No.F.1-22/Advisory/CDC/2024
Centers for Disease Control
National Institutes of Health, Islamabad
Ministry of National Health Services, Regulations & Coordination
Phone: (92-051) 9255237 Fax: (92-051) 9255099
National Focal Point for International Health Regulations

19th July 2024

Subject: **Guidelines for Sample Collection of Suspected Measles Cases**

Measles is a highly contagious and immediately reportable disease caused by the measles virus. In Pakistan, the Sub-Regional Reference Laboratory for the Measles Elimination Initiative, established in 2005 at the department of Virology, National Institute of Health (NIH) in Islamabad, providing free of cost diagnostic services for suspected measles cases and other epidemic prone diseases.

02. Over the last four years, the laboratory has tested over 115,000 samples, including 40,000 samples just in the first six months of 2024. However, collecting and testing such a large number of samples during an endemic/outbreak/epidemic setting is not in line with World Health Organization (WHO) guidelines. These guidelines are designed to help public health authorities to manage resources and time more effectively. Therefore, to avoid unnecessary expenditure and effort, it is important to follow the WHO guidelines for sample collection during measles outbreaks.

03. In this regard, the subject guidelines are prepared and placed herewith for your information and compliance.

04. This issues with the approval of Chief Executive Officer NIH.

(Dr. Mumtaz Ali Khan)
Chief CDC-NIH

Distribution Overleaf

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41. Officer In-charge, Provincial Disease Surveillance & Response Unit (PDSRU) at Provincial Health Directorates, Lahore, Hyderabad, Peshawar, Quetta, Gilgit and Muzaffarabad
42. Provincial Coordinator, EPI, Punjab, Sindh, KPK, Balochistan, GB and AJK

C.c:

1. Chief Secretary, Govt of Punjab, Sindh, KPK, Balochistan, GB and AJK.
2. Surgeon General Pakistan Army, GHQ Rawalpindi
3. Chief Commissioner, ICT Administration Islamabad
4. WHO Country Representative, Islamabad
5. SPS to Federal Minister of Health, M/o NHSR&C, Islamabad
6. SPS to Secretary, M/o NHSR&C, Islamabad
7. PS to Director General Health, M/o NHSR&C, Islamabad

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Guidelines for Sample Collection of Suspected Measles Cases

I) Background: Measles is a highly contagious and immediately reportable disease caused by the measles virus. In Pakistan, the Sub-Regional Reference Laboratory for the Measles Elimination Initiative, established in 2005 at the department of Virology, National Institute of Health (NIH) in Islamabad, providing free of cost diagnostic services for suspected measles cases and other epidemic prone diseases. Additionally, this laboratory performs genotyping, which is crucial for tracking different strains and understanding the spread of the virus as part of VPDs surveillance.

Over the last four years, the laboratory has tested over 115,000 samples, including 40,000 samples just in the first six months of 2024. However, collecting and testing such a large number of samples during an endemic/outbreak/epidemic setting is not in line with World Health Organization (WHO) guidelines. These guidelines are designed to help public health authorities to manage resources and time more effectively. Therefore, to avoid unnecessary expenditure and effort, it is important to follow the WHO guidelines for sample collection during measles outbreaks.

II) Objective: To familiarize healthcare professionals with the standard sampling criteria for measles detection.

III) Case Definitions: By standardizing criteria for identifying measles cases, case definition streamlines the diagnostic process, ensuring that only those meeting specific clinical and epidemiological criteria are subjected to testing. This approach reduces the excessive burden of over-sampling, conserving laboratory resources and minimizing unnecessary expenditures. Consequently, it allows for more targeted and efficient use of public health resources, leading to improved outbreak management and control measures.

- **Suspected case:** Any person in whom clinicians suspect measles infection, or any person with fever, maculopapular rash (i.e. non-vesicular), cough, conjunctivitis and coryza.
- **Probable Case:** Any person with a history of fever, rash, cough, conjunctivitis, coryza and linked with a confirmed case of measles.
- **Confirmed case:** Suspected or probable case confirmed through detection of measles RNA virus through PCR or measles specific IgM.
- **Alert Threshold:** One suspected case.
- **Outbreak threshold:** Five or more clinical cases on a single location over a 30 day time period with at least one lab confirmed case.

IV) Type of Specimen

a. **Blood/Serum Sample:** For the detection of IgM antibodies, which indicate a recent measles infection, blood or serum samples should be collected between 3 to 28 days after the onset of rash. This time frame is critical because IgM antibodies typically become detectable within this period, providing a reliable diagnostic window.
b. **Throat Swab**: For genotyping the, which involves identifying the specific strain of the virus, a throat swab specimen should be collected within 7 days after the onset of the rash. Early collection is important because the viral load is highest during this period, making it easier to obtain a sample sufficient for genotyping.

V) Specimen collection: Collect throat swab for virus isolation and genotyping in VTM. Whereas collect 5ml of blood, centrifuged for serum separation at 3000rpm for 5 minutes. If centrifugation is not possible blood should be kept in refrigerator until there is complete retraction of blood clot from the serum. Carefully remove the serum and transfer aseptically to a sterile labeled vial.

VI) Specimen storage and transportation: Store serum at 4-8 degrees for not more than 48 hours. Do not freeze the whole blood. Transport the specimens in triple package with complete request form maintaining cold chain.

VII) Collection of Specimens during Outbreak/Epidemic/Endemic Settings

a. **Endemic Periods**: In measles endemic areas, it is not necessary to confirm every suspected case through the lab especially those reported with an epidemiological link. However sporadic cases without epidemiological linkage need to be confirmed through lab. This approach prevents the overuse of laboratory resources and focuses efforts on monitoring and controlling the disease more broadly.
b. **Widespread Epidemics**: If a measles epidemic spreads across a large geographical area or affects the entire country, it is recommended to investigate outbreaks in select locations, one rural area and one urban area, rather than in every affected town. This strategy ensures a representative understanding of the outbreak without overwhelming the laboratory system.
c. **Suspected Outbreaks**: When an outbreak is suspected, **district surveillance staff should collect blood specimens of at least 5-10 suspected cases from same locality to confirm the presence of the virus through laboratory testing.** Additionally, throat swabs should be collected from the same 5-10 cases for viral isolation and genetic sequencing. This dual approach provides both diagnostic confirmation and valuable data on the viral strain.
d. **Confirmed Outbreak:** Once an outbreak is laboratory confirmed, it is recommended to use clinical criteria and epidemiological linkage for further cases which aims to reduce unnecessary blood collection and testing rather than confirming every case. Moreover, periodic collection of clinical specimens for molecular testing might be helpful to monitor the genotype over time. If no epidemiologic link is found, an additional serum specimen may be needed to classify the case.
e. **Sustainable Use of Resources**: Combining laboratory testing with epidemiologic linkage allows for a sustainable approach that maximizes

laboratory resources. **In endemic settings, prioritizing epidemiologic linkage during routine case investigations is crucial for effective and efficient case confirmation.**

f. **Coordination between Laboratory and Field Staff**: Ongoing collaboration between laboratory personnel and field staff helps to avoid unnecessary blood collection and testing. This coordination ensures that resources are used where they are most needed and reduces redundant efforts.

By adhering to these detailed guidelines, public health authorities can efficiently manage measles outbreaks, ensuring that diagnostic efforts are targeted, and resources are conserved while maintaining effective surveillance and control of the disease.

For any further assistance in this context, the Center for Disease Control (CDC-NIH) (051-9255237 and Fax No. 051-9255099) and Virology Department of Public Health Laboratories Division (051-9255082), NIH may be contacted.

The above 'Guidelines' may please be circulated widely to all concerned.