



# WEEKLY REPORT

## CORONAVIRUS 2019 (COVID-19) – GLOBAL: 7<sup>TH</sup> EDITION

06 March 2020

### STATE, LOCAL, TRIBAL & TERRITORIAL EDITION

#### Current Event Status (Worsening)

The rapidly evolving situations in Iran, Japan, South Korea, and Western Europe caused the WHO Director-General to warn the international community that the world is in “unchartered territory” as numerous countries experience community transmission, despite China’s verified reduction in case incidence.<sup>4</sup> Global personal protective equipment shortages are compromising countries’ abilities to respond to coronavirus disease (COVID-19) outbreaks. As of March 06, Johns Hopkins University (JHU) reported 236 confirmed or presumptive positive cases of COVID-19, including 14 deaths, in 20 U.S. states.<sup>5</sup> Additionally, JHU reported 100,350 confirmed cases of COVID-19, including 3,408 deaths, in 95 countries and territories worldwide. A total of 19,794 cases have been identified outside of China, including 366 deaths.<sup>5</sup> A total of 55,753 cases have reportedly recovered.<sup>5</sup> The WHO remains adamant that the virus can be contained with immediate and effective interventions.

Worsening No Change Improving Undetermined

#### Why We Are Reporting on This Event

According to the U.S. CDC, COVID-19 has met two of the three criteria of a pandemic: 1) causing illness, including death, and 2) sustained person-to-person spread.<sup>1</sup> The third criteria, community spread, is currently being detected in more countries. In late January, the WHO declared the outbreak a public health emergency of international concern (PHEIC).<sup>2</sup> Similarly, the U.S. Department of Health and Human Services declared the event a U.S. public health emergency. In the U.S., multiple cases have been reported with unknown sources of exposure and health officials expect to identify further cases.<sup>3</sup> While much remains unknown about the disease, numerous countries have increased screening of travelers and issued travel advisories for affected countries. Due to the knowledge gaps regarding COVID-19, including transmission routes, effective treatments, and its origin, NBIC is closely monitoring this event.

**Please note, this is a rapidly evolving event, and developments may occur during the publication process. All information presented is accurate and up to date as of 1000 EST, 06 March 2020.**

National Biosurveillance Integration Center

Department of Homeland Security

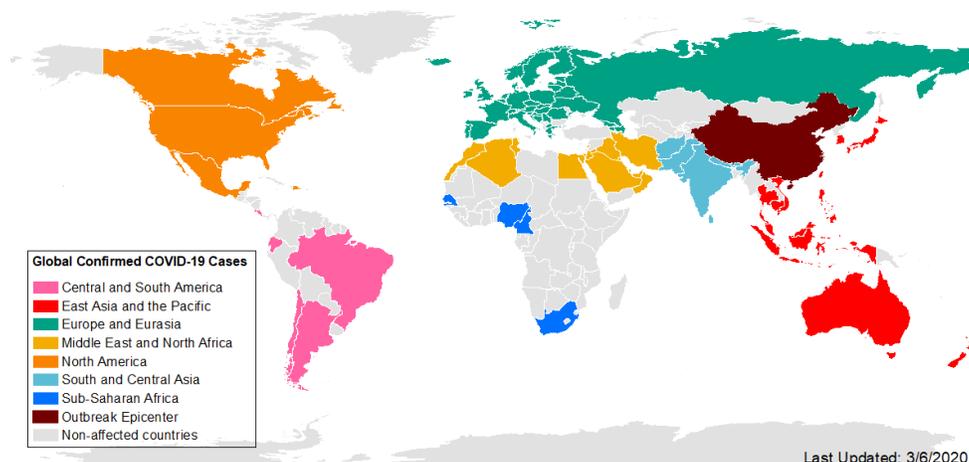


Figure 1: Global geographic distribution of reported confirmed cases of COVID-19, as of 06 March 2020, as reported by national and/or local health authorities.

State, Local, Tribal, & Territorial Edition – Unclassified // Not for Public Release

New information is highlighted in blue. [Hyperlinks](#) and [email addresses](#) are in blue.

For questions, comments, or to receive this report, please contact [CWMD.NBIC@hq.dhs.gov](mailto:CWMD.NBIC@hq.dhs.gov)



## SITUATION OVERVIEW – NOVEL CORONAVIRUS ACTIVITY

### UNITED STATES

As of 06 March, Johns Hopkins University (JHU) has reported 236 confirmed or presumptive positive cases of COVID-19 in 20 states, including 14 deaths in California (n=1) and Washington states, primarily in elderly persons with underlying health conditions.<sup>5</sup> According to the U.S. CDC, cases are categorized as travel-related, person-to-person spread, under investigation, and among persons repatriated from Wuhan, China and the Diamond Princess Cruise Ship in Japan.<sup>6</sup> However, JHU does not distinguish the cases among repatriated persons as separate from the other categories. Cases reported by state health agencies, as captured by JHU, are more up-to-date than those reported by the U.S. CDC due to confirmatory testing and subsequent reporting time lags.

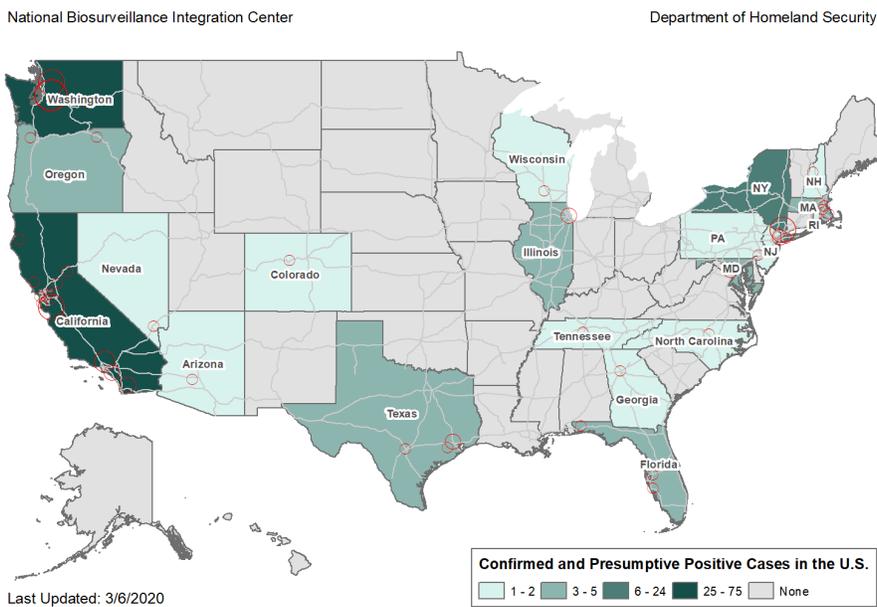


Figure 2: Geographic distribution of confirmed and presumptive positive cases of COVID-19 in the U.S., as of 06 March 2020, as reported by Johns Hopkins University. (Note: not all cases among persons repatriated to the U.S. are accounted for in Figure 1 due to data discrepancies)

State	Cases	Deaths	State	Cases	Deaths
Arizona	2	-	New York	24	-
California	51	1	Nevada	1	-
Colorado	2	-	North Carolina	1	-
Florida	4	-	Oregon	3	-
Georgia	2	-	Pennsylvania	1	-
Illinois	5	-	Rhode Island	2	-
Maryland	4	-	Tennessee	1	-
Massachusetts	3	-	Texas	5	-
New Hampshire	2	-	Washington	75	14
New Jersey	2	-	Wisconsin	1	-

Table 1: COVID-19 cases, as of 06 March, as reported by Johns Hopkins University, except for some cases among persons repatriated to the U.S.



On 28 February, the U.S. CDC announced possible instances of community spread in California, Oregon, and Washington.<sup>7</sup> Since that time, cases of COVID-19 have intensified in geographic distribution with at least eleven states reporting their first confirmed detections. Geographic spread has included cases being reported in major urban centers such as New York City and Los Angeles County. Additionally, potential clusters of cases are rapidly growing in New York and Washington states, including cases in other states with epidemiological links to the Life Care Center (a long-term care facility) in Kirkland, Washington.

**WORLDWIDE**

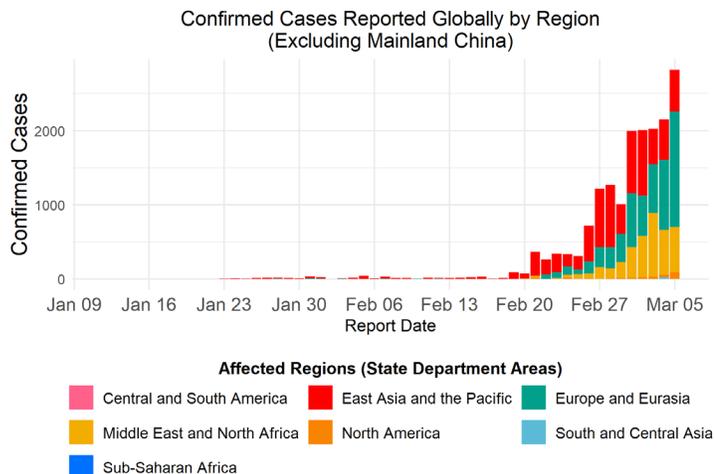


Figure 3: Temporal distribution of reported confirmed cases of COVID-19, outside of China as of 06 March 2020, as reported by national and/or local authorities

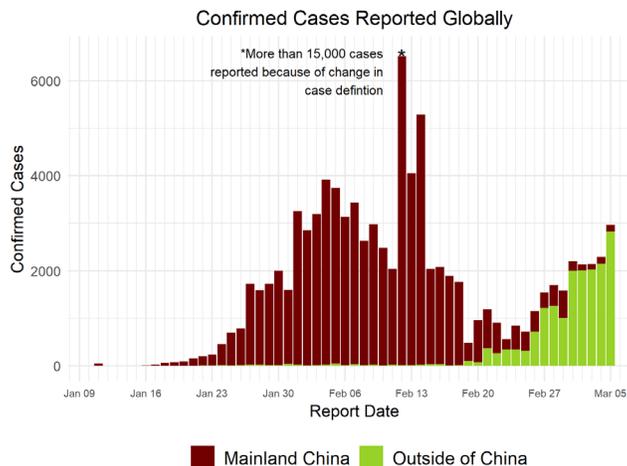


Figure 4: Temporal distribution of reported confirmed cases of COVID-19 from within and outside of Mainland China, as of March 2020, as reported by national and/or local health authorities.

As of 06 March, at 1000 ET, the JHU Dashboard reports a total of 100,350 confirmed cases of COVID-19 worldwide, across countries, including 3,408 deaths (with 366 deaths reported in 17 countries outside of China, as well as from the Diamond Princess cruise ship).<sup>5</sup>

Country/Territory	Confirmed Cases	Deaths	Country/Territory	Confirmed Cases	Deaths
Andorra	1	0	Lebanon	16	0
Afghanistan	1	0	Liechtenstein	1	0
Algeria	17	0	Lithuania	1	0
Argentina	2	0	Luxembourg	2	0
Armenia	1	0	Macau	10	0
Australia	60	2	Malaysia	83	0
Austria	47	0	Mexico	5	0
Azerbaijan	6	0	Monaco	1	0
Bahrain	55	0	Morocco	2	0
Belarus	6	0	Nigeria	1	0
Belgium	109	0	North Macedonia	1	0
Bosnia and Herzegovina	2	0	Norway	106	0
Brazil	4	0	Nepal	1	0



Country/Territory	Confirmed Cases	Deaths	Country/Territory	Confirmed Cases	Deaths
Bhutan	1	0	Netherlands	128	1
Cambodia	1	0	New Zealand	4	0
Cameroon	1	0	Oman	16	0
Canada	48	0	Others (Cruise Ship)	696	6
China	80,573	3,042	Palestine	4	0
Chile	4	0	Pakistan	6	0
Costa Rica	1	0	Philippines	5	1
Croatia	11	0	Poland	1	0
Czech Republic	12	0	Portugal	9	0
Denmark	23	0	Romania	6	0
Dominican Republic	1	0	Russia	4	0
Ecuador	15	0	Qatar	8	0
Egypt	15	0	Saint Barthelemy	3	0
Estonia	10	0	San Marino	21	1
Faroe Islands	1	0	Saudi Arabia	5	0
Finland	15	0	Senegal	4	0
France	423	7	Serbia	1	0
Georgia	4	0	Slovakia	1	0
Germany	577	0	Slovenia	2	0
Gibraltar	1	0	Singapore	130	0
Greece	45	0	South Africa	1	0
Hong Kong	106	2	South Korea	6,593	42
Hungary	2	0	Spain	360	5
Iceland	37	0	Sri Lanka	1	0
India	31	0	Sweden	101	0
Indonesia	4	0	Switzerland	138	1
Iran	4,747	124	Taiwan	45	1
Iraq	40	3	Thailand	48	1
Ireland	6	0	Tunisia	1	0
Israel	16	0	Ukraine	1	1
Italy	3,858	148	United Arab Emirates	29	0
Japan	381	6	United Kingdom	116	1
Jordan	1	0	United States	236	14
Kuwait	58	0	Vatican City	1	0
Latvia	1	0	Vietnam	16	0

Table 2: Confirmed COVID-19 cases globally, as of 06 March 2020, at 1000 ET, as reported by the JHU Dashboard.



## OFFICIAL RESPONSE AND EVENT IMPACT

### UNITED STATES

U.S. CDC Travel Notices <sup>8</sup>	Country
Warning Level 3, Avoid Nonessential Travel (Widespread Community Transmission)	China, Iran, Italy, South Korea
Alert Level 2, Practice Enhanced Precautions (Sustained Community Transmission – Special Precautions for High-Risk Travelers)	Japan
Watch Level 1, Practice Usual Precautions	Hong Kong
U.S. Department of State Travel Advisories <sup>9</sup>	Country
Level 4, Do Not Travel	China, Iran
Level 3, Reconsider Travel	Italy, Mongolia, South Korea
Level 2, Exercise Increased Caution	Hong Kong, Japan, Macau

*Table 3: U.S. CDC and Department of State coronavirus related travel advisories, as of 06 March 2020.*

According to U.S. CDC's most recent update, although the overall potential public health threat of COVID-19 to the U.S. public and globally is high, the immediate risk to the general U.S. public is low in those who are unlikely to be exposed to the virus.<sup>10</sup> However, the CDC also states that current global circumstances suggest it is likely that the virus will cause a pandemic and in that case, the risk assessment would be different.<sup>10</sup>

In efforts to enhance flexibility in response activities, U.S. Health and Human Services (HHS) declared a public health emergency for the U.S.<sup>11</sup> Unprecedented response actions have been taken by the U.S. government with respect to travel, including the suspension of entry of foreign nationals who have been in China or Iran within the past 14 days and subjecting U.S. citizens, residents, and their family members to health monitoring and possible quarantine upon arrival to the U.S. from China and Iran.<sup>12</sup> U.S. President Donald Trump stated his administration may take further steps to address travel from areas with high rates of coronavirus, but said officials were not weighing any restrictions on domestic travel.<sup>13</sup> As the outbreak continues to spread rapidly across the globe, the U.S. CDC and Department of State have issued travel advisories for numerous countries, as noted in Table 2. Those allowed entry into the U.S. who have traveled to China in the previous two weeks are directed for screening to one of 11 U.S. airports with appropriate quarantine facilities, including Atlanta (ATL), Chicago (ORD), Dallas (DFW), Detroit (DTW), Honolulu (HNL), Los Angeles (LAX), New York (JFK), Newark (EWR), San Francisco (SFO), Seattle (SEA), and Washington D.C. (IAD).<sup>14</sup> However, U.S. public health authorities are concerned that the imposed travel restrictions could become ineffective if the outbreak continues to escalate throughout the world.<sup>15</sup>

According to the U.S. CDC, two out of the three criteria involved with a pandemic have occurred, which include illness resulting in death and sustained person-to-person transmission.<sup>16</sup> The third factor, worldwide spread, is becoming closer to being met as community spread is reported increasingly in other countries.<sup>16</sup> As the U.S. continues to implement aggressive containment measures, the use of personal, community, and environmental non-pharmaceutical interventions (NPIs) will be critical to preparing for mitigation of community spread.<sup>16</sup> The U.S. Food and Drug Administration (FDA) is also conducting surveillance of the medical product supply chain for potential shortages or disruptions. It was noted that one drug shortage had been identified, with 20 drugs tied to Chinese sources are being closely monitored.<sup>17</sup> President Donald Trump signed the \$8.3 billion USD spending bill for COVID-19 public health response, such as preparedness, laboratory testing, quarantine costs, and the development of vaccines.<sup>18</sup> On 26 February, President Trump announced Vice President Michael Pence would lead the U.S. government COVID-19 response.<sup>19</sup> On 27 February, Vice President Pence appointed Ambassador Deborah Birx as the White House Coronavirus Response Coordinator, and together with HHS Secretary Alex Azar, announced the addition of Steven Mnuchin (Secretary of the Treasury), Dr. Jerome Adams (Surgeon



General of the U.S.), and Larry Kudlow (Director of the National Economic Council) to the President's Coronavirus Task Force.<sup>20,21</sup>

## WORLDWIDE

The WHO raised the risk of spread and impact to "very high" globally, as more than 90 countries have reported confirmed COVID-19 detections.<sup>22</sup> The rapidly evolving situations in Iran, Japan, South Korea, and Western Europe caused the WHO Director-General to warn the international community that the world is in "unchartered territory" as numerous countries experience community transmission, despite China's verified reduction in case incidence.<sup>23</sup> As new countries report sustained community transmission the risk of a pandemic increases. Countries must also be prepared for the reintroduction of virus. Numerous countries around the globe have responded by implemented enhanced screening at port of entries and issued updated or extended travel advisories. According to the WHO, 675 million USD is needed globally to fund activities and resources to assist countries with limited health infrastructure with their preparation and response efforts from February through April 2020.<sup>24</sup> As of 04 March, 289 million USD has been pledged from member states and partners.<sup>25</sup> The World Bank also committed 12 billion USD to support at-risk countries.<sup>25</sup>

WHO operations Support and Logistics continues to assess critical needs, such as personal protective equipment (PPE) for member states.<sup>26</sup> The WHO Director-General stated that available PPE is rapidly depleting due to panic buying and market manipulation.<sup>27</sup> Despite shipments of more than half a million sets of PPE to 27 countries, the WHO remains increasingly concerned that the global shortage of PPE will compromise countries' abilities to effectively respond. The WHO estimates the response to COVID-19 will require 89 million medical masks, 76 million pairs of examination gloves, and 1.6 million goggles each month.<sup>27</sup>

In addition to declaring the outbreak a public health emergency of international concern (PHEIC), the WHO suggested that further international exportation of cases is expected, and it emphasized that all countries should be prepared for containment by strengthening active surveillance, early detection, isolation, case management, and contact tracing measures.<sup>2</sup> The WHO also issued a reminder that countries are required to share information with WHO according to the International Health Regulations (IHR). Furthermore, the WHO called for global solidarity through enhanced data sharing, public-private sector collaboration, and an emphasis on reducing fear and stigma.<sup>2</sup>

## East Asia and the Pacific

### China

From 16 to 24 of February, the WHO-China joint delegation mission took place, in which a report summarizing all findings was published on 28 February.<sup>28</sup> In addition to Chinese counterparts, the WHO-led team consisted of a total of 25 experts in epidemiology, virology, clinical management, outbreak control, and public health from the U.S., Germany, Japan, Nigeria, Russia, Singapore, South Korea, and the WHO.<sup>29</sup> Over a course of nine days, the team visited Beijing and Wuhan, as well as Guangdong and Sichuan provinces, to conduct field visits; engage in discussions with national, provincial, and local authorities, healthcare workers and researchers; and participate in working sessions.<sup>28</sup> As the team gained further insight on the virus, outbreak, transmission, and disease progression in China, they sought to understand the implementation and impact of response activities. The team concluded that containment measures implemented by China have significantly prevented further impact.<sup>28,34,30</sup> A new report by Chinese researchers further noted that timely containment measures implemented by China not only curbed the epidemic, but that as little as a five-day delay would have led to an epidemic three times as large within mainland China.<sup>31</sup> Furthermore, WHO highlighted that China's ability



to contain the outbreak is indication that the spread of the virus can be contained altogether, urging the global community to implement comprehensive approaches and work in solidarity at all levels.<sup>32,33</sup>

It was reported that cases in China had peaked on 23 January, plateaued on 02 February, and steadily declined since. The WHO highlights that a real decline was witnessed during the mission.<sup>28,34</sup> On 25 February new reported cases outside of China surpassed new cases reported from within China.<sup>32</sup> As new cases reported in China have fallen and Chinese authorities work to boost the economy, six provinces (Gansu, Guangdong, Guzhou, Liaoning, Shanxi, and Yunnan) have lowered their alert levels.<sup>35</sup> However, Chinese researchers predict that easing quarantine measures in Hubei Province could lead to a second epidemic peak which would extend the epidemic to April 2020.<sup>31</sup> Approximately 780 million people are under partial or full transportation lockdown in China, and the duration of lockdown is currently unclear.<sup>36</sup> In efforts to address concerns around suspected wild life link to the outbreak, Chinese authorities have banned the trade and consumption of wild animals and those used for purposes such as scientific or medical use will need to be approved and subject to strict regulation.<sup>37</sup>

### South Korea

The Korean Centers for Disease Control (KCDC) and Prevention reported a significant rise in cases, becoming the largest outbreak outside of China. As of 06 March, 6,593 COVID-19 cases have tested positive, including 42 deaths.<sup>5</sup> South Korean officials expect the number of new cases to remain at an elevated level in the near-term. More than 60% of cases in South Korea are linked to a 61-year-old woman, known as "Patient 31", who attended church services at the Shincheonji Church of Jesus, the Temple of the Tabernacle of the Testimony along with many of the cases identified in the southeastern city of Daegu, North Geyongsang Province, South Korea.<sup>38</sup> Authorities are unclear how Patient 31 contracted the virus, but the KCDC confirmed that other members of the church visited Wuhan, Hubei Province, China in January and are investigating epidemiological links.<sup>38</sup> Officials have nearly completed testing more than 200,000 people associated with the Shincheonji Church of Jesus, the Temple of the Tabernacle of the Testimony in South Korea.<sup>39</sup> Up to 10,000 people are being tested each day according to the KCDC.<sup>39</sup> However, hospitals in the hardest hit areas are struggling to accommodate the surge of new patients. In response, the South Korea President ordered more hospital beds and apologized for mask shortages while declaring a war against the virus. In addition to Daegu city and Cheongdo County, officials designated the city of Gyeongsan as a "special care zone" and promised extra resources.<sup>40</sup> Due to economic impacts involving supply disruptions and reduced consumption, South Korea introduced a 9.8 billion USD stimulus package to help cushion the fallout.<sup>41</sup> Nearly 100 countries have imposed some form of entry restrictions on arrivals from South Korea.

The United States Forces Korea (USFK) and the Republic of Korea Armed Forces postponed joint training, marking the first concrete signs of the virus' impact on global U.S. military activities.<sup>42</sup> To date, thirty-one members of South Korea's military and seven people affiliated with USFK, including at least one soldier, have been affected.<sup>43</sup> The KCDC and USFK are actively conducting contact tracing to determine if others may have been exposed.

### Japan

As of 06 March, 381 COVID-19 cases have tested positive domestically throughout Japan, including six deaths.<sup>5</sup> However, the Japanese Ministry of Health stated that there are likely around 3,000 cases nationwide.<sup>44</sup> Cases who are asymptomatic or have mild symptoms are currently not included in the testing criteria, although officials plan on expanding the target range to include mild cases.<sup>44</sup> Reportedly, Japan can carry out 3,800 tests per day, but only 8,111 have been conducted as of 04 March. As testing increases, officials are likely to identify additional cases. In response to the outbreak, Japan closed schools from 02 March through late March, and large gatherings and sporting events have



been curtailed.<sup>45</sup> With the 2020 Summer Olympics set to begin in August 2020 in Tokyo, discussions are ongoing to address the possibility of a cancellation or postponement. Japan's Olympic minister stated the Olympics could be postponed until later in the year, although reassured that the committee is doing everything possible to ensure the Olympics go ahead as planned.<sup>46</sup> According to the WHO, no decision will be made in the near term regarding the future of the 2020 Summer Olympics.

Aside from the domestic cases in Japan, as of 06 March, 696 COVID-19 cases, including six deaths, have tested positive on board the Diamond Princess cruise ship which was quarantined at the Port of Yokohama.<sup>5</sup> The disembarkation of Diamond Princess cruise ship passengers completed on 27 February.<sup>47</sup> Several passengers who were evacuated from the ship tested positive after returning to their respective countries, including passengers from Israel, the U.S., and the United Kingdom.<sup>5</sup> The remaining crew members completed disembarkation on 01 March.<sup>48</sup>

### Australia

The New South Wales Minister of Health stated on 04 March that containment is now unlikely as authorities scramble to identify all contacts from a radiology conference and an affected nursing home in Sydney.<sup>49</sup> As of 06 March, Australia has recorded 60 COVID-19 cases, including two deaths.<sup>5</sup> The New South Wales Minister of Health urged the community to take appropriate steps to support the government's efforts in limiting spread and combating the virus.

### Middle East and North Africa

#### Iran

On 20 February, the Iranian Ministry of Health confirmed its first two cases of COVID-19, which subsequently died later that day.<sup>5</sup> As of 06 March, Iranian officials report a total of 4,747 confirmed cases and 124 deaths of COVID-19.<sup>5</sup> The National Committee for Infectious Diseases at the Iranian Ministry of Health stated that the virus may have originated from a Chinese worker, who had recently returned from China and was working in the northern city of Qom, where the initial cluster of cases were first detected.<sup>50</sup> The virus has subsequently spread throughout the country with several Iranian government officials also infected. The provinces of Tehran, Gilan, Qom, Isfahan, and Markazi have recorded the most cases.<sup>51</sup> To help curb spread in prisons, Iranian authorities temporarily released 54,000 prisoners.<sup>52</sup> In addition, 300,000 healthcare workers have been deployed to assist with outbreak response. Due to the alarming spike in cases, Iranians fear a massive underestimation of cases and are accusing the government of a cover-up. An expert team from the WHO arrived in Tehran on 02 March to support COVID-19 response.<sup>53</sup> The team is focused on identifying transmission dynamics, scaling up the response, and providing technical guidance for areas not yet affected. In addition, Iran launched a national plan to combat the virus.<sup>54</sup> As part of the plan, Iran will open specialized hospitals designed for the virus in all regions of the country, while disinfecting all public places and controlling entry to infected cities and towns. Currently, 22 medical laboratories are capable of testing for the virus. By the end of next week, 40 medical laboratories are expected to be able to test for the virus. The plan will be implemented in the most affected areas before expanding throughout the rest of the country. Several countries have banned incoming flights from Iran, while Armenia, Iraq, Pakistan, and Turkey closed their borders to Iran. Despite these measures, cases from Iran have been exported to numerous countries including Bahrain and Kuwait which have now recorded more than 50 cases each to date.<sup>5</sup>

#### Saudi Arabia

Despite recording only five cases of COVID-19 to date, Saudi Arabia is taking extraordinary measures to prevent spread of the virus.<sup>5</sup> Officials temporarily banned Umrah pilgrimages to the holy cities of Mecca and Medina for Saudi Arabian nationals.<sup>55</sup> Previously, Saudi Arabia had banned foreign nationals from visiting Mecca and Medina. It is unclear how



long the ban on Umrah pilgrimages will be implemented. No confirmation has been given by Saudi Arabian authorities on whether the outbreak will affect the annual Hajj pilgrimage set to take place in July.

## Europe and Eurasia

### Italy

As of 06 March, Italian officials report a total of 3,858 confirmed cases and 148 deaths of COVID-19, becoming the largest outbreak in Europe and Eurasia.<sup>5</sup> Most of the cases are in the northern Lombardy Region, although spread has occurred to all other regions of Italy. Thus far, officials have been unable to identify the source of reintroduction resulting in the significant increase in cases. According to the European Society of Intensive Care Medicine, approximately 10% of cases were admitted to intensive care units, almost entirely due to severe respiratory failure requiring mechanical ventilation.<sup>56</sup> To control further spread of disease, Italian officials closed all schools and universities nationwide on 05 March until at least 15 March and put several northern cities on lockdown by banning people from entering or leaving affected areas and suspending public events.<sup>57</sup> In addition, an expert team from the WHO arrived on 24 February to support Italian authorities in their response.<sup>58</sup> The WHO team consists of experts in clinical management, infection prevention and control, surveillance, and risk communication and will focus on limiting person-to-person transmission in the country. Numerous countries have recorded cases linked to Italy. Despite the challenges Italian officials have encountered to limit spread, the European Union announced it would not close its borders to Italy, claiming it would be an ineffective measure.<sup>59</sup> The outbreak is placing Italy at risk of an economic recession.

### Germany

Following the reintroduction of the virus in Germany from Italy, the German Health Minister admitted that the country had entered a new phase of the outbreak after some transmission chains were no longer traceable.<sup>60</sup> As of 06 March, Germany has reported 577 COVID-19 cases, with no deaths.<sup>5</sup> Fifteen of Germany's 16 states have recorded cases, with nearly half the cases detected in North Rhine-Westphalia in western Germany, the most populated German state.<sup>60</sup>

### France

Following the reintroduction of the virus in France from Italy, the French President indicated an epidemic in France was inevitable and compared the situation as similar to that in Italy.<sup>61</sup> As of 06 March, France has reported 423 COVID-19 cases, including seven deaths. Most of the cases are concentrated in four cluster zones.<sup>5</sup> According to specialists in France, the country will enter the epidemic phase in one or two weeks.<sup>61</sup> French officials are preparing to limit the spread of the virus and have banned large public gathering and closed around 150 schools.<sup>61</sup> French officials have also warned against all non-essential travel and advised people to avoid direct contact with others.<sup>61</sup>

### Spain

The virus has spread throughout almost all regions of Spain as the number of cases begin to soar nationwide.<sup>5</sup> As of 06 March, Spain has reported 360 COVID-19 cases, including five deaths. However, Spain has not yet raised its health alert level beyond level-1, containment.<sup>62</sup> In addition, Spain has decided against closing schools and universities, although the government insisted that it is monitoring the evolving situation and taking all necessary measures.<sup>62</sup>

### United Kingdom

United Kingdom health officials are preparing to enter phase two of the outbreak, the "delay" phase.<sup>63</sup> To date, the United Kingdom has reported 116 COVID-19 cases, including one death.<sup>5</sup> The United Kingdom's chief medical adviser



said it was highly likely that people are now being infected locally with no connection to overseas cases. At least thirteen cases have unknown sources of exposure.<sup>63</sup> Officials have not yet decided what measures will be taken in the “delay” phase, but previously stated they would consider banning large events, closing schools, and discouraging public transport. The Prime Minister reiterated that the overwhelming majority of the people in the United Kingdom will be able to carry out daily activities without noticeable interruptions.<sup>63</sup>

### Sub-Saharan Africa

To date, Cameroon, Nigeria, Senegal, and South Africa are the only countries to report COVID-19 cases in sub-Saharan Africa.<sup>5</sup> The WHO and key health partners are strengthening cooperation to coordinate preparedness and response efforts across the continent.<sup>64</sup> Traditional methods of risk communication through posters and video messaging at transit hubs are being utilized. In addition, the WHO is attempting to counter misinformation with frequent interviews and televised conferences. The WHO remains concerned about the potential impacts of an outbreak in countries with weaker health systems that are not adequately equipped to handle the threat. Most countries in sub-Saharan Africa now have the capacity to test for COVID-19. Botswana, Chad, Comoros, Guinea-Bissau, Lesotho, Liberia, Malawi, and São Tomé and Príncipe are currently unable to test for the virus.<sup>64</sup>

### South and Central Asia

To date, Afghanistan, Bhutan, India, Nepal, Pakistan, and Sri Lanka are the only countries to report COVID-19 cases in South and Central Asia.<sup>5</sup> While India has recorded 31, none of the other affected countries have reported more than five cases.<sup>5</sup>

#### India

As the virus hampers global supply chains, India has restricted the export of 26 active pharmaceutical ingredients and the medicines developed from them. The Indian government urged its citizens to remain calm and specified that there were enough stocks to manufacture medicines for two to three months. It is unclear how the restriction will impact the availability of these active pharmaceutical ingredients and medicines in countries that import from India and also depend on China.

### Central and South America

To date, Argentina, Brazil, Chile, Costa Rica, Dominican Republic, and Ecuador are the only countries to report COVID-19 cases in Central and South America.<sup>5</sup> Ecuador is the only country to report more than 10 cases in Central and South America with 13 to date.<sup>5</sup> The Pan American Health Organization has provided documents including detection and diagnosis, hospital readiness, infection prevention and control, and risk communication in preparation for new COVID-19 cases.

### Global Impacts

With cases identified in every continent except for Antarctica, global markets declined significantly in the past week as the threat of pandemic rises.<sup>65</sup> According to Capital Economics, the economic effects of a severe pandemic could be as bad as those of the global financial crisis of 2008. Disruptions rippled across the European and American economies as markets have fallen almost 10% since late January.<sup>65</sup> The most visible economic damage is hitting the tourist sector as numerous restrictions and advisories, accompanied by reduced air traffic and public anxiety, have resulted in diminished travel worldwide. Shutdowns have resulted in disrupted supply chains leading to economic damage throughout the world. In addition, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) stated that



approximately 290.5 million children are out of school due to nationwide shutdowns.<sup>66</sup> An additional nine countries have implemented localized school closings which are not reflected in UNESCO's number.<sup>66</sup>

## THE VIRUS AND COUNTERMEASURE DEVELOPMENT

According to the WHO-China Joint Mission Report, the virus has a genetic sequence 96% similar to a bat SARS-like coronavirus and 86%-92% to a pangolin SARS-like coronavirus. However, phylogenetic analyses indicate bats as the likely cause of the outbreak.<sup>28</sup> Globally, 3.4% of reported COVID-19 cases have died, which the WHO notes is higher than seasonal flu where 1% of cases result in

<p><b>Incubation Period:</b> 2-14 days<sup>67</sup>  <b>Transmission Rate:</b> 2.2-3.1<sup>68,69</sup>  <b>Case Fatality Rate</b> (assumed based on JHU Dashboard): ~3.4%<sup>5</sup></p>
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death.<sup>28</sup> Based on 55,924 laboratory confirmed cases in China as of 20 February, the majority of cases (77.8%) occurred in those between the ages of 30-69 years of age, in which those over the age of 60 and those with underlying health conditions were most at risk of severe disease and death.<sup>28</sup> Most people infected with the virus have mild cases and recover, in which 80% of cases in China were mild to moderate. Severe (13.8%) and critical (6.1%) cases were much lower in comparison.<sup>28</sup> Furthermore most human-to-human cases were found to have occurred among families, with 78%-85% of clusters in Guangdong and Sichuan having occurred in families.<sup>28</sup> According to the U.S. CDC, the general incubation period is 2 to 14 days, and symptoms can include fever, cough, and shortness of breath.<sup>67</sup>

In a minority of cases, there have been reports of unusual incubation periods beyond the 14-day window, causing concern of possible dormancy of the virus. A study examining 1,099 patients found 13 patients with an incubation period of more than 14 days and one patient with an incubation period of 24 days; however, the median was found to be three to seven days.<sup>70</sup> Three additional cases with extended incubation periods were observed in patients in China who tested positive after 27 days, 19 days and even 38 days of incubation.<sup>71</sup> Chinese authorities also reported cases where infected persons had low or normal temperatures during early stages, which could pose a challenge in identifying cases when screening.<sup>72</sup> In a recent study involving 18 COVID-19 patients, the viral load in nasal and throat samples of symptomatic and asymptomatic patients were observed to be similar, indicating possible transmission of the virus by those without or with minimal symptoms.<sup>73</sup> The viral load found in nose samples were found to be higher than in the throat, with virus shedding behavior similar to seasonal influenza.<sup>73</sup> However, it was also noted that additional research on transmission is needed to further inform screening practices.<sup>73</sup> Possible reinfection has more recently come into debate as two confirmed cases in Japan and South Korea recovered and tested negative before their release, but subsequently fell ill weeks later and were found to test positive again.<sup>74,75</sup> Although much is still unknown about the virus, it is suspected that there may be a latent affect, similar to SARS-CoV, where the virus is dormant and can later be reactivated.<sup>74,75</sup>

Based on currently available data, the WHO specified that symptomatic cases are the main driver of transmission.<sup>76</sup> The WHO is aware of possible transmission from asymptomatic individuals, such as in China where 1% of reported cases were asymptomatic, but maintains that it is not likely to be a major contributor of transmission.<sup>76,28</sup> The U.S. CDC confirmed there are asymptomatic cases and that they can transmit the virus, however, the extent to which they are driving transmission remains unknown.<sup>77</sup> Furthermore, the U.S. CDC anticipates COVID-19 will last throughout the season to establish enough of a foothold to lead to community-based transmission.<sup>77</sup> When compared to seasonal flu, the WHO highlights that COVID-19 is not as effectively transmitted but can lead to more severe disease due to the lack of immunity built up over time and exposure to seasonal influenza.<sup>28</sup> The WHO-China Joint Team notes that the virus has been detected in respiratory, fecal, and blood specimens, as previously reported in other studies.<sup>28</sup> According to Chinese health authorities, direct and indirect contact of respiratory droplets are the main modes of transmission observed, however, aerosol transmission remains unclear and must be studied.<sup>78</sup> Although it is yet to be confirmed, possible vertical transmission was observed in the case of an infant of a confirmed case tested positive for COVID-19 30 hours after birth.

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<sup>79,80</sup> However, in another study no evidence of vertical transmission was found in research conducted in nine patients with confirmed COVID-19 in their third trimester who delivered by caesarean section.<sup>81</sup> The study also notes that a small sample size was used and other considerations need to be observed, such as the trimester of pregnancy, impacts of vaginal delivery, and state of the placenta in infected patients.<sup>81</sup> Additional research will need to be conducted to clearly determine if infants are infected in the womb or through post-birth exposure, however, pregnant woman are generally advised to avoid contact with those infected.

Most recently, the ability of pets to be infected with COVID-19 via human-to-animal transmission has come into question. According to Hong Kong authorities and the World Organisation for Animal Health (OIE), the dog of a COVID-19 confirmed case in Hong Kong was found to have a weak positive test result, though asymptomatic, after being quarantined.<sup>82,83</sup> However, based on current information, both the U.S. CDC and WHO note that there is no evidence that pets such as dogs and cats can be infected with the virus and advise implementation of good hygiene practices when handling animals.<sup>84,85</sup>

Although the survival of the virus on surfaces is unknown, studies suggest other coronaviruses, such as SARS-CoV, can survive on non-porous surfaces for up to nine to ten days and on porous surfaces for three to five days.<sup>86,87,88</sup> Other coronaviruses also survive better in environments with lower in temperature and humidity.<sup>86,87</sup> Furthermore, the use of 62-71% ethanol, .05% hydrogen peroxide, 0.1% sodium hypochlorite (or bleach) to disinfect surfaces can efficiently inactivate other human coronaviruses.<sup>89</sup> However, more research is needed to study the stability of the virus in order to establish how long it survives on various surface types.

The U.S. CDC successfully grew and isolated the virus and deposited it to the Biodefense and Emerging Infections Research (BEI) Resources Repository to be used for research.<sup>90,91</sup> The U.S. CDC stated that five cities will use existing influenza surveillance systems to detect the virus and see if the disease is spreading in the U.S., including Chicago, Los Angeles, New York City, San Francisco, and Seattle.<sup>92</sup> The U.S. CDC plans to expand to more sites in the coming weeks until national surveillance is established. The U.S. CDC issued guidance on testing and management of patients with COVID-19 and publicly posted the assay protocol for the real time Reverse Transcription-Polymerase Chain Reaction (rRT-PCR) diagnostic test they developed.<sup>93</sup> The criteria for evaluating and reporting People Under Investigation (PUI) was updated to include a wider group of symptomatic patients based on clinical features and local epidemiology, as well as those from geographic areas with widespread or sustained community transmission, such as China, Iran, Italy, Japan, and South Korea.<sup>94</sup> The U.S. CDC has two laboratories with the ability to conduct approximately 350 tests per day.<sup>10</sup> Although some challenges were experienced with the initial test kits the U.S. CDC sent out to states, a new protocol was established noting the third component of the test kit, which was found to have an issue, could be excluded from testing without affecting the accuracy of the original test.<sup>10,95</sup> In addition, newly manufactured kits were also provided to the International Reagent Resource for distribution.<sup>10</sup> As cases increase in the U.S. and the situation continues to rapidly evolve, the FDA issued guidance allowing certified laboratories to use tests they independently develop and validate.<sup>96</sup> This effort provides states with more flexibility to conduct rapid testing and respond to the critical public health needs in their communities.<sup>96</sup> Additional testing developments are occurring globally. For example scientists at the Guangzhou Medical University in China developed a rapid antibody screening test kit which is expected to improve the identification of suspected cases and address issues of false negative test results when used in combination with nucleic acid testing.<sup>97</sup> In Singapore, Duke-National University of Singapore Medical School researchers were able to identify a link between a cluster of COVID-19 cases at a church and another cluster of cases linked to a couple visiting from Wuhan through serological testing.<sup>98</sup>

Although there are currently no proven drugs to treat COVID-19 specifically, the global scientific and medical community continue to work towards medical countermeasures. U.S. scientists from the University of Texas at Austin and the National



Institutes of Health (NIH) identified and created the first three-dimensional molecular model of the spike protein involved with attaching and infecting human cells.<sup>99,100</sup> This breakthrough is anticipated to allow for expedited development of vaccines, therapeutic antibodies, and diagnostics with enhanced precision.<sup>99,100</sup> Researchers also observed a 10 to 20 fold higher affinity of the virus binding to human cell receptors, when compared to SARS-CoV, which may provide insight on how easily human-to-human transmission occurs.<sup>99</sup> New modeling research by scientists also suggests that the virus can bind and infect human, bat, civet, monkey and swine cells.<sup>101</sup> A study by German researchers provided additional insights on the binding and entry of the virus into human cells, further establishing its similarity to SARS-CoV and furthermore suggesting that antibodies from recovered SARS-CoV patients may provide some protection against the infection by the novel coronavirus.<sup>102</sup> The use of plasma therapy in China shows promising preliminary results in COVID-19 patients, where a decline in signs of inflammation was observed in patients within 12 to 24 hours.<sup>103</sup> Although plasma therapy is considered an older treatment option, Chinese health experts and WHO officials consider it a valid approach which can be particularly effective when administered to ill patients at the right time to boost their immune system.<sup>104,105</sup>

The WHO notes hundreds of clinical trials are underway in China, examining the use of drugs such as Remdesivir, Chloroquine, Favipiravir, and Chloroquine.<sup>28</sup> A combination of the anti-influenza drug, Oseltamivir, along with HIV drugs, Lopinavir and Ritonavir, was used in a patient in Thailand, who tested negative for the presence of the virus after 48 hours of treatment.<sup>106</sup> New research findings suggest the use of Remdesivir and Chloroquine in COVID-19 patients, due to its high efficacy in-vitro.<sup>107</sup> Although experimental, intravenous use of Remdesivir has shown promise as it was used to treat the first U.S. COVID-19 patient in Washington.<sup>108</sup> However, additional research is needed to determine the use of Remdesivir in COVID-19 patients. The American pharmaceutical company, Gilead, who owns the patent and manufactures Remdesivir, is using its current stockpile of the anti-viral drug to aid in clinical trials and for individual patient use, with hopes of expanding manufacturing in preparation for potential future demand.<sup>109</sup> The U.S. National Institute of Allergy and Infectious Diseases (NIAID) has a clinical trial in progress as part of an adaptive treatment trial to evaluate the safety and efficacy of novel therapeutic agents, such as Remdesivir, in hospitalized COVID-19 patients in Omaha, Nebraska, which is estimated to be completed in April 2023.<sup>110</sup> In addition to the U.S., China and Japan are also performing Remdesivir clinical trials, with South Korea most recently set to begin phase-three clinical trials in adult patients.<sup>111</sup> South Korean health officials have also approved the use of a locally-developed antiviral drug by ImmuneMed, Virus Suppressing Factor (VSF), to be administered to COVID-19 patients, and it is reported that a combination of influenza medication and the HIV antiviral drug, Kaletra, has been used in more severe cases.<sup>111</sup> German researchers identified the drug Camostat Mesylate, currently used in Japan to treat various non-infectious diseases, to be effective in inhibiting the virus from infecting human lung cells by disrupting targeted viral receptors.<sup>102,112</sup> However, it is noted that the use of Camostat Mesylate would need to be further studied through animal and human clinical trials to fully understand its effectiveness.<sup>112</sup>

The U.S. based biotech company, Moderna, has shipped a vaccine to the U.S. NIAID to potentially begin clinical trials of a two-dose vaccine schedule in Seattle, Washington in March 2020 through June 2021.<sup>113</sup> Inovio Pharmaceuticals, based in the U.S., announced they have developed a pre-clinical synthetic COVID-19 vaccine, with aims of entering Phase 1 human clinical testing in China and the U.S. in Summer 2020.<sup>114</sup> Additionally, the Biomedical Advanced Research and Development Authority (BARDA) of U.S. HHS is working with Johnson & Johnson and the French pharmaceutical company, Sanofi, on vaccine development efforts.<sup>115</sup> According to WHO, a vaccine against the novel coronavirus could become available in as little as 18 months, and more than 20 vaccines are currently in development worldwide.<sup>33,116</sup>

The WHO published recommendations on the rational use of PPE, in light of the global shortage which is particularly concerning for healthcare workers.<sup>117</sup> The WHO also updated their recommendations for international traffic, advising against the use of any travel or trade restrictions to countries with outbreaks as it has been found to be restrictive in



public health emergencies.<sup>118</sup> The WHO platform contains several online courses, in multiple languages, to provide training on COVID-19 response. The latest course to be launched is the COVID-19 Operational Planning Guidelines and COVID-19 Partners Platform to support country preparedness and response.<sup>119,120</sup> The WHO has also developed numerous interim guidance and recommendations on various aspects of preparedness and response to the outbreak, including case and contact investigations, laboratory diagnosis, clinical management, and precautionary measures.<sup>121</sup>

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