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## COVID-19, Australia: Epidemiology Report 3:

Reporting week ending 19:00 AEDT 15 February 2020

COVID-19 National Incident Room Surveillance Team

# Communicable Diseases Intelligence

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# Weekly epidemiological report

## COVID-19, Australia: Epidemiology Report 3:

Reporting week ending 19:00 AEDT 15 February 2020

COVID-19 National Incident Room Surveillance Team

### Summary

This is the third epidemiological report for coronavirus disease 2019 (COVID-19), previously known as novel coronavirus (2019-nCoV), from the virus now known as SARS-CoV-2, reported in Australia as at 19:00 Australian Eastern Daylight Time [AEDT] 15 February 2020. It includes data on the COVID-19 Australian cases, the international situation and current information on the severity, transmission and spread.

Keywords: SARS-CoV-2; novel coronavirus; 2019-nCoV; coronavirus disease 2019; COVID-19; acute respiratory disease; case definition; epidemiology; Australia

*The following epidemiological data are subject to change both domestically and internationally due to the rapidly evolving situation. Australian cases are still under active investigation. While every effort has been made to standardise the investigation of cases nationally, there may be some differences between jurisdictions.*

#### In Australia:

- A total of fifteen COVID-19 cases were notified up until 19:00 AEDT 15 February 2020;
- All fifteen cases reported a travel history to China;
- Zero deaths were reported;
- At the conclusion of this report's coverage, eleven days have elapsed since the onset of illness in the latest confirmed case; and
- On 13 February 2020, the Australian Health Protection Principal Committee (AHPPC) issued a statement on resolution on travel restrictions and COVID-9 recommending that the current travel restrictions remain in place.

#### Internationally:

- Case numbers are increasing rapidly with 67,102 infections confirmed globally;
- The majority of confirmed infections (66,492) were reported in mainland China, as well as 1,523 deaths;
- On 12 February 2020 the case diagnosis classification in Hubei Province was changed to include clinically diagnosed cases in addition to laboratory-confirmed cases.
- As of 15 February 2020, Hubei Province reported 54,406 cases, of which 30% (16,522) were clinically diagnosed; and
- Three deaths were reported outside mainland China, one each in Hong Kong, Japan and the Philippines.

## Domestic cases

There were fifteen confirmed cases reported in Australia at 19:00 AEDT 15 February 2020 (Table 1). Cases were reported in New South Wales (n = 4), Victoria (n = 4), Queensland (n = 5) and South Australia (n = 2). The first onset of signs and symptoms in a case occurred on 13 January 2020 (Figure 1). The median age of cases was 43 (range 8–66) years. The male-to-female ratio was 1.5:1. Fourteen of the 15 cases (93%) reported fever and/or chills and 73% (11/15) reported cough. Two cases reported with pneumonia. Approximately 73% (11/15) of cases were hospitalised for clinical management and infection control. The remaining cases, in accordance with infection control procedures, were assessed to be well enough to self-isolate at home. The clinical course of infection was unavailable from these preliminary data. No deaths were reported.

The five laboratory-confirmed cases from Queensland were all part of a tour group of nine people from mainland China. The index case was isolated on presentation to hospital and all others within the tour group were quarantined. Four of those in quarantine were subsequently confirmed as cases, one of whom was a co-primary case, who like the index case had been in Wuhan, Hubei Province during the 14 days prior to illness onset. The other three cases were consistent with secondary transmission from the index case prior to isolation.

## International cases

On 12 February 2020 the General Office of the National Health Commission of the People's Republic of China and the Office of the State Administration of Traditional Chinese Medicine added clinical diagnosis to the case diagnosis classification in Hubei Province. This change was issued through the 'Diagnosis and Treatment Plan for Pneumonia of New Coronavirus (Version)' to ensure that patients can receive standardised treatment according to confirmed cases as early as possible to further improve the success rate of treatment.<sup>2</sup> This is

the first time China has reported clinically diagnosed cases in addition to laboratory-confirmed cases.<sup>3</sup> The number of clinically-diagnosed cases in Hubei Province will be included in the number of confirmed cases for publication from 12 February 2020 onwards.<sup>2</sup>

As at 19:00 AEDT 15 February 2020, the number of confirmed COVID-19 cases was 67,102 globally, including 16,522 clinically-diagnosed cases from Hubei Province, China (Table 2).<sup>4</sup> Mainland China reported 99% of cases (66,492) and 1,523 deaths. Twenty-eight countries and Special Administrative Regions outside of mainland China reported 392 confirmed COVID-19 cases. Three deaths were reported outside of mainland China, a 44-year-old male Wuhan resident in the Philippines, a 39-year-old male Hong Kong resident with recent travel to Wuhan and a female in her 80s from Kanagawa Prefecture near Tokyo, Japan who had no recent travel history to China. A cruise ship with approximately 3,700 passengers and crew quarantined in Japanese territorial waters reported 218 confirmed COVID-19 cases.

## Background

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020.<sup>5</sup>

Cases were initially associated with exposure to a wet market – located in Wuhan, Hubei Province, China – indicating a possible zoonotic source. Sustained human-to-human transmission is now occurring in the majority of provinces outside of Hubei Province in China. Fourteen countries (Australia, Egypt, France, Germany, Japan, Malaysia, Republic of Korea, Singapore, Spain, Thailand, UAE, UK, USA and Vietnam) report possible or confirmed transmission in close contact settings outside of China.<sup>4,6,7</sup> There is no evidence of widespread sustained community transmission in these countries.

**Table 1: Cumulative notified cases of confirmed COVID-19 by jurisdiction, Australia, 2020**

Jurisdiction	This week (to 19:00 AEDT 15 Feb) No. of cases	Last week (to 19:00 AEDT 8 Feb) No. of cases	Total cases (to 19:00 AEDT 15 Feb 2020) No. of cases
NSW	0	0	4
Vic	0	0	4
Qld	0	3	5
WA	0	0	0
SA	0	0	2
Tas	0	0	0
NT	0	0	0
ACT	0	0	0
<b>Total cases</b>	<b>0</b>	<b>3</b>	<b>15</b>

In an effort to contain the spread of the virus, Chinese authorities imposed a lockdown on the city of Wuhan on 23 January 2020, suspending all public transport including international flights.<sup>8</sup> The measure was extended to neighbouring cities in Hubei Province over subsequent days, quarantining an estimated 50 million people.<sup>9</sup>

Following advice from the Australian Health Protection Principle Committee (AHPPC) to substantially reduce the volume of travellers coming from mainland China, additional border measures were implemented in Australia. From 1 February 2020, Australia has denied entry to anyone who had left or transited through mainland China, with the exception of Australian citizens, permanent residents and their immediate family and air crew who have been using appropriate personal protective equipment.<sup>10</sup> Australia implemented these measures to slow the spread of COVID-19 into the country and to prepare healthcare services and laboratories for a targeted response.

On 13 February 2020, AHPPC released a statement on the resolution on travel restrictions and coronavirus (COVID-19) recommending current travel restrictions remain in place.<sup>11</sup> AHPPC noted approximately 70% reduction in entry to Australia of people who have been in mainland China, contributing to a much more

manageable program of self-isolation of recent arrivals. Border measures to screen flights and vessels from mainland China and for people who have come from or transited through mainland China in the past 14 days should continue as should the policy of requiring isolation for 14 days after leaving mainland China.<sup>11</sup>

The WHO continues to reiterate its concern for high-risk nations with weaker health systems that may lack the facilities to identify and manage COVID-19 cases.<sup>12</sup>

*The current estimates on epidemiological parameters including severity, transmissibility and incubation period are uncertain. Estimates are likely to change as more information becomes available.*

## Severity

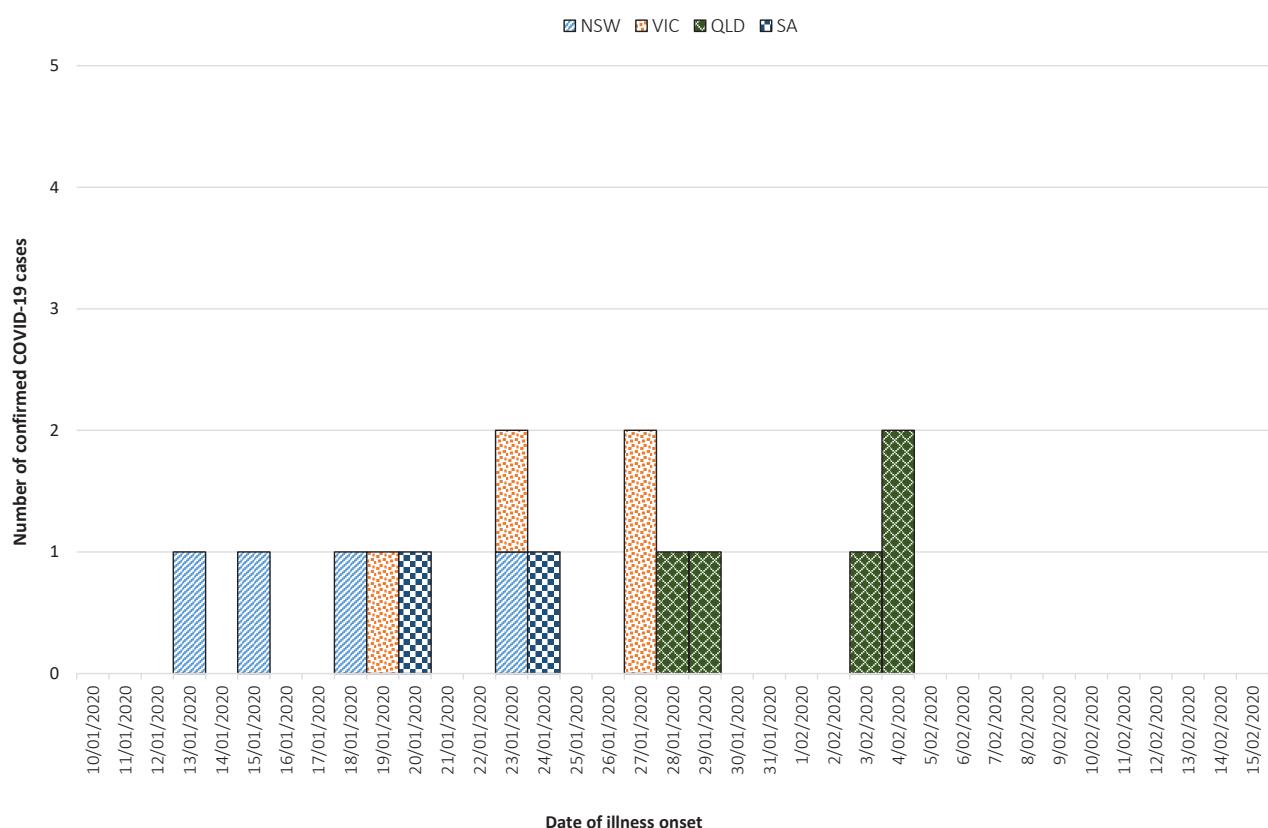
COVID-19 is a respiratory illness. Patients present with a wide range of symptoms. Most seem to have mild disease, and about 18% appear to progress to severe disease, including pneumonia, respiratory failure and in some cases death.<sup>13</sup> Fever, dry non-productive cough and fatigue are common symptoms. Atypical features include dizziness, headache, vomiting and abdominal pain.<sup>14</sup>

**Table 2: Cumulative confirmed cases of COVID-19 globally, 2019–2020**

Country / Special Administrative Region	This reporting week (to 19:00 AEDT 15 Feb 2020)	Total cases (from Dec 2019) <sup>a</sup>
Mainland China (laboratory confirmed)	15,424	49,970
Hubei Province (clinically diagnosed)	16,522	16,522
Cruise ship quarantined in Japanese waters	154	218
Singapore	34	67
Hong Kong	30	56
Japan	16	41
Thailand	2	34
Republic of South Korea	4	28
Malaysia	6	21
Taiwan	2	18
Germany	2	16
Vietnam	3	16
Australia	0	15
United States of America	3	15
France	5	11
Macau	0	10
United Kingdom	6	9
United Arab Emirates	1	8
Canada	0	7
India	0	3
Italy	0	3
Philippines	0	3
Russian Federation	0	2
Spain	1	2
Belgium	0	1
Cambodia	0	1
Egypt	1	1
Finland	0	1
Nepal	0	1
Sri Lanka	0	1
Sweden	0	1
<b>Total</b>	<b>32,216</b>	<b>67,102</b>

a Data taken from WHO Situation Reports.

**Figure 1: Confirmed cases of COVID-19 infection by date of illness onset, Australia 2020 (n = 15)<sup>a</sup>**



a Date of illness onset for New South Wales, Queensland and Victorian cases has been corrected since Epidemiology Report 2.<sup>1</sup>

Reports from China on the clinical presentation are limited to novel coronavirus-infected pneumonia (NCIP) patients. Of patients with NCIP, 30% develop difficulty breathing five days after onset of illness (range 1–10 days).<sup>14,15</sup> The median time from onset of illness to hospitalisation for NCIP patients was seven days (range 4–8 days), with acute respiratory distress syndrome (ARDS) experienced on day eight (range 6–12 days).<sup>14</sup> Of 138 NCIP patients, approximately a quarter required ICU admission (2% receiving high-flow oxygen, 11% non-invasive ventilation, 9% invasive ventilation and 3% extracorporeal membrane oxygenation (ECMO)).<sup>14</sup> ICU patients were typically older than 65 years and had a greater number of comorbidities. The first case report from the US described the clinical course and management of a case, including the patient's initial mild symptoms that progressed to pneumonia on day 9 of illness.<sup>6</sup> These studies suggests clinicians should be prepared for some

individuals, who initially present with mild-to-moderate symptoms, to deteriorate over subsequent days to severe disease.

Evidence on COVID-19 in pregnant women and children is limited. Concern was raised when a baby 30 hours after birth was confirmed with COVID-19; however, close contact history cannot be excluded.<sup>16,17</sup> In a small study evaluating the clinical characteristics of nine pregnant women with confirmed COVID-19, no evidence of transplacental or perinatal viral transmission was detected.<sup>15</sup> No women developed pneumonia or died. Delivery of nine live births by caesarean was employed to reduce risk of vertical transmission or due to pre-existing conditions. It is premature to consider a caesarean delivery a universal prevention approach.<sup>18</sup> Larger studies with longer duration are needed to confirm these results. According to a recent review, children (ranging from 1 month to 17 years) made up 0.3% (28/9682) of all confirmed cases in Wuhan City by 30 January 2020.<sup>19</sup>

Cases presented with mild clinical manifestations with some asymptomatic infections.<sup>19</sup> No deaths were reported.

The true fatality rate for COVID-19 cannot be presently calculated. Diagnosis of COVID-19 will precede death or recovery by days to weeks. The number of deaths should be compared to past confirmed cases, taking into account this lag period and estimating the fraction of mild under-reported disease.<sup>20</sup> In a pre-print, non-peer-reviewed study of 4,021 cases with laboratory-confirmed COVID-19 where approximately 48% were aged over 50 years, the case fatality rate (CFR) was 3.06%.<sup>21</sup> When stratified by sex and age, male patients had a CFR of 4.45 compared to 1.25 in females, and those  $\geq 60$  years had a CFR of 5.30 versus those  $< 60$  years of 1.43. This emphasises the importance of early detection in elderly patients, particularly males, to pre-empt clinical deterioration.

## Transmission

The exact nature of transmission is poorly understood. The WHO has reported 'during previous outbreaks due to other coronavirus (Middle-East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS)), human-to-human transmission occurred through droplets, contact and fomites, suggesting that the transmission mode of the 2019-nCoV can be similar'.<sup>22</sup> The basic reproductive number,  $R_0$ , indicates the contagiousness of an infectious disease and is defined as the average expected number of secondary cases produced by a single infection in a completely susceptible population. Chinese authorities reported a preliminary  $R_0$  of 1.4–2.5 on 23 January 2020 to the WHO International Health Regulations (2005) Emergency Committee.<sup>23</sup> On 13 February a review of 12 studies which estimated the  $R_0$  was published. It found the mean  $R_0$  to be 3.28 and median  $R_0$  to be 2.79, which exceeds the WHO preliminary  $R_0$  of 1.4–2.5 (average 1.95).<sup>24</sup> Models using stochastic and statistical methods, such as exponential growth were reasonably

comparable, while mathematical methods produced estimates on the higher side.  $R_0$  in more recent studies has stabilised around 2–3.

China and France have reported hospital-related transmission.<sup>14,25</sup> In one study from Wuhan, of 138 NCIP patients 41% were presumed infected in the hospital, including 40 healthcare workers.<sup>14</sup> Media have reported shortages of masks and personal protective equipment in Hubei Province due to the quarantine measures which may have exacerbated the high proportion of hospital-related infections in this study.<sup>26</sup> On 14 February China confirmed 1,716 medical staff infected, 87.5% (1502/1716) from Hubei Province, and six deaths.<sup>27</sup>

Asymptomatic and pre-symptomatic infection has been reported.<sup>4,28</sup> A reverse transcription polymerase chain reaction (RT-PCR)-confirmed asymptomatic child was described with radiological signs of pneumonia reported from a family cluster in Shenzhen, although onward transmission from this case was not documented.<sup>29</sup> On 15 February Egypt confirmed an asymptomatic COVID-19 case. The case was identified through contact screening of an index case who travelled from China to Egypt.<sup>30</sup> A report describing a suspected asymptomatic transmission in Germany was proven inaccurate once health officials interviewed the patient directly.<sup>31</sup>

## Incubation period

Current estimates of the incubation period of COVID-19 from the WHO range from 2 to 10 days, with these estimates to be refined as more data become available.<sup>22</sup> A recently-published article characterising the first 425 cases in Wuhan, Hubei Province China estimated the mean incubation period to be 5.2 days (95% confidence interval, 4.1–7.0 days) with the 95<sup>th</sup> percentile of the distribution at 12.5 days.<sup>32</sup> A modelling paper using known travel history to and from Wuhan and symptom onset date in 88 exported cases calculated the mean incubation period to be 6.4 days (95% confidence interval, 5.6–7.7 days) ranging from 2.1 to 11.1 days (2.5<sup>th</sup>

and 97.5<sup>th</sup> percentile).<sup>33</sup> Both reports support the use of 14 days as the upper limit of the incubation period used in the Australian interim advice.<sup>34</sup> Using 50 patients with well-defined exposure periods Jiang et al. applied various statistical models to the dataset and inferred the mean incubation period was 4.9 days (95% confidence interval, 4.4–5.5 days).<sup>35</sup>

A pre-print non-peer-reviewed article posted on 9 February retrospectively described the clinical characteristics of 1,099 patients with laboratory-confirmed COVID-19 acute respiratory disease (ARD) from 552 hospitals in 31 provinces in China. The results suggested that the median incubation period was 3 days, ranging from 0 to 24 days.<sup>36</sup> The researchers relied on clinical records and did not conduct active contact tracing. This study was refuted by two Canadian medical experts who described the reports of patients with 24-day incubation periods as ‘outliers’ that should be studied further and do not represent a significant shift in thinking around the virus.<sup>37</sup>

### Recommendations for control

The WHO recommends the general public reduce their exposure and transmission to COVID-19 by:

- Frequently cleaning hands by using alcohol-based hand rub or soap and water;
- When coughing and sneezing cover mouth and nose with flexed elbow or tissue – throw tissue away immediately and wash hands;
- Avoid close contact with anyone who has fever and cough; and
- If you have a fever, cough and difficulty breathing seek medical care early and share previous travel history with your health care provider.

### Treatment

Currently there is no specific medication recommended for COVID-19. Antibiotics are not effective against viruses. A number of antiviral medications will be trialled to assess whether they can be used to treat COVID-19. Experimental vaccines are also in development.

Clinical care of suspected patients with COVID-19 should focus on early recognition, immediate isolation, implementation of appropriate infection prevention and control measures and provision of optimised supportive care.<sup>8</sup>

### Virology

SARS-CoV-2, the virus that causes COVID-19, is 96% identical to the whole genome sequence of a known bat coronavirus (BATCoV RaTG13) and 79.5% identical to SARS-CoV-1.<sup>38</sup> Like SARS-CoV-1, it attaches its spike (S) protein to the angiotensin-converting enzyme 2 (ACE-2) to enter and infect host cells located in the lower respiratory tract.<sup>38</sup> Progressive respiratory failure is due to alveolar damage.<sup>38</sup>

### Methods

Data for this report were current as at 19:00 hours AEDT, 15 February 2020.

This report outlines what is known epidemiologically on COVID-19 in Australia and from publicly available data from WHO Situation Reports, other countries' official updates and the scientific literature. Data on domestic cases in this report were collected from National Notifiable Diseases Surveillance System (NNDSS) and state and territory case investigation reports. The Communicable Diseases Network Australia (CDNA) developed the case definition for suspected and confirmed cases, which was modified at different time points in the epidemic (23 and 27 January and 2, 4, 6, 7 and 14 February 2020) (Table 3). CDNA developed national guidance on investigating suspected and confirmed cases of COVID-19. Based on this guidance, state and territory health department investigators con-

**Table 3: Australian COVID-19 case definition as of 15 February 2020<sup>34</sup>**

<b>Version</b>	<b>Date of development</b>	<b>Suspected Cases</b>	<b>Confirmed Cases</b>
1.6 <sup>a</sup>	14 February 2020	<p>As the full clinical spectrum of illness is not known, clinical and public health judgement should also be used to determine the need for testing in patients who do not meet the clinical criteria below. If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.</p> <p><b>Epidemiological criteria</b></p> <ul style="list-style-type: none"> <li>• Travel to (including transit through) mainland China in the 14 days before the onset of illness.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Close or casual contact in 14 days before illness onset with a confirmed case of COVID-19.</li> </ul> <p><b>Clinical criteria</b></p> <ul style="list-style-type: none"> <li>• Fever</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Acute respiratory infection (e.g. shortness of breath or cough) with or without fever</li> </ul>	<p>A person who tests positive to a specific COVID-19 PCR test (when available) or has the virus identified by electron microscopy or viral culture, at a reference laboratory.</p>

a Version 1.6 includes updated information about personal protective equipment.

ducted interviews of suspected cases to collect core and enhanced data for inclusion in NNDSS. Data were analysed using Stata to describe the epidemiology of infections in Australia and the progress of the epidemic.

Previous case definitions are provided in Appendix A.

Data for the international cases of COVID-19 by country were compiled from the latest WHO Situation Report. Case definitions may vary by country making comparisons difficult. Rapid reviews of the current state of knowledge on COVID-19 were conducted from the literature using PubMed.

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## Appendix

### Appendix A – Previous case definitions and contact definitions<sup>a</sup>

Version	Date of development	Suspected Cases	Confirmed Cases
1.5	7 February 2020	<p>As the full clinical spectrum of illness is not known, clinical and public health judgement should also be used to determine the need for testing in patients who do not meet the clinical criteria below. If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.</p> <p><b>Epidemiological criteria</b></p> <ul style="list-style-type: none"><li>Travel to (including transit through) mainland China in the 14 days before the onset of illness.</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>Close or casual contact in 14 days before illness onset with a confirmed case of COVID-19.</li></ul> <p><b>Clinical criteria</b></p> <ul style="list-style-type: none"><li>Fever</li><li>OR</li><li>Acute respiratory infection (e.g. shortness of breath or cough) with or without fever</li></ul>	<p>A person who tests positive to a specific COVID-19 PCR test (when available) or has the virus identified by electron microscopy or viral culture, at a reference laboratory.</p>
1.4	6 February 2020	<p><b>Epidemiological criteria</b></p> <ul style="list-style-type: none"><li>Travel to (including transit through) mainland China in the 14 days before the onset of illness.</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>Close or casual contact<sup>a</sup> in 14 days before illness onset with a confirmed or suspected case of COVID-19.</li></ul> <p><b>Clinical criteria</b></p> <ul style="list-style-type: none"><li>Fever.</li><li>OR</li><li>Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.</li></ul>	

Version	Date of development	Suspected Cases	Confirmed Cases
			<b>Epidemiological criteria</b> <ul style="list-style-type: none"> <li>Travel to (including transit through) mainland China in the 14 days before the onset of illness.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Close contact<sup>a</sup> in 14 days before illness onset with a confirmed or suspected case of COVID-19.</li> </ul> <b>Clinical criteria</b> <ul style="list-style-type: none"> <li>Fever.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.</li> </ul>
1.2	2 February 2020		<b>Epidemiological criteria</b> <ul style="list-style-type: none"> <li>Travel to (including transit through) mainland China in the 14 days before the onset of illness.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Close contact<sup>a</sup> in the 14 days before illness onset with a confirmed or suspected case of COVID-19.</li> </ul> <b>Clinical criteria</b> <ul style="list-style-type: none"> <li>Acute respiratory infection (sudden onset of respiratory infection with at least one of: shortness of breath, cough or sore throat) with or without fever or history of fever.</li> </ul>
1.1	27 January 2020		<b>Epidemiological criteria</b> <ul style="list-style-type: none"> <li>Travel to Hubei Province, China in the 14 days before the onset of illness.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Travel to agreed areas of human-to-human transmission, or a declared outbreak, within 14 days before onset of illness</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Close contact<sup>a</sup> in 14 days before illness onset with a case of COVID-19.</li> </ul> <b>Clinical criteria</b> <ul style="list-style-type: none"> <li>Fever or history of fever (<math>\geq 38^{\circ}\text{C}</math>) and acute respiratory infection (sudden onset of respiratory infection with at least one of: shortness of breath, cough or sore throat)</li> </ul> <p>OR</p> <p>Severe acute respiratory infection requiring admission to hospital with clinical or radiological evidence of pneumonia or acute respiratory distress syndrome (i.e. even if no evidence of fever)</p>

Version	Date of development	Suspected Cases	Confirmed Cases
1.0	23 January 2020	<p><b>Epidemiological criteria</b></p> <ul style="list-style-type: none"> <li>• Travel to Wuhan City (Hubei Province, China) in the 14 days before the onset of illness.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Travel to an area with evidence of sustained human-to-human transmission, or a declared outbreak, within 14 days before onset of illness.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Close contact<sup>a</sup> in 14 days before illness onset with a case of COVID-19.</li> </ul> <p><b>Clinical criteria</b></p> <ul style="list-style-type: none"> <li>• Fever or history of fever (<math>\geq 38^{\circ}\text{C}</math>) and acute respiratory infection (sudden onset of respiratory infection with at least one of: shortness of breath, cough or sore throat).</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Severe acute respiratory infection requiring admission to hospital with clinical or radiological evidence of pneumonia or acute respiratory distress syndrome (i.e. even if no evidence of fever).</li> </ul>	

<sup>a</sup> Full details on the definition of a close contact are available on the Australian Government Department of Health CDNA National Guidelines for Public Health Units: Coronavirus Disease 2019 (COVID-19).<sup>34</sup>