Risk Assessment for International Dissemination of 2019-nCoV across ASEAN

As of January 24, 2020
Introduction

An outbreak of novel coronavirus was initially identified last December 2019 in the city of Wuhan (in central China) wherein an emerging cluster of people with pneumonia with no clear cause were linked primarily to stallholders who worked at the Huanan Seafood Market. The suspected source is a wholesale seafood market with a thousand stalls also selling chickens, pheasants, bats, marmots, venomous snakes, spotted deer and the organs of rabbits and other wild animals. According to US-CDC, many of the patients in the outbreak in Wuhan, China reportedly had some link to this market, suggesting animal-to-person spread. However, a growing number of patients reportedly have not had exposure to animal markets, suggesting possible person-to-person spread is occurring. At this time, it’s unclear how the virus is spreading between people.

Wuhan is the seventh-largest city in China, with a population of more than 11 million people. It is a major transportation hub in central China, approximately 700 miles (1,100 km) south of Beijing, 500 miles (800 km) west of Shanghai, and 600 miles (970 km) north of Hong Kong.

2019-nCoV Highlights and Situation Overview

Ground Zero - Wuhan City, Hubei Province, China

- Capital of Hubei province, People's Republic of China
- It is the largest city in Hubei and the most populous city in Central China, with a population of 19 million
- Seventh most populous Chinese city, and one of the nine National Central Cities of China.
- Reported a cluster of cases of a respiratory syndrome of unknown cause associated with the Wuhan China Seafood Market last 30 December 2019. Contact with meat from various animals sold in the market has been established as the most likely cause of the first reported human infections.

As of 24 January 2020

- As of 14:00 EST on January 24th, 2020, there have been a total of 948 confirmed cases of the novel coronavirus (2019-nCoV), 882 of which have been confirmed within China.
- The 2019-nCoV outbreak, originally centered in Wuhan city, is continuing to show evidence of broader geographic spread across mainland China.
As of **January 24**, there were cases confirmed across 25 provinces and three autonomous regions throughout the country. In total, 882 cases have now been confirmed. The 7 provinces, 2 autonomous regions, and municipalities of Hubei, Anhui, Tianjin, Beijing, Shanghai, Chongqing, Sichuan, Jiangxi, Yunnan, Shandong, Fujian, Guangxi, and Hebei declare a level 1 public health emergency. The city of Jingzhou was quarantined, raising the number of people in quarantined cities to 35 million.

Wuhan closed transport networks effective **January 23, 2020**. **Chinese health officials suspended outbound travel** from Wuhan via air and rail, as well as local transportation services within the city, in an effort to curb further spread of the 2019-nCoV virus.

Public activities related to the **Lunar New Year in Wuhan** have also been **cancelled**.

- **Imported cases of 2019-nCoV** have been reported in Thailand (5), Japan (2), South Korea (2), Taiwan (1), the United States (2), France (2), Singapore (3), Macao (2), Vietnam (2), Hong Kong (5), and Nepal (1).

- **WHO emergency committee postponed making a decision** on whether the 2019-nCoV Wuhan coronavirus is a global health emergency.

- **After the first case was detected in Washington State, USA, the CDC activated its emergency operations center and raised its travel health notice level** for Wuhan, China.

- **Canadian airport screening has been initiated for** all international travellers arriving in Toronto, Montreal and Vancouver international airports. Additional screening questions to determine if they have visited the city of Wuhan in China, where the outbreak was first reported, will be asked.
Wuhan Health and Medical Commission issued an alert highlighting cases of a respiratory syndrome of unknown cause associated with the Wuhan China Seafood Market.

**Urgent notice on the treatment of Pneumonia of unknown case**

**30 DECEMBER 2019**

Wuhan China Seafood Market has been temporarily closed for environmental sanitation and disinfection.

**Wuhan China Seafood Market was closed**

**1 JANUARY 2020**


**Isolation and identification of 2019-nCoV**

**7 JANUARY 2020**

- **41** confirmed cases of pneumonia preliminary diagnosed with 2019-nCoV
- Symptom onset ranges from December 8, 2019 to January 2, 2020
- No case other than Wuhan
- Gene sequence was found 87.6% similar to bat coronavirus

WHO Statement published

**12 JANUARY 2020**

27 people with pneumonia of unknown cause were reported to WHO.

**31 DECEMBER 2019**

27 people with pneumonia of unknown cause were reported to the WHO. Most were stallholders from the Wuhan South China Seafood Market. As a result, Hong Kong, Macau and Taiwan tightened their inbound screening process.

**A total of 44 patients have been reported to WHO**

**3 JANUARY 2020**

A total of **44** patients have been reported to WHO by the national authorities in China. Of the 44 cases reported, **11** are severely ill, while remaining **33** patients are in stable condition.

**1st death related to 2019-nCoV**

**10 JANUARY 2020**

61/M: First death related to nCoV 2019 reported in China - a frequent customer at the Wuhan food market - with underlying medical conditions.
61/F: imported case reported in Thailand
-taken to a Thai hospital immediately after arriving at Suvarnabhumi Airport in Bangkok on 8 January.
-Presently free of the infection, recovering and ready to return to Wuhan

69/M: Second death related to nCoV 2019 in China
-became ill on December 31, 2019, became worse on January 4, 2020, and was transferred to Wuhan Jinyintan Hospital for treatment.
-Admitted with severe myocarditis, abnormal renal function, and multiple organ functions. Died at 00:45 on January 15.

30/M: Imported case reported and confirmed in Japan:
-travelled to Wuhan, returned on 6 January; admitted in hospital on 10 January; no visit to the seafood market; presented with persistent fever and eventually discharged from hospital

Wuhan: 17 additional laboratory-confirmed cases, with three cases in critical condition. The number of laboratory-confirmed cases rose to 62 with age ranging from 30 to 79, of which 19 were discharged and eight remain critical

Wuhan, China: Newly identified 45 cases of pneumonia with new coronavirus infection based on the clinical manifestations, epidemiological history of the patients, and the results detected by the diagnostic kit.

Thailand: 74/F: Imported case (2nd case) reported and confirmed
-travelled to Wuhan, arrived at Thailand on January 13

1st confirmed case in Thailand
13 JANUARY 2020

1st confirmed case in Japan
16 JANUARY 2020

Additional confirmed cases in Wuhan
18 JANUARY 2020
**Wuhan:** A total of 201 cases, 3 deaths reported

**Shenzhen, Guangdong:** 66/M, Chinese, visited relatives in Wuhan on December 29, 2019 and developed fever and fatigue on January; returned to Shenzhen on January 4 and was admitted to the hospital and placed in isolation on January 11, where he is currently reported to be in stable condition.

**Beijing** Daxing District Health Committee reported 2 laboratory-confirmed cases of 2019-nCoV: with febrile illnesses, no respiratory symptoms and recent travel to Wuhan. They are currently in isolation, in stable condition.

- **Wuhan:** 136 additional confirmed cases; 3rd confirmed death
- **3 confirmed cases outside Wuhan**

19 JANUARY 2020

**Total confirmed cases in China:** 321 cases, 6 deaths

Newly confirmed cases were reported in several locations in China: Zhejiang (5), Tianjin (2), Henan (1), Chongqing (5), Hunan (1), Yunnan (1), Shandong (1), Jiangxi (1), and Sichuan (1). Guangdong and Shanghai reported 3 and 4 additional confirmed case respectively.

**Taiwan:** 55/F, Taiwanese who works in Wuhan reported to quarantine officials that she was suffering from a fever upon arriving at Taoyuan International Airport; first non-Chinese national diagnosed.

**United States:** 1st US case of Wuhan coronavirus reported. Patient was admitted to hospital on Sunday, after arriving in Seattle from Wuhan, China, on January 15. The man did not visit any of the markets connected to the virus while in Wuhan, nor did he know anyone ill, and

- **1st confirmed case in Taiwan**
- **1st confirmed case in United States**
- **New cases outside Wuhan but within China**

21 JANUARY 2020

- **1st confirmed case in South Korea**
- **1st confirmed case in Shanghai, China**
- **Beijing:** additional 3 confirmed cases
- **Guangdong:** 13 additional case

20 JANUARY 2020

- First confirmed case reported in Incheon City (near Seoul)
- **Shanghai** confirms its first case, bringing the total number of laboratory-confirmed cases in China to 218
- **Beijing** and **Guangdong** reported an additional three and thirteen laboratory-confirmed cases respectively.
- WHO raises possibility of ‘sustained’ human-to-human transmission
WHO's emergency committee was unable to reach a consensus on whether the outbreak should be classified as PHEIC due to lack of information.

China confirmed cases: 571 cases, 17 deaths

Additional cases in China: Beijing (5), Guangdong (9), Shanghai (5), Tianjin (2), Zhejiang (5), Jiangxi (1), Hunan (3)

New cases in China: Hainan (4), Guangxi (2), Liaoning (2), Guizhou (1), Fujian (1), Anhui (1), Shanxi (1), and Ningxia (1).

2 additional cases in Thailand

2 first cases in Hong Kong

France reported its first two confirmed cases. The French Health Minister stated in a press conference that it is likely other cases would arise in the country.

Nepal confirms its first case, a student who returned from Wuhan

The first incidence of possible human to human transmission outside of China was documented by the WHO in Vietnam. One confirmed case has no travel history in Wuhan.

Confirmed cases: 948 cases (882 from China), 26 deaths reported

WHO’s Emergency Committee was unable to reach consensus on classifying 2019-nCoV as PHEIC

New and additional cases in China

Additional cases in Thailand

2 cases in Hong Kong was reported

22 JANUARY 2020

1st confirmed case in Singapore: 66/M from China

1st two confirmed cases in Vietnam: 66-year-old father and 28-year-old son from China

23 JANUARY 2020

Wuhan suspended all public transport

New and additional cases in China

1st confirmed case in Singapore

1st two confirmed case in Vietnam

24 JANUARY 2020

Wuhan suspended all public transportation from 10 a.m. onwards, including all bus, metro and ferry lines. Additionally, all outbound trains and flights were halted

New case in China: Jiangsu (1), Heilongjiang (2), Xinjiang (2), Shaanxi (3), Gansu (2)

Additional cases: Fujian (3), Guangxi (3), Shanghai (7), Macau (1)

Confirm all cases: 582 cases (571 cases in China), 17 deaths (all from Hubei)

1st confirmed case in Singapore: 66/M from China

1st two confirmed cases in Vietnam: 66-year-old father and 28-year-old son from China
Map of 2019-nCoV Affected Countries

Figure 1. Map of countries with 2019-nCoV confirmed cases as of January 24, 2020

Reasons for Concern

- There is evidence of broader geographic spread across mainland China and the rest of Asia.

- WHO said earlier that an animal source seemed to be "the most likely primary source" with "some limited human-to-human transmission occurring between close contacts."

- Evidence supports human-to-human transmission of the virus.
  - In Guangdong, two patients were infected by family members who visited Wuhan.
Fifteen medical workers helping with coronavirus patients in Wuhan have also been diagnosed with pneumonia, with one in critical condition.

The Wuhan South China Seafood Market which sold various live animal species and may have been the source of the novel virus, was closed 01 January 2020. The increasing cases reported more recently indicate further spread through human-to-human transmission is likely to continue.

Further information is required to understand how readily the virus can be transmitted between infected individuals.

**Public Health Outlook**

- With evidence that 2019-nCoV can be transmitted between humans, and daily reports of international importation, further domestic and international spread is possible. Southeast Asian nations are most highly connected to Wuhan by international air travel. Many international cities are connected to the larger affected region.

- Close monitoring of case reports from within China and highly connected countries is essential to prepare for further domestic and international spread of 2019-nCoV.

- It is expected that further spread within China may occur secondary to increased travel for the Chinese Lunar New Year which takes place on January 25th.

- The WHO has provided general recommendations following the MERS Guidelines to the medical community including the use of enhanced standard infection prevention and control practices, especially in emergency departments. For the general public, preventive measures include avoiding close contact with people suffering from acute respiratory illnesses, avoiding contact with wild or farm animals in affected areas, and practicing good hand and respiratory hygiene.
Risk of 2019-nCoV spread via Air Travel

AIR TRAVEL FROM WUHAN TO INTERNATIONAL CITIES IN 2019

Table 1. Top ranking international cities receiving passengers from Wuhan Tianhe International Airport, Hubei, China in 2019.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Origin City</th>
<th>Destination Country</th>
<th>Direct Volume</th>
<th>Indirect Volume</th>
<th>Total Volume*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wuhan</td>
<td>China</td>
<td>9,980,789</td>
<td>44,494</td>
<td>10,025,283</td>
</tr>
<tr>
<td>2</td>
<td>Wuhan</td>
<td>Thailand</td>
<td>268,118</td>
<td>59,237</td>
<td>327,355</td>
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<td>3</td>
<td>Wuhan</td>
<td>Japan</td>
<td>102,229</td>
<td>36,263</td>
<td>138,492</td>
</tr>
<tr>
<td>4</td>
<td>Wuhan</td>
<td>Malaysia</td>
<td>94,920</td>
<td>35,627</td>
<td>130,547</td>
</tr>
<tr>
<td>5</td>
<td>Wuhan</td>
<td>Taiwan</td>
<td>88,768</td>
<td>16,975</td>
<td>105,743</td>
</tr>
<tr>
<td>6</td>
<td>Wuhan</td>
<td>Singapore</td>
<td>76,206</td>
<td>16,693</td>
<td>92,899</td>
</tr>
<tr>
<td>7</td>
<td>Wuhan</td>
<td>Korea (South)</td>
<td>67,205</td>
<td>11,690</td>
<td>78,895</td>
</tr>
<tr>
<td>8</td>
<td>Wuhan</td>
<td>Hong Kong (SAR)</td>
<td>71,521</td>
<td>374</td>
<td>71,895</td>
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<tr>
<td>9</td>
<td>Wuhan</td>
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<td>44,347</td>
<td>56,328</td>
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<tr>
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<td>Wuhan</td>
<td>Cambodia</td>
<td>35,363</td>
<td>20,728</td>
<td>56,091</td>
</tr>
<tr>
<td>12</td>
<td>Wuhan</td>
<td>Australia</td>
<td>17,671</td>
<td>37,100</td>
<td>54,771</td>
</tr>
<tr>
<td>13</td>
<td>Wuhan</td>
<td>Macao (SAR)</td>
<td>42,759</td>
<td>74</td>
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<tr>
<td>14</td>
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<td>15,600</td>
<td>35,505</td>
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<tr>
<td>15</td>
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<td>13,201</td>
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<tr>
<td>16</td>
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<td>21,214</td>
<td>22,729</td>
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<tr>
<td>18</td>
<td>Wuhan</td>
<td>France</td>
<td>11,000</td>
<td>11,436</td>
<td>22,436</td>
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<tr>
<td>19</td>
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<td>18,368</td>
<td>18,368</td>
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<td>20</td>
<td>Wuhan</td>
<td>Italy</td>
<td>7,591</td>
<td>10,634</td>
<td>18,225</td>
</tr>
</tbody>
</table>

*Data from International Air Travel Association (IATA) totaled across January to November 2019
Table 2. Estimated travel data from International Air Travel Association (using Biodiaspora tools) based on the booked flights from Wuhan to ASEAN countries

<table>
<thead>
<tr>
<th>Rank</th>
<th>Origin City</th>
<th>Destination City</th>
<th>Destination Country</th>
<th>Flights</th>
<th>Seats*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wuhan</td>
<td>Bangkok</td>
<td>Thailand</td>
<td>160</td>
<td>28,110</td>
</tr>
<tr>
<td>2</td>
<td>Wuhan</td>
<td>Singapore</td>
<td>Singapore</td>
<td>44</td>
<td>12,692</td>
</tr>
<tr>
<td>3</td>
<td>Wuhan</td>
<td>Kota Kinabalu</td>
<td>Malaysia</td>
<td>45</td>
<td>7,946</td>
</tr>
<tr>
<td>4</td>
<td>Wuhan</td>
<td>Phuket</td>
<td>Thailand</td>
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<td>5,580</td>
</tr>
<tr>
<td>5</td>
<td>Wuhan</td>
<td>Ho Chi Minh City</td>
<td>Viet Nam</td>
<td>31</td>
<td>5,146</td>
</tr>
<tr>
<td>6</td>
<td>Wuhan</td>
<td>Denpasar Bali</td>
<td>Indonesia</td>
<td>14</td>
<td>3,010</td>
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<td>7</td>
<td>Wuhan</td>
<td>Siem Reap</td>
<td>Cambodia</td>
<td>14</td>
<td>2,520</td>
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<tr>
<td>8</td>
<td>Wuhan</td>
<td>Chiang Mai</td>
<td>Thailand</td>
<td>13</td>
<td>2,054</td>
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<td>Wuhan</td>
<td>Surat Thani</td>
<td>Thailand</td>
<td>9</td>
<td>1,422</td>
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<td>10</td>
<td>Wuhan</td>
<td>Sihanoukville</td>
<td>Cambodia</td>
<td>4</td>
<td>720</td>
</tr>
</tbody>
</table>

*Data is still incomplete and may vary from the actual passengers travelling to country of destination
Note: Chinese health officials suspended outbound travel from Wuhan via air and rail since January 23, 2020

Figure 2. Map showing air travel movements from Wuhan to ASEAN countries in January to March 2020
ESTIMATED AIR TRAVEL FROM CHINA TO ASEAN COUNTRIES FROM JANUARY-MARCH 2020

Table 2. Estimated travel data from International Air Travel Association (using Biodiaspora tools) based on the booked flights from China to ASEAN countries

<table>
<thead>
<tr>
<th>Rank</th>
<th>Origin Country</th>
<th>Destination Country</th>
<th>Flights</th>
<th>Seats*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>Thailand</td>
<td>5610</td>
<td>1,067,170</td>
</tr>
<tr>
<td>2</td>
<td>China</td>
<td>Singapore</td>
<td>1763</td>
<td>398,456</td>
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<td>3</td>
<td>China</td>
<td>Malaysia</td>
<td>1557</td>
<td>321,255</td>
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<td>4</td>
<td>China</td>
<td>Cambodia</td>
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<td>China</td>
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<td>China</td>
<td>Philippines</td>
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<td>134,310</td>
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<td>7</td>
<td>China</td>
<td>Myanmar</td>
<td>537</td>
<td>87,286</td>
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<td>8</td>
<td>China</td>
<td>Lao</td>
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<td>9</td>
<td>China</td>
<td>Brunei</td>
<td>53</td>
<td>8,252</td>
</tr>
</tbody>
</table>

*Data is still incomplete and may vary from the actual passengers travelling to country of destination

Note: Chinese health officials suspended outbound travel from Wuhan via air and rail since January 23, 2020

Figure 3. Map showing air travel movements from China to ASEAN countries in January to March 2020