

# MERS-CoV

## Middle East respiratory syndrome coronavirus

MERS is an emerging infectious disease. This protocol is based on the Ministry of Health Communicable Disease Control Manual<sup>1</sup> MERS chapter, last updated in February 2015, as well as subsequent 2015 Ministry of Health advice<sup>2,3</sup>, and more recent information on the [Ministry of Health](#) and [World Health Organisation](#) MERS-CoV websites<sup>4,5</sup>.

- Protocol users should **check those documents and websites** for any recent updates.
- Protocol users should **document** their response to **action points**, marked throughout with this arrow.

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## Associated documents

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[CDHB Māori health policy](#)

[CDHB tikanga policy](#)

[CDHB interpreter procedure](#)

[CPH privacy/nohotapu policy](#)

Case report form:

[K:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\MERS\FormsLettersQuest\ESRMERSReportForm.pdf](#)

MERS contact form:

[K:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\MERS\FormsLettersQuest\MERSContactForm.pdf](#)

WHO MERS factsheet:

[https://www.who.int/en/news-room/fact-sheets/detail/middle-east-respiratory-syndrome-coronavirus-\(mers-cov\)](https://www.who.int/en/news-room/fact-sheets/detail/middle-east-respiratory-syndrome-coronavirus-(mers-cov))

## The Illness

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### Epidemiology<sup>2, 4</sup>

MERS is a viral respiratory illness first reported in Saudi Arabia in 2012. It is caused by a novel coronavirus called Middle East Respiratory Syndrome coronavirus (MERS-CoV). MERS-CoV is a zoonotic virus that has repeatedly entered the human population via direct and indirect contact with infected dromedary camels in the Middle East. Although sustained person-to-person transmission has not been observed in communities, secondary transmission particularly in healthcare settings has frequently been reported. Therefore, ongoing efforts to contain the nosocomial clusters occurring are important in the prevention of wider transmission. People who are most vulnerable to MERS are those with co-morbidities (i.e. chronic disease). These people are more likely to visit health facilities, and, if infected, more likely to have a severe disease and be able to spread the virus more effectively.

No cases of MERS have been detected in New Zealand.

### Clinical description<sup>1</sup>

Most confirmed cases have presented with, or later developed, acute, serious respiratory illness. Typical symptoms have included fever, coughing and breathing difficulties. Some cases have also presented with gastrointestinal symptoms (vomiting or diarrhoea). Asymptomatic cases and cases with only mild flu-like symptoms have also been reported.

Most of the severe cases have occurred in people with underlying co-morbidities, particularly type II diabetes. Reported cases have also been more common in the middle-aged and elderly populations. The case fatality rate is higher in patients who are immunocompromised and elderly or who demonstrate significant co-morbidities.

### Incubation<sup>1</sup>

The incubation period of infection has not yet been fully determined but is likely to be from 2–14 days (most commonly 5 days). This timeframe is based on what is known about other coronaviruses and the MERS-CoV cases in which exposures are known.

### Transmission<sup>1</sup>

The mode of transmission of MERS-CoV has not yet been fully determined. Some cases have involved a strong history of exposure to camels or camel products (eg, milk). However, many cases have had no history of exposure to camels or other animals. A considerable proportion of MERS-CoV cases have been part of clusters in which limited, non-sustained, human-to-human transmission has occurred.

### Communicability<sup>1</sup>

The period of communicability of MERS-CoV has not yet been fully determined. Isolation precautions should be continued until 24 hours after the resolution of symptoms.

### Prevention<sup>5</sup>

No vaccine or specific treatment is currently available, however, several MERS-CoV specific vaccines and treatments are in development. As a precaution, anyone visiting farms, markets, barns, or other places where dromedary camels and other animals are present should practice general hygiene measures, including regular hand washing before and after touching animals, and should avoid contact with sick animals.

## Notification

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MERS is a notifiable and quarantinable disease under the Health Act 1956. Any suspected case should be notified immediately to the local Medical Officer of Health, by the attending medical practitioner and the laboratory. The Medical Officer of Health should inform the Office of the Director of Public Health by phone and email. Any contacts of a probable or confirmed case should also be reported to the local Medical Officer of Health<sup>4</sup>.

## Case classification<sup>1, 2</sup>

### Suspected case<sup>2</sup> (under investigation)

Clinical description		Epidemiological Risk
<b>Severe illness</b> A person with fever (temperature 38°C or above) AND pneumonia or pneumonitis or acute respiratory distress syndrome (ARDS) <sup>i</sup>	AND	<b>lower risk:</b> a history of residence in, or travel to, potentially affected countries in the Middle East <sup>ii</sup> within 14 days before symptom onset, OR close contact <sup>iii</sup> within 14 days before symptom onset with a symptomatic person who developed fever and acute respiratory illness of unknown aetiology within 14 days after travelling from the potentially affected countries in the Middle East or from a region with a known MERS-CoV outbreak at that time <sup>4</sup> , OR is part of a cluster of severe acute respiratory illness of unknown aetiology.
<b>Milder illness</b> A person with fever (temperature 38°C or above) AND symptoms of respiratory illness (e.g. cough, shortness of breath) OR <b>Severe illness</b> (as above)	AND	<b>higher risk:</b> a history of being in a healthcare facility (as a patient, worker, or visitor) in a potentially affected country in the Middle East <sup>ii</sup> or a country with recent healthcare-associated cases of MERS within 14 days before symptom onset, OR a history of contact with camels or raw camel products within affected countries in the Middle East <sup>ii</sup> within 14 days before symptom onset.
<b>Identified contacts of a probable or confirmed case</b>		
A person with fever (temperature 38°C or above) OR acute symptoms compatible with MERS	AND	onset within 14 days after close contact <sup>iii</sup> with a probable or confirmed MERS case while the case was ill.

### Probable case

A probable case is a person:

- with an acute febrile respiratory illness with clinical, radiological or histopathological evidence of pulmonary parenchymal disease (eg, pneumonia or acute respiratory distress syndrome) and
- for whom there is no possibility of laboratory confirmation for MERS-CoV because either the patient or samples are not available for testing and
- who has had close contact with a laboratory-confirmed case.

<sup>i</sup> Immune-compromised patients may not present with typical or severe symptoms.

<sup>ii</sup> Potentially affected countries in the Middle East include:

- countries with locally acquired cases resulting from zoonotic, environmental, or unknown source transmission, whether or not they have been followed by further transmission, i.e. Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Lebanon, Yemen, Iran and the United Arab Emirates (UAE),
- neighbouring countries with health services affected by civil unrest, i.e. Iraq and Syria.

Whenever available, recent epidemiological information on MERS in Middle East countries should be taken into account. Please refer in particular to World Health Organization (WHO) coronavirus website <http://www.who.int/emergencies/mers-cov/en/>. Transiting through an international airport (<24 hours stay, remaining within the airport) in these countries is not considered to be risk factor for infection.

<sup>iii</sup> See close contact [Definition](#) below.

## Confirmed case

A confirmed case is a person with laboratory confirmation of infection with MERS-CoV.

## Laboratory testing<sup>1, 2</sup>

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Laboratory confirmation requires molecular diagnostic testing, including either a positive PCR on at least two specific genomic targets or a single positive target with sequencing on a second.

While PCR testing for MERS-CoV may be undertaken in any PC2 laboratory, positive samples should be sent to Institute of Environmental Science and Research (ESR) for confirmatory testing.

The laboratory should be notified about the referral and samples should be transported in accordance with current regulatory requirements. Please refer to the Annex for the procedure for shipping respiratory samples.

It is recommended that both upper and lower respiratory tract specimens be collected whenever possible.

Respiratory samples – including upper respiratory tract viral swabs, nasopharyngeal swabs and aspirates, sputum, endotracheal aspirate, bronchoalveolar lavage fluid, lung biopsies and postmortem tissues – are suitable for testing for MERS-CoV.

Even after the initial detection of the virus, continued sampling and testing will add to current knowledge about the duration of virus shedding and are strongly encouraged.

For further information on testing, including the current status of serological tests, refer to [Laboratory Testing for Middle East Respiratory Syndrome Coronavirus](#) on the WHO website.

## Cultural and social context

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Cultural, social, work and home environments affect any person's risk of contracting a communicable disease, the likely impact of that disease on them, and their likelihood of passing the infection on others. Keep these factors in mind at every point of your investigation and follow-up.

- Request an **interpreter** if needed
- **Consider** the potential impact of cultural, social, work or home factors on a person or family's ability or willingness to provide information and/or follow public health advice
- **Tailor your advice** to the situation
- **Seek advice yourself** if unsure. Talk to:
  - CPH's Maori Relationships Manager or Communicable Diseases Manager for advice on community and primary care support people or agencies
  - Ngā Ratonga Hauora Māori for Maori patients at Christchurch Hospital or Christchurch Women's hospital
- If appropriate, and with the case and/or contact's permission, seek the **assistance** of family or other community members, community leaders, and/or support agencies if required

## Management of case

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### Investigation

- **Advise the Medical Officer of Health** that a MERS notification has been received.
- For cases notified at the **border** see the detailed advice in the Ministry of Health's 2015 [Risk Assessment Framework for Managing Ill Travellers with Suspected Symptoms of MERS-CoV and Contacts Arriving in New Zealand: Guidelines for DHB Public Health Units](#)<sup>3</sup>
- Any suspected cases (and/or family members) should be **interviewed within the first 24–48 hours** of the investigation to collect basic demographic, clinical and epidemiological information.
- Ensure **laboratory confirmation** has been attempted (see [Laboratory testing](#)<sup>1, 2</sup> above).

## Restriction

- The use of **standard precautions in conjunction with contact and airborne precautions** is recommended for suspected, probable or confirmed cases until the transmission characteristics of MERS-CoV are better understood.
- Also refer to CDC advice at <https://www.cdc.gov/coronavirus/mers/infection-prevention-control.html><sup>6</sup>

In general, where cases do not meet the definition of a probable or confirmed case after investigation, standard, contact and droplet precautions should be applied. The exception is when respiratory samples are being taken, in which case airborne precautions are also required.

Transmission-based precautions should include:

- placement of suspected, confirmed and probable cases in an airborne infection isolation (negative pressure) room if available or, as a minimum, a single room with a closed door
- standard precautions, including wearing a mask and eye protection (goggles or a face shield) and an apron or gown
- additional contact and airborne precautions, including wearing a P2/N95 respirator and strictly adhering to hand hygiene.

If it is necessary to transfer the patient outside the airborne infection isolation room, the patient should wear a surgical mask while they are being transferred and follow respiratory hygiene and cough etiquette. They should also be encouraged to perform hand hygiene.

- For further information on case management, **refer to the WHO technical guidance page** on the WHO website.

## Treatment<sup>5</sup>

No vaccine or specific treatment is currently available, however, several MERS-CoV specific vaccines and treatments are in development. Treatment is supportive and based on the patient's clinical condition.

## Counselling

- **Advise** the case and their caregivers of the nature of the infection and what is known of its mode of transmission.
- Provide the WHO MERS **factsheet**:  
[https://www.who.int/en/news-room/fact-sheets/detail/middle-east-respiratory-syndrome-coronavirus-\(mers-cov\)](https://www.who.int/en/news-room/fact-sheets/detail/middle-east-respiratory-syndrome-coronavirus-(mers-cov))

## Airport

See the detailed advice in the Ministry of Health's 2015 [Risk Assessment Framework for Managing Ill Travellers with Suspected Symptoms of MERS-CoV and Contacts Arriving in New Zealand: Guidelines for DHB Public Health Units](#)<sup>3</sup>

## Management of contacts

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### Definition<sup>2</sup>

Close contact includes:

- anyone who **provided care** for or **handled clinical samples/respiratory secretions** from the patient, including a health care worker or family member, or who had other similarly close physical contact without the recommended infection control precautions;
- anyone who had a prolonged (>15 minutes) **face-to-face contact** with, or **stayed at the same place** (e.g. lived or worked with, visited) as a probable or confirmed case while the case was ill without the recommended infection control precautions;
- where a case has travelled on an **aeroplane or any other conveyance** while ill, close contacts include passengers seated in the same row as the case and two rows in front and behind the case, and crew or passengers that have had face-to-face prolonged interaction (e.g. 15 minutes) with, or contact with respiratory secretions of the ill person.

## Air travel

See [Airport](#) and contact [Definition](#) above.

## Investigation

- Close contacts of probable and confirmed cases should be **identified and monitored for up to 14** days for the onset of respiratory symptoms, and **tested for MERS-CoV infection** if respiratory symptoms develop (regardless of the severity of illness).

## Restriction

Quarantine of asymptomatic contacts is not required as current evidence shows limited human-to-human transmission of MERS-CoV. Current evidence does not show that the disease is transmissible in the pre-symptomatic or early symptomatic stages.

- For further information on contact management, **refer to the [WHO technical guidance page](#)** on the WHO website.

## Prophylaxis

Nil.

## Immunisation

Nil.

## Counselling

- Advise all contacts of the estimated **incubation period and typical symptoms** of MERS-CoV infection.
- Encourage them to **contact their local public health unit and seek early medical** attention if symptoms develop.
- Provide the WHO MERS **factsheet**:  
[https://www.who.int/en/news-room/fact-sheets/detail/middle-east-respiratory-syndrome-coronavirus-\(mers-cov\)](https://www.who.int/en/news-room/fact-sheets/detail/middle-east-respiratory-syndrome-coronavirus-(mers-cov))

## Other control measures

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### Identification of source

- Check for **other cases** in the community.

### Disinfection

Clean and disinfect surfaces and articles soiled with respiratory secretions or faeces, using a product with antiviral activity. For further details, see [Ministry of Health Disinfection guidelines](#)<sup>7</sup>

### Health education

- **Consider a media release and direct communication with local health professionals** to encourage prompt reporting of symptoms and to provide advice (for both the public and health professionals).

## Reporting

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- Public health units should enter cases into **EpiSurv**, using the Generic Case Report Form. If entering a case directly on the EpiSurv website then choose Middle East Respiratory Syndrome.
- Any **change in a case status** (eg, case confirmation, death or de-notification) should also be immediately reported and updated in EpiSurv.
- If a **cluster** of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at the Institute of Environmental Science and Research. Also complete the Outbreak Report Form.
- **Document** your response to each **action point** (marked with this arrow) in this protocol

WHO will be notified of probable and confirmed cases through the National Focal Point for International Health Regulations (ie, the Office of the Director of Public Health, Ministry of Health).

## References and further information

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1. Ministry of Health, *Communicable Disease Control Manual*. 2019, Ministry of Health: Wellington.
2. Ministry of Health, *Updated information for Health Professionals: Middle East Respiratory Syndrome (MERS)*. 2015: Wellington.
3. Ministry of Health, *Risk Assessment Framework for Managing Ill Travellers with Suspected Symptoms of MERS-CoV and Contacts Arriving in New Zealand: Guidelines for DHB Public Health Units*. 2015: Wellington.
4. Ministry of Health. *Middle East Respiratory Syndrome Coronavirus (MERS-CoV)*. 2018; Available from: <https://www.health.govt.nz/our-work/diseases-and-conditions/middle-east-respiratory-syndrome-coronavirus-mers-cov>.
5. World Health Organisation. *Middle East respiratory syndrome coronavirus (MERS-CoV)*. 2019; Available from: <https://www.who.int/emergencies/mers-cov/en/>.
6. Centers for Disease Control and Prevention. *Middle East Respiratory Syndrome (MERS)*. 2019; Available from: <https://www.cdc.gov/coronavirus/mers/index.html>.
7. Ministry of Health, *Communicable Disease Control Manual Appendix 1: Disinfection*. Ministry of Health: Wellington.
8. Australian Government Department of Health. *Middle East Respiratory Syndrome Coronavirus (MERS-CoV)*. 2015; Available from: <https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-mers-cov.htm>.



## Document Control

Protocol review task	Responsibility	Date completed
Advise team of review (and planned timeframes)	PHS	02/10/19
Create draft update document, including this table, and save in: <a href="#">Y:\CFS\Quality\NewDraftDocuments\CDProtocols</a>	PHS	01/10/19
Review Ministry of Health (MoH) advice, literature, other protocols, and write draft update	PHS	02/10/19
Update Fact Sheet (or source link from <a href="#">MoH website</a> )	PHS	02/10/19
Send drafts to MOSh, CD, Team Leader, and HPO for feedback	PHS	02/10/19
Update drafts further as required	PHS	
Send final drafts to Com Dis MOH	PHS	
Com Dis MOH sign-off	Com Dis MOH	11/11/19
Send final drafts to Clinical Director for approval	Com Dis MOH	12/11/19
Clinical Director approval (by email to PHS and QC, who will save in <a href="#">Y:\CFS\Quality\ApprovedDocuments\DAFApprovals</a> ).	CD	8/12/19
Complete <b>electronic</b> document control tasks incl. header; footer; eMDS metadata. Check <a href="#">CPH P&amp;P site page</a> links work, or add new links as required. Create .pdfs (for external links), and save to: <ul style="list-style-type: none"> <li>• Protocols – <a href="#">Y:\CFS\Quality\ApprovedDocuments\ProtectionTeam\IntranetPROTOCOLS</a></li> <li>• Fact Sheets – <a href="#">Y:\CFS\Quality\ApprovedDocuments\ProtectionTeam\FactSheets</a></li> </ul> Above folders are checked once a week and new documents are uploaded to: <ul style="list-style-type: none"> <li>• Protocols – <a href="#">Surveillance (PHU server) website</a> and <a href="#">Dropbox</a></li> <li>• Fact Sheets – <a href="#">CPH website</a> or links are checked to <a href="#">MoH website</a></li> </ul>	QC	8/12/19
Update <b>paper</b> copies (on-call folder/ vehicle)	HPO	n/a
Advise operational/ regional staff of update, summarising any substantial changes (text highlighted in <b>blue</b> in document)	HPO	9/12/19
Once finalised, save the original draft document incl. this table (recording update process) in: <a href="#">Y:\CFS\Quality\Archive\Protection\ComDisProtocolsArchive</a>	QC	9/12/19
Minor update notes:		
Minor update notes:		
Minor update notes:		