

# Appendix 8: Cases with Positive COVID-19 Serology Results and Management of Cases with Multisystem Inflammatory Syndrome in Children (MIS-C) Temporally Associated with COVID-19

Version 2.0 February 18, 2021

## Key Updates

- Updated section on Positive Serology Reports (page 1-4)

## Positive Serology Reports

### Reporting of Positive Serology Results to the Medical Officer of Health

- Detection of serum/plasma [antibodies to SARS-CoV-2](#) are reportable to the local Medical Officer of Health from laboratories in Ontario that are licensed to conduct serology testing and where the testing is done for clinical purposes. Serology testing for research/serosurveillance, even by a licensed lab, is not reportable.
- Only positive results must be reported to the local Medical Officer of Health. Negative and inconclusive results do not need to be reported.
- [Confirmed case](#): An individual with evidence of seroconversion in viral specific antibody in serum or plasma using a validated laboratory-based serological assay for SARS-CoV-2 over a 4 week interval, regardless of nucleic acid amplification testing (eg. real-time PCR), is considered a “confirmed” case if the individual has not received a COVID-19 vaccination.
- [Probable case](#): An individual with SARS-CoV-2 antibody detected in a single serum/plasma specimen is considered a “probable” case if they have not yet received a COVID-19 vaccination AND
  - Had symptoms of COVID-19; AND

- Had a high-risk exposure; AND
- Antibody was detected within four weeks of symptoms

Given the limitations of serology testing at the individual level, this testing is only available for limited [clinical situations](#), and is not intended for diagnosis of acute infection or reinfection, for determining infectivity, or for determining immunity (from previous infection or vaccination) of the individual.

Serology testing should **not** be used to inform vaccine prioritization or for determining vaccination status of the individual.

### **Public Health Management of Positive Reports of Antibodies to SARS-CoV-2**

- With the roll-out of the COVID-19 vaccination program, serology testing results need to be interpreted within the context of vaccination history.
  - At this time, serology testing should not be used for classification of cases who have received a COVID-19 vaccination.
  - In addition, serologic testing is not needed after receipt of vaccination to assess immune response to the vaccine or as proof of vaccination.
- Antibodies (IgG) typically develop at least 7-14 days after symptom onset from COVID-19 illness.
- Detection of antibodies to SARS-CoV-2 may indicate prior exposure to the virus or vaccination; however, a single IgG antibody result cannot differentiate between a recent or remote infection or between previous infection and vaccination.
- The duration of the IgG response has not yet been well characterized, with studies showing variability among assays. A reduction in IgG levels and seronegativity after 2-3 months have been observed in some patients.
- **Confirmed cases:** The identification of a confirmed case based on serology will likely not change the contact management since seroconversion will likely only be observed after the acute infection has been resolved.
  - Case management should still continue as per usual (see below)
  - Contact management is at the discretion of the health unit and based on whether contacts would already be > 14 days from their last exposure.
- **Probable cases:** Case management should still continue as per usual (see below).
  - Contact management is at the discretion of the health unit and based on whether contacts would already be > 14 days from their last exposure.

- Currently, the main indication for serology testing is for pediatric patients suspected to have multisystem inflammatory syndrome in children (MIS-C) with a negative, or indeterminate PCR test result or who were not tested. Serology testing may also be considered for patients with severe illness with negative or indeterminate PCR tests, where serology results may be helpful for clinical management.
- Given the timing of development of antibodies to SARS-CoV-2, and the indication for testing is in those who have had a negative or indeterminate PCR test result, it is less likely that cases reported to public health units will be within their period of communicability.
- In the event newly reported cases based on serology results also have a positive PCR result around the time of the serology result, the case should be assessed for evidence of more recent infection based on the clinical and epidemiological history of the case to guide any further clinical and public health management.
- If the probable or confirmed case, based on serology, is **already known** to the local public health unit (through prior positive PCR test, or as a probable case with prior symptoms and epidemiological exposure):
  - Update the case laboratory history with the positive serology result(s), and in the case of seroconversion, the two serology results demonstrating seroconversion.
  - For cases previously reported as a probable case, update the case classification to 'confirmed' if evidence of seroconversion.
  - Follow-up with the case and/or the ordering provider to determine if there are any updates to their **complications** or **outcomes** (see PHO guidance on data entry scenarios).
  - Follow-up is not required for subsequent positive serology results.
  - Serology results do not change case and public health management from when the case was initially reported (e.g., their isolation period, contact follow-up).
- If the case, based on serology, has **not been previously reported** to the local PHU for COVID-19:
  - Create a new confirmed or probable case (based on the scenario).
  - Follow-up with the case to obtain information on case as per PHO Data Entry guide.
  - Case follow-up should ascertain the clinical, laboratory and epidemiological context of the case.

- For cases with a negative PCR test result around the time of the serology test, no contact management is required.
- If the case, based on serology, **currently** has symptoms of COVID-19 and there is no recent PCR result or no result pending, recommend obtaining a specimen for diagnostic PCR testing.
  - A subsequent positive PCR result (after/around the time the serology result is reported) should be interpreted in the context of the clinical and epidemiological history.
    - PCR can remain positive for several weeks after initial infection, and does not necessarily mean the case is currently infectious.
    - As IgG antibody may be detected within 7-14 days of infection, it is possible that cases with current PCR positive results and symptoms are still within their period of communicability.
    - Case and contact management should proceed as outlined in the [Management of Cases and Contacts of COVID-19 in Ontario](#) based on date of symptom onset.
- Follow-up is not required for subsequent positive serology results.

## Multisystem Inflammatory Syndrome in Children (MIS-C) in Cases of COVID-19

- MIS-C has been added to the [list of symptoms](#) associated with SARS-CoV-2 infection in Ontario. Presentation may include persistent fever, abdominal pain, conjunctivitis, gastrointestinal symptoms (nausea, vomiting and diarrhea) and rash.
- In Ontario, MIS-C is listed as a **complication** of cases of SARS-CoV-2 infection for case reporting purposes (see PHO guidance on data entry scenarios).
- PHUs may become aware of cases of MIS-C by 2 methods:
  1. Clinicians reporting cases of MIS-C to the local PHU when they identify this as a complication of COVID-19.
  2. Receipt of a positive serology result from a laboratory. In this case the local PHU should prompt public health follow-up of the case including assessment for complications, such as MIS-C, as this is the primary use of serology testing at this time.

- MIS-C is a clinical diagnosis as determined by the health care provider. It is not the responsibility of the PHU to determine whether a case meets the clinical definition of MIS-C, rather PHUs should rely on the clinical decision of the health care provider.
- Health care providers may be using case definitions established by the [World Health Organization Definition \(WHO\)](#) or [Canadian Paediatric Surveillance Program \(CPSP\)](#).

### **Public Health Unit Management of Reports of MIS-C**

- The required data elements for national reporting of MIS-C cases include:
  - Age at time of illness
  - Gender
  - Symptom Onset Date
  - Hospitalization and/or ICU admission date
  - Case ever tested positive for SARS-CoV-2 (PCR or serology)
  - Disposition (including Death)
- PHUs receiving clinical reports of MIS-C should determine whether the case meets the [case definition for COVID-19](#).
- Where a probable or confirmed case of COVID-19 is reported to have MIS-C, the health unit does not need to verify the case meets WHO or CPSP (or other) case definition, and should enter MIS-C as a complication of COVID-19 as reported by the clinician.
- Report of MIS-C as a complication in a case of COVID-19 does not change case/contact management of the case from when they were initially reported to the health unit (e.g., their isolation period, contact follow-up).