

Appendix B: Provincial Case Definitions for Diseases of Public Health Significance

Disease: Smallpox

Effective: February 2019

Smallpox

1.1 Provincial Reporting

Confirmed, probable and suspect cases of disease

2.0 Type of Surveillance

Case-by-case

3.0 Case Classification

3.1 Confirmed Case

Laboratory confirmation of infection:

- Isolation of variola virus from an appropriate clinical specimen (e.g., whole blood, lesion (vesicular or pustular) fluid, crust material)

OR

- Detection of variola virus nucleic acid

Note: Any testing related to suspected smallpox should be carried out under level 4 containment facilities at the National Microbiology Laboratory (NML).

3.2 Probable Case

Clinical evidence of illness (see Section 5.0) in a person who is epidemiologically linked to a laboratory-confirmed case or to a probable case

OR

Laboratory evidence of infection:

- Electron microscopic identification of a poxvirus in an appropriate clinical specimen (e.g., whole blood, lesion (vesicular or pustular) fluid, crust material).

Note: The different members of the orthopoxvirus genus (e.g., cowpox virus, monkeypox virus, variola virus, vaccinia virus) and molluscum contagiosum virus, the sole member of the molluscipoxvirus genus of poxviruses, and a common cause of self-limiting benign skin lesions, have identical appearance under the electron microscope.

3.3 Suspect Case

Clinical evidence of illness in a person who is not epidemiologically linked to a laboratory-confirmed case or to a probable case of smallpox

OR

Atypical lesion known to be associated with the variola virus on a person who is epidemiologically linked to a laboratory-confirmed or probable case.

4.0 Laboratory Evidence

4.1 Laboratory Confirmation

Any of the following will constitute a confirmed case of Smallpox:

- Positive variola virus culture in an appropriate clinical specimen (e.g., whole blood, lesion (vesicular or pustular) fluid, crust material)
- Positive for variola virus nucleic acid detection by nucleic acid amplification test (NAAT)

4.2 Approved/Validated Tests

- Standard culture for variola virus
- Standard electron microscopy with negative staining (can only identify to the level of poxvirus)
- NAAT for variola virus

4.3 Indications and Limitations

- Polymerase Chain Reaction (PCR) can definitively diagnose infection with variola virus; all other tests screen for orthopoxviruses
- Diagnostic investigation should include ruling out varicella-zoster virus and other common conditions that cause a vesicular/pustular rash illness
- Any testing related to suspected smallpox should be carried out under level 4 containment facilities at NML
- In the event of a suspected case, immediately contact the Public Health Ontario Laboratories (PHOL) Customer Service Centre at 416-235-6556/1-877-604-4567 or the after-hours Duty Officer at 416-605-3113. PHOL medical and clinical microbiologists will provide advice prior to sampling. PHOL can assist with arranging safe transportation of clinical specimens to NML in compliance with the *Transportation of Dangerous Goods Act*.

5.0 Clinical Evidence

Smallpox is characterized by a febrile prodrome consisting of fever $> 38.3^{\circ}\text{C}$ and systemic symptoms (prostration, headache, back pain, abdominal pain, and/ or vomiting), which generally lasts two to four days and is followed by the development of a characteristic rash. The rash consists of deep, firm, well-circumscribed pustules that are mostly all in the same stage of development. The lesions are characteristically umbilicated. The lesions initially appear as macules, evolving into papules, vesicles and then pustules in a matter of days. Finally, crusted scabs form; they then fall off several weeks after the initial appearance of the rash. Lesions initially appear in the oral mucosa/palate and then progress in a centrifugal pattern to involve the face, arms, legs, palms and soles. Atypical presentations include flat velvety lesions that do not evolve into vesicles and more severe forms with confluent or hemorrhagic lesions.

6.0 ICD-10 Code(s)

B03 Smallpox

7.0 Comments

Boards of health must contact the Ministry of Health and Long-Term Care, immediately using the 24 hour Healthcare Provider Hotline: 1-866-212-2272 in the event of a suspected case.

Clinicians must contact their local medical officer of health prior to collecting specimens on any suspect or probable case of smallpox for laboratory diagnosis.

8.0 Sources

Committee on Infectious Diseases, American Academy of Pediatrics. Section 3: Summaries of Infectious Diseases: Smallpox (Variola). In: Kimberlin DW, Brady MT, Jackson MA, Long SS, editors. Red Book: 2018 Report of the Committee on Infectious Diseases. 31 ed. Itasca, IL: American Academy of Pediatrics; 2018.

Public Health Agency of Canada. Smallpox. In: Case Definitions for Communicable Diseases under National Surveillance. Canada Communicable Disease Report. 2009;35S2.

9.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
February 2019	General	Minor revisions were made to support the regulation change to Diseases of Public Health Significance.
February 2019	3.0 Case Classification	Section updated.
February 2019	4.0 Laboratory Evidence	Section updated.
February 2019	5.0 Clinical Evidence	Section updated.
February 2019	7.0 Comments	Contact details updated.
February 2019	8.0 References	Section updated and renamed to Sources.

