**Case Response for Diphtheria**

**Infectious agent:** Bacterium: Corynebacterium diphtheriae

**Mode of transmission**: The disease is transmitted from person to person by respiratory droplets or direct contact with respiratory secretions, discharges from skin lesions or, rarely, fomites.

**Incubation period:** **2-5 days** (range, 1-10 days).

**Alert Threshold**: One probable case is an alert and requires an immediate investigation.

**Outbreak threshold** One confirmed case is an outbreak.

**Case Definition**:

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| **Probable Case**:  An acute illness characterized by a visible adherent “membrane” on the tonsils, pharynx and/or nose and any one of these:  Laryngitis  Pharyngitis  Tonsillitis  **Confirmed Case**:  A confirmed case is a probable case who has been laboratory confirmed or linked epidemiologically to a laboratory confirmed case. At least one of the following criteria is used for diagnosing a confirmed case:  Isolation of Corynebacterium diphtheriae from a clinical specimen; OR  PCR assay showing presence of the A and B subunits of the Diphtheria toxin gene (tox). | Related image  Fig-I: Dirty white pseudomembrane classically seen in diphtheria |

* **Specimen Collection**:

Collect nasopharyngeal samples by using alginate swabs or throat culture by cotton swabs or any specific swab/media/tube/stick used for diphtheria in the hospital

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| * Pharynx should be clearly visible and well illuminated. * Depress the tongue with a tongue-depressor and swab the throat without touching the tongue or inside the cheeks. * Rub vigorously over any membrane, white spots, or inflamed areas; slight pressure with rotating movement must be applied to the swab. • If any membrane is present, lift the edge and swab beneath it to reach the deeply located organisms. * Place the swab in Amies transport medium and dispatch immediately to the laboratory for culture. | Related image |

**Procedure for the collection of Nasopharyngeal swabs**

• Through one nostril, insert the swab into the nose beyond the anterior nares.

• Gently introduce the swab along the floor of the nasal cavity, under the middle turbinate, until the pharyngeal wall is reached.

• Force must not be used to overcome any obstruction.

• Place the swab in Amies transport medium and dispatch immediately to the laboratory for culture

**Laboratory criteria for diagnosis:**

1. Isolation of Corynebacterium diphtheriae from a clinical specimen, or

**Population at risk** Those having close contact with the patient in a household-type setting. This includes those living and/or sleeping in the same household; those such as relatives/friend/students etc. who sleep in the same house or have shared kitchen facilities etc.

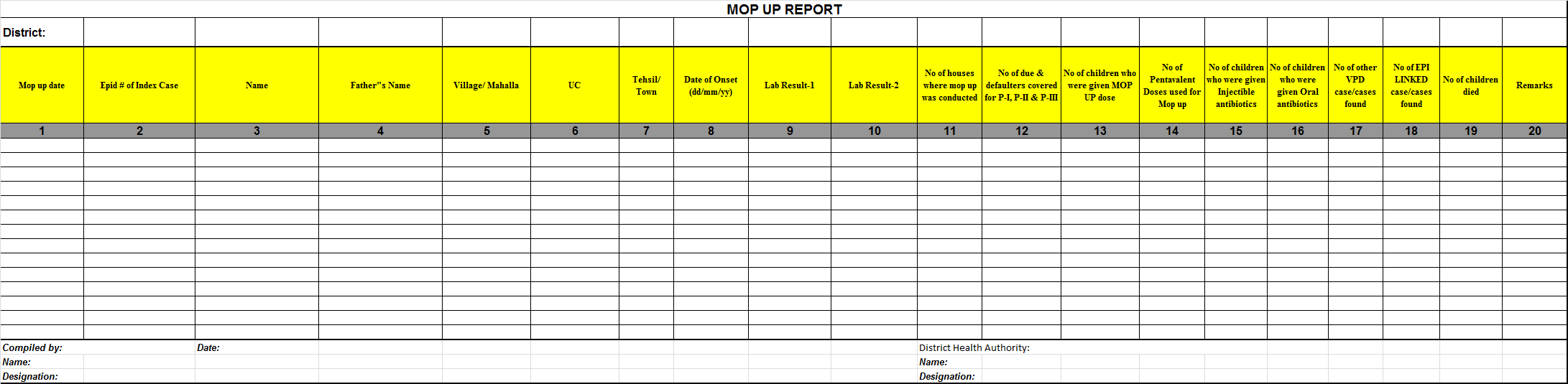
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**Brief guidelines to investigate and control Diphtheria outbreaks;**

1. **Epidemiological Investigation of probable diphtheria**
2. Medical Officer with Preventive Out-reach Team (SH&NS, Vaccinator, LHS, CDCS, SI, LHW)
3. Investigate and examination of the case and identify close contacts
4. Review of the existing outdoor/indoor/emergency record of the hospital and Data Collection
5. Desk review (Pentavalent-I, II & III coverage analysis in this UC)
6. 30 H-H cluster for active case search and RI status
7. If you found case, then again 30 H-H cluster in surrounding area
8. School visit of area to probe for similar cases
9. Epidemiological existence / confirmation and verification of Outbreak
10. Sampling of at least 5 case having signs and symptoms of Diphtheria
11. Health seeking behavior of community and risk factors
12. Identify high risk population
13. Interaction with Community influencers and Local GPs
14. Recommendations for control measures
15. Final report should have CIF, Penta Coverage analysis, 30 H-H Cluster & Case response report
16. **Case Response activity**
17. 40 houses in the surrounding of Diphtheria case (Urban)
18. Whole Village if small and 40 houses if large (Rural)
19. All due and defaulter children should be covered for Penta I, II & III less than 02 years of age.
20. A single dose of Pentavalent vaccine to children age between 2 to 5 years, followed by a 2nd doses after 28 days.
21. Give two doses of Td vaccine to close contacts, age higher than 5 years of probable or confirmed case. Duration between the doses should be at least 28 days.
22. Prophylactic dose of antibiotic (Oral Erythromycin) to close contacts of up to 15 years for 7-10 days with monitoring for signs and symptoms for at least 7 days.
23. Report Generation and dissemination of information to all concern.

**7. Follow-up:**

All outbreaks need follow up visit after 30 days to confirm whether the outbreak has subsided or continue.



**Annexure-1**

**Case Management**:

**Patients:** Do not wait for laboratory results before starting treatment/control activities.

**Diphtheria antitoxin:** WHO recommend the following schedule for Anti Diphtheria Toxin (ADS)

a. For mild cases with laryngeal or pharyngeal disease, 20,000 - 40,000 IU

b. For moderate nasopharyngeal disease, 40,000 - 60,000 IU

c. For severe extensive or late cases 60,000 - 80,000 IU

d. Removal of membrane to prevent airway obstruction.

**Antibiotics:** e. Penicillin 250 mg orally 6 hourly or Erythromycin 500 mg orally 6 hourly for 7-14 days.

**Vaccination:** Clinical diphtheria does not necessarily confer natural immunity, and patients should thus be vaccinated before discharge from a health facility with either primary or booster doses.

**Contacts:** a. All close contacts regardless of vaccination history should have nose or throat culture.

b. One dose of Benzathine Penicillin IM (600,000 Units for <6 years and 1.2 million units for 6 years and above) or a 7-10 days’ course of Erythromycin orally.

c. If culture of contact is positive and person is symptomatic, admit him/her to the hospital and treat as positive case.

d. If culture is positive and the case is asymptomatic treat the case as carrier.

**Carrier treatment:** Give single dose of Benzathine Penicillin G (600,000 Units for <6 years and 1.2 million units for 6 years and above).

If allergic to penicillin, give erythromycin (40-50 mg/kg/day) in divided doses for 14 days.

**Prevention:** a. Contacts and children (age 45 days to 4 years) in the area of outbreak who are unimmunized or partially immunized should be given 3 doses or complete the vaccination schedule (each dose 4 weeks apart) with Pentavalent vaccine.

b. Children above 4 years and adults should receive 3 doses of Td vaccine (currently not available with the program) as per following schedule;

1st dose on first contact, 2nd dose after 2 months and 3rd dose after 6-12 months.

**Supportive care:** Refer all probable or confirmed diphtheria cases for specialist assessment by a pediatrician or ENT surgeon. Patients with respiratory diphtheria require careful monitoring (ideally in a high or intensive care setting) for potentially life-threatening complications from local disease (e.g. airway obstruction or respiratory compromise due to tracheobronchial disease) or systemic manifestations (especially cardiac complications).

**Annexure-2**

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| Diphtheria Case Investigation Form |
| 1st copy to be sent to laboratory with specimen, 2nd copy to DHO/ AS office and 3rd copy to be kept in the reporting health facility |

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| **PART I: For Use by Reporting Facility and DHO/ Agency Surgeon**  Name of Reporting Health Facility: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Union Council: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Tehsil/City: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  District: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Province/Area: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date Patient Visited Hospital: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  *PAK/Province Code/District ID/Year/Dip/Case Serial # # # #*  Patient's Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Sex: Male/ Female  Father's Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date of Birth: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_ Age: \_\_\_\_\_\_\_\_\_Months  Address of Patient: Village/Street/Mahalla\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Union Council: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Tehsil/Taluka/City\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  District: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Province/Area: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Clinical evidence: Sore Throat Low Grade Fever Adherent Membrane  Date of onset: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  Number of Pentavalent vaccine doses received (circle): Nil/ One/ Two/Three  Date of last dose of pentavalent vaccination: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  Type of specimen (circle): Nasal swab Throat swab  Date of Specimen Collection: \_\_\_\_ / \_\_\_\_\_/ \_\_\_\_\_ \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  Date of Specimen S e n t to Lab: \_\_\_\_ / \_\_\_\_\_/\_\_\_\_\_ \_\_\_\_ / \_\_\_\_\_/\_\_\_\_\_  Lab Result to be Sent to: (EDO-H, DSC/SO-WHO, Provincial and Federal officials) and  Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Telephone/FAX: \_\_\_\_\_\_\_\_\_\_ Email: \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Name of person completing the form: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Designation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_D a t e : \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_ |

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| **PART II: For Use by Receiving Laboratory**  Type of specimen (circle): Nasal swab Throat swab  Date specimens received at lab: \_\_\_\_\_ /\_\_\_\_ / \_\_\_\_ \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  Lab Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Condition of specimen:  Quantity Adequate: Yes No Yes No  Cold Chain OK Yes No Yes No  Specimen Received by:  Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Designation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date of Lab Test done: \_\_\_\_\_ / \_\_\_\_ / \_\_\_\_\_ \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  Type of test done: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Test result: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Comment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Report sent by: Nam: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Designation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |