / /Year / /</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facility________________</td>
<td>Facility________________</td>
</tr>
<tr>
<td></td>
<td>Date diphtheria diagnosed for the first time</td>
<td>Day/ /month / /Year / /</td>
<td>Day/ /month / /Year / /</td>
</tr>
<tr>
<td></td>
<td>Date of notification to CPH</td>
<td>Day/ /month / /Year / /</td>
<td>Day/ /month / /Year / /</td>
</tr>
<tr>
<td></td>
<td>Date of investigation</td>
<td>Day/ /month / /Year / /</td>
<td>Day/ /month / /Year / /</td>
</tr>
<tr>
<td></td>
<td>Date of first diagnosis</td>
<td>Day/ /month / /Year / /</td>
<td>Day/ /month / /Year / /</td>
</tr>
<tr>
<td></td>
<td>Hospitalized when, where?</td>
<td>Hospital________________</td>
<td>Hospital________________</td>
</tr>
<tr>
<td></td>
<td>Final diagnosis</td>
<td>Local, Generalized, Toxic</td>
<td>Local, Generalized, Toxic</td>
</tr>
<tr>
<td></td>
<td>Antitoxin given?</td>
<td>/ / / / ______ units</td>
<td>/ / / / ______ units</td>
</tr>
<tr>
<td></td>
<td>If yes, when and what amount?</td>
<td>Day/ month/ year</td>
<td>Day/ Month Year</td>
</tr>
<tr>
<td></td>
<td>Date and time of specimen collection</td>
<td>hr/ Day/ /month/ /Year/ /</td>
<td>hr/ Day/ /month/ /Year/ /</td>
</tr>
<tr>
<td></td>
<td>Date antibiotics started?</td>
<td>Day/ /month/ /Year/ /</td>
<td>Day/ /month/ /Year/ /</td>
</tr>
<tr>
<td></td>
<td>Before culture? Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td></td>
<td>Outcome</td>
<td>Died, discharged/ Day Month Year</td>
<td>Died, discharged/ Day Month Year</td>
</tr>
<tr>
<td></td>
<td>If dead, indicate cause.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Culture dates and results (biotype and toxigenicity of strain, if culture positive)</td>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td></td>
<td>If not done, please, indicate NOT DONE.</td>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td></td>
<td>DT or Td given before discharging?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Number of received vaccinations</td>
<td>______ unknown</td>
<td>______ unknown</td>
</tr>
<tr>
<td></td>
<td>Date of last vaccination and vaccine type</td>
<td>Day/ /month/ /Year/ /</td>
<td>Day/ /month/ /Year/ /</td>
</tr>
<tr>
<td></td>
<td></td>
<td>______ unknown</td>
<td>______ unknown</td>
</tr>
<tr>
<td></td>
<td>How many people were in close contact?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How many of them tested bacteriologically?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>From how many was C. diphtheria isolated?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* If the information represents additional data on the case already reported, please indicate this.

Responsible Person________________________ Signature____________________

Name ___________________________ Tel: __________________________ Address, fax, E-mail_____

The card should be submitted to the region CPH before day 5 and to NCDC (Tbilisi, 380077, st. M. Asatiani #9, Tel. 37-16-77.39-64-38) before day 7 of the next month for each diphtheria case.
### Part II (to be filled and kept at CPH)

| 27 | If doses <3 for children less than 4 months indicate reason |
| 28 | How many received prophylaxis w/antibiotics? |
| 29 | How many were vaccinated? |

**Response actions**

**List of contacts**

<table>
<thead>
<tr>
<th>name</th>
<th>age</th>
<th>address</th>
<th>Lab investigation / results</th>
<th>measures taken: antibiotic prophylaxis, vaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Other outbreak control measures implemented:
1. 
2. 
3. 

Comments/Conclusions:

Responsible person ____________________________ ____________________________ (name, position)
10.7.5 Outbreak Control/Response

An outbreak of diphtheria requires the following control actions by the health facility and rayon CPH:

1. If diphtheria is suspected on the basis of clinical findings, antitoxin\(^{20}\) should be given *immediately* after bacteriologic specimens are taken, without waiting for results, since it can only neutralize circulating toxin and has no effect on toxin already bound to tissue. Late administration of antitoxin (after the third day from disease onset) may not help reduce the risk of development of diphtheria complications (toxic shock, myocarditis, neuritis) and a fatal outcome.

**Note:** Physicians who do not have antitoxin at their disposal must promptly inform the regional health administration.

2. Diphtheria patients should be isolated until two cultures are taken from both throat and nose not less than 24 hours apart, and not less than 24 hours after cessation of anti-microbial therapy, and fail to show diphtheria bacilli. Where cultures are not done, isolation may be ended after 14 days of appropriate antibiotic treatment.

3. Articles in contact with patient or soiled by discharges of patient should be disinfected.

4. Diphtheria patients should get a booster or start/continue vaccination series (if not immunized) prior to discharge from a hospital, because development of natural immunity after diphtheria cannot be guaranteed.

5. **Close diphtheria contacts (see Section 10.7.4 d)** should do the following:

   - Undergo bacteriological investigation as described above
   - Remain under clinical surveillance for signs/symptoms specific for diphtheria for seven days after the last contact with a diphtheria case
   - Be offered prophylactic antibiotics irrespective of their immunization status. Those cases where *C. diphtheriae* was isolated must be cultured again at the end of the preventive course to assure eradication of the organism
   - Get a booster of diphtheria toxoid if more than 3 years have elapsed since their last dose, or initiate/continue a primary series (if they were not immunized) with Td if they are older than 7 years of age or administer the DPT/DT if they are young children.

10.7.6 Recommended Scope of Routine Analysis of Diphtheria Surveillance Data to Be Performed by CPH

(See Chapter 5 for more details.)

The CPH should perform routine monthly analysis of the following data:

- DPT-3 (at 12 months), DPT-4 (at 24 months), DT (at 6 years) and Td (at 14 years and among

---

\(^{20}\) The recommended dosage and route of administration of diphtheria antitoxin depend on the extent and duration of the disease. Detailed recommendations can be obtained from the MoLHSA order #58. Treatment with a 14-day course of antibiotics should be promptly started as well.
adults) coverage by subordinated area/setting

▲ Cases by month/year, age group, immunization status, and geographic area
▲ Proportion of cases laboratory tested
▲ Case/laboratory confirmation rates for the territory
▲ Proportion of cases treated with antitoxin “on time” (≤ 3 days from the onset of symptoms)
▲ Major reasons for late treatment with antitoxin:
  ▲ Patient sought care too late
  ▲ Diphtheria was not recognized promptly
  ▲ Physicians delayed measures aimed at ensuring immediate start of the specific treatment
  ▲ CPH/NCDC failed to ensure availability of antitoxin at the place of patient’s hospitalization
▲ Completeness/timeliness of monthly reporting
▲ Diphtheria case/outbreak investigation rate.

10.7.7 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

1. Monitor diphtheria vaccination and booster coverage in all age groups by geographic area to identify areas with weak program performance where action needs to be taken to correct the situation.

2. Promptly identify cases and outbreaks and determine why they occurred (e.g., failure to immunize, vaccine failure, accumulation of susceptibles, waning immunity). Implement respective measures to stop further transmission and monitor the effectiveness of the control strategies.

3. Determine age-specific incidence rates, immunization status of cases, and other factors to understand epidemiology of diphtheria and define risk groups. Implement respective routine control strategies such as local Td booster campaigns for adolescents and adults or selected high-risk groups.

4. Determine major reasons for late treatment of diphtheria patients with antitoxin and implement measures to address them, such as
  ▲ enhancing provider education,
  ▲ making a regional reserve of diphtheria antitoxin, and
  ▲ health education of population.

5. Evaluate and improve the performance of other aspects of the diphtheria surveillance system (e.g., reaction time for notification, proportion of cases laboratory tested) and take corrective measures as appropriate.
### I. DOCUMENTATION

<table>
<thead>
<tr>
<th>Supplies needed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Register 60/A</td>
</tr>
<tr>
<td>○ Lab investigation request form</td>
</tr>
<tr>
<td>○ Marker (water resistant)</td>
</tr>
<tr>
<td>○ Specimen label</td>
</tr>
</tbody>
</table>

#### Steps:
1. Create a specimen label with patient’s name, identification number, date, and time.
2. Fill in a copy of a lab investigation request form with patient information. (It will accompany specimen to the lab).
3. Make sure patient information has been entered in register 60/A and an urgent notification has been sent to CPH.

### II. COLLECTION AND HANDLING

**Note**: Collect both throat and nasal, or naso-pharyngeal swabs, preferably before administration of antibiotics, at the first contact with patient.

**Supplies needed:**
- Dacron or calcium alginate swabs (rayon or cotton swabs)
- Sterile saline solution
- Blood agar slant
- Amies or Stewart’s transport medium

#### Steps:
1. Pharynx should be clearly visible and well illuminated.
2. Depress tongue with an applicator and swab the throat without touching the tongue or inside of check.
3. Rub vigorously over any membrane, white spots or inflamed areas; slight pressure with a rotating movement must be applied to the swab.
4. The swab is extended between the tonsillar pillars and behind the uvula. Care should be taken not to touch the lateral walls of the buccal cavity or the tongue to minimize contamination with commensal bacteria.
5. Having the patient phonate a long “aaah” serves to lift the uvula and helps prevent gagging.
6. The tonsillar areas and the posterior pharynx should be firmly rubbed with the swab.
7. If any membrane is present, swab from the edge of membrane. Any purulent exudate should also be sampled.

### IV. TRANSPORTATION

<table>
<thead>
<tr>
<th>Supplies needed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Ziplock plastic bag</td>
</tr>
<tr>
<td>○ Shipping box/container</td>
</tr>
<tr>
<td>○ Plastic container</td>
</tr>
<tr>
<td>○ Box label</td>
</tr>
</tbody>
</table>

#### Steps:
1. Tighten the cap, apply waterproof sealing tape over the cap and top of specimen container.
2. Place specimen container in a suitably sized plastic bag (1st layer) together with a small amount of absorbent material, such as cotton wool. The bag must be sealed either using heated bag sealer or waterproof adhesive tape; as an alternative, use ziplock plastic bags. Specimens from different patients should never be sealed in the same bag.
3. Sealed bags containing the specimens should be placed inside plastic containers with screw-cap lids (2nd layer). Provided that specimens have been double-bagged properly in sealed plastic bags, specimens from several patients may be packed inside the same secondary plastic container. Additional absorbent material should be placed inside the container to absorb any leakage that may occur.
4. Sealed plastic containers should be fitted into insulated 3rd layer containers (e.g., a cold box). First, place ice packs at the bottom of the box, and, along the sides, place the plastic container with the specimen in the center, then place more ice packs on top. Make sure that the container is firmly fixed in the outer box.
5. Put the lab investigation request form in a plastic bag and place it in the outer box.
6. Label box with name, address, and telephone number of the referral laboratory and the sender.
7. Label box with the safety precautions (“Do not freeze,” “Do not expose to heat,” “This side up,” “Biological specimen,” etc.).
8. Arrange shipping date.
9. When arrangements are finalized, inform the recipient of time and manner of transport and make sure that package reaches referral laboratory within 2–3 days of specimen collection.
<table>
<thead>
<tr>
<th>Nasal swabs</th>
<th>Naso-pharyngeal swabs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal specimens are obtained under direct light using over-the-shoulder illumination using the aseptic technique to prevent contamination by other micro-organisms.</td>
<td></td>
</tr>
<tr>
<td>1. Gently elevate the nose with the thumb of one hand.</td>
<td></td>
</tr>
<tr>
<td>2. Moisten the tip of a small flexible wire nasal swab with sterile water or saline and gently insert it into one of the nostrils.</td>
<td></td>
</tr>
<tr>
<td>4. Take the specimen with the same swab from the second nostril.</td>
<td></td>
</tr>
<tr>
<td>Naso-pharyngeal specimens are obtained under direct light using over-the-shoulder illumination using the aseptic technique to prevent contamination by other micro-organisms.</td>
<td></td>
</tr>
<tr>
<td>1. Gently elevate the nose with the thumb of one hand.</td>
<td></td>
</tr>
<tr>
<td>2. Moisten the tip of a small flexible wire naso-pharyngeal swab with sterile water or saline and gently insert it into one of the nostrils.</td>
<td></td>
</tr>
<tr>
<td>3. Guide the swab backward and upward along the nasal septum until a distinct feel of resistance indicates that the posterior pharynx has been reached.</td>
<td></td>
</tr>
<tr>
<td>4. Gently remove the swab.</td>
<td></td>
</tr>
<tr>
<td>If while guiding the swab undue resistance is met, attempt the procedure through the opposite nostril (pay attention if a tear drop appears – you are in the right place!)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skin diphtheria and other lesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lesions should be cleansed with normal saline and crusted material removed.</td>
</tr>
<tr>
<td>2. Press the swab firmly into the lesion.</td>
</tr>
<tr>
<td><strong>Note:</strong> In case of skin or eye diphtheria the throat and nasal specimens should be taken as well.</td>
</tr>
</tbody>
</table>

**After collection,** inoculate the specimen on Amies or Stewart’s transport medium or Blood agar.

**Note:** If these media are unavailable place the swab in the sterile container or special packet containing silica gel and send promptly to the lab. In this case, the specimen should arrive at the laboratory within 2 hours.

<table>
<thead>
<tr>
<th>III. STORAGE</th>
<th>V. COMMUNICATING TEST RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Steps:</strong></td>
<td></td>
</tr>
<tr>
<td>1. Specimen inoculated on the transport media can be stored at room temperature (25°C) for up to 24 hours until shipment.</td>
<td></td>
</tr>
<tr>
<td>2. If transportation is delayed, the specimen with the help of an epidemiologist should be inoculated on the Blood agar and placed in a thermostat at 37°C (for 24-48 hours).</td>
<td></td>
</tr>
<tr>
<td>3. In other cases the specimen should be decontaminated. If the facility is not able to decontaminate, the specimen should be sent to the laboratory for this purpose.</td>
<td></td>
</tr>
<tr>
<td>Laboratory should communicate results to the clinician within 2 days of receiving the sample. If the result of the test is positive, it should also notify the rayon CPH.</td>
<td></td>
</tr>
<tr>
<td><strong>Steps:</strong></td>
<td></td>
</tr>
<tr>
<td>1. Record the results in the case history and Journal 60/A.</td>
<td></td>
</tr>
</tbody>
</table>
10.8 Poliomyelitis

10.8.1 Rationale for Surveillance

Infection with poliovirus results in a spectrum of clinical manifestations from inapparent infection to non-specific febrile illness, aseptic meningitis, paralytic disease, and death. Two phases of acute poliomyelitis can be distinguished: a nonspecific febrile illness, followed in 0.1 to 1.0 percent of patients by aseptic meningitis and/or paralytic disease. Depending on the site of paralysis, poliomyelitis can be classified as spinal, bulbar, or spino-bulbar disease. Progression to maximum paralysis is rapid (two to four days), usually associated with fever and muscle pain, and it rarely continues after the temperature has returned to normal. Spinal paralysis is typically asymmetric, more severe proximally than distally, and deep tendon reflexes are absent or diminished. Bulbar paralysis may compromise respiration and swallowing. Between 2 and 10 percent of cases of paralytic poliomyelitis are fatal.

Poliomyelitis is targeted for eradication. In June 2002, Georgia as well as other European countries was certified by WHO as polio free. Experts noted that Georgia has established a good system of Acute Flaccid Paralysis (AFP) surveillance and that no indigenous wild polioviruses have been isolated in the country since 1991. Routine oral poliomyelitis vaccine (OPV) coverage rates have been steadily increasing and are now believed to be greater than 80 percent. One case of vaccine-associated paralytic poliomyelitis (VAPP) was reported in 1997.21 Despite the success of polio eradication activities, the potential for importation of wild poliovirus into Georgia will remain until worldwide poliomyelitis eradication is achieved.22

Highly sensitive surveillance for AFP, including immediate case investigation and specimen collection, is critical to detect potential wild poliovirus circulation with the ultimate objective of polio eradication. Countries with adequate surveillance systems should find at least one case of AFP each year for every 100,000 children less than 15 years of age. This minimum annual rate is based on the fact that in absence of wild poliovirus transmission, cases of AFP due to other causes (e.g., Guillain Barre syndrome, transverse myelitis, or tumors) will continue to occur. Therefore, a sensitive AFP surveillance system would be expected to detect these background cases, even when wild poliovirus is not circulating in a country.

Examination of sewage specimens for poliovirus (environmental surveillance) was adopted as a supplementary tool in the surveillance of poliomyelitis in Georgia to determine if “silent” transmission of poliomyelitis in the population takes place. Approximately 50 sewage samples are tested annually. Wild poliovirus not been detected in the past 5 years.

Other strategies include maintaining and increasing routine OPV-3 coverage (target 98 percent), implementing additional immunization measures such as national/subnational immunization days and regular mop-up campaigns in border zones and hard-to-reach territories, where local circulation of the virus might take place.

---

21 VAPP is a very rare disease with a risk of about one case per 2.5 million doses of OPV administered.
22 A nonparalytic case of confirmed imported wild poliovirus infection caused by poliovirus type 1, originating from the Indian subcontinent, occurred in Kvemo Kartli Region in 2001. The case was clinically manifested as meningoencephalitis and classified as nonparalytic polio.
10.8.2 Recommended Polio Case Definition

**Clinical (probable) Case** – A case that meets the following criteria:

- Any case of AFP rapidly developed within one to four days (including Guillain Barre syndrome\(^{23}\)) in children aged 0-15 years (except for paralysis of confirmed traumatic or tumor etiology), or
- Any person at any age in which a physician suspects acute poliomyelitis

**Note:** These suspected diagnoses can be used for a limited period of time, and a final case classification must be made within 70 days of disease onset by the National Expert Panel, according to the scheme presented in Figure 25.

---

**Figure 25. AFP/Polio Case Classification Scheme**

```
+-------------------+------------------+
| Wild poliovirus isolated | Confirmed polio case |
| AFP                | Poliovirus of vaccine origin isolated |
| Wild poliovirus NOT isolated | Died, lost to follow-up, or residual paresis 60 days later |
| Specimens do not meet requirements* or are absent | EXPERT PANEL decides whether to discard the case or classify it as “Polio Compatible**” |
| Adequate* specimens | No residual paresis 60 days later |
|                      | Polio case discarded |
```

---

* Specimens are adequate if two specimens were collected 24 to 48 hours apart and within 14 days of paralysis onset. The specimen arriving at the laboratory must be of adequate volume (8 to 10 grams), have appropriate documentation (i.e., laboratory request form) and be in “good condition.” Good condition means no leakage, no desiccation, and evidence that the reverse cold chain was maintained (based on the presence of ice or temperature indicator).

** “Compatible” cases indicate surveillance failures and should be monitored for clustering in space and time.

---

**Laboratory testing** is mandated for every AFP and suspected polio case. Specimens should be sent to the National Polio Laboratory accredited by WHO. This laboratory is located at NCDC.

10.8.3 Case Notification Procedures and Forms

Any AFP or suspected polio case identified by providers requires urgent notification to the CPH within 24 hours by any existing means of communication.

---

\(^{23}\) Guillain Barre syndrome, also known as Landry’s ascending paralysis, is an acute idiopathic inflammatory demyelinating polyneuropathy characterized by the rapid onset of weakness and, often, paralysis of the legs, arms, breathing muscles, and face. The exact cause is unknown, but has been associated with abnormal immune response to viral infection.
10.8.4 AFP/Polio Case Investigation

Rapid recognition of suspected poliomyelitis cases is critical to identifying possible wild poliovirus transmission. It will allow collection of specimens for poliovirus isolation, which is critical for ruling out or confirming paralytic poliomyelitis, whether wild virus associated or vaccine related. Rapid detection of wild poliovirus-associated cases will permit the timely implementation of control efforts.

**Note:** Every single reported AFP or polio case has to be investigated by an investigation team led by an NCDC expert and including an expert neurologist, regional and rayon CPH epidemiologists, and facility health workers, within 2 business days of notification.

The following steps are required for the investigation:

- **Collect data as envisioned in Section I of the AFP Investigation Card (shown in Figure 26).**

---

**Figure 26. AFP Investigation Card**

<table>
<thead>
<tr>
<th>SECTION I</th>
<th>General information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of investigation</td>
<td>/------/-------/----------/ Epidemiological number*</td>
</tr>
<tr>
<td>Patient's name and surname</td>
<td>Gender ○Male ○Female</td>
</tr>
<tr>
<td>Address</td>
<td>Mother’s name and surname</td>
</tr>
<tr>
<td>Father’s name and surname</td>
<td>Patient's date of birth /------/------/--------/ or indicate age ___years</td>
</tr>
<tr>
<td>Case registration and hospitalization</td>
<td></td>
</tr>
<tr>
<td>Date of the first visit to a physician after AFP onset</td>
<td>/------/-----/--------/</td>
</tr>
<tr>
<td>Indicate the name of the facility visited</td>
<td></td>
</tr>
<tr>
<td>Date of urgent notification</td>
<td>/------/-----/--------/</td>
</tr>
<tr>
<td>Date of hospitalization</td>
<td>/------/-----/--------/</td>
</tr>
<tr>
<td>Place of hospitalization</td>
<td></td>
</tr>
<tr>
<td>Case history number</td>
<td></td>
</tr>
<tr>
<td>Clinical diagnosis</td>
<td></td>
</tr>
<tr>
<td>Name of diagnosing physician</td>
<td></td>
</tr>
<tr>
<td>Clinical information</td>
<td></td>
</tr>
<tr>
<td>Date of paralysis onset</td>
<td>/-----/-----/-------/</td>
</tr>
<tr>
<td>If the patient died, indicate date</td>
<td>/-----/-----/-------/</td>
</tr>
<tr>
<td>Seizures or other neurological disorders?</td>
<td>○Yes ○No ○Unknown</td>
</tr>
<tr>
<td>If yes, specify:</td>
<td></td>
</tr>
<tr>
<td>Is paralysis acute (quickly progressing)?</td>
<td>○Yes ○No</td>
</tr>
<tr>
<td>Is paralysis flaccid?</td>
<td>○Yes ○No</td>
</tr>
<tr>
<td>If the paralysis is neither acute nor flaccid – STOP the investigation.</td>
<td></td>
</tr>
<tr>
<td>If the diagnosis is known – specify it here:</td>
<td></td>
</tr>
<tr>
<td>Are there other confirmed causes of paralysis (e.g., trauma)</td>
<td>○Yes ○No</td>
</tr>
<tr>
<td>If yes, indicate the cause and STOP the investigation. If no - poliomyelitis is possible. Investigation should be continued</td>
<td></td>
</tr>
<tr>
<td>Did the patient have temperature at paralysis onset?</td>
<td>○Yes ○No</td>
</tr>
<tr>
<td>Is the paralysis asymmetrical?</td>
<td>○Yes ○No ○Unknown</td>
</tr>
<tr>
<td>Paralysis location</td>
<td>Left leg</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Travel history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the patient travel farther than 10km from his house within 28 days preceding the paralysis onset?</td>
</tr>
<tr>
<td>If yes date of leaving /--------/------/-------/ date of return /--------/------/-------/</td>
</tr>
<tr>
<td>Did the patient visit another country?</td>
</tr>
<tr>
<td>If yes – which one?</td>
</tr>
<tr>
<td>If not, specify the names of rayon(s) and towns/villages visited in Georgia</td>
</tr>
<tr>
<td>Have any other paralysis cases been reported in places visited by the patient within 60 days from the onset of paralysis in this case?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Immunization history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are patient's immunization records available?</td>
</tr>
<tr>
<td>Specify OPV doses received and type of evidence</td>
</tr>
<tr>
<td>OPV-2</td>
</tr>
<tr>
<td>OPV-3</td>
</tr>
<tr>
<td>OPV-4</td>
</tr>
<tr>
<td>OPV-5</td>
</tr>
<tr>
<td>Additional OPV doses received during mass campaigns</td>
</tr>
<tr>
<td>First</td>
</tr>
<tr>
<td>Second</td>
</tr>
<tr>
<td>Third</td>
</tr>
<tr>
<td>Date of the last OPV dose /--------/------/-------/</td>
</tr>
<tr>
<td>Was anyone living with the case vaccinated with OPV during 28 days prior to the onset of paralysis?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fecal sample collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date first sample taken /--------/------/-------/ date sent to NCDC /--------/------/-------/</td>
</tr>
<tr>
<td>Date second sample taken /--------/------/-------/ date sent to NCDC /--------/------/-------/</td>
</tr>
<tr>
<td>Have specimens from contacts been taken?</td>
</tr>
<tr>
<td>If yes, from how many people? ________</td>
</tr>
</tbody>
</table>

Name, Last name of person who carried out investigation____________ Signature__________________

The card should be submitted to the region CPH before the fifth day and to NCDC before seventh day of the next month.

* A 12-symbol epidemiological number is assigned to every suspected polio case. Detailed instructions on how to assign a number are specified in the MoLHSA order #243/O dated July 2, 1997. Codes for administrative levels are provided in Annex B.
b) **Collect two stool specimens from the case.**

Two stool specimens should be obtained within 14 days from the paralysis onset with a 24- to 48-hour interval. Samples should not be dry and should be obtained in sufficient amount (approximately 8 to 10 grams). Transport media is not needed for stool sample transportation; it could be sent in hermetically closed Penicillin vial (not necessarily washed) or in a similar sterile vial observing cold chain requirements (+4 to 8°C).

Samples should be sent to the NCDC for investigation, accompanied by a referral form (Figure 27).

<table>
<thead>
<tr>
<th>Figure 27. Laboratory Referral Form for Poliomyelitis Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidemiological number: ____________________________ Hospital</td>
</tr>
<tr>
<td>Type of material (e.g., feces, blood) sent for investigation</td>
</tr>
<tr>
<td>Patient's name and surname: ________________________________</td>
</tr>
<tr>
<td>Address: ____________________________________________________</td>
</tr>
<tr>
<td>Date of birth: [<strong><strong>/</strong></strong>/____] D M Y</td>
</tr>
<tr>
<td>If not known indicate age in months: _________________________</td>
</tr>
<tr>
<td>Date of paralysis onset: [<strong><strong>/</strong></strong>/____]</td>
</tr>
<tr>
<td>Date the first stool sample was taken: [<strong><strong>/</strong></strong>/____]</td>
</tr>
<tr>
<td>Date the second stool sample was taken: [<strong><strong>/</strong></strong>/____]</td>
</tr>
<tr>
<td>Date the first sample was sent: [<strong><strong>/</strong></strong>/____]</td>
</tr>
<tr>
<td>Date the second sample was sent: [<strong><strong>/</strong></strong>/____]</td>
</tr>
<tr>
<td>Date the last OPV vaccination: [<strong><strong>/</strong></strong>/____]</td>
</tr>
<tr>
<td>Preliminary clinical diagnosis: _______________________________ (if specimen is taken from a contact, state so here)</td>
</tr>
<tr>
<td>Name of the person who carried out epidemiological investigation:</td>
</tr>
<tr>
<td>Name of the person to whom laboratory test results should be sent:</td>
</tr>
<tr>
<td>Address: ____________________________________________________</td>
</tr>
<tr>
<td>This part should be filled in the laboratory</td>
</tr>
<tr>
<td>Date specimen received by the laboratory: [<strong><strong>/</strong></strong>/____]</td>
</tr>
<tr>
<td>Name of the person who received specimen: _____________________________</td>
</tr>
<tr>
<td>Is the specimen in good condition: Yes No</td>
</tr>
</tbody>
</table>

c) **Identify close and distant contacts** of the case and check if they are properly vaccinated according to the immunization schedule to determine their susceptibility.

d) **Collect a single stool sample from 5 close contacts of the AFP case who are under 5 years of age** (e.g., brothers, sisters, playmates, classmates). Use the above recommendations and referral form for specimen transportation (as indicated in b).

e) **Implement control and prevention measures.**
Unvaccinated or not fully vaccinated contacts under 15 years of age should be promptly immunized (however, the virus could have infected susceptible close contacts by the time the first case is recognized).

The expert team may consider it necessary to immunize additional cohorts of children (e.g., 0- to 4-year-olds not covered during national immunization days in 2002).

Patient’s throat discharges, feces, and articles soiled therewith should be disinfected. In communities with modern and adequate sewage disposal systems, feces could be discharged into sewers without preliminary disinfection.

_f) Monitor the case and follow up after 60 days of disease onset_. Complete Section II of the AFP investigation card.

### AFP Investigation Card (cont.)

<table>
<thead>
<tr>
<th>Date of investigation</th>
<th>Epidemiological number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient's name and surname</td>
<td>Gender ○Male ○Female</td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>Was patient’s condition evaluated after 60 days?</td>
<td>○Yes ○No</td>
</tr>
<tr>
<td>If not, why? Date of patient’s death</td>
<td>○Resident paralysis after 60 days</td>
</tr>
<tr>
<td>Patient lost out from supervision on (date)</td>
<td>○Patient died with symptoms of residual Polio</td>
</tr>
<tr>
<td>Other reasons, specify ____________________________________________________________</td>
<td></td>
</tr>
<tr>
<td>If yes, does the paralysis still exist?</td>
<td>○Yes ○No</td>
</tr>
<tr>
<td>Date of evaluation</td>
<td>○Indigenous ○Imported ○Vaccine associated ○Unknown</td>
</tr>
<tr>
<td>Evaluator’s name and surname</td>
<td>Signature</td>
</tr>
<tr>
<td>Evaluator’s address</td>
<td>Telephone</td>
</tr>
</tbody>
</table>

_i) Prepare and submit all relevant documentation for the National Expert Panel meeting_. Include a copy of patient’s medical record, completed Sections I and II of the epidemiological investigation card, laboratory test results, and control activity report. The Expert Panel will carry out the final case classification and complete the final section (III) of the investigation card.

### AFP Investigation Card (cont.)

<table>
<thead>
<tr>
<th>Date of investigation</th>
<th>Country</th>
<th>Epidemiological number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient's name and surname</td>
<td>Final polio case classification (check only one) ○Confirmed ○Compatible ○Discarded</td>
<td></td>
</tr>
<tr>
<td>Basis for the case classification (check all that apply)</td>
<td>○Isolation of poliovirus in stool sample</td>
<td></td>
</tr>
<tr>
<td>○Poliovirus was not isolated from stool sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td>○Stool specimens were not investigated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>○Residual paralysis after 60 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>○Patient died with symptoms of residual Polio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>○Autopsy results</td>
<td></td>
<td></td>
</tr>
<tr>
<td>○Patient with residual polio symptoms lost to follow-up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If poliomyelitis is confirmed</td>
<td>indicate its type</td>
<td></td>
</tr>
<tr>
<td>○Indigenous ○Imported ○Vaccine associated ○Unknown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If poliomyelitis is discarded, specify the final diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature of the Expert Panel Head</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10.8.5 Routine Active Surveillance for AFP Cases

Active surveillance for AFP cases continues in order to completely eradicate poliomyelitis in the world. Surveillance measures include the following:

- Making weekly visits to hospitals and rehabilitation centers to refresh awareness of AFP registration
- Checking hospital and outpatient medical records for clinical signs of AFP
- Conducting seminars and meetings with neurologists, pediatricians, and physiotherapists concerning AFP diagnosis, registration, and investigation
- Conducting interviews with religious and community leaders, school teachers, social service workers, traditional healers, and others.

The CPH should carry out weekly active surveillance in medical facilities where AFP cases may occur. Surveillance results are recorded in the form shown in Figure 28. The form is sent monthly together with the monthly reports. One copy of the form should remain at the CPH.

10.8.6 Recommended Indicators for Evaluation of the AFP Surveillance

Target

1. Annualized non-polio AFP rate per 100,000 children under 15 years of age ≥1/100,000
2. Percentage of all expected monthly reports that were received >90%
3. Percentage of AFP cases investigated within one business day of notification >90%
4. Percentage of AFP cases with two adequate* stool specimens collected 24 to 48 hours apart and ≤14 days of paralysis onset >80%
5. Percentage of specimens arriving at the laboratory in adequate condition >90%

* Note that specimens are adequate if two specimens were collected 24 to 48 hours apart and within 14 days of paralysis onset. The specimen arriving at the laboratory must be of adequate volume (8 to 10 grams), have appropriate documentation (i.e., laboratory request form), and be in “good condition.” Good condition means no leakage, no desiccation, and evidence that the reverse cold chain was maintained (based on the presence of ice or temperature indicator).

10.8.7 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

- Monitor routine OPV-3 and polio boosters coverage in geographic areas and focus corrective efforts in low-performing areas
Identify high-risk areas, conduct Supplementary Immunization Activities (SIA) where appropriate

Investigate clusters of AFP cases (if any) and consider SIA in consultation with NCDC

Monitor performance of AFP surveillance using standard indicators listed above and focus efforts in low performing areas.
Figure 28. Weekly Surveillance Form for AFP

<table>
<thead>
<tr>
<th>Health facility:</th>
<th>Health facility:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address: region-----------rayon--------------------------</td>
<td>Address: region-----------rayon--------------------------</td>
</tr>
<tr>
<td>Reporting month, year ---/-----</td>
<td>Reporting month, year ---/-----</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date of visit</th>
<th>Period of time from the last visit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I week</th>
<th>II week</th>
<th>III week</th>
<th>IV week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Signature of responsible person (chief doctor or head of the department)
* Pediatric department (yes  no)
* Neurology department (yes  no)
* Infectious department (yes  no)

No. of APF cases revealed during the visit
Among them AFP cases which have not been notified

Remarks:

Name of investigator,
Position

signature________________ signature_________________

Note: both parts of the form should be filled. One copy is sent to NCDC by day 7 of the next month. One copy remain at CPH.
*Checking of registration journals and medical records, conversation with the clinicians
**Sampling strategy:** Collect specimens from every AFP and suspected polio case. Two specimens should be obtained within 14 days from the paralysis onset, with a 24-48 hour interval.

**Confirmation test:** Isolation of a poliovirus

**Specimen to be collected:** Stool

**Referral laboratory:** NCDC

**Important:** Stool samples must reach the laboratory within 2 to 3 days for testing.

### I. DOCUMENTATION

**Supplies needed:**
- Register 60/A
- Marker (water resistant)
- Lab investigation request form
- Specimen label

**Steps:**
1. Create a specimen label with patient’s name, identification number, date, and time.
2. Fill in a copy of a lab investigation request form (see next page) with patient information to accompany the specimen.
3. Make sure patient information has been entered in register 60/A and an urgent notification has been sent to CPH.

### II. COLLECTION AND HANDLING

**Supplies needed:**
- Sterile container
- Wooden spatula, or plastic spoon
- Viral transport medium

**Steps:**
1. Place a separate clean container with a wide opening (for example, a plastic ice-cream container), or plastic wrap, or newspaper in the toilet bowl. Pass feces directly into the container or onto the plastic wrap or newspaper. Do not contaminate the feces with urine.
2. Using a wooden spatula or plastic spoon, place enough feces (8-10g) to at least half fill the specimen container (e.g., penicillin vial).
3. Add 8–10 ml of VTM (Viral Transport Medium) to prevent drying if transport to laboratory is not immediate.
4. Screw the lid on the specimen container firmly.
5. Make sure the container is properly labeled (see Section I).
6. Place it in a sealed plastic bag.

### III. STORAGE

**Steps:**
1. Immediately refrigerate at 4-8°C.
2. Keep refrigerated until shipment.

### IV. TRANSPORTATION

**Supplies needed:**
- Ziplock plastic bag
- Cold box with ice packs
- Plastic container
- Box Label

**Steps:**
1. Tighten the cap, apply waterproof sealing tape over the cap and top of specimen container.
2. Place specimen container in a suitably sized plastic bag (1st layer) together with a small amount of absorbent material, such as cotton wool. The bag must be sealed either using heated bag sealer or waterproof adhesive tape; as an alternative, use ziplock plastic bags. Specimens from different patients should never be sealed in the same bag.
3. Sealed bags containing the specimens should be placed inside plastic containers with screw-cap lids (2nd layer). Provided that specimens have been double-bagged properly in sealed plastic bags, specimens from several patients may be packed inside the same secondary plastic container. Additional absorbent material should be placed inside the container to absorb any leakage that may occur.
4. Sealed plastic containers should be fitted into insulated 3rd layer containers (e.g., a cold box). First, place ice packs at the bottom of the box, and, along the sides, place the plastic container with the specimen in the center, then place more ice packs on top. Make sure that the container is firmly fixed in the outer box.
5. Put the lab investigation request form in a plastic bag and place it in the outer box.
6. Label box with name, address, and telephone number of the referral laboratory and the sender.
7. Label box with the safety precautions ("Do not freeze," "Do not expose to heat," "This side up," "Biological specimen," etc.).
8. Arrange shipping date.
9. When arrangements are finalized, inform the recipient of time and manner of transport and make sure that package reaches referral laboratory within 2–3 days of specimen collection.

### V. COMMUNICATING TEST RESULTS

**Steps:**
1. Record the results in the case history and Journal 60/A.
10.9 Rabies

10.9.1 Rationale for Surveillance

Rabies is a fatal zoonotic viral disease, transmitted to humans through contact (mainly bites and scratches) with infected animals. Infected animals can be both domestic and wild, including dogs (the principal reservoir), cats, foxes, wolves, jackals, raccoons, and mongooses. The period of communicability before onset of clinical signs in these animals is usually 3-7 days.

Transmission from person to person is theoretically possible, but has never been documented.

Eleven (11) rabies deaths were registered in Georgia in 2003. Almost all cases had not sought medical care and subsequently did not receive post-exposure prophylaxis. Rabies mortality rate is 0.25 per 100,000 population; the case-fatality rate is 100 percent. Each year on average 15,000 people in Georgia need to receive post-exposure treatment after being exposed to animals suspected of carrying rabies.

Surveillance of both human and animal rabies is essential to detect high-risk areas and outbreaks quickly, and to monitor the use of vaccine.

Major strategies for combating human rabies promoted in these recommendations include:

1. Prevention of human rabies through well-targeted post-exposure treatment and increased availability of rabies vaccine

2. Disease elimination through mass vaccination of dogs and other animals as well as stray animal control.

10.9.2 Recommended Case Definition

Clinical description of human rabies: an acute encephalitis dominated by forms of hyperactivity or paralytic syndromes that progresses towards coma and death (usually by respiratory failure), within 7 to 10 days after the first symptom if no intensive care is instituted. Bites or scratches from a suspected animal can usually be tracked back in the patient medical history. The incubation period may vary from days to years and more but usually falls between 30 and 90 days.

Human rabies case classification

- **Clinical (probable):** A case that meets the clinical description of rabies.
- **Confirmed:** A clinically compatible case with at least one of the following:
  - Detection of rabies viral antigens by direct fluorescent antibody (FA) in clinical specimens, preferably brain tissue (collected post mortem)
  - Isolation of rabies virus from clinical specimens collected ante mortem (e.g., skin or cornea smear) and confirmation of rabies viral antigens by direct fluorescent antibody testing

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24 WHO estimates that approximately 250 people receive rabies post-exposure prophylaxis per one human rabies death; according to Georgia statistics, 1,348 post-exposure prophylaxis correspond to one human rabies case.
Detectable rabies-neutralizing antibody titer in the cerebral spinal fluid (CSF) of an unvaccinated person

Identification of viral antigens by PCR on fixed tissue collected post mortem or in a clinical specimen (brain tissue, skin, cornea, saliva)

Bio-test: Mice inoculation with infected brain extract and one-month follow-up.

**Human exposure to rabies that requires post-exposure prophylaxis**

- A person who had close contact (bite, scratch, exposure to saliva) with any animal in a rabies infected area.

**Rabies confirmed in euthanized animal:**

- Detection of rabies viral antigens by direct fluorescent method in brain tissue
- Bio-test: Mice inoculation with infected brain extract and one-month follow-up

The degree of exposure is taken into account when administering post-exposure prophylaxis (see Chapter 6).

**Laboratory testing** is currently mandated for every clinical (probable) case of rabies in animal and humans. At present the only method – detection of rabies viral antigens by direct FA is performed. The regional CPH or NCDC can be contacted to arrange sample transportation to the National Center of Veterinary Expertise and Diagnostics, Tbilisi, Godziashvili Str.#65.

### 10.9.3 Case Notification Procedures and Forms

Any clinical (probable) or confirmed case of human rabies identified by providers or laboratories, as well as any human exposure to rabies (definite or probable), requires urgent notification of the CPH as soon as possible but not later than within 24 hours by any existing means of communication. If the notification is made by phone, there is no need to send an urgent notification card.

### 10.9.4 Human Rabies Exposure/Rabies Case/Death Investigation

Investigation is aimed at identifying sources of infection as well as humans exposed, in order to accurately assess the risk of infection and appropriately manage the exposure. Rapid exchange of information with services in charge of animal rabies surveillance and control is required to streamline implementation of other general rabies prevention measures.

Investigation is carried out

1. Individuals with a history of rabid (clinical or laboratory-confirmed) animal contact should be investigated at once. They should be treated as an emergency

2. In rabies-infected areas when group cases occur (exposure of more than one individual to the same animal)

---

25 “Rabies infected area” is a geographical area where confirmed animal and/or human rabies cases have been registered in the past five years. The entire territory of Georgia is regarded as a “rabies infected area.”
3. In the human rabies area

Steps of an investigation:

   a) **Verify that all cases meet the clinical description of human rabies.**

   b) **Collect data as envisioned in the rabies investigation card** (see Figure 29).

   c) **Identify the source of infection, euthanize the animal, and collect specimens for lab testing as appropriate** (see Chapter 5, points 5 and 6).

   d) **Identify all other exposed humans** through review of health records and interviews with health workers and community members.

   e) **Ensure urgent post-exposure prophylaxis for all persons with animal exposure (bites, scratches, exposure to saliva)** (more details are provided in Chapter 6).

   f) **Implement general rabies prevention measures** as outlined in Chapter 5.

   g) **Institute appropriate control of rabies patient and contacts** (see Chapter 7).

   h) **Write a report which includes rabies investigation card (Figure 29) and send it to the regional CPH in two copies (the region CPH will forward one copy to NCDC).**

   i) **Inform local health administration and other stakeholders about rabies cases and human exposure trends verbally or in a written form.** Inter-sectoral cooperation of medical and veterinary services, and community involvement and participation are required for targeted response and control in animal reservoirs.
**Figure 29. Rabies Exposure/Rabies Case Investigation Card**

<table>
<thead>
<tr>
<th>#</th>
<th>Data</th>
<th>Patient #1</th>
<th>Patient #2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>EpidNumber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>City, rayon, address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Date(s) of bite/scratch/exposure to saliva?</td>
<td>Day/ /month / /year / /</td>
<td>Day/ /month / /year / /</td>
</tr>
<tr>
<td>6.</td>
<td>Geographical location of biting episode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Group case?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8.</td>
<td>Type of biting animal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Site of bite on the body</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Nature (circumstances) of bite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Animal samples taken?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>12.</td>
<td>Animal sample results</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Hospitalized when, where?</td>
<td>Day/ /month / /Year / /</td>
<td>Day/ /month / /Year / /</td>
</tr>
<tr>
<td>14.</td>
<td>Local wound treatment provided? If yes by whom and what type?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>RIG given? If yes, when and what amount? Indicate lot number and expiration date.</td>
<td>/ / / / units</td>
<td>/ / / / units</td>
</tr>
<tr>
<td>16.</td>
<td>Rabies vaccine given? If yes, indicate dates of doses, lot numbers and expiration date</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>17.</td>
<td>Outcome</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Date of onset of symptoms? (for cases/deaths only)</td>
<td>Day/ /month / /year / /</td>
<td>Day/ /month / /year / /</td>
</tr>
<tr>
<td>19.</td>
<td>Lab samples taken? (for cases/deaths only)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>20.</td>
<td>Lab sample results (for cases/deaths only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Responsible Person________________________ Signature____________________

Name Tel: _________________ Address, fax, E-mail_____

The card should be submitted to the region CPH before day 5 and to NCDC (Tbilisi, 380077, st. M. Asatiani #9, Tel. 37-16-77.39-64-38) before day 7 of the next month for each human rabies case or human rabies exposure.
10.9.5 Rabies Prevention Measures

Rabies prevention includes a number of measures provided by communal, veterinary and health care services.

1) Register, license, and immunize all dogs. Immunize all cats.

2) Collect ownerless animals and strays, vaccinate them and regulate their reproduction using modern methods to reduce their threat to the population, and euthanize if required.

3) **Educate the public and pet owners about the following list:**

- Pets such as dogs and cats must be immunized.
- Other domestic animals should be immunized in rabies-infected areas.
- Strange-acting or sick animals of any species, domestic or wild, may be dangerous and should not be picked up or handled.
- It is necessary to report such animals and animals that have bitten a person to the local health department.
- Children should be cautioned against provoking or attempting to capture stray or wild animals and against touching carcasses.
- Wild animals should not be kept as pets.
- Pets must be leashed in congested areas when not confined on owner’s premises.

4) **Develop/maintain laboratory capacity to perform FA testing on all wild animals involved in human or domestic animal exposures and all domestic animals clinically suspected of having rabies.**

5) Educate physicians, veterinarians and animal control officials to obtain/euthanize/test\(^{26}\) animals involved in human and domestic exposures

6) Detain and clinically observe for 10 days any healthy-appearing dog or cat known to have bitten a person (unwanted dogs may be euthanized immediately and examined for rabies by fluorescent microscopy). Dogs and cats showing suspicious signs of rabies\(^{27}\) should be sacrificed\(^{26}\) and tested for rabies. All wild mammals that have bitten a person should be sacrificed\(^{26}\) immediately and the brain examined for evidence of rabies.

7) Euthanize immediately non-immunized dogs or cats bitten by known rabid animals.

8) Individuals at high risk (e.g., veterinarians, animal control and wildlife workers, laboratory and field personnel working with rabies, hunters) should receive pre-exposure immunization given in 1 ml doses by IM injection on days 0, 7, and 30 and a booster dose one year later. If risk of exposure continues, either additional single booster doses are given, or preferably serum is tested for neutralizing antibody every three years, with booster doses given when indicated.

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\(^{26}\) The intact heads, packed in ice (not frozen), of animals that die of (or that have been euthanized due to) suspected rabies should be submitted immediately to a laboratory for viral antigen testing by FA staining, or, if this is not available, by microscopic examination for Negri bodies, followed by mouse inoculation.

\(^{27}\) If the biting animal was infective at the time of the bite, signs of rabies will usually follow within 4 to 7 days, with a change in behavior and excitability or paralysis, followed by death.
9) Individuals who previously received full course of pre- or post-exposure prophylaxis, which was completed within the past year, should receive 3 doses of the vaccine – 1 ml on days 0, 3, and 7. If the period after completion of the prophylaxis exceeds one year, the person should receive vaccination and RIG according to the ordinary scheme. See Chapter 6.

10.9.6 Post-exposure Prophylaxis of Rabies after Animal Bites/Scratches or Contact with Saliva

1) Treatment of bite wound: The most effective rabies prevention is immediate and thorough cleaning with soap or detergent and flushing with water all wounds caused by an animal bite or scratch. The wound should not be sutured unless unavoidable for cosmetic or tissue-support reasons. Sutures, if required, should be placed after local infiltration of antiserum. They should be loose and not interfere with free bleeding and drainage.

2) Specific immunologic protection is provided by administration of rabies immune globuline (RIG) as soon as possible after exposure to neutralize the virus at the bite wound site, and then by giving vaccine at a different site to elicit active immunity.

   △ Human RIG should be used in a single dose of 20 IU/kg; with half the dose infiltrated into and around the bite wound if possible, and the rest given IM. If serum or animal origin is used, an intra-dermal or subcutaneous test dose should precede its administration to detect allergic sensitivity, and the dose should be increased to a total of 40 IU/kg. Both serums should be administered according to the attached instruction.

   △ Rabies vaccine28 is given in the deltoid region in accordance with the instruction on vaccine use (see scheme below). The first dose is administered as soon as possible after the bite (at the same time as the single dose of RIG is given).

RIG and rabies vaccines should be available in all rayon and regional hospitals.

If neither RIG nor rabies vaccine is immediately available, health workers must refer the patient to the nearest rayon hospital.

28 Immunization with rabies vaccine carries a very small risk of post-immunization encephalitis. No cases have been reported in Georgia so far.

Local reactions, such as pain, erythema, swelling or itching at the injection site, have been reported in 25 percent of those receiving 1.0 ml doses. They are usually successfully managed with anti-inflammatory and antipyretic agents such as ibuprofen and acetaminophen.

Special situations: The vaccine can be safely given to pregnant women. Persons with immuno-suppression should receive the vaccine for post-exposure prophylaxis, too. Persons with a history of serious hypersensitivity to rabies vaccine should get post-exposure vaccination after administration of antihistamines. Adrenaline preparations should be readily available to counteract anaphylactic reactions.
Table 14 is a general guide to prophylaxis in various circumstances according to the instruction of most frequently used vaccine and immunoglobulin in Georgia (produced in the Russian Federation and approved by Chief Sanitary doctor on 12. 03. 2003):

**Table 14. Guide to Rabies Prophylaxis**

<table>
<thead>
<tr>
<th>Type of exposure</th>
<th>Information about animal</th>
<th>Post-exposure prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 No skin lesion, no exposure to saliva, no direct contact*</td>
<td>Rabid animal**</td>
<td>No treatment</td>
</tr>
<tr>
<td>2 Exposure to saliva of uninjured skin; single superficial scratch or bite on the body, hands, or legs (except for head, face, palm, fingers, toes, and genital area) by a domestic animal.</td>
<td>If after 10 days of supervision the animal remains healthy, interrupt treatment (after giving 3 doses of vaccine). In other cases (animal died, disappeared, euthanized), treatment should be continued with the recommended scheme.</td>
<td>Treatment is started immediately. Rabies vaccine is given in 1-ml doses on days 0, 3, 7, 14, 30, 90.</td>
</tr>
<tr>
<td>3 Any exposure of mucous to saliva; any scratch or bite on hand, face, neck, palm, fingers, toes, and genital area. Multiple bites and massive injuries (single deep bites and scratches) of any localization by domestic animals. Any exposure to saliva, any skin lesion from contact with wild animals (rodents, bats, etc.)</td>
<td>If 10 days of supervision is possible and after 10 days the animal remains healthy, interrupt treatment (after 3 doses of vaccine). In other cases (animal died, disappeared, euthanized), treatment should be continued with the proposed scheme.</td>
<td>Combined treatment is started immediately with RIG on day 0 and rabies vaccine (1ml) on days 0, 3, 7, 14, 30, 90.</td>
</tr>
</tbody>
</table>

* *Contact* is considered exposure to saliva, scratches, abrasion, bites.

** If animal exhibits clinical signs of rabies (change of behavior, aggressiveness, excitability, dilated pupils, tremors or paralysis, salivation), it should be euthanized immediately and tested. If immunofluorescence test results of the animal are negative, a biotest (mice inoculation) should be performed, and in the case of a negative result, vaccination should be discontinued.

Note: Vaccines and immunoglobulins produced by other manufacturers should be always administered in accordance with respective instructions.

**10.9.7 Control of Rabies Patient and Patients’ Contacts**

1) Contact isolation of rabies patient for respiratory secretions for the duration of the illness.

2) Concurrent disinfection of saliva and articles soiled thereof. Although transmission from a patient to attending personnel has not been documented, immediate attendants should be warned of the potential hazard of infection from saliva, and should wear rubber gloves, protective gowns, and protection to avoid exposure from a patient coughing saliva in the attendant’s face.

3) Contacts who have an open wound or mucous membrane exposure to the patient’s saliva should receive anti-rabies specific treatment (see Chapter 6).
### 10.9.8 Monitoring of Rabies Occurrence and Anti-rabies Activities at the Rayon Level

The rayon CPH should prepare an anti-rabies activity report (form CD-4) on a monthly basis and send two copies to the regional CPH along with monthly reports (see Figure 30).

#### Figure 30. Anti-rabies Activity Report

<table>
<thead>
<tr>
<th>Vaccine supply (sets)</th>
<th>at the beginning of current month</th>
<th>No. of anti-rabies cabinets functioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunoglobulin supply (ampoules)</td>
<td>Rabies confirmed in animals</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of injured individuals by age, animal, health condition</th>
<th>by dogs</th>
<th>by cats</th>
<th>other (indicate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (of total)</td>
<td>dogs</td>
<td>cats</td>
<td>clinically</td>
</tr>
<tr>
<td>Injured by owned animals</td>
<td></td>
<td></td>
<td>lab.</td>
</tr>
<tr>
<td>Number of injured individuals by type of animal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by dogs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by cats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>other (indicate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of injured individuals by ownerless animals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injured by ownerless animals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of total, no. under 15 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervision of dog completed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veterinary supervision during 10 days</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervision of cat completed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Among them vaccinated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Among them fully immunized</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not completed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interrupted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immunoglobulin used</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of ampoules</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of individuals to whom immunoglobulin was administered</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Disease-Specific VPD Prevention and Control Guidelines
10.9.9 Recommended Scope of Data Analysis at Rayon and Regional Levels

The CPH should perform routine monthly analysis of the following data:

1. Human exposure by:
   - geographical area
   - dates of biting/scratch episode
   - type/species of animal
   - by outcome in human and animal populations

2. Cases by:
   - geographical area
   - dates of biting/scratch episode
   - type of animal
   - occupation
   - outcome

10.9.10 Principle Uses of Data for Decision Making at Rayon and Regional Levels

Rayon- and regional-level CPHs will use the data primarily to accomplish the following:

1. Detect outbreaks in endemic areas and new cases in rabies-free areas
2. Determine high-risk areas and population groups for intervention

Based on the above, local authorities should:

1. Estimate the amount of rabies vaccines and RIG needed to keep in stock.
2. Evaluate effectiveness of intervention at the level of the animal reservoir and exposed human population
3. Control the number of ownerless animals
4. Plan additional interventions
10.10 Shigellosis

10.10.1 Rationale for Surveillance

The genus *Shigella* is comprised of 4 serogroups: *S. dysenteriae* (Group A), *S. flexneri* (Group B), *S. boydii* (Group C) and *S. sonnei* (Group D), which are further subdivided into a number of serotypes.

*S. sonnei* accounts for over 60 percent of the shigellosis in Georgia. *S. flexneri* accounts for almost all of the rest. Other types of shigella are rare in the country.

Outbreaks may be food-borne or water-borne. Shigella can also be transmitted by flies. In many cases, a small inoculum (10 to 200 organisms) is sufficient to cause infection. As a result, spread can easily occur by the fecal-oral route, particularly in areas with disrupted access to safe drinking water supply, malfunctioning sewage systems, or where hygiene is poor.

The severity of illness and the likelihood of a fatal outcome depend on the age and preexisting nutritional state of the host and the serotype of the bacteria.

- *Shigella dysenteria* type 1 is often associated with serious disease and severe complications that include toxic megacolon and the hemolytic-uremic syndrome that may result in case-fatality rates as high as 15 percent.

- Certain strains of *S. Flexneri* can cause a reactive arthropathy (Reiter syndrome), especially in persons who are genetically predisposed by having the HLA-B27 antigen. The Reiter’s syndrome can last for years, and can lead to chronic arthritis.

- In contrast, many infections with *S. Sonnei* and *boydii* result in a short clinical course and an almost negligible case-fatality rate.

- Convulsions may occur in small children due to a rapid rise in temperature or metabolic alterations.

Approximately 150 laboratory-confirmed cases of shigellosis and 300 total reported cases occur in Georgia each year. Because many milder cases are not diagnosed or reported, the actual number of infections may be up to 20 times greater. No deaths have been reported in the past 5 years.

The objective of shigellosis surveillance is to promptly investigate outbreaks to determine the mechanism of transmission, identify high-risk groups in the population and institute appropriate control measures.

**Main strategies** to prevent and control outbreaks of shigellosis include the following:

- Health education to modify hygiene and hand-washing behavior of the population;

- Sanitary control of food preparers and handlers who can resume work only after they have been shown to no longer be carrying the *Shigella* bacterium.

- Ensuring safety of municipal drinking water supply and appropriate treatment of sewage

- Improvements in hygiene for vegetable and fruit picking and packing
10.10.2 Recommended Shigellosis Case Definition

**Clinical description:** Any person with frequent (three or more times a day) and painful passage of stools that have visual presence of blood, mucus or pus, accompanied by fever and stomach cramps.

**Note:** Asymptomatic infections may occur.

**Case classification**

- **Clinical (probable):** not applicable
- **Confirmed:**
  - **Laboratory-confirmed shigellosis:** A case that meets the clinical description of shigellosis that is laboratory confirmed (isolation of *Shigella* from a stool specimen)
  - **Epidemiologically confirmed:** A case that meets the clinical description of shigellosis and who was exposed to the same source of infection as a laboratory-confirmed case

**Laboratory testing** is currently mandated for every hospitalized case of a diarrheal disease and for confirmation of outbreaks when there is a clustering of three or more cases of clinical diarrhea. The regional CPH can be contacted to obtain the most current list of NCDC recognized/recommended laboratories in the area. Isolation of *S. dysenteriae type 1* must be confirmed by the NCDC.

The protocol for laboratory confirmation is given at the end of this section (10.10).

10.10.3 Shigellosis Case Notification Procedures and Forms.

Any case of acute diarrhea meeting the clinical description of shigellosis and any confirmed case of shigellosis identified by providers or isolation of *Shigella* by any laboratory requires urgent notification of the CPH within 24 hours by any existing means of communication. General requirements for notification are outlined in more detail in Chapter 4.

Health service providers should report any cases of acute diarrhea meeting the clinical description of shigellosis to the rayon CPH as “Diarrhea” specifying in brackets (Suspected Shigellosis) on urgent case notifications.

During subsequent investigation, the rayon CPH will classify such cases as “Confirmed Shigellosis” or “Unspecified Infectious Diarrheal Disease” and report them accordingly, taking into account results of laboratory tests and investigation findings.

10.10.3 Shigellosis Outbreak Investigation

Rapid identification and investigation of confirmed shigellosis and acute diarrhea cases meeting the clinical description of shigellosis is important for the source and the mechanism of transmission to be identified and measures taken to prevent further spread to other persons.

**Note:** A cluster of 3 cases of acute diarrhea or confirmed cases of shigellosis during 2 weeks in a given geographic territory requires an investigation by a rayon CPH epidemiologist in cooperation with facility health workers within 2 business days of notification.
The following steps are recommended in an investigation (see also Chapter 6):

a) **Verify that all cases meet the clinical description of shigellosis by reviewing medical records**

b) **Collect laboratory specimens if this has not been done yet** (refer to the protocol at the end of this chapter). In case of a large outbreak try to obtain specimens from at least 10-20 people.

c) **Collect data as envisioned in an cluster/outbreak investigation report for diarrheal diseases** (see suggested template in Figure 31 for Diarrheal Disease Investigation Report). If a food-borne shigellosis is suspected, complete also an annex report about food-borne bacterial intoxication (see Figure 32a)

d) **Inform local health administration and other stakeholders about outbreak/group cases verbally or in a written form** (e.g., share with them preliminary investigation results)

e) **Implement control and prevention measures regardless of whether laboratory confirmation of shigellosis is already available** (see next section).

f) **Continue analyzing the data about the outbreak** as described in the general part of the guidelines on a daily basis as new information on the outbreak becomes available. The objective is to monitor the effectiveness of control measures.

g) **Finalize the cluster investigation report (Figure 31) and annex (in case of food-borne shigellosis, see Figure 32a) and submit them to the regional CPH in two copies (the regional CPH will forward one copy to NCDC).**

### 10.10.4 Shigellosis Outbreak Control/Response

A cluster of 3 or more cases is considered an outbreak and requires the following control actions from the health facility and rayon CPH:

1. If the cause of the outbreak has been identified (such as disrupted drinking water supply, malfunctioning sewage systems), advise local health administration, sanitary inspection and other appropriate authorities on the need to fix the problem immediately.

2. Advise patients on the importance and effectiveness of hand-washing with soap and water after defecation as a means of curtailing transmission of *Shigella* to contacts.

3. Patients with known *Shigella* infections (and, whenever feasible, ill contacts of shigellosis patients) should not be employed to handle food or to provide child or patient care until 2 successive fecal samples or rectal swabs (collected 24 or more hours apart, but not sooner than 48 hours following discontinuance of antimicrobials) are found to be free of *Shigella*.

4. Carry out concurrent disinfection of feces and contaminated articles with a chlorine solution or any other MoHLSA-recommended disinfectants. In communities with a modern and adequate sewage system, feces can be discharged directly into sewers without preliminary disinfection.

5. Recommend keeping small children with diarrhea out of child care settings

6. Deliver appropriate health education messages to the population (some examples are provided below) taking into account local traditions and cultural sensitivities targeting first of all mothers, schoolchildren and street vendors. An organized effort to promote careful hand-washing with
soap and water is the single most important control measure to decrease transmission rates in most settings.

**PERSONAL HYGIENE**

- Wash your hands, including under the nails with soap using plenty of clean water
  - before you prepare or serve food;
  - before you eat or feed children;
  - after you use the toilet or clean up children
- Use a toilet or latrine and keep them clean
- Dispose of babies’ feces in the toilet or latrine
- Supervise hand washing of small children after they use the toilet

**FOOD**

- Cook raw food thoroughly
- Eat cooked food while it is still hot
- Store leftover cooked food in a refrigerator
- Reheat cooked food thoroughly
- Avoid contact between raw and cooked food
- Eat raw fruit only after it has been freshly peeled
- Wash your dishes, utensils, and especially cutting board with soap and water

**DRINKING WATER**

- Boil or chlorinate your drinking water
- Store drinking water in a clean container with a small opening or a cover away from small children
- Cover open wells when not in use
- Hang up the buckets used to collect water when not in use – do not leave them on a dirty surface
- Pour the water from the container, do not dip a cup into it
- Do not defecate in or near a source of drinking water

7. If the access to clean water supply is disrupted, provide needed supplies and educate health workers and the population that water for drinking can be made safe in two ways:

△ By boiling it

△ By chlorinating it. For this purpose, first prepare a stock solution of chlorine by adding to 1 liter of water one of the following:

- 15 grams of 70% calcium hypochlorite or
- 33 grams of chlorinated lime at 30% active chlorine or
- 250 ml of 5% sodium hypochlorite (or 120 ml of 10% sodium hypochlorite)

Store the stock solution in a cool place in a closed container that does not admit light. Then use the stock solution to make water safe by adding three drops (or 0.6 ml) of the stock solution to each liter of water. Mix well and allow the chlorinated water to stand for at least 30 minutes before using it.

10.10.5 Recommended Scope of Routine Analysis of Shigellosis Surveillance Data to Be Performed by CPH

(See Chapter 5 for more details.)

The CPH should perform routine monthly analysis of the following data:

△ Shigelllosis incidence rate / number of cases by month, year, age group and geographic area (line graphs can facilitate observing seasonal and secular trends)
Laboratory testing and confirmation rates for diarrheal diseases

Urgent notification and outbreak investigation rates

10.10.6 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

- Monitor trends in disease incidence
- Detect and monitor outbreaks and epidemics for appropriate response
- Identify high-risk areas for further targeting of intervention
- Determine the effectiveness of control measures
- Help mobilize additional funds to support outbreak control measures
- Evaluate and improve the performance of the surveillance system (e.g., reaction time for notification, case confirmation rate, outbreak investigation rate)
Figure 31. Suggested Template: Investigation Report for Cluster of Diarrheal Disease

Introduction:

1. General context, description of the affected territory: accessibility of the area, type of setting(s) involved (e.g., school, hospital), condition of the sewage and drinking water supply systems, etc.

Investigation findings:

2. Date outbreak started, that is, the date of onset of the first case
3. Number of individuals affected by the outbreak – no. of cases, no. of deaths, case fatality rate
4. Epidemic curve: distribution of cases per day or per week since the beginning
5. Geographical distribution of cases: attach maps as necessary
6. Age, gender and social distribution of cases
7. Attack rates\(^1\) for specific food items eaten and not eaten (if applicable)
8. Results of laboratory investigation of cases: organism isolated and its antimicrobial susceptibility patterns
9. Results of laboratory investigation of the environment (if applicable)
10. Partners operating locally in the domain of water/sanitation and health care

Discussion:

11. Confirmed or probable source of infection
12. Confirmed or probable mode of transmission
13. Risk of spread of the outbreak and potential consequences
14. Conditions that support spread of the disease
15. Potential limitations of the field investigation (areas not visited, quality of data collected, etc.)

Actions taken and recommendations:

16. List response and preventive measures taken
17. Give clear practical recommendations regarding additional control measures to be undertaken
18. Provide advice on the need for additional resources (human, material, financial) to help control the outbreak and coordination with other partners operating in this domain.

\(^1\) Attack rate is the proportion of an exposed population at risk that becomes infected or develops clinical illness during a defined period of time.
**PROTOCOL FOR LABORATORY CONFIRMATION OF SHIGELLOSIS and SALMONELLOSIS**

**Sampling strategy:** Collect specimens from up to 10-20 clinical cases at each investigation site. Cases should meet all of the following criteria:
- currently having bloody diarrhoea or probable salmonellosis;
- b) onset of illness less than 4 days before sampling;

**Confirmation test:** Isolation of Shigella or Salmonella

**Specimen to be collected:** Stool

**Referral laboratory:** Contact regional CPH office or NCDC for the list of approved laboratories

**Important:** Stool samples should reach the laboratory within 48 hours of collection

### I. DOCUMENTATION

<table>
<thead>
<tr>
<th>Supplies needed</th>
<th>IV. TRANSPORTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Register 60/A</td>
<td>○ Ziplock plastic bag</td>
</tr>
<tr>
<td>○ Lab investigation request form</td>
<td>○ Cold box with ice packs</td>
</tr>
<tr>
<td>○ Marker (water resistant)</td>
<td>○ Plastic container</td>
</tr>
<tr>
<td>○ Specimen label</td>
<td>○ Box label</td>
</tr>
</tbody>
</table>

**Steps:**

1. Create a specimen label with patient's name, identification number, date, time and suspected diagnosis
2. Fill in a copy of a lab investigation request form with patient information to accompany the specimen.
3. Make sure patient information has been entered in register 60/A and an urgent notification has been sent to CPH.

### II. COLLECTION AND HANDLING

<table>
<thead>
<tr>
<th>Supplies needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ One tube of Cary Blair transport medium</td>
</tr>
<tr>
<td>○ Leak-proof screw-cap container</td>
</tr>
<tr>
<td>○ Sterile cotton-tipped applicators (swabs)</td>
</tr>
</tbody>
</table>

If specimen can not reach the laboratory within 2 hours, Cary Blair transport medium should be used.

**Steps:**

1. If possible, chill the tube of Cary Blair medium by placing it in ice packs in a refrigerator 1-2 hours before collecting the specimen
2. Put on gloves & wear them at all times when handling the specimen
3. Using a wooden spatula or plastic spoon, collect fresh stool (8-10g) including portions with blood and/or mucus. Place stool in a leak-proof sterile screw-cap container. Do not let stool dry out.
4. If a patient is not able to pass stool, take a rectal swab as follows:
5. Remove the wrapper from the handle end of the sterile swab. Do not touch the tip of the swab
6. Moisten the swab in chilled Cary Blair medium
7. Insert the swab through the rectal sphincter 2-3 cm and gently rotate
8. Withdraw and examine the swab to make sure fecal material is visible on the tip
9. Transfer a small amount of the stool (or the rectal swab) to the bottom a tube of Cary Blair transport medium.
10. Break off the top portion of the stick so the cap can be tightly screwed onto the tube.
11. Make sure the tube is properly labeled (see Section I).
12. Safely dispose of all contaminated materials. Do not reuse.

### III. STORAGE

<table>
<thead>
<tr>
<th>Steps:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Immediately refrigerate at 4-8°C.</td>
</tr>
<tr>
<td>2. Keep refrigerated until shipment.</td>
</tr>
</tbody>
</table>

### IV. TRANSPORTATION

**Steps:**

1. If the laboratory is nearby, specimens may be hand carried in an insulated box with ice packs, otherwise follow the following procedures:
   1. Tighten the cap, apply waterproof sealing tape over the cap and top of specimen container.
   2. Place specimen container in a suitably sized plastic bag (1st layer) together with a small amount of absorbent material, such as cotton wool. The bag must be sealed either using heated bag sealer or waterproof adhesive tape; as an alternative, use ziplock plastic bags. Specimens from different patients should never be sealed in the same bag.
   3. Sealed bags containing the specimens should be placed inside plastic containers with screw-cap lids (2nd layer). Provided that specimens have been double-bagged properly in sealed plastic bags, specimens from several patients may be packed inside the same secondary plastic container. Additional absorbent material should be placed inside the container to absorb any leakage that may occur.
   4. Sealed plastic containers should be fitted into insulated 3rd layer containers (e.g., a cold box). First, place ice packs at the bottom of the box, and, along the sides, place the plastic container with the specimen in the center, then place more ice packs on top. Make sure that the container is firmly fixed in the outer box.
   5. Put the lab investigation request form in a plastic bag and place it in the outer box.
   6. Label box with name, address, and telephone number of the referral laboratory and the sender.
   7. Label box with the safety precautions (“Do not freeze,” “Do not expose to heat,” “This side up,” “Biological specimen,” etc.).
   8. Arrange shipping date.
   9. When arrangements are finalized, inform the recipient of time and manner of transport and make sure that package reaches referral laboratory within 2 days of specimen collection.

### V. COMMUNICATING TEST RESULTS

**Steps:**

Laboratory should communicate results to the clinician within 2-4 days of receiving the sample. If the result of the test is positive, it should also notify the rayon CPH.

1. Record the results in the case history and Journal 60/A.
10.11 Salmonellosis

10.11.1 Rationale for Surveillance

Salmonellosis is the main cause of food-borne disease. The predominant mode of transmission is ingestion of the organisms in food derived from infected animals or contaminated by feces or an infected animal or person. This includes raw and undercooked eggs and egg products, raw milk and raw milk products, contaminated water, meat and meat products, poultry and poultry products.

Most cases occur sporadically. However, large outbreaks in hospitals, institutions for children, and restaurants are not uncommon and usually arise from food contaminated at its source, or less often, during handling by an ill person or a carrier.

NCDC receives reports about approximately 200 culture-confirmed cases every year for an average rate of 4.5 per 100,000 people. However, most Salmonella infections are mild and self-limited and only a small proportion of all cases (1-2 percent) are recognized clinically and reported. The severity of illness depends on the serotype, number of organisms ingested and host factors. Infants, the elderly and those with impaired immune system are more likely to have a severe illness requiring hospitalization. Case fatality rate is approximately 0.2 percent with most deaths occurring in people with Salmonella sepsis or severe dehydration. 2 percent of cases are complicated by chronic arthritis.

In addition to the above health-related complications, salmonella food poisoning is costly for the patient (loss of wages and cost of treatment), for the health and social services (cost of treatment, investigation, sick leave benefits) and for the food industry (loss of production, bad publicity, possible litigation).

The purpose of reporting and surveillance

- To identify the source of transmission (e.g., a commercial product or a food handler) and to prevent further disease transmission
- To inform population how they can reduce their risk of exposure
- To educate potentially exposed people about the signs and symptoms of disease to facilitate early diagnosis

10.11.2 Recommended Salmonellosis Case Definition

Clinical description: Any person with diarrhea, fever > 37°C, abdominal pain, nausea with or without vomiting.

Note: Asymptomatic infections may occur and the organism may cause extraintestinal infections.

Case classification

- **Clinical (probable):** not applicable

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29 In the present guidelines, the term “salmonellosis” is used to define the clinically manifest disease of people and animals resulting from infection by Salmonella other than Salm. typhi or Salm. paratyphi A, B, or C.
**Confirmed:**

- **Laboratory-confirmed:** A case that meets the clinical description of salmonellosis that is laboratory confirmed (isolation of *Salmonella* from a clinical specimen)

- **Epidemiologically confirmed:** A case that meets the clinical description of salmonellosis and who was exposed to the same source of infection as a laboratory-confirmed case

**Laboratory testing** is currently mandated for every hospitalized case of a diarrheal disease and for confirmation of outbreaks when there is a clustering of three or more cases of diarrhea. The regional CPH can be contacted to obtain the most current list of NCDC recognized/recommended laboratories in the area.

Specific steps for obtaining, handling, storage and transportation of stool specimens are presented in the Shigellosis/Salmonellosis laboratory confirmation protocol in Section 10.10. Refer to Figure 32 at the end of this chapter for the instructions concerning collection and transportation of food specimens and interpretation of laboratory results.

### 10.11.3 Salmonellosis Case Notification Procedures and Forms.

Any clinical (probable) or confirmed case of salmonellosis identified by providers or isolation of *Salmonella* by any laboratory requires urgent notification of the CPH within 24 hours by any existing means of communication. General requirements are outlined in more detail in Chapter 4.

Providers of health services should report any cases of acute diarrhea meeting the clinical description of salmonellosis to the rayon CPH as “Diarrhea” specifying in brackets (Suspected Salmonellosis) on urgent case notifications.

During subsequent investigation, the rayon CPH will classify such cases as “Confirmed Salmonellosis” or “Unspecified Infectious Diarrheal Disease” and report them accordingly taking into account results of laboratory tests and investigation findings.

### 10.11.4 Salmonellosis Outbreak Investigation

Rapid identification and investigation of salmonellosis cases is important for the source and the mechanism of transmission to be identified so that measures can be taken to prevent further spread to other persons.

**Note:** A cluster of 3 clinical (probable) or confirmed cases of salmonellosis within 2 weeks in a given geographic territory requires an investigation by a rayon CPH epidemiologist in cooperation with facility health workers within 2 business days of notification.

The following steps are recommended in an investigation (see also Chapter 6):

* **a) Verify the outbreak,** that is, that all cases meet the clinical description of salmonellosis, by reviewing medical records

* **b) By quick review of reported cases,** determine time and place of exposure and the population at risk.
c) Obtain a complete listing of the foods served (see Figure 32a). Survey cases and exposed healthy controls. *Compare the attack rates for specific food items eaten and not eaten* in sick and exposed healthy population. The implicated food item(s) will usually have the greatest attack rates. When healthy controls are not available, prepare a list of foods consumed by the cases. Implicated food items will usually be common to all cases.

d) *Inquire about the origin of the incriminated food and the manner of its preparation and storage* before serving. Look for food handling errors, such as unsafe raw ingredients, possible sources of contamination, and periods of inadequate refrigeration and heating that would permit growth of *Salmonella*.

Here is a list of sample questions you may need to ask health workers and/or cases to implement steps b-d:

- What date and time did the symptoms start?
- Where has the patient eaten in the 3 days before the symptoms started?
- What has the patient eaten in the 3 days before the symptoms started?
- Has the patient been in contact with animal feces (lives on a farm, has pets, cleaned a bird cage, etc.)?
- Does anyone living with the patient have symptoms of salmonellosis?

e) *Search for additional cases* if 3 or more cases occur in association with common exposure.

j) *Collect specimens of feces and vomitus from up to 10-20 cases as well as any leftover suspected food (if the food was consumed in an organized setting or by a large number of households) and send for laboratory examination* if this has not been done yet. Specific steps for obtaining, handling, storing and transporting stool specimens are presented in the Shigellosis/Salmonellosis laboratory confirmation protocol in Section 10.10. Refer to Figure 32 at the end of this chapter for the instructions concerning collection and transportation of food specimens and interpretation of laboratory results.

g) *Culture stools of any household contacts who are involved in food handling, direct patient care, or care of young children* in institutional settings or elderly people.

h) *Search for food handlers with symptoms of the disease, and collect stool specimens from them.*

i) *Collect other data* as envisioned in an cluster/outbreak investigation report for diarrheal diseases (the suggested templates are presented as Figure 31 in Section 10.10) and report about a food-borne bacterial intoxication (see Figure 32a).

j) *Inform local health administration and other stakeholders about outbreak/group cases verbally or in a written form* (e.g., share with them a preliminary investigation report).

k) *Implement control and prevention measures (see next section).*

l) *Continue analyzing the data about the outbreak* as described in the general part of the guidelines on a daily basis as new information on the outbreak development becomes available. The objective is to monitor the effectiveness of control measures.

m) *Finalize the cluster investigation report (Figure 31), including data on food-borne bacterial intoxication (Figure 32a)* and submit them to the regional CPH in two copies (the regional CPH will forward one copy to NCDC).
10.11.5 Salmonellosis Outbreak Control/Response

The main objective of control measures is to ensure that food for consumption is free of *Salmonella*.

1. Obtain a complete listing of the suspected foods served and embargo, under refrigeration, all foods still available.

2. Take measures to make sure that symptomatic individuals are excluded from food handling and from direct care of infants, elderly, immuno-compromised and institutionalized patients. Release to return to work handling food or inpatient care requires 2 consecutive negative stool cultures for *Salmonella* collected not less than 24 hours apart; if antibiotics have been given, the initial culture should be taken at least 48 hours after the last dose.

3. Educate known *Salmonella* carriers on the need for very careful hand-washing after defecating and before handling food and discourage them from handling food for others as long as they shed organisms.

4. Carry out concurrent disinfection of feces and soiled articles with a chlorine solution or other MoHLSA-recommended disinfectant. In communities with a modern and adequate sewage system, feces can be discharged directly into sewers without preliminary disinfection.

5. Educate food handlers and preparers about the importance of:
   - Hand-washing before, during and after food preparation
   - Refrigerating prepared food in small containers
   - Thoroughly cooking all foodstuffs derived from animal sources, particularly poultry, pork, egg products and meat dishes
   - Avoiding recontamination within the kitchen after cooking is completed
   - Maintaining a sanitary kitchen and protecting prepared foods against rodent and insect contamination

6. Educate the public to avoid consuming raw, incompletely cooked, dirty or cracked eggs, unpasteurized milk and other diary products.

7. Recommend that respective authorities inspect for sanitation and adequately supervise abattoirs, food processing plants, feed blending mills and butcher shops.

8. Recommend that animal-derived foods prepared for animal consumption be adequately cooked to eliminate pathogens.

10.11.6 Recommended Scope of Analysis of Salmonellosis Surveillance Data to Be Performed by CPH

(See Chapter 5 for more details.)

The CPH should perform analysis of the following data:

- Salmonellosis incidence rate / number of cases by month, year, age group and geographic area (line graphs can facilitate observing trends and identify clusters of cases)
Laboratory testing and confirmation rates

Urgent notification and outbreak investigation rates

10.11.7 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

- Monitor trends in disease incidence
- Detect and monitor outbreaks and epidemics for appropriate response
- Identify high-risk food, high-risk food practices, and high-risk populations to design specific interventions
- Monitor the effectiveness of control measures
- Guide the formation of food-related policies
- Evaluate and improve the performance of the surveillance system (e.g., reaction time for notification, case confirmation rate, outbreak investigation rate)
**Figure 32. Instructions for the Collection and Transportation of Food and Water Specimens and Interpretation of Laboratory Results**

Specimens of food and water should be submitted for testing if they are considered to be possibly implicated as a vehicle of the disease or outbreak (for example, based on the attack rate).

The general principles regarding collection of specimens are given here. However, always consider seeking advice from the laboratory on appropriate specimens to collect.

1. Collect specimens of suspect food at the earliest and place them in sterile containers.
   
   a) If the food article is solid, cut it with a sterile knife and collect 100-200 grams of the sample from the center.
   
   b) In case of liquids, first thoroughly shake the specimen to mix and then with the help of a sterile tube collect the specimen and shift into a sterile container.
   
   c) In case of water, collect a minimum of one liter in sterile bottles provided by the laboratory.

2. All the specimens should be properly labeled and packed. Make sure the following details accompany the specimens:
   
   ✓ Identification of the case by name, address and circumstances of the incident;
   
   ✓ Information on the product/food (source, date of purchase, date of production);
   
   ✓ Suspect organism and clinical symptoms of illnesses attributed to the food
   
   ✓ Date specimens collected

3. Store samples chilled, ideally at 4°C. Hot food should be cooled rapidly by putting the containers under cold running water and then held at 0-4°C.

4. Transport specimens to the laboratory by the most rapid mode available. Perishable food should be kept at 2-8°C. Samples should be packed in such a way that there is no spillage during transportation. The receiving laboratory should be pre-informed about the method of transport and anticipated time of receipt in the laboratory.

**Interpretation of results:**

✓ Correlate the isolate with epidemiological data before incriminating the causative agent.

✓ Organism is more likely to be the causative agent if the same organism (same serotype/phage type) is recovered both from suspect food and the clinical specimen taken from the patient.

✓ The source/mode of spread of the causative agent can often be ascertained if the agent is isolated from raw foods, food ingredients, equipment or food handlers or environment.

✓ Food is confirmed as a vehicle of toxic substance if organism or toxin (e.g., staphylococcal enterotoxin or botulinum toxin) is detected, even in the absence of any clinical specimen.
**Figure 32a Annex Report about a Food-borne bacterial intoxication**

<table>
<thead>
<tr>
<th>Region</th>
<th>Rayon/City</th>
<th>Village</th>
<th>200_ year</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Place of exposure (infection/intoxication)</th>
<th>Exposure (infection/intoxication)</th>
<th>Age group of exposed population at risk, years</th>
<th>Age group of infected population</th>
<th>Lethal cases by age group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Time</td>
<td>Total cases</td>
<td>Under 1</td>
<td>1-4</td>
</tr>
</tbody>
</table>

1. 
2. 
3. 

* Social events (wedding etc.), place of used drinking water

**continue:**

<table>
<thead>
<tr>
<th>Date and time disease onset</th>
<th>Number of sick persons who have</th>
<th>Confirmation of causative agent</th>
<th>Number of sick persons</th>
<th>Suspected food products</th>
<th>Number and type (strain) of causative agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Last</td>
<td>patient</td>
<td>patient</td>
<td>Lab-investigated</td>
<td>With positive result</td>
</tr>
<tr>
<td>nausea</td>
<td>vomiting</td>
<td>diarrhea</td>
<td>abdominal cramps</td>
<td>fever</td>
<td>neurological symptoms</td>
</tr>
</tbody>
</table>

1. 
2. 
3. 

Director of center: 
Epidemiologist: 

Seal
# List of exposed persons

<table>
<thead>
<tr>
<th>#</th>
<th>Name of probable infected person</th>
<th>Age</th>
<th>Date of notification</th>
<th>Date of disease onset</th>
<th>Probable diagnosis</th>
<th>Symptoms by sequence of appearance (1st, 2nd, 3rd)</th>
<th>Result of lab. investigation</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nausea, Vomiting, Diarrhea, Abdominal cramps, Fever, Neurological symptoms, Cardiovascular symptoms</td>
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<td></td>
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</tbody>
</table>

10. Disease-Specific VPD Prevention and Control Guidelines
<table>
<thead>
<tr>
<th>#</th>
<th>First name, last name of exposed persons</th>
<th>Infecte d or not</th>
<th>List of food and cooked products consumed by persons present at potential outbreak location</th>
</tr>
</thead>
<tbody>
<tr>
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</table>
## Rate of exposure by type of used food

<table>
<thead>
<tr>
<th>#</th>
<th>List of food products</th>
<th>Number of persons consuming listed food</th>
<th>Number of persons not consuming listed food</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Infected</td>
<td>healthy</td>
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</table>
10.12 Acute Viral Hepatitis A

10.12.1 Rationale for Surveillance

Hepatitis A is a self-limited disease caused by the hepatitis A virus (HAV) that is transmitted from person-to-person via the fecal-oral route, typically by ingestion of feces-contaminated food or water. Direct person-to-person spread is common under poor hygienic conditions. Occasionally, HAV is also acquired through anal-oral sexual contact and blood transfusions.

The disease results in a liver failure and death in nearly 2 percent of clinically manifested cases in adults older than 50 years of age and approximately 0.2-0.3 percent of younger cases. It is also a significant cause of morbidity and socio-economic losses. On average, adults miss 30 days of work. For each hospitalized case, direct and indirect medical costs can sum up to 500-800 Lari or more.

Georgia is a country with intermediate endemicity of HAV infection. Most infections used to occur early in life with nearly all children infected with HAV before the age of 9. With improved sanitation and hygiene, infections are delayed and consequently the number of persons susceptible to the disease increases. Under these conditions explosive epidemics can arise from fecal contamination of a single source.

In Georgia approximately 2,500 HAV infections are reported annually (incidence rate 56 per 100,000 population). However, there is substantial underestimation of hepatitis A cases, because HAV infections of young children are mostly asymptomatic and therefore unrecognized. Less that 20 percent of cases are laboratory-confirmed.

Surveillance for this disease helps monitor incidence, detect outbreaks, identify contacts of case-patients for post-exposure prophylaxis, and contain spread.

Main strategies to prevent and control outbreaks of Hepatitis A include the following:

- Health education to improve hygiene and hand-washing behavior of population;
- Improved sanitation to ensure clean water sources, etc.
- Administration of Immune globulin for post-exposure prophylaxis

Cost-effectiveness studies have shown that where HAV immunity of adult population is 45 percent or less, routine Hepatitis A vaccination may be a strategy of choice. Since in Georgia HAV immunity is much higher, routine hepatitis A vaccination is not currently recommended.

10.12.2 Recommended Hepatitis A Case Definition

Clinical description: Any person who has an acute illness, typically including acute jaundice, dark urine, anorexia, malaise, fatigue, and right upper-quadrant tenderness. Biological signs include increased urine urobilinogen and usually >2.5 times the upper limit of serum alanine aminotransferase (ALT).

Note: The proportion of asymptomatic infections is variable.
Case classification

**Clinical (probable)** (unspecified acute viral hepatitis): A case that meets the clinical description above.

**Confirmed**: A case that has at least one of the following.

- IgM antibody to hepatitis A antigen (IgM anti-HAV) positive or

- A case compatible with the clinical description in a person who has an epidemiological link (a close contact with a lab-confirmed case during his/her period of communicability 15-50 days prior to the onset of symptoms) with a confirmed hepatitis A case.

**Note**: Positive IgG antibody to hepatitis A antigen (IgG anti-HAV) appearing in the convalescent phase of infection remains for the lifetime of the person, and confers enduring protection against the disease. *Detection of IgG anti-HAV alone indicates past infection.*

For patients negative for hepatitis A, further testing for a diagnosis of acute hepatitis B, C, D, or E is recommended.

Because the clinical picture for all acute viral hepatitis A through E is similar, only laboratory testing can reliably distinguish various etiological agents. Testing for as many markers as possible is therefore very important, because response measures depend on the type of hepatitis identified.

**Laboratory testing** is currently mandated for every clinical (probable) case of acute viral hepatitis (except for an outbreak of hepatitis A, where it is required to confirm at least one case, provided that all cases are epidemiologically linked or every case where such link cannot be established). The regional CPH can be contacted to obtain the most current list of NCDC recognized/recommended laboratories in the area.

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10.12.3 Case Notification Procedures and Forms

Any clinical (probable) case of acute viral hepatitis identified by providers or a positive lab test for any hepatitis require urgent notification of the CPH within 24 hours by any existing means of communication. General requirements are outlined in more detail in Chapter 4.

10.12.4 Hepatitis A Case/Outbreak Investigation

Rapid identification and investigation of cases of acute hepatitis A is important for the source to be identified so that measures can be taken to prevent further transmission to other persons (e.g., post-exposure prophylaxis).

**Note**: A cluster of 3 or more probable cases of acute hepatitis during the same period consistent with viral Hepatitis A incubation period (15-50 days) in a given geographic territory requires an investigation by a rayon CPH epidemiologist in cooperation with facility health workers within 2 business days of notification.

The following steps are recommended in an investigation (see also Chapter 6):

- **a) Verify the outbreak on-site** by reviewing medical records. Check if cases meet the case definition.
Collect serum specimens to confirm the evidence of acute liver disease (elevated aminotransferase levels) and determine its type if this has not been done previously. Specimen collection, storage and transportation procedures are specified in the PROTOCOL FOR LABORATORY CONFORMATION OF ACUTE VIRAL HEPATITIS given in Section 10.6.

b) **Carry out field visits, and interview health staff to identify the source of infection, the mode of transmission and collect other data** as envisioned in an cluster/outbreak investigation report for diarrheal diseases (the suggested template is presented as Figure 31 in Section 10.10.)

c) **Identify and prepare a list of contacts of cases who require post-exposure prophylaxis**

- Close personal contacts (e.g., household, sexual)
- Children in day-care settings if one or more hepatitis A cases are recognized in children or employees of the setting
- Food handlers in the same establishment where a common source outbreak was recognized

d) **Inform local health administration and other stakeholders** about outbreak/group cases verbally or in a written form (e.g., share with them a preliminary investigation report)

e) **Implement control and prevention measures (see next section).**

f) **Continue analyzing the data about the outbreak** as described in the general part of the guidelines on a daily basis as the new information on the outbreak development comes. The objective is to monitor the effectiveness of control measures.

**g) Finalize the cluster investigation report and submit it** to the regional CPH in two copies (the regional CPH will forward one copy to NCDC).

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### 10.12.5 Hepatitis A Outbreak Control/Response

An outbreak of acute viral hepatitis A requires the following control actions from the health facility and rayon CPH:

1. Eliminate any common sources of infection (if identified).

2. Make sure that sewage disposal and water distribution systems work properly. Alert sanitary and local authorities if problems are identified.

3. Advise patients on the importance and effectiveness of hand-washing after defecation as a means of curtailing transmission of the virus to contacts.

4. Educate the public about good sanitation and personal hygiene, with special emphasis on careful hand-washing and sanitary disposal of feces.

5. Recommend that **post-exposure prophylaxis** be carried out. A single intramuscular dose of Immune globulin (the dose is specified in a respective package insert), if administered within 2 weeks of exposure to population groups specified above, may help prevent or reduce the severity of the disease. However, it is of no help in the acute phase of hepatitis A.

**Note 1:** Persons who received one dose of hepatitis A vaccine at least 2 weeks before a HAV exposure do not need IG.
Note 2: Serologic screening of contacts of infected individuals for anti-HAV before they are given IG is not recommended because screening is more costly than IG and would delay its administration.

6. Certain population groups with increased risk of hepatitis A infection, such as household contacts of infected persons, personnel of medical, child care and food service settings, preschool children, persons with chronic liver disease and disorders requiring transfusion of blood products, injecting drug users, homosexually active men should be encouraged to consider medical consultation regarding a need to get hepatitis A vaccination at their own expense. Age breakdown of registered hepatitis A cases shows that transmission shifts to older age groups, which means that a decreasing proportion of population gets immunity in the childhood and thus they may be at risk.

Inactive hepatitis A vaccines registered in Georgia may be used for both pre- and post-exposure prophylaxis.

**10.12.6  Recommended Scope of Routine Analysis of Hepatitis A Surveillance Data to Be Performed by CPH**

(See Chapter 5 for more details.)

The CPH should perform routine monthly analysis of the following data:

- Hepatitis A incidence rate by month, year, age group and geographic area (line graphs can facilitate observing seasonal and secular trends)
- Laboratory testing and confirmation rates
- Urgent notification and outbreak investigation rates

**10.12.7  Principle Uses of Data for Decision Making at the Regional and Rayon Levels**

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

- Monitor trends in disease incidence
- Detect outbreaks
- Determine the effectiveness of control measures
- Determine the epidemiologic characteristics of infected persons, including the source of their infection to guide policy development
- Evaluate and improve the performance of the surveillance system (e.g., reaction time for notification, case confirmation rate, outbreak investigation rate)
10.13 Cholera

10.13.1 Rationale for Surveillance

Cholera is a secretory diarrheal disease caused by enterotoxin-producing strains of *V. cholerae*. Although over 150 serogroups of *V. cholerae* have been identified, for decades toxigenic *V. cholerae* serogroup O1 was the only known cause of epidemic cholera. Serogroup O1 occurs as two biotypes – classical and El Tor – each of which occurs as 3 serotypes (Inaba, Ogawa and rarely Hikojima). After a large epidemic in Asia in 1992 and 1993, it became clear that toxigenic *V. cholerae* serogroup O139 also could cause epidemics very similar to those caused by *V. cholerae* O1. According to WHO, both *V. cholerae* O1 and O139 are now recognized causes of cholera and should be reported the same way. Isolates of non-O1 and non-O139 *V. cholerae* can cause illness, but they do not pose the public health threat.

The enterotoxin produced by *V. cholerae* O1 and O139 causes a massive outpouring of fluid and electrolytes into the bowel. This rapidly leads to profuse watery diarrhea, loss of circulation and blood volume, metabolic acidosis, potassium depletion, and ultimately vascular collapse and death. 75 percent or more of initial infections with *V. cholerae* O1 or O139 may be asymptomatic, depending on the infecting dose. Of the 25 percent of persons with symptomatic infections, most have mild illness. Approximately 5 percent of patients have moderate illness that requires medical attention but not hospitalization. In only about 2 percent of patients does the illness progress to life-threatening “cholera gravis”. In such severe dehydrated cases death may occur within a few hours, and the case fatality rate may exceed 50 percent. With proper and timely rehydration, this can be less than 1%.

Cholera causes an estimated 120,000 deaths per year worldwide and is prevalent in 80 countries. The disease is acquired through ingestion of an infective dose of contaminated food or water. New outbreaks can occur sporadically in any part of the world where water supply, sanitation, food safety, and hygiene are inadequate. Although no cases of cholera have been reported in Georgia recently, the risk of cholera epidemics is intensified during manmade and natural disasters, such as conflicts and floods, and when large populations are displaced. Cases of cholera are also regularly imported into industrialized countries.

The current response to cholera in many countries is often reactive and takes the form of an emergency response with inadequate preparedness. Although these responses can prevent many deaths, they fail to prevent cholera cases on a long-term basis. Improvements in water supply and sanitation represent the most sustainable approach to protecting against cholera and other diarrheal diseases.

WHO recommends the following approaches to control and prevent cholera outbreaks and manage epidemics more effectively:

- **Improved surveillance** to obtain better data for risk assessment and the early detection of outbreaks.
- **Improved preparedness** to provide a rapid response to outbreaks and limit their spread.
- **Improved case management** to reduce deaths among cases.
- **Improved environmental management** to enhance prevention.
- **Health education** focused on behavioral change.
10.13.2  Recommended Cholera Case Definition

Clinical description: severe dehydration or death from acute watery diarrhea in a patient aged 5 years\(^30\) or more.

Case classification

- **Clinical (probable):** A case that meets the clinical description of cholera
- **Confirmed:** A case that meets the clinical description of cholera that is laboratory confirmed (isolation of *Vibrio cholerae O1 or O139* from stools in any patient with diarrhea)

Note: In a cholera-threatened area, when the number of confirmed cases rises, shift should be made to using primarily the clinical case classification (see the laboratory testing recommendation below)

**Laboratory testing** is currently mandated for the first 5-10 clinical cases (if any are positive, then for every tenth case during the outbreak). Isolation of *Vibrio cholerae O1 or O139* must be confirmed by the NCDC.

The protocol for laboratory confirmation is given at the end of this chapter.

10.13.3 Cholera Case Notification Procedures and Forms.

Cholera is one of 3 diseases requiring notification under the International Health Regulation, because it has the potential to cause many deaths, to spread quickly and eventually internationally, and to seriously affect travel and trade.

Any clinical (probable) or confirmed case of cholera identified by providers or isolation of *Vibrio cholerae O1 or O139* by any laboratory requires **immediate notification of the CPH within 1 hour** by any existing means of communication.

General requirements are outlined in more detail in Chapter 4.

10.13.4 Cholera Outbreak Investigation

Rapid identification and investigation of cholera cases is important for the source and the mechanism of transmission to be identified so that measures can be taken to prevent further spread to other persons.

Note: A single clinical (probable) or confirmed cases of cholera requires an investigation led by the NCDC or a regional CPH epidemiologist in cooperation with rayon CPH and facility health workers as soon as possible but not later than 24 hours after notification.

---

\(^{30}\) When cholera first appears in epidemic form in an unexposed population (e.g., in such countries as Georgia), it can affect all age groups, including children under 5 years; however, in children under 5 years of age, a number of pathogens can produce symptoms similar to those of cholera. To maintain specificity, therefore, children under 5 are not included in the case definition of cholera.
The following steps are recommended in an investigation (see also Chapter 6):

a) **Verify that all cases meet the clinical description of cholera by reviewing medical records.**

b) **Collect laboratory specimens if this has not been done yet** (refer to the protocol at the end of this chapter).

c) **In cooperation with health facilities, carry out active case finding** on the affected territory by interviewing public in work, educational settings and residencies and establishing surveillance of persons who shared food and drink with a cholera patient in the preceding 5 days.

d) **Collect data on cases as envisioned in a cluster/outbreak investigation report for diarrheal diseases** (see Figure 31 in 10.10). The key is to identify and investigate potential “vehicles of transmission” (e.g., contaminated water, food) so that appropriate control measures can be taken.

e) **Inform local health administration and other stakeholders about outbreak/group cases verbally or in a written form** (e.g., share with them a preliminary investigation results).

f) **Implement control and prevention measures (see next section).**

g) **Continue analyzing the data about the outbreak** as described in the general part of the guidelines on a daily basis as the new information on the outbreak development comes. The objective is to monitor the effectiveness of control measures.

h) Responsibility for the final report preparation and dissemination belongs to the NCDC.

10.13.5 Cholera Outbreak Control/Response

A. Epidemic Measures:

Note: depending on the extent of the outbreak, a Cholera Coordination Committee composed of key national and local stakeholders may be established to coordinate response.

1. **Inform the public** – avoid rumor and panic by maintaining a very open and complete flow of information without delays. Designate a single spokesperson who will be the focal point for dealing with the media. Plan regular press releases and conferences. Establish a balance in terms of the kind of information to be disseminated (e.g., both the news and preventive/control measures for the population).

2. **Conduct health education campaigns** for the population emphasizing the need to wash hands with soap (particularly after taking care of patients – touching them, their stools, their vomit, or their clothes) and seek appropriate treatment without delay.

<table>
<thead>
<tr>
<th>Key Messages to Give to the Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Come to the health care facility as soon as possible in case of acute watery diarrhea</td>
</tr>
<tr>
<td>• Start drinking oral rehydration solution (ORS) at home and during travel to the health care facility (See below for method of preparation)</td>
</tr>
<tr>
<td>• Wash your hands before cooking, before eating, and after using the toilet</td>
</tr>
<tr>
<td>• Cook food.</td>
</tr>
<tr>
<td>• Drink safe water.</td>
</tr>
</tbody>
</table>

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Additional examples of appropriate health education messages are given in Section 10.10.5.

3. **Advise health authorities** that emergency stocks of basic supplies should be prepared/mobilized estimating that the attack rate might reach 2-3 percent of population.

4. **Adopt emergency measures to ensure a safe water supply.** Chlorinate public water supplies, even if the source of water appears to be uncontaminated (see more details on methods of water treatment in Section 10.10.5). Chlorinate or boil water used for drinking, cooking and washing dishes and food containers unless the water supply is adequately chlorinated and subsequently protected from contamination.

5. **Ensure careful preparation and supervision of food and drinks.** After cooking or boiling, protect against contamination by flies and unsanitary handling. Leftover products should be thoroughly reheated before ingestion. Persons with diarrhea should not prepare food or haul water for others.

6. **Provide adequate safe facilities for sewage disposal.**

**B. Control of Patient and Contacts:**

1. Isolation of severely ill patients is desirable. Less severe cases can be managed on an outpatient basis.

2. Carry out concurrent disinfection of feces, vomit and contaminated articles with a chlorine solution or any other disinfectant recommended by NCDC. In communities with a modern and adequate sewage system, feces can be discharged directly into sewers without preliminary disinfection. Disinfect corpses with 2 percent chlorine solution.

3. Establish a surveillance of persons who shared food and drink with a cholera patient for 5 days from last exposure in order to promptly detect the disease and refer them for treatment.

4. Rehydration with replacement of electrolytes lost is the mainstay of cholera treatment. Most patients with mild to moderate fluid loss can be treated entirely with ORS. Severe cases may need intravenous therapy and they might be given antibiotics.

**How to Prepare Homemade ORS Solution**

If ORS sachets are available: dilute one sachet in one liter of safe water

Otherwise: Add to one liter of safe water:

- Salt: 1/2 small spoon (3.5 grams)
- Sugar: 4 big spoons (40 grams)

5. Mass chemoprophylaxis is **not** effective in controlling a cholera outbreak and is **not** indicated.

6. Currently available cholera vaccines are **not** effective and are **not** recommended by WHO.

**10.13.6 Recommended Scope of Analysis of Cholera Surveillance Data to be Performed by CPH**

During outbreak the CPH should perform analysis of the following data:

- Number of cases/incidence rate by age, sex, geographical area
- Number of hospital admissions/ rate of hospitalization
Number of deaths / case fatality rate

10.13.7 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

- Detect outbreaks, estimate the incidence and case-fatality rate
- Undertake appropriately timed investigations
- Assess the spread and progress of the disease
- Plan for treatment supplies, prevention and control measures
- Determine the effectiveness of control measures
**Protocol for Laboratory Confirmation of Cholera**

**Sampling strategy:** Collect specimen from the first 5 to 10 suspected cases during the acute stage (two to four days after disease onset) and preferably before antimicrobial treatment. If any are positive, then collect every tenth case during the outbreak.

**Confirmation test:** Isolation of Vibrio cholerae O1 or O139

**Specimen to be collected:** Stool or rectal swab, if patient is not able to pass stool

**Referral laboratory:** NCDC

**Important:** Stool samples should reach the laboratory within 48 hours from collection

### I. DOCUMENTATION

**Supplies needed:**
- Register 60/A
- Lab investigation request form
- Specimen label

**Steps:**
1. Create a specimen label with patient’s name, identification number, date, and time.
2. Fill in a copy of a lab investigation request form with patient information to accompany the specimen.
3. Make sure patient information has been entered in register 60/A and an urgent notification has been sent to CPH.

### II. COLLECTION AND HANDLING

**Supplies needed:**
- One tube of Cary Blair transport medium
- Leak-proof screw-cap container
- Sterile cotton-tipped applicators (swabs)

**Steps:**
1. If possible, chill the tube of Cary Blair medium by placing it in on ice packs in a refrigerator 1-2 hours before collecting the specimen
2. Put on gloves & wear them at all times when handling the specimen
3. Using a wooden spatula or plastic spoon, collect fresh stool (8-10g) including portions with blood and/or mucus. Place stool in a leak-proof sterile screw-cap container. Do not let stool dry out.
4. If a patient is not able to pass stool, take a rectal swab as follows:
   a) Remove the wrapper from the handle end of the sterile swab. Do not touch the tip of the swab
   b) Moisten the swab in chilled Cary Blair medium
   c) Insert the swab through the rectal sphincter 2-3 cm and gently rotate
   d) Withdraw and examine the swab to make sure fecal material is visible on the tip
5. Transfer a small amount of the stool (or the rectal swab) to the bottom a tube of Cary Blair transport medium.
6. Break off the top portion of the stick so the cap can be tightly screwed onto the tube.
7. Make sure the tube is properly labeled (see Section I).
8. Safely dispose of all contaminated materials. Do not reuse.

### III. STORAGE

**Steps:**
1. Immediately refrigerate at 4-8°C.
2. Keep refrigerated until shipment.

### IV. TRANSPORTATION

**Supplies needed:**
- Ziplock plastic bag
- Cold box with ice packs
- Plastic container
- Box label

**Steps:**
1. If the laboratory is nearby, specimens may be hand carried in an insulated box with ice packs, otherwise follow the following procedures:
   1. Tighten the cap, apply waterproof sealing tape over the cap and top of specimen container.
   2. Place specimen container in a suitably sized plastic bag (1st layer) together with a small amount of absorbent material, such as cotton wool. The bag must be sealed either using heated bag sealer or waterproof adhesive tape; as an alternative, use ziplock plastic bags. Specimens from different patients should never be sealed in the same bag.
   3. Sealed bags containing the specimens should be placed inside plastic containers with screw-cap lids (2nd layer). Provided that specimens have been double-bagged properly in sealed plastic bags, specimens from several patients may be packed inside the same secondary plastic container. Additional absorbent material should be placed inside the container to absorb any leakage that may occur.
   4. Sealed plastic containers should be fitted into insulated 3rd layer containers (e.g., a cold box). First, place ice packs at the bottom of the box, and, along the sides, place the plastic container with the specimen in the center, then place more ice packs on top. Make sure that the container is firmly fixed in the outer box.
   5. Put the lab investigation request form in a plastic bag and place it in the outer box.
   6. Label box with name, address, and telephone number of the referral laboratory and the sender.
   7. Label box with the safety precautions (“Do not freeze,” “Do not expose to heat,” “This side up,” “Biological specimen,” etc.).
   8. Arrange shipping date.
   9. When arrangements are finalized, inform the recipient of time and manner of transport and make sure that package reaches referral laboratory within 2 days of specimen collection.

### V. COMMUNICATING TEST RESULTS

**Steps:**
1. Record the results in the case history and Journal 60/A.

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156 Guidelines for Integrated Surveillance and Control of Vaccine Preventable Diseases in Georgia
10.14 Bacterial Meningitis

10.14.1 Rationale for Surveillance

Meningitis is inflammation of membranes that cover the brain and spinal cord. Meningitis occurs in all ages, but is more common in children under 10 years of age.

Meningitis may be caused by various infectious agents (virus, fungi, bacteria, protozoa), which reaches the cerebral membranes. Bacterial meningitis is mostly caused by: *Neisseria meningitides*, *Haemophilus influenzae*, *Streptococcus pneumoniae* and *Mycobacterium tuberculosis*. Among viral causes, the common agents are: Herpes simplex virus 1, polio, mumps and ECHO (human enterocyteptotic) Koksak viruses. Among fungi: Cryptococcus.

Public health response to non-bacterial meningitis is limited. For example, lethal form of tuberculosis meningitis may be prevented by the BCG vaccination. The introduction of BCG vaccination in Georgia has significantly decreased the proportion of TB meningitis among all extrapulmonary TB cases.

*Bacterial meningitis is a major cause of death and disability in Georgia*: 120-200 cases of bacterial meningitis are estimated to occur in Georgia annually, 5-20 percent of them fatal. Nearly one-third of survivors are left with disability including neurological sequelae, mental retardation and deafness.

While studies in a number of countries have indicated that the etiological causes of bacterial meningitis vary considerably across geographic regions, *Haemophilus influenzae* serotype b (Hib) and *S. pneumonia* infections are often the leading causes of pediatric meningitis in unvaccinated populations. Among unvaccinated infants, the proportion of bacterial meningitis due to Hib can be as high as 50 percent, with *S. pneumonia* accounting for 30-40%. However, no reliable data currently exist about etiological causes of meningitis in Georgia.

Vaccines against many serogroups and serotypes of *N. meningitidis*, Hib, and *S. pneumoniae* are currently available and play an important role in the control and prevention of bacterial meningitis in some countries.

- Routine use of polysaccharide-protein Hib conjugate vaccines for immunization of infants has virtually eliminated Hib meningitis and other forms of severe Hib disease in developed countries. Starting in 2000, GAVI has supported the introduction of Hib vaccine in developing countries where the burden of disease warranted it.

- Heptavalent pneumococcal conjugate vaccines have been routinely used for immunization of children in the U.S. and Western European countries for several years resulting in dramatic reduction in the incidence of *Streptococcus pneumoniae* infections. In a recently completed field trial in Africa, a 9-valent vaccine reduced all cause mortality in children by 17 percent, and severe pneumonia by 37 percent. 23-valent pneumococcal polysaccharide vaccines are being used to prevent the disease in certain risk groups such as the elderly and in persons with chronic illnesses.

- Meningococccial polysaccharide vaccines are generally used in response to epidemics of meningococcal disease that are most common in those parts of the African continent often referred to as the “meningitis belt.” In 2005, a new tetravalent polysaccharide-protein
conjugate vaccine “Menactra” was licensed for use among persons aged 11-55 years in the U.S.

In order to make an informed decision about the need for a new vaccine introduction, the etiological causes of bacterial meningitis in Georgia need to be determined and the burden of disease that can be prevented by vaccination needs to be assessed. In the next 5-10 years, as such data become available, the Hib and other new vaccines may be considered for the inclusion in the Georgia immunization program.

Epidemiological and laboratory surveillance of bacterial meningitis will be introduced in Georgia starting in 2006 to study these issues, as well as to help detect outbreaks, and formulate and monitor the effectiveness of response measures.

10.14.2 Recommended Case Definition

Clinical description of meningitis:

Any person presenting with fever >38.0°C, and one or more of the following

- Neck stiffness
- Severe unexplained headache
- Altered consciousness
- Other meningeal signs
- Neck pain and 2 or more of the following
  - photophobia
  - nausea
  - vomiting
  - abdominal pain
  - pharyngitis with exudates

Notes:

- Meningitis may be accompanied by clinical symptoms of the underlying infectious disease (such as TB, mumps, etc.)
- In patients less than two years of age, meningitis is suspected when fever is accompanied by bulging fontanels

Case classification

- Clinical (unspecified) meningitis: A case that meets the clinical description above.
- Probable bacterial meningitis: A case that meets the clinical description above with cerebral spinal fluid (CSF) examination showing at least one of the following:
  - turbid appearance
  - leukocytosis > 100 cells/mm³
leukocytosis 10-100 cells mm\(^3\) AND either an elevated protein (>1.0 g/l) or decreased glucose* (<400mg/l)

* CSF glucose level is normally 50-75% of blood glucose level

**Probable viral meningitis:** A case that matches the clinical description above with CSF examination showing all of the following:
- Normal glucose level
- Normal protein or increased not significantly (>0.5 g/l)
- Slightly elevated leukocytosis (<500 cells/mm\(^3\)) with prevailing lymphocytes (50 percent)

**Probable TB meningitis:** A case that matches the clinical description above with CSF examination showing all of the following:
- CSF is received with high pressure
- Leukocytosis (<500 cells/mm\(^3\)) with prevailing lymphocytes (on the initial stage of infection polymorphonuclears may prevail)
- Protein is elevated and glucose is decreased

**Confirmed bacterial meningitis:** A case consistent with the clinical description above and identification of a bacterial pathogen (i.e., Hib, pneumococcus or meningococcus) in the CSF or blood by culture, antigen detection methods or by Gram stain.

**Confirmed viral meningitis:** A case that matches the clinical description above and has a proper titer of antibodies to the respective virus in CSF.

**Confirmed TB meningitis:** A case that matches the clinical description above and identification of *Mycobacterium tuberculosis* in CSF.

### 10.14.3 Laboratory Testing for Meningitis Diagnosis

Every effort should be made to ensure that a lumbar puncture and a blood culture are included in the routine evaluation of people who present with symptoms of meningitis. Because the clinical picture for all meningitis is similar, only laboratory testing can reliably distinguish various etiological agents. Samples should be collected into 3 sterile tubes for various tests (see protocol at the end of this chapter).

Whenever possible, specimens for the isolation and identification of the organism should be sent to NCDC. Alternatively, the regional CPH can be contacted to obtain the most current list of NCDC recognized/recommended laboratories in the area.

An outline of the three methods for laboratory confirmation of meningitis are presented at the end of the chapter.

### 10.14.4 Case Notification Procedures and Forms

Any probable or confirmed cases of meningitis identified by providers or identification of a *Hib, pneumococcus or meningococcus* in the CSF or blood by any laboratory require urgent notification of...
the CPH within 24 hours by any existing means of communication. General requirements are outlined in more detail in Chapter 4.

10.14.5 Meningitis Outbreak Investigation

Rapid identification and investigation of meningitis cases is important because measures can be taken to prevent further spread to other persons. While infections caused by *Hib* and *pneumococcus* do not have a substantial outbreak potential, infections with *N. meningitis* do. In the absence of a laboratory confirmation every single clinical or probable case of meningitis is considered an outbreak and requires an investigation by a rayon CPH epidemiologist in cooperation with facility health workers within 2 business days of notification.

The following steps are recommended in an investigation (see also Chapter 6):

a) **Verify that cases meet the clinical description of meningitis** by reviewing medical records

b) Ensure that a lumbar puncture and a blood culture are included in the routine evaluation of every person who presents with symptoms of meningitis. **Assist with the transportation of laboratory specimens as required** (refer to the protocol at the end of this chapter).

c) **In the case of probable bacterial or confirmed bacterial meningitis caused by Neisseria meningitides, Haemophilus influenzae, and Streptococcus pneumoniae, Mycobacterium tuberculosis, collect data as envisioned in the bacterial meningitis investigation card** (see Figure 33). If the diagnosis changes during the course of investigation, submit the updated investigation card.

d) **Identify close contacts** of probable and confirmed *N. meningitis* cases for whom prophylactic measures may be appropriate (see next section).

e) **Analyze the data about the bacterial meningitis outbreak** as described in the general part of the guidelines.

The emphasis should be on identifying population groups at highest risk.

f) **Implement bacterial meningitis control and prevention measures** (see next section).

g) **Inform local health administration and other stakeholders about outbreak/group cases of bacterial meningitis verbally or in a written form.**

h) **Write a bacterial meningitis report** and send it to the regional CPH in two copies (the region CPH will forward one copy to NCDC). This report should include:

- Bacterial Meningitis Investigation Card (see Figure 33) completed for each single case (number of cases in the card(s) should correspond to the number of cases indicated in the monthly report form)

- Cluster Investigation Report of bacterial meningitis cases, which is prepared for group cases (see Chapter 6 for recommendations)
### Figure 33. Bacterial Meningitis Investigation Card

<table>
<thead>
<tr>
<th>Registration #</th>
<th>Date</th>
<th>Facility</th>
<th>Rayon</th>
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<tbody>
<tr>
<td>Is the information additional?</td>
<td>Yes</td>
<td>No</td>
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<table>
<thead>
<tr>
<th>1</th>
<th>Name</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>2</th>
<th>Age (for children &lt;1y indicate date of birth)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>30</th>
<th>City, rayon, street address</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>31</th>
<th>Institutional setting?</th>
<th>Yes</th>
<th>No</th>
<th>Specify: ____________________</th>
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<table>
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<tr>
<th>32</th>
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<table>
<thead>
<tr>
<th>33</th>
<th>Date of disease onset</th>
<th>Day/</th>
<th>/month/</th>
<th>/Year/</th>
<th>/</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>34</th>
<th>Date meningitis diagnosed for the first time</th>
<th>Day/</th>
<th>/month/</th>
<th>/Year/</th>
<th>/</th>
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<table>
<thead>
<tr>
<th>35</th>
<th>Date of notification to CPH</th>
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<th>/month/</th>
<th>/Year/</th>
<th>/</th>
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</table>

<table>
<thead>
<tr>
<th>36</th>
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<th>Day/</th>
<th>/month/</th>
<th>/Year/</th>
<th>/</th>
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<table>
<thead>
<tr>
<th>37</th>
<th>Hospitalized when, where?</th>
<th>Day/</th>
<th>/month/</th>
<th>/Year/</th>
<th>/</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>38</th>
<th>Types and dates of specimen collection</th>
<th>CSF?</th>
<th>Yes</th>
<th>No</th>
<th>When?</th>
<th>Day/</th>
<th>/month/</th>
<th>/Year/</th>
<th>/</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>39</th>
<th>Date antibiotics started?</th>
<th>Day/</th>
<th>/month/</th>
<th>/Year/</th>
<th>/</th>
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<table>
<thead>
<tr>
<th>40</th>
<th>Outcome</th>
<th>Died, discharged</th>
<th>When?</th>
<th>Day/</th>
<th>/month/</th>
<th>/Year/</th>
<th>/</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>41</th>
<th>Evidence of neurologic deficit, deafness or other sequelae at discharge (for survivors)</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
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<table>
<thead>
<tr>
<th>42</th>
<th>CSF evaluation results</th>
<th>Appearance: Clear / Cloudy / Bloody / Unknown</th>
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<table>
<thead>
<tr>
<th>43</th>
<th>Specify bacteria identified from CSF or blood</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>44</th>
<th>Detection method (circle all that apply):</th>
<th>CSF culture</th>
<th>CSF latex</th>
<th>Blood culture</th>
<th>Other (specify)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>45</th>
<th>Final case classification</th>
</tr>
</thead>
</table>

### Control measures implemented:

1.
2.
3.

### Comments/Conclusions:

Responsible person ____________________________________________ (name, position) Signature ______________________

Tel: _________________ Address, fax, E-mail ____________________

The card should be submitted to the region CPH before day 5 and to NCDC (Tbilisi, 380077, st. M. Asatiani #9, Tel. 37-16-77.39-64-38) before day 7 of the next month for each meningitis case.
10.14.6 Bacterial Meningitis Outbreak Control/Response

An outbreak of bacterial meningitis requires the following control actions from the health facility and rayon CPH:

1. Administer respiratory isolation of cases for 24 hours after start of specific therapy.

2. Carry out close surveillance of household, daycare and other intimate contacts for early signs of illness, especially fever, to initiate appropriate therapy without a delay.

3. Recommend prophylactic administration of an effective chemotherapeutic agent to intimate contacts (e.g., household, close friends) and children contacts in day care centers. Mass chemoprophylaxis to control outbreaks of the disease is not recommended.

4. Educate the public on the need to reduce direct contact and exposure to droplet infection.

5. Consult NCDC on the need to use vaccine in case of a large outbreak caused by a bacterial agent.

10.14.7 Recommended Scope of Routine Analysis of Bacterial Meningitis Surveillance Data to Be Performed by CPH

(See Chapter 5 for more details.)

The CPH should perform routine monthly analysis of the following data:

- Number of clinical meningitis cases by month, year, age group and geographic area
- Case fatality ratio among clinical meningitis cases by age group
- Proportion of all clinical cases for which CSF/blood was obtained for evaluation (target >80 percent)
- Proportion of probable bacterial meningitis cases among all laboratory-tested clinical cases
- Proportion of all probable bacterial meningitis cases in which a bacterial pathogen was identified (target >50 percent)
- Urgent notification and outbreak investigation rates

10.14.8 Principle Uses of Data for Decision Making at the Regional and Rayon Levels

The regional- and rayon-level CPHs will use the data primarily to accomplish the following:

- Monitor trends in disease incidence and the local disease burden (cases, deaths, disability)
- Timely detect outbreaks and identify causative pathogen
- Plan and monitor effectiveness of control measures
Provide evidence for the need to modify immunization policies

Evaluate and improve the performance of the surveillance system (e.g., reaction time for notification, laboratory confirmation rates, outbreak investigation rate)

Box 1. An Outline of the Three Methods for Laboratory Confirmation of Meningitis

1. **Culture method**: isolation of a bacterial pathogen from a normally sterile clinical specimen such as cerebrospinal fluid (CSF)

   Standard media for bacterial agents: CSF should be inoculated in appropriate (i.e., specific) blood and chocolate agar or nutritive broth as soon as possible.

   If clinical indications are present, CSF is cultivated for mycobacteria, fungi and ameba on special media.

2. **Special investigations**

   a) Meningitis caused by *Neisseria meningitidis*, *Haemophilus influenzae* or *Streptococcus pneumoniae* may be simply confirmed by antigen detection in CSF. In urgent cases, latex agglutination and coagulation methods are used instead of immunophoresis.

   b) Syphilis-associated meningitis (neurosphilis) requires a positive serological reaction on syphilis in addition to a CSF serological investigation.

   c) If a viral meningitis is suspected, antibody titers to respective viruses should be determined.

   d) To detect fungi antigens: Latex agglutination test is more sensitive test for Cryptococcal meningitis than gram staining. Complement reaction is carried out when Coccidosis or Histoplasmosis is suspected.

3. **Microscopic investigations of centrifuged CSF sediment**

   a) Gram stain results

   b) Staining to detect acid-resistant bacteria (e.g. *Mycobacterium tuberculosis*). Likelihood of positive result increases with increased volume of testing material. For this purpose CSF sediment should be concentrated by gradually drying 4-5 drops on one section of the slide.

   c) Cryptococcus investigation should be started by gram staining (Cryptococci look like large cocci). Further step for Cryptococcus capsules identification is ink staining.

   d) Moist smears are used for Fungi and Ameba.

   e) Investigation of neutrophils by polarized candles can detect fragments of keratin – which is the sign of a secondary chemical meningitis caused by dermoid cyst or penetration of craniopharingioma into CSF.
PROTOCOL FOR LABORATORY CONFIRMATION OF BACTERIAL MENINGITIS

**Sampling strategy:** Collect CSF (if patient is not contraindicated to lumbar puncture) AND blood specimens from every clinical case of meningitis before commencement of antimicrobial therapy. However, treatment must not be delayed pending lumbar puncture or blood collection.

**Confirmation test:** Isolation of a bacterial pathogen

**Specimen to be collected:** CSF and blood

**Referral laboratory:** Contact regional CPH office or NCDC for the list of approved laboratories

**Important:** CSF and blood samples should reach the laboratory within 24 hours for testing.

### I. DOCUMENTATION

<table>
<thead>
<tr>
<th>Supplies needed:</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>○ Register 60/A</td>
<td>○ Marker (water resistant)</td>
<td></td>
</tr>
<tr>
<td>○ Lab investigation request form</td>
<td>○ Specimen label</td>
<td></td>
</tr>
</tbody>
</table>

**Steps:**

1. Create a specimen label with patient’s name, identification number, date, and time.
2. Fill in a copy of a lab investigation request form with patient information to accompany the specimen.
3. Make sure patient information has been entered in register 60/A and an urgent notification has been sent to CPH.

### II. COLLECTION AND HANDLING

<table>
<thead>
<tr>
<th>Supplies needed:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Sterile gloves, gown, towels, swabs, gauze pad</td>
<td>○ Alcohol 70%</td>
</tr>
<tr>
<td>○ Three small sterile screw-cap tubes</td>
<td>○ Local anesthetic</td>
</tr>
<tr>
<td>○ Sterile needle and syringe</td>
<td>○ Povidone iodine 10%</td>
</tr>
<tr>
<td>○ Sterile lumbar puncture needle</td>
<td>○ Adhesive plaster</td>
</tr>
<tr>
<td>○ One vial of trans-isolate (T-I) transport medium</td>
<td>○ Blood culture bottle</td>
</tr>
</tbody>
</table>

**Steps to collect CSF:** Lumbar puncture should be performed under sterile conditions by an experienced clinician. The description of this procedure is beyond the scope of this document.

a. Collect 3 tubes of CSF (1-2ml per tube). Tube 1 is for staining. Tube 2 is for biochemistry. Tube 3 is for isolation and identification. If only one tube is obtained it should be given to the microbiology laboratory.

b. Transfer CSF from tube 3 into a vial of T-I transport medium if the specimen can not reach the laboratory within 1 hour

a) Remove a vial of T-I transport medium from the refrigerator 30 min in advance and allow the vial to warm to room temperature and the gelatin in the broth to liquify. Discard any vial showing visible growth or turbidity.

b) Lift off the small lid in the middle of the metal cap. Disinfect the exposed rubber stopper on the top of the vial with 70% alcohol.

c) Remove 1 ml of CSF from the tube using a new sterile needle and syringe and inject the CSF through the rubber stopper into the vial.

**Steps to collect blood:**

1. Collect blood for culture by venepuncture (adults 5-10ml; children 2-5ml; infants 0.5-2ml) using a sterile vacutainer or sterile needle and syringe.
2. Inoculate blood into blood culture bottle immediately to prevent the blood clotting in the syringe. If the culture bottle contains a diafragm, clean it with 70% alcohol before inoculating the medium.
3. Make sure patient information has been entered in register 60/A and an urgent notification has been sent to CPH.
4. Safely dispose of all contaminated materials and sharps.

### III. STORAGE

**Steps:**

1. Keep tubes 1 and 2 with CSF refrigerated at 4-8°C.
2. Keep the transport medium vial with the 3rd CSF specimen and the inoculated blood culture bottle at room temperature. If there is a delay in transport > 6 hours, uncubate the vial and the bottle at 35-37°C.

### IV. TRANSPORTATION

<table>
<thead>
<tr>
<th>Supplies needed:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Gloves</td>
<td></td>
</tr>
<tr>
<td>○ Ziplock plastic bag</td>
<td></td>
</tr>
<tr>
<td>○ Plastic containers</td>
<td></td>
</tr>
<tr>
<td>○ Fibreboard/cardboard container</td>
<td></td>
</tr>
<tr>
<td>○ Box labels</td>
<td></td>
</tr>
<tr>
<td>○ Insulating material</td>
<td></td>
</tr>
<tr>
<td>○ Cold box with ice packs</td>
<td></td>
</tr>
</tbody>
</table>

**Steps:**

1. Tubes 1 and 2 for staining and biochemistry can be handcarried to the local laboratory in an insulated box with ice pack.

2. Vial with the 3rd CSF specimen and the blood culture bottle should be transported to the referral laboratory for isolation and identification at ambient temperature as follows:

   a) Tighten the cap, apply waterproof sealing tape over the cap and top of specimen container.

   b) Place specimen container in a suitably sized plastic bag (1st layer) together with a small amount of absorbent material, such as cotton wool. The bag must be sealed either using heated bag sealer or waterproof adhesive tape; as an alternative, use ziplock plastic bags. Specimens from different patients should never be sealed in the same bag.

   c) Sealed bags containing the specimens should be placed inside plastic containers with screw-cap lids (2nd layer). Provided that specimens have been double-bagged properly in sealed plastic bags, specimens from several patients may be packed inside the same secondary plastic container. Additional absorbent material should be placed inside the container to absorb any leakage that may occur.

   d) Sealed plastic containers should be fitted into 3rd layer container (e.g., containers made of corrugated fibreboard, cardboard, wood or other material strong enough to withstand the shock of handling and shipment)

   e) Put the lab investigation request form in a plastic bag and place it in the outer box.

   f) Label box with name, address, and telephone number of the referral laboratory and the sender.

   g) Label box with the safety precautions (“Do not freeze,” “Do not expose to heat,” “This side up,” “Biological specimen,” etc.).

   h) Arrange shipping date.

   i) When arrangements are finalized, inform the recipient of time and manner of transport and make sure that package reaches referral laboratory within 1 day of specimen collection.

### V. COMMUNICATING TEST RESULTS

Laboratory should communicate results to the clinician within 2-4 days of receiving the sample. If the result of the test is positive, it should also notify the rayon CPH.

**Steps:**

1. Record the results in the case history and Journal 60/A.
Figure 34. Illustration of the triple packaging system to maintain ambient temperature