

Public health management of cases and contacts of Middle East respiratory syndrome coronavirus in Ontario

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Public health management of cases and contacts of Middle East respiratory syndrome coronavirus

This document provides information for the public health sector in Ontario. The Ministry of Health and Long-Term Care developed this document with contributions from [Public Health Ontario \(PHO\)](#) based on current available scientific evidence and expert opinion. This document is subject to change as new information about the Middle East respiratory syndrome coronavirus (MERS-CoV) is identified and understood.

Nothing in this document is intended to restrict or affect the discretion of local medical officers of health to exercise their statutory powers under the [Health Protection and Promotion Act](#). This document is intended for information and guidance purposes only.

Purpose

The Ministry of Health and Long-Term Care (ministry) developed this guidance for public health units (PHUs) to use to conduct case and contact management activities for MERS-CoV.

This document outlines a strategy to contain the spread of MERS-CoV in Ontario. PHUs should use this document when the outbreak management objective is containment and there are low levels of importation or community transmission.

PHUs should conduct case and contact management for all probable, presumptive confirmed* and confirmed MERS-CoV cases†. Case definitions are available in the ministry's [Guidance for Health Care Workers and Health Sector Employers](#) posted on the [MERS-CoV website](#).

The Public Health Ontario Laboratories (PHOL) shares laboratory results with the requesting health care worker, relevant PHU and the ministry. The identification of a probable case or presumptive confirmed case triggers a number of actions, including activation of the Ministry's Emergency Operations Centre (MEOC)‡, at which PHO and relevant ministry divisions are represented. Once activated, the MEOC is the primary source of information, support and provincial coordination of health system response activities. The MEOC can be accessed through the Health Care Provider Hotline at 1-866-212-2272 on a 24/7 basis. Shortly after activation, the MEOC holds a Health Coordination Teleconference with all relevant stakeholders to discuss next steps, including implementation of the guidance in this document.

Investigation Tools

PHUs can use the following tools to conduct case and contact management activities:

- [Appendix 1: Ontario's Severe Acute Respiratory Infection \(SARI\) Case Report Form](#) – PHUs can use this form to collect information from probable, presumptive confirmed and confirmed cases or their proxies. It is based on the Public Health Agency of Canada's (PHAC) [SARI Case Report Form](#).
- [Appendix 2: Routine Activities Prompt Worksheet for Cases](#) – PHUs can use this sample worksheet to identify potential exposures that may have led to disease

* A presumptive confirmed case is defined as an individual with a positive polymerase chain reaction (PCR) test conducted by the [Public Health Ontario Laboratory \(PHOL\)](#). The [Public Health Agency of Canada's \(PHAC's\) National Microbiology Laboratory](#) will confirm the first few MERS-CoV cases in Ontario.

† Public health units may apply some of the public health actions outlined in this document to a person under investigation (PUI) who is a close contact of a presumptive confirmed, confirmed or probable case (as opposed to a PUI whose exposure is travel to an affected area) – especially when there is a high index of clinical suspicion. Public health units can work with the Ministry Emergency Operations Centre (MEOC) to decide what types of case and contact management activities to conduct for PUIs.

‡ For more information on the MEOC, please view the [Ministry of Health and Long-Term Care Emergency Response Plan](#).

acquisition in a case. Along with the SARI Case Report Form in Appendix 1, this worksheet can also be used to interview the case or his/her proxy to collect detailed information and to investigate potential exposures in the 14 days before onset of symptoms.

- [Appendix 3: Daily Clinical Update Form for a Case Managed in an Acute Care Setting](#) and [Appendix 4: Daily Clinical Update Form for a Case Managed in a Household Setting](#) – PHUs can use these sample forms to monitor the health status of a probable, presumptive confirmed or confirmed case for the duration of his/her illness or until a probable case no longer meets the case definition (i.e., as a result of additional laboratory testing).
- [Appendix 5: Close Contact Tracing](#) Worksheet – PHUs can use this sample worksheet to identify close contacts of a probable, presumptive confirmed or confirmed case.
- [Appendix 6: Daily Contact Clinical Update Form](#) – PHUs can use this sample form to follow-up and monitor close contacts.
- [Appendix 7: Frequently Asked Questions](#) – PHUs can use this document to develop guidance for close contacts.

Reporting of Cases to the Public Health Agency of Canada

Within 24 hours of the identification of a probable or presumptive confirmed case in Ontario, the ministry must submit the SARI Case Report Form to PHAC (see [Appendix 1](#) to view Ontario's SARI Case Report Form). This enables PHAC to fulfill its reporting obligations under the International Health Regulations.

To meet this timeline, the PHU gathers relevant information to complete the SARI form in as much detail as possible and as quickly as possible. Completing all the fields in the SARI Case Report Form may take some time as they are based on information gathered by PHUs over the course of the case and contact investigation. However, at a minimum the PHU must submit the following information to the MEOC[§] as soon as possible to enable provincial reporting to PHAC:

- reporting PHU
- outbreak or cluster related
- gender
- age
- date of symptom onset
- symptoms
- whether hospitalized/date of hospitalization
- whether in ICU/date of ICU admission

[§] The MEOC provides the PHU with instructions on the reporting process at the initial Health Coordination Teleconference.

- if deceased/date of death
- laboratory test method and result (when or if available)
- travel history
- other possible exposures (e.g., ill contact, camels)

Case and Contact Management

The identification of a probable, presumptive confirmed or confirmed case triggers an investigation by the PHU in order to assess potential sources of exposure in the 14 days before onset of symptoms of the case and to evaluate potential disease transmission among close contacts. The investigation results assist in preventing further transmission and provide information about duration and type of exposures that facilitate virus transmission to improve knowledge about the epidemiology of MERS-CoV.

Case Management

Recommendations to support PHUs to manage a probable, presumptive confirmed or confirmed case are outlined below.

Case follow-up and monitoring

- The PHU interviews the case and/or household contacts/family members (if the case is too ill to be interviewed or has died) as soon as possible to collect the reporting information outlined above (see [Reporting to the Public Health Agency of Canada](#)) and identify close contacts (see [Contact Management](#)).
 - Most PHU investigators conduct these interviews by telephone.
 - For interviews conducted in person, the investigator follows Routine Practices and Contact, Droplet and Airborne Precautions when entering the case's environment (see the [ministry's Guidance for Health Care Workers and Health Sector Employers on MERS-CoV](#) for further information on occupational health & safety (OHS)** and infection prevention & control (IPAC) measures).
- The PHU interviews the case to identify potential exposures that may have led to disease acquisition (see [Appendix 2](#) for a sample template).
- The PHU monitors the case's health status on a daily basis for the duration of illness (whether the case is in an acute care setting or household setting) or until laboratory investigation has ruled out MERS-CoV infection (see [Appendix 3](#) and [Appendix 4](#) for sample templates to assist with this monitoring).

Public health advice in household settings

The PHU should provide the following advice to a case in a household setting:

** Further information on legislated occupational health and safety requirements may be found on the Ministry of Labour's [Health and Safety](#) website.

- The case should isolate while ill and not go to work, school, or other public areas until his/her symptoms are resolving and two respiratory specimens taken 24 hours apart are confirmed negative by polymerase chain reaction (PCR) testing. This includes not using public transportation or taxis and limiting visitors.
- If the case must go out for a medical appointment or urgent care, he/she should wear a mask (surgical/procedure mask) over his/her nose and mouth, and travel in a private vehicle if at all possible.
- The case or family members should alert all health care workers about the case's status (exposure and illness) so that appropriate OHS & IPAC measures can be taken (including notifying paramedics if an ambulance is called to transport the case).
- The case and household members should reduce opportunities for disease transmission within the household setting:
 - The case should be separated from others in the household environment to the greatest extent possible (e.g., remain/sleep in a separate room and have a dedicated bathroom; if these steps are not possible, maintain a distance of two metres from others).
 - If the case cannot be separated from others, then he/she should wear a mask (if tolerated).
 - Shared rooms or areas (e.g., kitchen, bathroom, and the case's room) should be well ventilated (i.e., keep window open if possible and tolerated).
- The case should be instructed about respiratory etiquette:
 - The case should have tissues beside or with him/her to be able to cover coughs, sneezes or to wipe or blow their nose. If a tissue is not immediately available when coughing or sneezing, the case should cover his/her mouth and nose with the sleeve of their clothing to reduce droplets spread into the air.
 - The case should cover his/her mouth and nose with tissues or wear a mask while receiving care (e.g., assistance with feeding, drinking, taking medications, dressing, bathing, toileting, repositioning in bed).
 - The case should discard tissues/disposable materials including masks in a plastic-lined, covered garbage can.
 - The case should wash his/her hands with plain soap and water if hands have respiratory secretions on them or use an alcohol-based hand sanitizer if the case's hands have not become soiled with respiratory secretions immediately after disposing of used tissues or masks.
 - The case should use a paper towel to dry hands. If that isn't an option, the case should use a dedicated cloth towel that is kept separate from everyone else's towels.
- The case should limit contact with household members as much as possible, recognizing that care may need to be provided by household members. Caregiving activities may include washing the case's face or hands and assisting with bathing, toileting, dressing, feeding or offering liquids, and taking medications.
- The case may need to make arrangements to remain isolated, including having discussions with his/her employer, making alternate arrangements to support

children/other dependents and taking steps to ensure an adequate supply of groceries and other necessities.

The PHU should provide the following advice to household caregivers and others in the case's immediate household environment:

- The only people in the household should be those who are essential for providing care:
 - People who are not taking care of the case should live somewhere else. If this is not possible, they should stay in another room or be separated from the person as much as possible.
 - In particular, seniors and people with long-term or chronic conditions (e.g., individuals with diabetes, heart, lung or kidney problems, or immunosuppression) should find alternative housing, if possible. These people can get very sick if they get MERS-CoV.
- Household caregivers who have been living in the same household since the case became symptomatic (and who have already had an exposure risk) may decide to use gloves, a mask and eye protection (goggles or a face shield) to reduce their risk of acquiring the virus while providing care and when in the same room as the case.
- A new caregiver coming into the household and who hasn't had previous contact with the case while the case was symptomatic (and therefore has not had a previous exposure) should wear gloves, a mask and eye protection while providing care to the case and when in the same room as the case.
- When outside of the case's room, caregivers must remove personal protective equipment (PPE) in the appropriate sequence to reduce the risk of contamination of hands or face through inadvertent contact with contaminated PPE:
 - After gloves and the gown are removed, perform hand hygiene with an alcohol-based hand sanitizer. If hands are visibly soiled, clean them with plain soap and water.
 - Remove eye protection. Then remove the mask by holding only onto the ear loops or ties (do not touch the front of the mask that was over the face) and dispose of the mask immediately into a waste container or disposable bag. Clean eye protection with a cleaner/disinfectant as per manufacturer's instructions or place into a container for later cleaning/disinfection.
 - Perform hand hygiene again immediately after removing PPE with an alcohol-based hand sanitizer. If hands are visibly dirty or have come into contact with respiratory secretions or other body fluids, clean them with plain soap and water to physically remove the soil.
- Caregivers should avoid other types of possible exposure to the case or contaminated items. For example, they should avoid sharing toothbrushes, cigarettes, eating utensils, drinks, towels, washcloths or bed linen. Dishes and eating utensils should be cleaned with dish soap and water after use. Use of a dishwasher with a drying cycle also provides a sufficient level of cleaning.
- High-touch areas such as toilets, sink tap handles, doorknobs and bedside tables should be cleaned daily using regular household cleaners and more often if visibly soiled. The contact's clothes and bedclothes can be cleaned using regular

laundry soap and water and do not require separation from other household laundry.

- All waste generated can be bagged in a regular plastic bag and disposed of in regular household waste.
- Household contacts should monitor themselves for any signs of illness. They should isolate themselves immediately if signs of a respiratory infection or fever develop and notify their health care worker and PHU.

The ministry has developed a fact sheet on [Preventing MERS-CoV from Spreading to Others in Homes and Communities](#) that PHUs can use to provide guidance and information for probable cases, presumptive confirmed cases and confirmed cases who are being cared for in household settings.

Occupational health & safety and infection prevention & control advice for acute care settings

- If the PHU refers the probable, presumptive confirmed or confirmed case to an acute care setting for follow-up, the PHU should notify the acute care setting of the case's impending arrival and advise/remind the organization to follow appropriate OHS & IPAC measures, including the use of Routine Practices and Droplet, Contact and Airborne Precautions when exposed to the case and/or the case's environment.
- Acute care settings should consult the [ministry's website on MERS-CoV](#) and the [Provincial Infectious Diseases Advisory Committee's \(PIDAC\) Tools for Preparedness: Triage, Screening and Patient Management for Middle East Respiratory Syndrome Coronavirus \(MERS-CoV\) Infections in Acute Care Settings](#) for instruction on appropriate OHS & IPAC measures.

Occupational health & safety and infection prevention & control advice for primary health care settings

- If the PHU refers the probable, presumptive confirmed or confirmed case to a primary health care setting for follow-up, the PHU should notify the primary health care setting of the case's impending arrival and advise/remind the organization to follow appropriate OHS & IPAC measures including the use of Routine Practices and Droplet, Contact and Airborne Precautions when exposed to the case and/or the case's environment.
- Primary health care settings should consult the ministry's [Guidance for Health Care Workers and Health Sector Employers on MERS-CoV](#) and PIDAC's [Infection Prevention and Control for Clinical Office Practice](#) for further instruction on appropriate OHS & IPAC measures.

Occupational health & safety and infection prevention & control advice for home care providers

- If home care workers provide health services for the probable, presumptive confirmed or confirmed case, the PHU should notify the worker of the case's status and advise/remind the worker to follow appropriate OHS & IPAC measures, including the use of Routine Practices and Droplet, Contact and Airborne Precautions when exposed to the case and/or the case's environment.
- Home care providers should consult the [ministry's Guidance for Health Care Workers and Health Sector Employers on MERS-CoV](#) for further instruction on appropriate OHS & IPAC measures.

Contact Management

PHUs and acute care settings should conduct active monitoring of close contacts for 14 days after last exposure to a case. Contact management may involve collaboration between PHUs and acute care settings:

- PHUs actively monitor close contacts in the community. This includes close contacts who were exposed in an acute care setting or other health care setting (e.g., primary health care setting, urgent care clinic) but live in the community. The responsibility to actively monitor close contacts that were exposed during their hospital admission (i.e., inpatients) and subsequently discharged prior to completing 14 days should be transferred from the acute care setting to the PHU.
- Acute care settings actively monitor close contacts who were exposed in the hospital and are currently admitted (i.e., inpatients). This includes patients who were exposed in the emergency department and subsequently admitted. Acute care settings also actively monitor health care workers who were exposed at work. Acute care settings should refer to PIDAC [Tools for Preparedness: Triage, Screening and Patient Management for Middle East Respiratory Syndrome Coronavirus \(MERS-CoV\) Infections in Acute Care Settings](#) for additional information.

To implement enhanced monitoring, the PHU should define the targeted area to be assessed based on information from their contact management investigations. The duration of enhanced monitoring is dependent on evidence of ongoing transmission, but it would be reasonable to conduct enhanced surveillance for two incubation periods, or approximately one month at a minimum, given there may be some asymptomatic transmission, or that unidentified transmission may be occurring. The MEOC can support the PHU in making this decision.

Close contact tracing

- PHUs conduct contact tracing activities to identify close contacts of a probable, presumptive confirmed or confirmed case (see [Appendix 5](#) for a sample worksheet to conduct close contact tracing activities).
- For the purpose of follow-up and monitoring by PHUs, close contacts are defined as^{††}:
 - anyone who provided care (e.g., bathing, toileting, dressing or feeding) for the probable, presumptive confirmed or confirmed case while the person was symptomatic, including a health care worker, family member, or individual who had other similarly close physical contact OR
 - anyone who stayed at the same place (e.g., lived with, visited) while the case was ill.

Close contact follow-up and monitoring

- The PHU actively monitors close contacts on a daily basis for 14 days following last known exposure or until a probable case no longer meets the case definition (e.g., the laboratory investigation has ruled out MERS-CoV infection). ^{‡‡}
- The PHU can use the Daily Contact Clinical Update Form in [Appendix 6](#) to monitor close contacts. Close contacts should be informed of how to contact the PHU if they develop symptoms or have other questions.
 - A close contact who becomes ill with symptoms compatible with MERS-CoV infection within 14 days following last known exposure to the case should be tested for MERS-CoV and managed as a PUI (including the initiation of further case and contact management activities) until laboratory testing results are available. Health care workers should submit samples to the PHOL following the guidance on the ministry's website on MERS-CoV. Detailed information on [laboratory testing for MERS-CoV](#) is available at the PHO website.
 - Testing asymptomatic contacts for MERS-CoV is not recommended for community settings. However, in the event that an asymptomatic contact tests positive for MERS-CoV, the PHU should manage this person as if he/she is a case (including the initiation of further case and contact management activities). The PHU can remove an asymptomatic case from

^{††} This close contact definition assumes that the case self-isolated while symptomatic. If the case did not isolate while symptomatic - or if the case visited a health care setting while symptomatic - PHUs should consider additional environments where exposures may have occurred to identify contacts for follow-up and monitoring (e.g., workplace, places of worship, recreation centres, conveyance/vehicles, health care setting waiting area or room, and other health care setting exposures).

^{‡‡} PHUs may choose to prioritize follow-up and monitoring of close contacts based on their assessment of each contact's risk of exposure. Considerations for prioritizing follow-up and monitoring may include the length of exposure, the type and nature of exposure (e.g., ambulatory transfers, living with the case or having prolonged contact within two metres), features of the environment/location of the exposure, and the underlying health status of the contact. The MEOC can support the PHU in making these decisions.

isolation once there are two negative PCR tests from nasopharyngeal or oropharyngeal swabs collected 24 hours apart or after they have completed a 14-day isolation period without any symptoms.

- The PHU should advise asymptomatic close contacts to continue with their usual activities (e.g., attend work or school). The ministry is not recommending quarantine of asymptomatic close contacts at this time; however, the MEOC may recommend some restrictions on activities (e.g. long-distance travel) depending on the nature and duration of contact with presumptive or confirmed cases.

Public health advice

- The PHU should advise close contacts to undertake the following activities for 14 days following last known exposure to the case or until the probable case no longer meets the case definition (e.g., the laboratory investigation has ruled out MERS-CoV infection):
 - Close contacts should self-monitor for the appearance of acute respiratory illness, symptoms of which include acute onset of fever and respiratory symptoms, including measuring their temperature daily (recognizing that young children and the elderly may not develop a fever).
 - Close contacts should maintain good respiratory etiquette and hand hygiene practices.
 - Close contacts should avoid close contact with the cases as much as possible and follow relevant advice provided in the [Case Management](#) section.
 - Should symptoms develop, close contacts should maintain distance from others in the household environment to the extent possible (e.g., stay in separate room or maintain distance of two metres) and make contact with their usual health care worker.
 - Symptomatic close contacts should wear a mask when leaving the home prior to seeking care and should inform their health care worker that they are a close contact of a case.
- The PHU should advise close contacts to call 911 if they develop severe symptoms and inform paramedic services that they are a close contact of a case.
- The PHU should advise close contacts that if they develop symptoms, the PHU will ask them to isolate themselves for several days until laboratory testing has ruled out MERS-CoV infection – and to isolate themselves for even longer if laboratory testing confirms MERS-CoV infection.
- The PHU should ask close contacts to consider the steps that they would need to take to be able to isolate themselves. This might include discussion with employers, making alternate arrangements to support children/dependents and ensuring an adequate supply of groceries and other necessities.
- The PHU can use the Frequently Asked Questions in [Appendix 7](#) to develop guidance for close contacts.

Contact management for a case that travelled

- The MEOC supports the PHU to conduct contact tracing, follow-up and monitoring when a probable, presumptive confirmed or confirmed case travelled while symptomatic on any type of public or commercial conveyance – including aircraft, rail or bus – regardless of duration of travel.
 - Close contacts include passengers in the same row as the case, passengers in the three rows in front and three rows behind the case, all crew members, passengers who provided care for the case on board the conveyance, and passengers with > 15 minutes of face-to-face contact with the case or who were in contact with the case's secretions.
 - If the case is a crew member on a flight and if all passengers cannot be contacted, public health officials should concentrate contact tracing efforts on passengers seated in the area in which the crew member was working during the flight as well as other members of the crew.
 - Where feasible and depending on the symptomatology of the case during the flight/trip, the PHU and MEOC may consider conducting contact tracing, follow-up and monitoring of all passengers on the aircraft or in the same railcar.
- The PHU and/or MEOC works with PHAC's Office of Border Health Services to obtain passenger flight manifests for international flights.

Responsibilities

All PHUs:

- Keep updated on the MERS-CoV case definitions (available on the [ministry's Guidance for Health Care Workers and Health Sector Employers on MERS-CoV website](#)).
- Review the case and contact management guidance in this document.
- Ensure health care workers who may be engaged in case and contact management are aware of appropriate OHS & IPAC measures and have been recently fit-tested for an N95 respirator in case interviews must occur in person.

PHUs with a probable, presumptive confirmed or confirmed case within their jurisdiction:

- Submit initial minimum data fields from the SARI Care Report Form to the MEOC as soon as possible in order to facilitate the ministry's reporting to the PHAC (see [Reporting to the Public Health Agency of Canada](#) for more information).
- Submit any remaining data fields from the SARI Case Report Form to the MEOC as soon as possible.
- Conduct contact tracing to identify close contacts of the case.
- Monitor the case on a daily basis for the duration of illness or until laboratory investigation has ruled out MERS-CoV infection.
- Monitor close contacts on a daily basis for 14 days following last known exposure to a case.

- Ensure local health care workers are aware of appropriate screening, laboratory testing and IPAC & OHS measures.

PHO:

- Participate in the MEOC's response activities.
- Provide scientific and technical advice to stakeholders in areas such as laboratory testing, case and contact management information, outbreak management recommendations, and advice on clinical management and IPAC & OHS measures.
- Provide laboratory testing for MERS-CoV.

Ministry of Health and Long-Term Care:

- Coordinate the response to MERS-CoV in Ontario.
- Coordinate and participate in MEOC's response activities.
- Share information with the public.
- Report case details to PHAC.

Additional Resources

- Centers for Disease Control and Prevention's [MERS-CoV website](#)
- European Centre for Disease Prevention and Control's [MERS-CoV website](#)
- Ministry of Health and Long-Term Care's [MERS-CoV website](#)
- Provincial Infectious Diseases Advisory Committee's [Tools for Preparedness: Triage, Screening and Patient Management of Middle East Respiratory Syndrome Coronavirus \(MERS-CoV\) Infections in Acute Care Settings](#)
- Public Health Agency of Canada's [MERS-CoV website](#)
- Public Health England's [Treatment of MERS-CoV: Decision Support Tool](#)
- World Health Organization's [Disease Outbreak News website](#)
- World Health Organization's [Global Alert and Response website](#)

Emerging Pathogens and Severe Acute Respiratory Infection (SARI) Case Report Form

(2) ADMINISTRATIVE INFORMATION

| | | |
|---|---|--|
| <input type="checkbox"/> Initial Report Report | <input type="checkbox"/> Updated | Report Date: ____/____/_____ (dd/mm/yyyy) |
| Outbreak or cluster related? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, local Outbreak #: _____ Number of ill persons associated with the outbreak: _____ | For Provincial Use Only Has the outbreak been declared and made public? <input type="checkbox"/> Yes <input type="checkbox"/> No If case is related to a provincial /territorial outbreak, P/T Outbreak ID: _____ | |

(3) CASE DETAILS: DISEASE / AETIOLOGIC AGENT / SUBTYPE

| | |
|--|--|
| <input type="checkbox"/> Severe Acute Respiratory Infection <input type="checkbox"/> Middle East respiratory syndrome coronavirus (MERS-CoV) <input type="checkbox"/> Other Novel Respiratory Pathogen <i>Specify:</i> _____ _____ | <input type="checkbox"/> Novel Influenza A <input type="checkbox"/> H1__ <input type="checkbox"/> H3__ <input type="checkbox"/> H5__ <input type="checkbox"/> H7__ <input type="checkbox"/> Other: _____ <input type="checkbox"/> Novel Influenza B _____ |
|--|--|

(4) CASE DETAILS: CASE CLASSIFICATION (please refer to Ontario case definitions)

| | |
|------------------------------------|-----------------------------------|
| <input type="checkbox"/> Confirmed | <input type="checkbox"/> Probable |
|------------------------------------|-----------------------------------|

(5) CLIENT RECORD: DEMOGRAPHIC INFORMATION

| | |
|--|---|
| Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unk <input type="checkbox"/> Other (sp): _____ | Age: _____ years <i>If under 2 years</i> _____ months <input type="checkbox"/> Unk |
| Does the case identify as Aboriginal? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused to answer <input type="checkbox"/> Unk If yes, please indicate which group: <input type="checkbox"/> First Nations <input type="checkbox"/> Metis <input type="checkbox"/> Inuit Does the case reside on a First Nations reserve most of the time? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused to answer <input type="checkbox"/> Unk | |

(6) SYMPTOMS (check all that apply)

| |
|---|
| Date of onset of first symptom(s): ____/____/_____ (dd/mm/yyyy) |
|---|

| | | | |
|--|--|---|---|
| <input type="checkbox"/> Fever ($\geq 38^{\circ}\text{C}$) | <input type="checkbox"/> Swollen lymph nodes | <input type="checkbox"/> Shortness of breath/difficulty breathing | <input type="checkbox"/> Nose bleed |
| <input type="checkbox"/> Feverish (temp. not taken) | <input type="checkbox"/> Sneezing | <input type="checkbox"/> Chest pain | <input type="checkbox"/> Rash |
| <input type="checkbox"/> Cough | <input type="checkbox"/> Conjunctivitis | <input type="checkbox"/> Anorexia/decreased appetite | <input type="checkbox"/> Seizures |
| <input type="checkbox"/> Sputum production | <input type="checkbox"/> Otitis | <input type="checkbox"/> Nausea | <input type="checkbox"/> Dizziness |
| <input type="checkbox"/> Headache | <input type="checkbox"/> Fatigue/prostration | <input type="checkbox"/> Vomiting | <input type="checkbox"/> Other, specify: _____ |
| <input type="checkbox"/> Rhinorrhea/nasal congestion | <input type="checkbox"/> Malaise/chills | <input type="checkbox"/> Diarrhea | _____ |
| <input type="checkbox"/> Sore throat | <input type="checkbox"/> Myalgia/muscle pain | <input type="checkbox"/> Abdominal pain | <input type="checkbox"/> No Symptoms |
| | <input type="checkbox"/> Arthralgia/joint pain | | |

(7) SYMPTOMS, INTERVENTIONS, and OUTCOME

Date of first presentation to medical care: ____/____/____ (dd/mm/yyyy)

Clinical Evaluations (*check all that apply*)

| | | |
|---|--|---|
| <input type="checkbox"/> Altered mental status | <input type="checkbox"/> Encephalitis | <input type="checkbox"/> Renal Failure |
| <input type="checkbox"/> Arrhythmia | <input type="checkbox"/> Hypotension | <input type="checkbox"/> Sepsis |
| <input type="checkbox"/> Clinical or radiological evidence of pneumonia | <input type="checkbox"/> Meningismus/nuchal rigidity | <input type="checkbox"/> Tachypnea (accelerated respiratory rate) |
| <input type="checkbox"/> Diagnosed with Acute Respiratory Distress Syndrome | <input type="checkbox"/> O ₂ saturation $\leq 95\%$ | <input type="checkbox"/> Other (specify): _____ |

| | |
|--|--|
| Case Hospitalized? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | Admission Date: ____/____/____ (dd/mm/yyyy) |
| Diagnosis at time of admission: _____ | Re Admission Date: ____/____/____ (dd/mm/yyyy) |

| | |
|--|---|
| Case admitted to Intensive Care Unit (ICU) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | ICU Admission Date: ____/____/____ (dd/mm/yyyy) |
| | ICU Discharge Date: ____/____/____ (dd/mm/yyyy) |

| | |
|---|--|
| Patient isolated in hospital? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | If yes, specify type of isolation (e.g., respiratory droplet precaution, negative pressure): _____ |
|---|--|

| | |
|---|--|
| Supplemental oxygen therapy <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | Mechanical ventilation <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk |
|---|--|

| | | |
|---|--|---|
| | | If yes, number of days on ventilation _____ |
| Case Discharged from Hospital <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | | Discharge Date 1: ____/____/____ (dd/mm/yyyy) |
| Case Transferred to another hospital <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | | Discharge Date 2: ____/____/____ (dd/mm/yyyy) Transfer Date: ____/____/____ (dd/mm/yyyy) |
| Current Disposition <input type="checkbox"/> Recovered <input type="checkbox"/> Stable <input type="checkbox"/> Deteriorating <input type="checkbox"/> Deceased ____/____/____ (dd/mm/yyyy) | | |
| If deceased, is post-mortem: <input type="checkbox"/> Performed <input type="checkbox"/> Pending <input type="checkbox"/> None <input type="checkbox"/> Unk | | |
| Respiratory illness contributed to the cause of death? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | | |
| Respiratory illness was the underlying cause of death? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | | |
| Cause of death (as listed on death certificate): _____ | | |
| (8) RISK FACTORS (check all that apply) | | <input type="checkbox"/> None identified |
| Cardiac Disease <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> | | Hemoglobinopathy/Ane- mia <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> |
| Hepatic Disease <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> | | Receiving immunosuppressing medications <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> |
| Metabolic Disease <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> <input type="checkbox"/> Diabetes <input type="checkbox"/> Obese (BMI > 30) <input type="checkbox"/> Other: _____ _____ | | Substance use <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> <input type="checkbox"/> Smoker (current) <input type="checkbox"/> Alcohol abuse <input type="checkbox"/> Injection drug use <input type="checkbox"/> Other: _____ _____ |
| Renal Disease <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | | Malignancy <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> |

| | | |
|---|--|-----|
| <i>If yes, please specify:</i> | <i>If yes, please specify:</i> | Unk |
| Respiratory Disease <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> <input type="checkbox"/> Asthma <input type="checkbox"/> Tuberculosis <input type="checkbox"/> Other: _____ _____ | Other Chronic Conditions <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> | |
| Neurologic Disorder <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> <input type="checkbox"/> Neuromuscular Disorder <input type="checkbox"/> Epilepsy <input type="checkbox"/> Other: _____ _____ | Pregnancy <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, week of gestation:</i> _____ | |
| Immunodeficiency disease / condition <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify:</i> | Post-Partum (≤ 6 weeks) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | |

(9) TREATMENT *(submit additional information on a separate page if required)*

| | |
|--|--|
| Did the case receive prescribed prophylaxis prior to symptom onset? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | Specify name: _____ date of first dose: ____/____/____ (dd/mm/yyyy) date of last dose: ____/____/____ (dd/mm/yyyy) |
| In the treatment of this infection, is the case taking: <input type="checkbox"/> Antiviral medication <input type="checkbox"/> Antibiotic/antifungal medication <input type="checkbox"/> Immunosuppressant/immunomodulating medication <input type="checkbox"/> Unknown <input type="checkbox"/> None <input type="checkbox"/> Other | Specify name (1): _____ date of first dose (1): ____/____/____ (dd/mm/yyyy) date of last dose (1): ____/____/____ (dd/mm/yyyy) Specify name (2): _____ date of first dose (2): ____/____/____ (dd/mm/yyyy) date of last dose (2): ____/____/____ |

(dd/mm/yyyy)

(10) INTERVENTIONS: IMMUNIZATIONS

Did the case receive the *current* year's seasonal influenza vaccine? *If yes, date of vaccination:* ____/____/____ (dd/mm/yyyy)

Yes No Unk Vaccine not yet available

Did the case receive the *previous* year's seasonal influenza vaccine? Yes No Unk

Did the case receive pneumococcal vaccine in the past? Yes No Unk

If yes, year of most recent dose: ____/____/____ (dd/mm/yyyy)

If yes, type polysaccharide or conjugate: 7 or 13

(11) LABORATORY INFORMATION

Microbiology / Virology / Serology (complete if applicable)

| Lab ID | Date Specimen Collected | Specimen Type & Source | Test Method | Test Result | Test Date |
|--------|-------------------------|------------------------|-------------|-------------|-----------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Antimicrobial Resistance of suspect etiological agent(s) (complete if applicable)

| Lab ID | Name of Antimicrobial | Specimen Type & Source | Test Method | Test Result | Test Date |
|--------|-----------------------|------------------------|-------------|-------------|-----------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

(12) EXPOSURES (add additional details in the comments section as necessary)

Travel

In the 14 days prior to symptom onset, did the case travel outside of their province/territory of residence or outside of Canada? Yes No Unk

If yes, please specify the following (submit additional information on a separate page if required)

| | Country/City Visited | Hotel or Residence | Dates of Travel | | |
|---|----------------------|--------------------|-----------------|----------------|-----------------|
| Trip 1 | | | | | |
| Trip 2 | | | | | |
| In the 14 days prior to symptom onset, did the case travel on a plane or other public carrier(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, please specify the following</i> | | | | | |
| Travel Type | Carrier Name | Flight / Carrier # | Seat # | City of Origin | Dates of Travel |
| | | | | | |
| | | | | | |
| Human | | | | | |
| In the 14 days prior to symptom onset, was the case in close contact (<i>cared for, lived with, spent significant time within enclosed quarters (e.g., co-worker) or had direct contact with respiratory secretions</i>) with: | | | | | |
| A confirmed case of the same disease? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk If yes, specify the Case ID: _____ | | | | | |
| A probable case of the same disease? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk If yes, specify disease: _____ and specify the Case ID: _____ | | | | | |
| A person who had fever, respiratory symptoms like cough or sore throat, or respiratory illness like pneumonia? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <i>If yes, specify the type of contact:</i> | | | | | |
| <input type="checkbox"/> Household member | | | | | |
| <input type="checkbox"/> Person who travelled outside of Canada | | | | | |
| <input type="checkbox"/> Person who works in a healthcare setting | | | | | |
| <input type="checkbox"/> Person who works in a laboratory | | | | | |
| <input type="checkbox"/> Works with Patients | | | | | |
| <input type="checkbox"/> Other (specify): _____ | | | | | |
| <input type="checkbox"/> Person who works with animals | | | | | |
| Where did exposure occur? | | | | | |
| <input type="checkbox"/> In a household setting | | | | | |
| <input type="checkbox"/> In a health care setting (e.g., hospital, long-term care home, community provider's office) | | | | | |
| <input type="checkbox"/> School/daycare | | | | | |
| <input type="checkbox"/> Other institutional setting (dormitory, shelter/group home, prison, etc.) | | | | | |
| <input type="checkbox"/> Farm | | | | | |
| <input type="checkbox"/> Other (please specify) | | | | | |

Occupational / Residential

The case is a:

- | | |
|--|---|
| <input type="checkbox"/> Health care worker or volunteer <i>If yes, with direct patient contact?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk | <input type="checkbox"/> Resident in an institutional facility (<i>dormitory, shelter/group home, prison, etc.</i>) |
| <input type="checkbox"/> Laboratory worker handling biological specimens | <input type="checkbox"/> Veterinary worker |
| <input type="checkbox"/> School or daycare worker/ attendee | <input type="checkbox"/> Farm worker |
| <input type="checkbox"/> Resident of a retirement residence or long-term care facility | <input type="checkbox"/> Other: |

Animal

A. Direct Contact (*touch or handle*)

In the 14 days prior to symptom onset, did the case have *direct contact* with any animals or animal products (*faeces, bedding/nests, carcass/fresh meat, fur/skins, camel milk, etc.*)? Yes No Unk

If yes, specify date of last direct contact: ___/___/_____ (dd/mm/yyyy)

What type of animals did the case have direct contact with? (*check all that apply*)

- Cat(s) Dogs Horses Cows Poultry Sheep / Goat Wild Birds
 Rodents Swine Camel
 Wild game (eg. Deer) Bats Other: _____

Did the animal display any symptoms of illness or was the animal dead? Yes No Unk

Where did the direct contact occur? (*check all that apply*)

- Home Work (*fill in occupational section*) Agricultural fair or event/petting zoo
 Outdoor work/recreation (camping, hiking, hunting etc.)
Other: _____

B. Indirect Contact (*e.g., visit or walk through or work in an area where animals are present, etc.*)

In the 14 days prior to symptom onset, did the case have *indirect contact* with animals? Yes No Unk

If yes, specify date of last indirect contact: ___/___/_____ (dd/mm/yyyy)

Where did the *indirect contact* occur? (check all that apply)

Home Work (fill in occupational section) Agricultural fair or event/petting zoo

Outdoor work / recreation (camping, hiking, hunting etc)

Other: _____

(13) ADDITIONAL DETAILS/COMMENTS (add as necessary)

Appendix 2: Routine Activities Prompt Worksheet – Case⁸

When interviewing a case, ensure that the following activity prompts are considered to identify a possible source of infection within the 14 days prior to the onset of symptoms: work; school; visitors at home; volunteer activities; daycare; religious activities; social activities (restaurants, shopping); sports; visits to acute care settings, long-term care homes, retirement homes, medical labs, dentists, and other health care providers; contact with ill persons; and contact with birds/swine or other animals.

Date of Onset: _____ (Create an acquisition exposure for each activity)

Case Last Name: _____ Case First Name: _____ Date of Birth: _____ Gender: _____
(yy/mm/dd)

PHU representative: _____

| Date/Time (Start and End) | Activities/Contacts | Location of Activity | Contact Person (Name & Tel) | Comments |
|---------------------------|---------------------|----------------------|-----------------------------|----------|
| | | | | |
| | | | | |

⁸ Adapted with permission from Toronto Public Health

| Date/Time (Start and End) | Activities/Contacts | Location of Activity | Contact Person (Name & Tel) | Comments |
|--|----------------------------|---------------------------------|--|-----------------|
| | | | | |
| | | | | |
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Appendix 3: Daily Clinical Update Form – Case Managed in an Acute Care Setting

Case Last Name: _____ Case First Name: _____ Date of Birth: _____ Gender: _____
(yy/mm/dd)

| | Follow-up Date/Time (YEAR/MM/DD) | Purpose (1) | Admission Date (YEAR/MM/DD) | Discharge Date (YEAR/MM/DD) | Facility Name (Progression Recovery Location) (2) | Facility Type (3) | Class (4) | Progression (Clinical) (5) | Progression | | | | | PHU representative |
|-------------|-------------------------------------|----------------|--------------------------------|--------------------------------|---|----------------------|--------------|-------------------------------|-----------------|-----------------------------|-------------------|------|-----------------------|--------------------|
| | | | | | | | | | ICU (Y/N/DK) | Antiviral Drugs (Y/N/DK) | Oxygen Saturation | Temp | On Oxygen (Y/N/DK) | |
| Progression | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

| | | | | | | |
|--|--|--|--|--|--|---------------|
| 1) Purpose C = Convalescing D = Diagnostics I = Isolation T = Treatment | (2) Facility Name - Progression Recovery Location Enter facility name or DK = Don't know | (3) Facility Type Hosp = Hospital LTC = Long-term care Home = person is at home DK = Don't know | (4) Classification C= Confirmed P = Probable PUI = Person Under Investigation DNM = Does Not Meet case definition | 5) Progression – Clinical CC = Case Closed. Completed home isolation after discharged from hospital or no longer being followed. D = Deceased DC = Discharged I = Improving | II = Improving (Intubated) S = Stable SI = Stable (Intubated) W = Worsening WI = Worsening (Intubated) EX = Extubated | Notes: |
|--|--|--|--|--|--|---------------|

Appendix 5: Close Contact Tracing Worksheet⁹

When interviewing a case to identify potential close contacts, consider all individuals that could have had exposure since the case was symptomatic. See the [Close Contact Tracing](#) section for the definition of a close contact. Use the following activity prompts to help identify potential close contacts: work; school; visitors at home; volunteer activities; daycare; religious activities; social activities (restaurants, shopping); sports; visits to acute care settings, long-term care homes, retirement homes, medical labs, dentists, and other health care providers; contact with ill persons; and contact with birds/swine or other animals.

Date of Onset: _____

Case Last
Name: _____

Case first
Name: _____

Date of Birth: _____
(yy/mm/dd)

Gender: _____

PHU
representative: _____

| Date/Time (Start and End) | Activities | Location of Activity | Name & contact information of potential close contacts | Comments |
|---------------------------------|------------|----------------------|---|----------|
| | | | | |

⁹ Adapted with permission from Toronto Public Health

| Date/Time (Start and End) | Activities | Location of Activity | Name & contact information of potential close contacts | Comments |
|--|-------------------|-----------------------------|---|-----------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Date/Time (Start and End) | Activities | Location of Activity | Name & contact information of potential close contacts | Comments |
|--|-------------------|-----------------------------|---|-----------------|
| | | | | |

Appendix 6: Close Contact Daily Clinical Update Form

Contact Last Name: _____ Contact First Name: _____ Date of Birth: _____ Gender: _____
(yy/mm/dd)
 PHU representative: _____

| Follow-up Date/Time (YEAR/MM/DD and 24 Hour Clock) | Symptoms? (Y/N) | If yes, please specify (e.g., fever >38; cough, difficulty breathing, headache, fatigue, sore throat, chills, muscle pain, nasal congestion, nausea, vomiting, diarrhea, joint pain, decreased appetite) | Did contact seek medical attention for ARI symptoms? (Y/N) | If yes, please specify where contact went to seek attention (e.g., primary health care, home care, acute care, etc.) |
|--|-----------------|--|---|---|
| | | | | |
| | | | | |

| Follow-up Date/Time (YEAR/MM/DD and 24 Hour Clock) | Symptoms? (Y/N) | If yes, please specify (e.g., fever >38; cough, difficulty breathing, headache, fatigue, sore throat, chills, muscle pain, nasal congestion, nausea, vomiting, diarrhea, joint pain, decreased appetite) | Did contact seek medical attention for ARI symptoms? (Y/N) | If yes, please specify where contact went to seek attention (e.g., primary health care, home care, acute care, etc.) |
|---|------------------------|--|---|---|
| | | | | |
| | | | | |
| | | | | |
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Appendix 7: Frequently Asked Questions

What is a coronavirus?

A coronavirus typically cause symptoms that are similar to those of the common cold; however, it can also cause more severe illness including pneumonia and death. The Severe Acute Respiratory Syndrome (SARS) virus was a type of coronavirus.

What is the Middle East Respiratory Syndrome Coronavirus?

The Middle East Respiratory Syndrome Coronavirus (MERS-CoV) is a new kind of coronavirus that had not been known to public health officials prior to 2012, when it was first reported in the Kingdom of Saudi Arabia. This is a rare virus that can cause serious illness, including death in persons who have contracted it. It remains very rare and difficult to spread to others. However, persons who have other chronic medical conditions that affect their ability to fight off infections may be at a higher risk of developing illness as a result of having been exposed to the virus.

What are the main symptoms associated with MERS-CoV?

For most known cases of illness, the main symptoms are fever and cough as well as shortness of breath and breathing difficulties; pneumonia is the most common complication. About half the people known to be infected with MERS-CoV died as a result of complications. However, some of the people infected reported mild respiratory illness, with symptoms similar to those of the common cold. An unknown percentage of people exposed to MERS-CoV have tested positive for the virus but do not go on to develop symptoms of MERS-CoV infection. There is some evidence that these asymptomatic cases are capable of transmitting the infection.

Some people with MERS-CoV have developed kidney failure. People with existing medical conditions are more likely to experience more serious complications.

What is the treatment for MERS-CoV?

Current treatment is aimed at managing the symptoms including medical support and treatment of any complications. There is no vaccine or specific treatment for this virus.

How is MERS-CoV spread?

MERS-CoV has been found in some camels in the Middle East, and some MERS-CoV patients have reported contact with camels or camel products (e.g., raw milk or meat, secretions or excretions including urine); however, public health officials believe that the main method of spread is through close contact with an individual infected with the virus. The virus appears to be spread by droplets when people cough or sneeze. Common surfaces such as countertops or faucets may also become contaminated with the droplets, and infection may be spread when individuals touch these surfaces then touch their face. There is a potential risk of transmission for both symptomatic and asymptomatic confirmed cases.

What should I expect if I have been in contact with someone who has MERS-CoV infection?

In order to prevent the MERS-CoV virus from spreading, you must identify as soon as possible any symptoms that you may develop if you get sick. This will reduce your chance of spreading the virus to others. Staff from the public health unit will call you every day for 14 days after your last contact with the person who had MERS-CoV to find out how you are feeling and ask you questions in order to monitor any symptoms you may be having.

What do I need to do?

The Ministry of Health and Long-Term Care has developed a fact sheet on [Preventing MERS-CoV from Spreading to Others in Homes and Communities](#) that you can refer to for more information on the steps to take if you are living in a house with someone who has MERS-CoV.

For 14 days after you had contact with an individual who has MERS-CoV, you should take your temperature every morning and be watchful for symptoms such as fever or a new cough. Some people, such as very young children under the age of five or older individuals 65 years of age and older, or immunocompromised individuals may not develop a fever.

If you develop symptoms, call your local public health unit and also contact your usual health care worker. If you develop sudden difficulty breathing, call 911 and let them know that you were a contact of an individual with MERS-CoV infection. If you develop symptoms, do not leave your house except to seek health care.

