Appendix B: Provincial Case Definitions for Reportable Diseases

Disease: Measles

Revised August 2014

Ontario

Measles

1.0 Provincial Reporting

Confirmed and probable cases of disease

2.0 Type of Surveillance

Case-by-case

3.0 Case Classification

3.1 Confirmed Case

Laboratory confirmation of infection with clinically compatible signs and symptoms (see section 5) in the absence of recent immunization with measles-containing vaccine[1]:

- Isolation of measles virus from an appropriate clinical specimen (e.g., nasopharyngeal swab/aspirate/wash and urine);

  OR

- Detection of measles virus ribonucleic acid (RNA) from an appropriate clinical specimen;

  OR

- Seroconversion or a significant (i.e., fourfold or greater) rise in measles Immunoglobulin G (IgG) titre by any standard serologic assay between acute and convalescent sera;

  OR

- Positive serologic test for measles Immunoglobulin M (IgM) antibody using a recommended assay in a person who is either epidemiologically linked to a laboratory-confirmed case OR has recently travelled[2] to an area of known measles activity;

OR

Clinically compatible signs and symptoms in a person with a known epidemiologic link to a laboratory-confirmed case of measles.

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[1] Individuals with suspect measles who have been immunized with measles-containing vaccine in the last 5-42 days require specimen collection for viral detection (e.g. nucleic acid amplification testing) and subsequent genotyping. If wild-type measles virus is detected, the case would be classified as confirmed. Those with evidence of vaccine-derived measles virus on genotyping should be classified as adverse events following immunization (AEFI).

[2] Recent travel is defined as travel within 21 days of rash onset.

3.2 Probable Case

Clinical evidence of infection (see Section 5) in the absence of immunization with measles-containing vaccine in the last 5 – 42 days;

AND

- A positive serologic test for measles IgM antibody using a recommended assay;

  OR

- In a person who has recently travelled[2] to an area of known measles activity.

4.0 Laboratory Evidence

4.1 Laboratory Confirmation

Any of the following will constitute a **confirmed** case of measles:

- Positive measles virus culture.
- Positive for wild type measles virus RNA by direct nucleic acid amplification test (NAAT).
- Seroconversion or a significant (i.e., fourfold or greater) rise in measles IgG titre between acute and convalescent sera. The first (acute) sample should be collected at the first visit (ideally within 7 days after rash onset). The convalescent serology should be collected 7 to 10 days after the onset of rash (and a minimum of 5 days after the acute sample).
- Positive for measles IgM antibody **AND** an epidemiologic link or positive travel history (as above).
- Note: A person recently vaccinated with measles-containing vaccine requires measles virus genotyping to differentiate wild-type versus vaccine-derived measles. Genotyping requires the collection of specimens for nucleic acid amplification testing.

4.2 Approved/Validated Tests

- Commercial tests for measles IgM and IgG by enzyme immunoassay (EIA).
- NAAT for measles virus RNA.
- Consult with laboratory with regards to testing and appropriate specimens.

4.3 Indications and Limitations

- Measles IgM and IgG serology may be negative if blood is collected very early in infection; if measles is still suspected, the test can be repeated no less than 5 days after the acute sample.
- IgM serology has the potential for false positive findings. Further confirmation (IgG serology – paired sera – or measles virus isolation or detection of measles virus RNA) **is required** in cases especially where there is no established epidemiological link or travel

exposure. Negative IgM results in a true measles case may occur if specimen is taken earlier than 3 days or later than 28 days after rash onset.

- Isolates should be obtained on all persons suspected of having measles for molecular epidemiological analysis.
- Specimens for isolation or RNA detection include nasopharyngeal or throat swab collected no later than 7 days after onset of rash or urine collected within 14 days of rash onset. Consult with Public Health Ontario Laboratories with regards to testing and appropriate specimens. (http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Measles_Diagnostic_-_PCR.aspx)

5.0 Clinical Evidence

Clinically compatible signs and symptoms are characterized by **all** of the following:

- Fever ≥ 38.3 degrees Celsius (oral);
- Cough, coryza or conjunctivitis;
- Generalized maculopapular rash for at least three days.

6.0 ICD Code(s)

6.1 ICD-10 Code(s)

055 Measles

6.2 ICD-9/ICD-9CM Code(s)

B05 Measles

7.0 Comments

Provinces provide active, weekly case-by-case notification (including zero-notification) to the Canadian Measles/ Rubella Surveillance System (CMRSS) and weekly reporting to the Pan-American Health Organization, in accordance with the goal of eliminating measles in the Western Hemisphere.

Note about testing for Subacute Sclerosing Panencephalitis (SSPE):

Subacute sclerosing panencephalitis (SSPE) is a rare complication caused by persistent measles virus infection in the central nervous system. In the presence of the characteristic clinical, neurological and pathology signs, the diagnosis can be confirmed by detecting an increase of measles IgG titre in the cerebrospinal fluid (CSF) relative to the titre in serum. Further consultation with the laboratory and a medical microbiologist is advised.

8.0 Sources

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9.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
April 2014	3.1 Confirmed Case	First paragraph, deletion of: "in the last 7-42 days" and addition of footnote 1. First bullet point, deletion of "no later than 5 days (nasopharyngeal preferred) or 7 days (urine) from onset of the rash". Fourth bullet point, footnote 2 added to define recent travel. Fifth bullet point, deletion of "(i.e. close contact to a laboratory-confirmed case) or travel during the 21 days prior to onset of rash to a measles endemic area or where an outbreak of measles is occurring or belonging to a defined risk group during an outbreak". Fifth bullet point updated to "Clinically compatible signs and symptoms in a person with a known epidemiologic link to a laboratory-confirmed case of measles."

Revision Date	Document Section	Description of Revisions
April 2014	3.2 Probable Case	Changed from "Clinically compatible signs and symptoms: In the absence of appropriate laboratory tests; OR In the absence of an epidemiologic link to a laboratory confirmed case" to "Clinical evidence of infection (see Section 5) in the absence of immunization with measles-containing vaccine in the last 5-42 days; AND A positive serologic test for measles IgM antibody using a recommended assay"
April 2014	4.0 Laboratory Evidence	Second bullet point, replaced (NAT) with (NAAT). Deletion of third bullet point: "Positive for measles IgM antibody (with an epidemiologic link)". Addition of last two bullet points: "Positive for measles IgM antibody AND an epidemiologic link or positive travel history (as above)"; "Note: A person recently vaccinated with measles-containing vaccine requires measles virus genotyping to differentiate wild-type versus vaccine-derived measles. Genotyping requires the collection of specimens for nucleic acid amplification testing."
April 2014	4.2 Approved/Validated Tests	Second bullet point, "NAT" replaced with "NAAT".
April 2014	4.3 Indications and Limitations	Second bullet point, "…is required in cases specifically where there is no established…" replaced with "…is **required** in cases especially where there is no established…" Fourth bullet point, last sentence changed from "Consult with laboratory with regards…" to "Consult with Public Health Ontario Laboratories with regards…" Addition of link to Public Health Ontario's Measles - Diagnostic - PCR web page.

Revision Date	Document Section	Description of Revisions
April 2014	7.0 Comments	Addition of last sentence in second paragraph: “Further consultation with the laboratory and a medical microbiologist is advised.”
April 2014	8.0 Sources	Updated.
August 2014	4.1 Laboratory Confirmation	Third bullet, second sentence changed from: “The first acute sample should be collected no later than 7 days from rash onset and the second convalescent sample 10 – 30 days after the first;” to “The first (acute) sample should be collected at the first visit (ideally within 7 days after rash onset). The convalescent serology should be collected 7 to 10 days after the onset of rash (and a minimum of 5 days after the acute sample).”
August 2014	4.3 Indications and Limitations	First bullet, “…test can be repeated no less than 3 days after…” changed to “test can be repeated no less than 5 days after…”

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