Feedback from operational stakeholders who manage or respond to outbreaks is that they are often too busy to review literature or obtain relevant background information to assist them with acute response. Unlike a traditional analytical outbreak investigation report, ***Watching Briefs*** *are intended as a rapid resource for public health or other first responders in the field on topical, serious or current outbreaks, and provide a digest of relevant information including key features of an outbreak, comparison with past outbreaks and a literature review. They can be completed by responders to an outbreak, or by anyone interested in or following an outbreak using public or open source data, including news reports.*

Watching brief

Title	**Wuhan novel coronavirus 2019nCoV**
Authors	C R MacIntyre, The Biosecurity Program, Kirby Institute, University of New South Wales, Sydney, NSW, 2052, Australia
Date of first report of the outbreak	29 December 2019
Disease or outbreak	**Novel coronavirus 2019nCoV**
Origin (*country, city, region*)	Wuhan, Hubei, China
Suspected Source (specify food source, zoonotic or human origin or other)	Unknown. Snakes have been implicated (1), but the evidence for this is weak, and genetic analysis suggests a mammalian source such as bats. Coronaviruses arising from bats can have intermediary animal hosts.
Date of outbreak beginning	December 29 2019
Date outbreak declared over	Ongoing on January 24th 2020
Affected countries & regions	China (540 cases) Thailand (4 cases) Vietnam (2 cases) South Korea (1 case) Japan (1 case) Taiwan (1 case) Singapore (1 case) Hong Kong (1 case) Philippines (1 case) USA (1 case)

Number of cases (specify at what date if ongoing)	570
Clinical features	Fever, cough, shortness of breath, myalgia. Mild cases may present with a common cold like syndrome, whilst severe cases may develop severe acute respiratory syndrome and pneumonia.
Mode of transmission (dominant mode and other documented modes)	Coronaviruses are respiratory viruses, so can be found in the respiratory tract. Transmission is unknown yet and detailed risk factor analysis data have not yet been published. Most cases appear to be sporadic and are assumed to be from an animal source, with most cases localised to Wuhan and the initial outbreak linked to a fish market with other live animals. There has been some person to person spread, including a family in Guandoing, and a single case which infected 14 health workers. One of the two cases in Vietnam also appears to be spread person-to-person from the index case in Vietnam. SARS was transmitted person-to-person, especially in the hospital setting. MERS CoV has mostly been sporadic, with some person-to-person spread and nosocomial outbreaks.
Demographics of cases	All cases are adults, with males and females equally affected. Anecdotal reports that people with chronic conditions are more at risk. No cases have been reported in children at this stage. The majority of the cases are in China, mainly in Wuhan.
Case fatality rate (CFR)	Ranges from 2-3% depending on changes in daily case and death counts.
Complications	Severe pneumonia, respiratory failure, death.
Available prevention	A vaccine is being developed by the National Institutes for Health in the USA and by other companies. A MERS CoV vaccine has been developed(2) and is a high priority for the WHO and Coalition for Epidemic Preparedness Initiatives. Whether the MERS vaccine has cross protection against 2019nCoV is unknown.
Available treatment	Supportive treatment only. Intensive care, ventilation and ECMO may be used for severe pneumonia and respiratory failure. Broad spectrum antivirals may have effectiveness against coronaviruses but are untested against 2019nCoV.(3)

Comparison with past outbreaks	This is a new infection, so it can only be compared with SARS and MERS CoV. It appears less infectious than SARS, which had a R0 of 2. It may be closer to MERS CoV, which has a R0 close to 1, in terms of transmission. In terms of case fatality rate (CFR), the CFR with SARS was 12%, MERS CoV 26% and 2019nCoV appears to be about 2-3% based on informal reports of cases and deaths. The transmission appears mixed (like MERS CoV), with mostly sporadic or point-source cases and some propagated transmission from person to person. With SARS, travel-related cases in other countries frequently caused satellite epidemics with clear person to person transmission in Hong Kong, Vietnam, Singapore and Canada. This has not been seen so far with the new coronavirus. With MERS, the only outbreak outside of the Kingdom of Saudi Arabia was in South Korea, and over 60% of cases are sporadic.(4)
Unusual features	The source of infection remains unknown, although it is geographically in the city of Wuhan, Hubei, China. Transmission appears mainly point-source in the city of Wuhan, particularly linked to a seafood market which also sells other live animals. There has been some person-to-person spread, but like MERS CoV, most travel related cases imported to other countries have not caused satellite epidemics. China took the extraordinary measure of locking down Wuhan and other cities on January 23rd 2020, thereby reducing travel out of the disease epicentre. Given the timing of this epidemic around the Chinese Lunar New Year (Spring festival), when travel is at a peak, this would reduce the risk of travel-related importations of cases to other parts of China and the world. The phylogenetic analysis suggests low diversity (ie that the virus is not mutating rapidly) and a relatively recent origin of the virus.
Critical analysis and key questions	The key questions around this epidemic are: 1. What is the source? Identifying the source can help curtail the epidemic. 2. What is the dominant mode of transmission and what other modes of transmission are possible? This will inform optimal disease control strategies. 3. What are the risk factors for disease? A case-control analysis is required to determine sociodemographic, clinical, behavioural and other risk factors. A modelling study suggests that, based on the number of travel-related cases, there could be 1000 to 9000 undetected cases of 2019nCoV. (5). A similar modelling estimation of a large proportion of undetected, asymptomatic or mild cases was made for MERS CoV,(6) but not supported by active screening studies or serological surveys of humans in affected areas.(7,8). Serological surveys in Wuhan will help determine how much mild or asymptomatic infection there may be.

	Until the questions above are answered, the main disease control strategies should focus on 1. Enhanced disease surveillance to detect new cases early 2. Travel – the main route of global spread. Strategies include airport screening, health communication to passengers at risk, reduction or prevention of travel (such as the lock down of Wuhan which occurred on January 23rd 2020). 3. Hospitals and the health system – both SARS and MERS CoV caused nosocomial outbreaks. Patients with 2019nCoV will present to the health system, and if they are not suspected as cases and isolated rapidly, they may infect others. Triage, isolation and infection control are key, as well as personal protective equipment (PPE) for health care workers. Health workers paid a heavy price with SARS, with many preventable deaths due to delayed diagnosis or inadequate PPE.
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