

## COVID-19 Scientific and Public Health Policy Update – (March 17, 2020)

*In addition to our weekly brief on the spread of COVID-19 and the actions that Africa CDC is taking to help member states, Africa CDC has begun to share a weekly brief detailing the latest changes in scientific knowledge and public health policy changes, as well as updates to the latest guidance from WHO and others. Contents of this document are not intended to serve as recommendations from the Africa CDC; rather, it is a summary of the factbase to help inform member states. It is important to note that the outbreak is evolving rapidly and that the nature of this information will continue to change. So we will continue to provide regular updates to ensure member states are informed of the most critical developments in these areas.*

### A. EXECUTIVE SUMMARY

- A study (yet to be peer reviewed) on the aerosol and surface stability of SARS-CoV-2 suggests that aerosol and fomite transmissions are plausible as the virus remained viable in aerosols for 3 hours (albeit reduction in infectiousness was observed), on copper for up to 4 hours, on cardboards for up to 24 hours and on plastics and steel for up to 4 days.
- A study conducting a multicenter cohort analysis of 191 patients in Wuhan suggests that potential risk factors of older age, high SOFA score, and d-dimer greater than 1 µg/mL could help clinicians to identify patients with poor prognosis at an early stage. The analysis also reported that the median duration of viral shedding was 20 days in survivors, but SARS-CoV-2 was detectable until death in non-survivors. Further studies need to be conducted to validate post-mortem transmission.
- UK-based laboratory Mologic is starting work with scientists in Senegal (Pasteur Institute in Dakar) to make a diagnostic test for coronavirus that can produce test results within 10 minutes. The test kits will be produced by DiaTropix which has a production facility in Senegal.
- The Phase 1 clinical trial of the NIAD and Moderna's vaccine mRNA-1273 has begun. The first patient was administered the trial vaccine yesterday. Meanwhile, Inovio aims to begin safety tests of its vaccine candidate next month first in the US, followed by a similar study in China and South Korea. But even if the tests go well, experts say it could take more than a year to develop and fully test a vaccine.
- As cases in the continent continue to rise over the past week, African countries have imposed tighter travel and public health policies such as cessation of air traffic (e.g., Morocco, Egypt), entry restrictions for non-citizens / non-residents (e.g., Kenya), visa limitations (e.g., South Africa), social distancing etc.
- Similarly, heavily affected countries globally have started to enforce strict public health and travel policies such as community quarantines / shutdown (e.g., Germany, Spain), border closures (e.g., Canada, Czech Republic), extension of travel ban to EU countries (e.g., USA), and mandatory quarantine for all travelers (e.g., Australia, New Zealand)

## B. NEW GUIDELINES AND RESOURCES

- Since March 10th, WHO has published new and updated guidance on [Critical Preparedness and Response Actions for COVID-19](#), [Clinical Management of Severe Acute Respiratory Infections if COVID-19 is suspected](#), [Considerations in Investigation of Cases and Clusters](#), Guidance for [High Risk Populations](#) and [Children](#), [Guidance on Risk Communication and Community Engagement](#)
- US CDC has published guidance on [Preparedness of Healthcare Facilities](#), [Long-term Care Facilities / Nursing Homes](#), [Criteria for Return to Work of a Healthcare Personnel with Confirmed or Suspected COVID-19](#), [IPC for Outpatient Hemodialysis Facilities](#), Protecting and Preparing [Home](#) and [Family](#) for COVID-19
- ECDC has issued new guidance and resources on [Discharge criteria for confirmed COVID-19 cases](#), [IPC in Healthcare Settings](#), [Information for Specific Groups \(e.g., Elderly, Chronic Disease Patients, Pregnant Women etc.\)](#) and [Considerations relating to Social Distancing Measures](#)
- The full list of latest guidance and resources from WHO and other public health institutions are listed at the end of this update in **section F**.

## C. SCIENTIFIC UPDATES

### Epidemiology

- A study (yet to be peer reviewed) on the aerosol and surface stability of SARS-CoV-2 suggests that [aerosol and fomite transmissions are plausible](#) as the virus remained viable in aerosols for 3 hours (albeit reduction in infectiousness was observed), on copper for up to 4 hours, on cardboards for up to 24 hours and on plastics and steel for up to 4 days.
- A mathematical model of SARS-CoV-2 transmission in four datasets from within and outside Wuhan estimated that the [median daily reproduction number \(Rt\) in Wuhan declined from 2.35 one week before travel restrictions were introduced on Jan 23, 2020, to 1.05 one week after](#), implying the travel restrictions have limited spread.
- A study conducting a multicenter cohort analysis of 191 patients in Wuhan suggests that [potential risk factors of older age, high SOFA score, and d-dimer greater than 1 µg/mL could help clinicians to identify patients with poor prognosis at an early stage](#). The analysis also reported that the median duration of viral shedding was 20 days in survivors, but SARS-CoV-2 was detectable until death in non-survivors. The longest observed duration of viral shedding in survivors was 37 days, supporting the strategy of isolating infected patients. Further studies need to be conducted to validate post-mortem transmission.
- [A report on 12,000+ COVID-19 cases in Italy until March 11](#) shows that of the patients who died, 42% were aged 80–89 years, 32% were aged 70–79 years, 8% were aged 60–69 years, and 3% were aged 50–59 years (those aged >90 years made up 14%). The male to female ratio is 80% to 20% with an older median age for women (83.4 years for women vs

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79.9 years for men). 9-11% of patients from Mar 1-11, have been admitted to intensive care units. 20% of health workers have been infected.

- An analysis of the prediction value of the Internet search data from web-based search engines and social media for the COVID-19 outbreak in China suggests that [internet surveillance could help predict the trajectory of an outbreak](#), after analysis of Google and Baidu searches on 'coronavirus' and 'pneumonia' were found to be correlated ( $r>0.89$ ) with the published daily cases of COVID-19.

### **Diagnosics**

- An analysis of 1070 specimens collected from 205 patients with COVID-19 suggests that [lower respiratory tract samples most often test positive for the virus](#). The live virus was detected in feces, implying potential fecal transmission. A small percentage (1%) of blood samples had positive PCR test results, suggesting that infection sometimes may be systemic.
- Given that CT scanning is not available in all emergency departments, an initial report suggests the [use of Lung US for the early diagnosis of COVID-19 in emergency departments](#), after Chest CT scans of 12 patients showed a strong correlation with the results from Lung US.
- A comparative study on the clinical features of COVID-19 pneumonia to other pneumonias suggests that COVID-19 has similar onsets to other pneumonias. CT scan may be a reliable test for screening COVID-19 cases. Liver function damage is more frequent in COVID-19 than NON-NCOVID-19 patients. [LDH and  \$\alpha\$ -HBDH may be considerable markers for evaluation of COVID-19](#).
- UK-based laboratory [Mologic is starting work with scientists in Senegal \(Pasteur Institute in Dakar\) to make a diagnostic test for coronavirus that can produce test results within 10 minutes](#). The test kits will be produced by DiaTropix which has a production facility in Senegal.
- A group of scientists have [developed a preliminary laboratory safe, low-cost detection protocol for COVID-19](#), a real-time reverse-transcription PCR (rtPCR)-based assay protocol composed of easy specimen self-collection from a subject via pharyngeal swab, Trizolbased RNA purification, and SYBR Green-based rtPCR primarily for asymptomatic patients. This protocol shows an accuracy and sensitivity limit of 1-10 virus particles, the cost for each sample is estimated to be <USD15, and overall time it takes for an entire protocol is estimated to be less than 4 hours. Further examinations are required, however, for clinical use
- Given the high costs of hospital-based assessment, a report laid out the possibility of [a home assessment approach to evaluate potential COVID-19](#) cases which includes setting up a team of 1 physician, 1 nurse, 1 or more trained PPE observers, and a site-commander; using appropriate PPE; leaving used assessment tools with patient and etc.

### **Care and Treatment**

- A report on post-discharge surveillance of 2 positive cases [suggests that a small proportion of recovered patients may have positive virus detection after discharge](#) (after positive detection was observed after patients tested negative for the virus), and the positivity does

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not necessarily mean that the patient is transmissible. These findings need further investigation and thus post-discharge surveillance is suggested.

- A novel deep learning platform, Deep Docking (DD), applied to 1.3 billion compounds from ZINC15 library has [identified potential inhibitors of SARS-CoV-2 main protease](#). The compounds are made publicly available for further characterization and development by scientific community

### **Vaccines**

- The [Phase 1 clinical trial of the NIAD and Moderna's vaccine mRNA-1273 has begun](#). The first patient was administered the trial vaccine yesterday. Meanwhile, [Inovio aims to begin safety tests of its vaccine candidate next month](#) first in the US, followed by a similar study in China and South Korea. But even if the tests go well, experts say it could take more than a year to develop and fully test a vaccine.

### **Country response**

- Report on [Italy's response to the COVID-19 outbreak](#) suggests that to better manage the outbreak, Italy could have increased laboratory testing capacity immediately and converted a dedicated COVID-19 facility more quickly on top of surge ICU capacity response. The report also suggests that given the surge in ICU demand from this outbreak, health care systems not organized in collaborative emergency networks should work toward one now.
- The report summarizes [Singapore's approach in containing COVID-19 which led to an effective reproduction number that is less than 1](#). Interventions implemented include rapid scale up testing capacity (up to 2,200 tests per day), enhanced surveillance at health care settings, rollout of 800 Public Health Preparedness Clinics (PHPC) and etc.
- An analysis of the [impact of travel restrictions and border control measures](#) suggests that 779 COVID-19 cases would have been exported by February 15, 2020 without any border or travel restrictions from China. Travel lockdowns enforced by the Chinese government averted 71% of these cases. In addition, during the first 3.5 weeks of implementation, the travel restrictions decreased the daily rate of exportation by 81.3%, on average.

## **D. RELATED PUBLIC HEALTH POLICY**

*Contents of this section include only publicly announced public health policies.*

### **Africa**

- As cases in the continent continue to rise over the past week, African countries have imposed tighter travel and public health policies to manage the outbreak:
  - **Entry restrictions:**
    - › [Ghana](#) will ban entry to anyone who has been to a country with more than 200 cases in the last 14 days starting from March 17
    - › [Kenya](#) is blocking entry to all non-citizens and non-residents travelling from countries with COVID-19 cases

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- › [Somalia](#) bans entry all passengers originating from China, Iran, South Korea, and Italy or transiting through one of those countries in the last 14 days
- › Botswana will ban entry to non-citizens and non-residents travelling from 17 high risk countries
- **Border closures and flight suspensions**
  - › [Algeria](#) suspends all travel to and from Europe starting March 19
  - › [Chad](#) closes its border with Cameroon
  - › [Egypt](#) will halt all air traffic from its airports starting Thursday (Mar 19) until Mar 31
  - › [Madagascar](#) has suspended all flights to and from Europe for 30 days
  - › [Morocco](#) has suspended day all international passenger flights to and from its airports
  - › [Namibia](#) has suspended flights to and from Qatar, Ethiopia and Germany for 30 days
  - › [Senegal](#) is banning cruise ships from docking in its ports
  - › [South Africa](#) is banning flights to and from Italy, Spain, Germany, UK, the US, South Korea, Iran and China from March 18 onwards; it has also [shut down 55 land entry points and two sea ports of entry](#)
  - › [South Sudan](#) has halted direct flights to and from several countries including Egypt and the UAE
  - › [Sudan](#) has closed all airports, ports and land crossings; only humanitarian, commercial and technical support shipments would be excluded from the restrictions
  - › [Tunisia](#) closes maritime borders to all countries, while air borders with Italy will be suspended permanently
- **Visa limitations:** [Gabon](#) suspends issuance of tourist visas for EU, China, South Korea and US citizens; [South Africa](#) will revoke nearly 10,000 visas issued this year to people from China and Iran, and visas will now be required for other high-risk countries that had been visa-free, including Italy and the United States; Botswana suspends visa issuance for travelers from high risk areas
- **Mandatory quarantine:** [Uganda](#) requires travelers from 16 high risk countries (including US, UK, Italy, China, France) to self-quarantine at their own cost for 14 days either at home or at a government facility
- **Shutdown of educational / religious institutions and entertainment venues, banning of mass gatherings:** [Algeria](#), [Egypt](#), [Ethiopia](#), [Gabon](#), [Kenya](#), [Mauritania](#), [Morocco](#), [Ghana](#), [Namibia](#), [Rwanda](#), [Senegal](#), [South Africa](#), [Sudan](#), [Tunisia](#)
- **Limiting official travel:** [Angola](#), [Botswana](#), [Ghana](#), Botswana
- [Ethiopia](#) will also operate government buses free of charge to help control crowding in public transport and has announced budget for supply of masks, sanitizers and soap to the public. PM Abiy announced a partnership with Chinese e-commerce founder Jack Ma for an Africa wide supply of key coronavirus materials including masks, testing kits and literature.

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- [Ghana](#) allocates \$100M to a coronavirus fund, while [Egypt](#) pledges \$6 billion to combat COVID-19
- [Rwanda is requiring passengers in Kigali to wash their hands](#) thoroughly before being allowed onto buses, while [Uganda plans to spray travelers arriving in the country with disinfectants](#).
- [Algeria](#) calls for the creation of a national health monitoring agency and a national health observatory to manage the outbreak.
- [South Africa](#) has repatriated 146 people from Wuhan last Saturday. They are now in quarantine at the Ranch Resort outside Polokwane
- The [Southern African Development Community \(SADC\)](#) has recommended temporary suspension of all in-person SADC meetings, urging instead the use of video conferencing, webinars and other tech-based solutions during the ongoing coronavirus outbreak.

### **Rest of World**

- As COVID-19 cases outside China accelerate rapidly, heavily affected countries have continued to **impose public health policies to contain the outbreak**
  - [South Korea](#) has expanded special screening measures to arrivals from all European countries amid concerns of imported cases; [requiring travelers to use an app that they will be required to interact for two weeks](#), answering questions on their health. If a person does not comply then they will receive a call, and action could be taken.
  - [USA](#) has declared a national emergency and has imposed a travel ban on foreigners travelling from EU's Schengen border free zones, UK and Ireland. The government has issued recommendations for people to [avoid social gatherings of more than 10 people](#). Multiple states have [closed down bars, cafes and restaurants](#).
  - [Italy](#) closes Rome's Ciampino airport and a terminal at the Fiumicino airport as airlines slash flights to Italy.
  - [France](#) will deploy 100,000 police to enforce a lockdown, fixed checkpoints will be set up across the country, people will be required to stay at home and only go out for essential activities.
  - [Germany](#) shuts down non-essential shops, bars, clubs, theatres, museums, brothels and churches and [restricts border access](#) with France, Austria, Switzerland and Luxembourg
  - [Spain](#) imposes community quarantine and restricts entry to citizens, residents, diplomats, cross-border workers and people justifying force majeure.
- As cases across multiple countries across all continent grow, countries have increasingly **imposed restrictive travel and public health policies** (not exhaustive)
  - [Border closures \(full or partial e.g., entry restrictions for travelers from high risk areas\)](#): Czech Republic, Canada, Denmark, Armenia, Chile, Colombia, Cyprus, Guatemala, Georgia, Hungary, Latvia, Lebanon, Poland, Qatar, Russia, Cambodia, Peru, Vietnam
  - [Suspension of all international flights](#): Norway, Saudi Arabia, Kuwait, Jordan, Iraq

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- [Suspension of flights to and from high risk areas](#) e.g., Italy, Germany: Greece, Moldova, Portugal, Russia, Turkey
- [Mandatory quarantine](#): Australia, China, Greece, New Zealand and Poland are requiring all arrivals from overseas to self-quarantine for 14 days, while Singapore, Taiwan, Turkey and Vietnam are extending mandatory quarantine requirements to travelers from UK and EU countries
- [Shutdown of educational institutions, religious institutions, and other public areas](#): Czech Republic, Denmark, Greece, Indonesia, Malaysia, Costa Rica, India, Netherlands, Turkey, UAE and etc.
- [Banning of mass / public gatherings](#): Austria, New Zealand, Switzerland and etc.
- [Visa limitations](#): India and UAE suspends visa issuance; Russia and Qatar limits visa issuance to EU citizens; Thailand cancels visa on arrival
- In addition, countries have taken multiple actions to manage dwindling PPE material supply
  - [Indonesia](#) will temporarily ban the export of face masks
  - [Japan](#) has issued a law banning resale of face masks
  - [UK](#) has asked manufacturers including Ford, Honda and Rolls Royce to help make health equipment including ventilators
- [Multiple events globally have been cancelled or postponed](#) due to the outbreak e.g., French mayoral elections, London marathon, Boston marathon, Coachella, English Premier League etc.

## E. LIST OF TRAVEL RESTRICTIONS IMPOSED BY AFRICAN COUNTRIES

Contents of this section include only publicly announced public health policies. Source of this section is the [IATA website](#) (unless otherwise stated)

<a href="#">Angola</a>	Passengers who arrive from or have been in China, Iran, Italy and Korea (Rep.) are not allowed to enter Angola. This does not apply to nationals of Angola.
<a href="#">Algeria</a>	Suspends all travel links to Europe starting March 19
<b>Benin</b>	Passengers who have been in Coronavirus (COVID-19) affected countries are subject to self-quarantine for 14 days. This does not apply to crew members.
<b>Burundi</b>	All travellers from China, France, Germany, Iran, Italy, Japan, South Korea and Spain will be quarantined for 14 days.
<b>Chad</b>	Travellers who have been to China, Italy or South Korea will be quarantined for 14 days at a local health facility  <a href="#">Closed border with Cameroon</a>
<b>Comoros</b>	Passengers who have been in China or in any other country with confirmed cases of COVID-19 in the past 14 days must spend a period of 14 days in quarantine in a country that is free from COVID-19.
<b>Congo</b>	All travellers from China, Italy, South Korea, Iran and France will be quarantined for 14 days.
<a href="#">DRC</a>	The Democratic Republic of Congo will quarantine travelers arriving from Italy, France, China and Germany.
<a href="#">Egypt</a>	Egypt will halt all air traffic from its airports starting Thursday until March 31 to prevent the spread of coronavirus.
<b>Equatorial Guinea</b>	Travellers who have been to China will be quarantined for 14 days.
<b>Eritrea</b>	Travellers coming from China, South Korea, Italy and Germany will be subject to quarantine regardless of symptoms.
<b>Gabon</b>	Travellers who have been to China will be denied entry until further notice.  The authorities have also announced the temporary closure of its borders with Cameroon and Equatorial Guinea to restrict the movements of people from these countries.  Granting of <a href="#">tourist visas is suspended</a> for travelers from the most infected areas, namely the European Union, China, South Korea and the United States.
<a href="#">Ghana</a>	Ghana will ban entry to anyone who has been to a country with more than 200 cases in the last 14 days starting from March 17, unless they are an official resident or a Ghanaian national.
<a href="#">Kenya</a>	Foreign travelers (not residents) travelling from countries with COVID-19 cases are banned entry.

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	Citizens and residents returning from countries with COVID-19 cases will be required to self-isolate or be quarantined in a government facility.
<b>Lesotho</b>	Travellers from China and other COVID-19 affected areas are requested to self-quarantine for 14 days.
<b>Liberia</b>	<p>All travellers who, within 14 days prior to arrival to Liberia, have visited countries with 200 or more confirmed cases of COVID19 are to be placed under precautionary observation.</p> <p>Those who have visited countries with between 50-200 confirmed cases will be evaluated based on the specific locations they visited. Those who have visited countries with 15-50 confirmed cases will be asked to self-monitor and report any COVID-19 symptoms to the authorities.</p> <p>The government has suspended issuance of 'laissez-passer' to prevent people leaving China from using intermediary countries as a means of avoiding the travel advisory.</p>
<b>Madagascar</b>	<p>Passengers who have been in China in the past 14 days are not allowed to enter Madagascar.</p> <p>This does not apply to nationals of Madagascar or to passengers who reside in Madagascar. Travelers who have been to Iran, Italy or South Korea in the past 14 days will be denied entry.</p> <p>All travelers from China will be subject to a 14-day quarantine.</p> <p>All connecting flights <a href="#">between Madagascar and Europe will be suspended</a> for 30 days.</p>
<b>Malawi</b>	Incoming travellers with symptoms will be quarantined. Travellers from China and other affected countries or regions will be required to self-quarantine for 14 days.
<b>Mauritania</b>	All travellers from China, South Korea, Iran and Italy will be quarantined for 14 days.
<b>Mauritius</b>	<p>1.Passengers who reside or have been in China (People's Rep.), Chinese Taipei, Hong Kong (SAR China), Iran, Italy, Korea (Rep.) or Macao (SAR China) in the past 14 days are not allowed to transit or enter Mauritius</p> <p>2.Nationals of Mauritius and residents of Mauritius who have been in China (People's Rep.), Chinese Taipei, Hong Kong (SAR), Iran, Italy, Korea (Rep.) or Macao (SAR China) in the past 14 days will be placed in quarantine.</p> <p>All travellers who have transited in China, including Hong Kong and Macao, in the 15 days prior to arrival will be quarantined. Citizens and their immediate family members will be granted entry, but will be required to undergo quarantine.</p>
<b>Mozambique</b>	All visas have been indefinitely suspended for travellers holding People's Republic of China passports.
<b><a href="#">Morocco</a></b>	Morocco suspended all international passenger flights to and from its airports

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<b>Namibia</b>	<p>Travellers who either show symptoms of COVID-19 or have been in a country that is exposed to the COVID-19 virus may be taken into quarantine</p> <p>Flights linking Namibia to and from <a href="#">Qatar, Ethiopia and Germany</a> have been suspended for 30 days</p>
<b>Nigeria</b>	<p>Passengers coming from China will be subjected to a 14-day quarantine.</p>
<b>Seychelles</b>	<p>Passengers who have been in China, Hong Kong (SAR China) or Macao (SAR China) in the past 14 days are not allowed to transit or enter Seychelles. This does not apply to nationals or residents of Seychelles. Passengers residing in China, Hong Kong (SAR China) or Macao (SAR China) are not allowed to transit or enter Seychelles. This does not apply to nationals of Seychelles.</p> <p>All foreign travellers who have been in China, including Hong Kong and Macao, Iran, Italy and South Korea in the 14 days prior to arrival are not allowed to enter or transit through the country. This does not apply to Seychelles citizens and permanent residents</p>
<b>Sierra Leone</b>	<p>All passengers arriving at the POE in any part of Sierra Leone, who had visited China in the last 14 days, would be subjected to quarantine with a regular follow ups by trained health workers to monitor their health for the duration of the incubation period of the virus which is 14 days.</p>
<a href="#"><u>Somalia</u></a>	<p>All passengers originating from China, Iran, South Korea, and Italy or transiting through one of those countries for the last 14 days will not be allowed to enter the country.</p>
<b>South Africa</b>	<p>South Africa has implemented <a href="#">travel bans on flights to and from Italy, Spain, Germany, UK, the US, South Korea, Iran and China</a></p> <p>Effective March 16, government will <a href="#">shut down 55 land entry points and two sea ports of entry will be shut down.</a></p> <p>South Africa will <a href="#">revoke nearly 10,000 visas</a> issued this year to people from China and Iran, and visas will now be required for other high-risk countries that had been visa-free, including Italy and the United States.</p>
<b>South Sudan</b>	<p>Travellers who have visited China in the 14 days prior to arrival will have to undergo home-based self-monitoring with daily calls with public health officials.</p> <p>Direct flights to and from several countries including <a href="#">Egypt and UAE</a> have been halted.</p>
<a href="#"><u>Sudan</u></a>	<p>Sudan has closed all airports, ports and land crossings; only humanitarian, commercial and technical support shipments would be excluded from the restrictions</p>
<a href="#"><u>Tunisia</u></a>	<p>Maritime borders will be closed to all countries while air borders with Italy will be suspended permanently.</p>
<a href="#"><u>Uganda</u></a>	<p>Travelers from 16 high risk countries (China, France, Germany, Iran, Italy, South Korea, Spain, Netherlands, Sweden, Norway, Austria, and Malaysia)</p>

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	would have to self-quarantine at their own cost for 14 days either at home or at a government facility
<b>Zimbabwe</b>	People visiting Zimbabwe from countries affected by COVID-19 without valid medical certificates showing they are negative, will be sent back at the port of entry as the country strengthens its fight against the spread of the virus. The medical clearance certificates should show that the visitors were examined for symptoms and tested for COVID-19 at a Government-designated institution in their home country.

## E. GUIDANCE AND RESOURCES (FULL LIST)

### WHO guidelines and resources

Organization	Date published	Guidance or resource name
<b>Country readiness</b>		
WHO	9-Jan-2020	<a href="#">National capacities review tool for a novel coronavirus</a>
WHO	16-Mar-2020	<a href="#">Critical preparedness, readiness and response actions for COVID-19</a>
WHO	4-Mar-2020	<a href="#">Operational Planning Guidelines and COVID-19 Partners Platform to support country preparedness and response</a>
<b>Surveillance and case definitions</b>		
WHO	27-Feb-2020	<a href="#">Global Surveillance for human infection with coronavirus disease (COVID-19)</a>
WHO	27-Feb-2020	<a href="#">Revised case reporting form for COVID-19 for confirmed cases and their outcome</a>
WHO	n/a	<a href="#">Emerging respiratory viruses, including 2019-nCoV: methods for detection, prevention, response and control</a>
WHO	n/a	<a href="#">Global COVID-19 Clinical Characterization Case Record Form and new data platform for anonymized COVID-19 clinical data</a>
WHO	n/a	<a href="#">Case Reporting Form for COVID-19</a>
<b>Laboratory guidance</b>		
WHO	2-Mar-2020	<a href="#">Laboratory testing for 2019 novel coronavirus (2019-nCoV) in suspected human cases</a>
WHO	1-Mar-2020	<a href="#">Guidance for laboratories shipping specimens to WHO reference laboratories that provide confirmatory testing for COVID-19 virus</a>
<b>Patient management</b>		

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WHO	13-Mar-2020	<a href="#">Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected</a>
WHO	20-Jan-2020	<a href="#">Home care for patients with suspected novel coronavirus (nCoV) infection presenting with mild symptoms and management of contacts</a>
WHO	n/a	<a href="#">WHO Critical Care Severe Acute Respiratory Infection Training Short Course</a>
WHO	18-Feb-2020	<a href="#">The Rights, Roles and Responsibilities Of Health Workers, Including Key Considerations For Occupational Safety And Health</a>
<b>Infection prevention and control</b>		
WHO	25-Jan-2020	<a href="#">Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected</a>
WHO	29-Jan-2020	<a href="#">Advice on the use of masks in the community, during home care and in health care settings in the context of the novel coronavirus (2019-nCoV) outbreak</a>
WHO	10-Feb-2020	<a href="#">Q&amp;A on infection prevention and control for health care workers caring for patients with suspected or confirmed 2019-nCoV</a>
WHO	11-Feb-2020	<a href="#">Key considerations for repatriation and quarantine of travellers in relation to the outbreak of novel coronavirus 2019-nCoV</a>
WHO	16-Feb-2020	<a href="#">Management of ill travellers at Points of Entry – international airports, seaports and ground crossings – in the context of COVID-19 outbreak</a>
WHO	18-Feb-2020	<a href="#">Surface sampling of coronavirus disease (COVID-19): A practical “how to” protocol for health care and public health professionals</a>
WHO	14-Feb-2020	<a href="#">Key planning recommendations for Mass Gatherings in the context of the current COVID-19 outbreak</a>
WHO	n/a	<a href="#">Online course for public health preparedness for mass gathering events</a>
WHO	n/a	<a href="#">Infection Prevention and Control (IPC) for Novel Coronavirus (COVID-19)</a>
WHO	27-Feb-2020	<a href="#">Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19)</a>
WHO	1-Mar-2016	<a href="#">Handbook for the Management of Public Health Events in Air Transport</a>
WHO	1-Jan-2016	<a href="#">Handbook for management of public health events on board ships</a>
WHO	24-Jan-2011	<a href="#">Handbook for inspection of ships and issuance of ship sanitation certificates</a>
<b>Early investigations</b>		

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WHO	25-Jan-2020	<a href="#">Protocol for assessment of potential risk factors for 2019-novel coronavirus (2019-nCoV) infection among health care workers in a health care setting</a>
WHO	25-Jan-2020	<a href="#">Household transmission investigation protocol for 2019-novel coronavirus (2019-nCoV) infection</a>
WHO	29-Jan-2020	<a href="#">The First Few X (FFX) Cases and contact investigation protocol for 2019-novel coronavirus (2019-nCoV) infection</a>
WHO	25-Jan-2020	<a href="#">Global 2019-nCoV Clinical Characterization Case Record Form</a>
WHO	16-Feb-2020	<a href="#">Coronavirus disease (COVID-19) technical guidance: Early investigations</a>
WHO	13-Mar-2020	<a href="#">Considerations in the investigation of cases and clusters of COVID-19</a>
<b>Risk communication &amp; community engagement</b>		
WHO	16-Mar-2020	<a href="#">Risk Communication and Community Engagement (RCCE) Action Plan Guidance COVID-19 Preparedness and Response</a>
WHO	5-Mar-2020	<a href="#">The COVID-19 Risk Communication Package For Healthcare Facilities</a>
WHO	10-Mar-2020	<a href="#">Risk Communication guidance - COVID-19, older adults and people with underlying medical conditions</a>
WHO	10-Mar-2020	<a href="#">Guidance to protect children and support safe school operations</a>
<b>Disease commodity package</b>		
WHO	10-Jan-2020	<a href="#">Disease commodity package - Novel Coronavirus (nCoV)</a>
<b>Reduction of transmission of animals to humans</b>		
WHO	n/a	<a href="#">WHO recommendations to reduce risk of transmission of emerging pathogens from animals to humans in live animal markets</a>
<b>Travel advice</b>		
WHO	29-Feb-2020	<a href="#">Updated WHO recommendations for international traffic in relation to COVID-19 outbreak</a>
<b>Others</b>		
WHO	3-Feb-2020	<a href="#">2019-nCoV Strategic Preparedness and Response Plan</a>
IATA (in partnership with WHO)	n/a	<a href="#">Emergency Response Plan and Action Checklist (for air carriers)</a>
IATA (in partnership with WHO)	n/a	<a href="#">Air Transport &amp; Communicable Diseases Guidelines</a>
WHO	12-Feb-2020	<a href="#">2019 Novel Coronavirus: Global Research and Innovation Forum: Towards a Research Roadmap/report</a>

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WHO	11-Feb-2020	<a href="#">2019 Novel Coronavirus: Global Research and Innovation Forum: Towards a Research Roadmap/report</a> - presentation
WHO	18-Feb-2020	<a href="#">COVID-19 Phase IIb/III Vaccine Trial Synopsis</a>
WHO	19-Feb-2020	<a href="#">Emerging respiratory viruses, including nCoV: methods for detection, prevention, response and control</a>
WHO	19-Feb-2020	<a href="#">ePROTECT Respiratory Infections (EN)</a>
WHO	24-Feb-2020	<a href="#">Operational considerations for managing COVID-19 cases/outbreak on board ships</a>
WHO	6-Mar-2020	<a href="#">Q&amp;A on COVID-19 vs. Influenza</a>

**Other public health institutions guidance and resources**

Organization	Date published	Guidance or resource name
<b>Surveillance and case definitions</b>		
US CDC	2-Feb-2020	<a href="#">Interim Guidance for Healthcare Professionals</a>
US CDC	2-Feb-2020	<a href="#">Flowchart to Identify and Assess 2019 Novel Coronavirus</a>
US CDC	n/a	<a href="#">Check and Record Everyday Booklet – China</a>
ECDC	n/a	<a href="#">Case definition and European surveillance for human infection with novel coronavirus (2019-nCoV)</a>
<b>Laboratory guidance</b>		
US CDC	28-Jan-2020	<a href="#">US CDC panel primer and probes– U.S. CDC, USAV – U.S. CDC, USA</a>
US CDC	n/a	<a href="#">Information for Laboratories 2019-nCoV Requests for Diagnostic Panels and Virus</a>
US CDC	n/a	<a href="#">Real-Time RT-PCR Panel for Detection 2019-Novel Coronavirus</a>
US CDC	n/a	<a href="#">2019-Novel Coronavirus (2019-nCoV) Real-time rRT-PCR Panel Primers and Probes</a>
US CDC	10-Feb-2020	<a href="#">Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Coronavirus Disease 2019 (COVID-19)</a>
US CDC	9-Mar-2020	<a href="#">Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens from Persons Under Investigation (PUIs) for Coronavirus Disease 2019 (COVID-19)</a>
US CDC	19-Feb-2020	<a href="#">Interim Guidance for Collection and Submission of Postmortem Specimens from Deceased Persons Under Investigation (PUI) for COVID-19, February 2020</a>

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ECDC	13-Jan-2020	<a href="#">Diagnostic detection of Wuhan coronavirus 2019 by real-time RTPCR</a>
China CDC	24-Jan-2020	<a href="#">China CDC Primers and probes for detection 2019-nCoV</a>
<b>Patient management</b>		
US CDC	n/a	<a href="#">Healthcare Professional Preparedness Checklist For Transport and Arrival of Patients Potentially Infected with 2019-nCoV</a>
US CDC	n/a	<a href="#">Hospital Preparedness Checklist for Suspected or Confirmed 2019-nCoV Patients</a>
US CDC	7-Mar-2020	<a href="#">Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease (COVID-19)</a>
US CDC	31-Jan-2020	<a href="#">Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for 2019 Novel Coronavirus (2019-nCoV)</a>
US CDC	12-Feb-2020	<a href="#">Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for 2019 Novel Coronavirus (2019-nCoV)</a>
US CDC	n/a	<a href="#">Interim Guidance on Breastfeeding for a Mother Confirmed or Under Investigation For COVID-19</a>
US CDC	n/a	<a href="#">Frequently Asked Questions and Answers: Coronavirus Disease-2019 (COVID-19) and Children</a>
US CDC	n/a	<a href="#">Frequently Asked Questions and Answers: Coronavirus Disease 2019 (COVID-19) and Pregnancy</a>
US CDC	n/a	<a href="#">What Healthcare Personnel Should Know about Caring for Patients with Confirmed or Possible COVID-19 Infection</a>
US CDC	n/a	<a href="#">Interim Guidance for Public Health Professionals Managing People With COVID-19 in Home Care and Isolation Who Have Pets or Other Animals</a>
US CDC	n/a	<a href="#">Interim Guidance for Healthcare Facilities: Preparing for Community Transmission of COVID-19 in the United States</a>
US CDC	n/a	<a href="#">Preparing for COVID-19: Long-term Care Facilities, Nursing Homes</a>
US CDC	n/a	<a href="#">Steps Healthcare Facilities Can Take Now to Prepare for Coronavirus Disease 2019 (COVID-19)</a>
US CDC	n/a	<a href="#">Criteria for Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19 (Interim Guidance)</a>
ECDC	30-Jan-2020	<a href="#">Advice to healthcare workers: management of patients with 2019-nCoV infection</a>
ECDC	10-Feb-2020	<a href="#">Guidelines for the use of non-pharmaceutical measures to delay and mitigate the impact of 2019-nCoV</a>

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ECDC	10-Mar-2020	<a href="#">Novel coronavirus (SARS-CoV-2) - Discharge criteria for confirmed COVID-19 cases</a>
PHE	5-Mar-2020	<a href="#">Infographic on COVID-19 primary care in the UK</a>
<b>Infection prevention and control</b>		
US CDC	21-Feb-2020	<a href="#">Interim Infection Prevention and Control Recommendations for Patients with Confirmed Coronavirus Disease 2019 (COVID-19) or Persons Under Investigation for COVID-19 in Healthcare Settings</a>
US CDC	n/a	<a href="#">Healthcare Supply of Personal Protective Equipment</a>
US CDC	8-Feb-2020	<a href="#">Interim US Guidance for Risk Assessment and Public Health Management of Persons with Potential 2019 Novel Coronavirus (2019-nCoV) Exposure in Travel-associated or Community Settings</a>
US CDC	n/a	<a href="#">Interim Considerations for Infection Prevention and Control of Coronavirus Disease 2019 (COVID-19) in Inpatient Obstetric Healthcare Settings</a>
US CDC	11-Feb-2020	<a href="#">Interim Guidance for Discontinuation of In-Home Isolation for Patients with COVID-19</a>
US CDC	11-Feb-2020	<a href="#">Interim Guidance for Discontinuation of Transmission-Based Precautions and Disposition of Hospitalized Patients with COVID-19</a>
US CDC	25-Feb-2020	<a href="#">Interim Guidance for Preventing the Spread of Coronavirus Disease 2019 (COVID-19) in Homes and Residential Communities</a>
US CDC	n/a	<a href="#">Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with 2019 Novel Coronavirus (2019-nCoV)</a>
US CDC	n/a	<a href="#">Interim Guidance for Public Health Personnel Evaluating Persons Under Investigation (PUIs) and Asymptomatic Close Contacts of Confirmed Cases at Their Home or Non-Home Residential Setting</a>
US CDC	n/a	<a href="#">Healthcare Infection Prevention and Control FAQs for COVID-19</a>
US CDC	n/a	<a href="#">Strategies for Optimizing the Supply of N95 Respirators</a>
US CDC	28-Feb-2020	<a href="#">Checklist for Healthcare Facilities: Strategies for Optimizing the Supply of N95 Respirators during the COVID-19 Response</a>
US CDC	28-Feb-2020	<a href="#">Release of Stockpiled N95 Filtering Facepiece Respirators Beyond the Manufacturer-Designated Shelf Life: Considerations for the COVID-19 Response</a>
US CDC	n/a	<a href="#">Interim Additional Guidance for Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed COVID-19 in Outpatient Hemodialysis Facilities</a>

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ECDC	29-Jan-2020	<a href="#">Public health management of persons having had contact with novel coronavirus cases in the European Union</a>
ECDC	12-Mar-2020	<a href="#">Infection prevention and control for COVID-19 in healthcare settings</a>
ECDC	7-Feb-2020	<a href="#">Personal protective equipment (PPE) needs in healthcare settings for the care of patients with suspected or confirmed novel coronavirus (2019-nCoV)</a>
ECDC	18-Feb-2020	<a href="#">Interim guidance for environmental cleaning in non-healthcare facilities exposed to SARS-CoV-2</a>
ECDC	2-Mar-2020	<a href="#">Resource estimation for contact tracing, quarantine and monitoring activities for COVID-19 cases in the EU/EEA</a>
ECDC	28-Feb-2020	<a href="#">Guidance for wearing and removing personal protective equipment in healthcare settings for the care of patients with suspected or confirmed COVID-19</a>
ECDC	25-Feb-2020	<a href="#">Public health management of persons, including health care workers, having had contact with COVID-19 cases in the European Union</a>
ECDC	26-Feb-2020	<a href="#">Checklist for hospitals preparing for the reception and care of coronavirus 2019 (COVID-19) patients</a>
<b>Early investigations</b>		
US CDC	28-Feb-2020	<a href="#">Recommendations for Reporting, Testing, and Specimen Collection</a>
US CDC	3-Feb-2020	<a href="#">Patient Under Investigation form</a>
US CDC	4-Mar-2020	<a href="#">Evaluating and Reporting Patients Under Investigation (PUI)</a>
US CDC	2-Feb-2020	<a href="#">Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens from Patients Under Investigation (PUIs) for 2019 Novel Coronavirus (2019-nCoV)</a>
US CDC	n/a	<a href="#">Information for Health Departments on Reporting a Patient Under Investigation (PUI) for 2019-nCoV</a>
US CDC	n/a	<a href="#">Case Report Form for 2019 Novel Coronavirus</a>
ECDC	30-Jan-2020	<a href="#">Algorithm for management of contacts of probable or confirmed 2019-nCoV cases</a>
<b>Risk communication &amp; community engagement</b>		
US CDC	24-Feb-2020	<a href="#">CDC in Action: Preparing Communities for Potential Spread of COVID-19</a>
US CDC	n/a	<a href="#">Interim Guidance: Get Your Household Ready for Coronavirus Disease 2019 (COVID-19)</a>
US CDC	n/a	<a href="#">Interim Guidance for Administrators of US Childcare Programs and K-12 Schools to Plan, Prepare, and Respond to Coronavirus Disease 2019 (COVID-19)</a>
US CDC	8-Mar-2020	<a href="#">Resources for Institutes of Higher Education</a>

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US CDC	8-Mar-2020	<a href="#">COVID-19 and Cruise Ship Travel</a>
US CDC	8-Mar-2020	<a href="#">Environmental Cleaning and Disinfection Recommendations</a>
US CDC	8-Mar-2020	<a href="#">People at Risk for Serious Illness from COVID-19</a>
US CDC	8-Mar-2020	<a href="#">What law enforcement personnel need to know about coronavirus disease 2019 (COVID-19)</a>
US CDC	n/a	<a href="#">Resources for Community- and Faith-Based Leaders</a>
US CDC	n/a	<a href="#">Resources for Homeless Shelters</a>
US CDC	n/a	<a href="#">Protect Your Home</a>
US CDC	n/a	<a href="#">Protect Your Family</a>
US CDC	n/a	<a href="#">How to Prepare for COVID-19</a>
ECDC	13-Feb-2020	<a href="#">Guidance on community engagement for public health events caused by communicable disease threats in the EU/EEA</a>
ECDC	12-Mar-2020	<a href="#">Information on COVID-19 for specific groups: the elderly, patients with chronic diseases, people with immunocompromising condition and pregnant women</a>
ECDC	11-Mar-2020	<a href="#">Considerations relating to social distancing measures in response to the COVID-19 epidemic</a>
<b>Disease commodity package</b>		
US CDC	2-Feb-2020	<a href="#">Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with 2019 Novel Coronavirus (2019-nCoV)</a>
<b>Travel advice</b>		
US CDC	n/a	<a href="#">Travelers from China Arriving in the United States</a>
US CDC	n/a	<a href="#">Communication Resources for Travelers</a>
US CDC	24-Feb-2020	<a href="#">Coronavirus Disease 2019 Information for Travel</a>
ECDC	30-Jan-2020	<a href="#">Advice for travellers: outbreak of a novel coronavirus 2019-nCoV</a>
<b>Others</b>		
US CDC	13-Feb-2020	<a href="#">Interim Guidance for Airlines and Airline Crew: Coronavirus Disease 2019 (COVID-19)</a>
US CDC	4-Feb-2020	<a href="#">2019 Novel Coronavirus: Interim Health Guidance from the Federal Aviation Administration and the Centers for Disease Control and Prevention for Air Carriers and Crews</a>
US CDC	n/a	<a href="#">Preventing Spread of Disease on Commercial Aircraft: Guidance for Cabin Crew</a>
US CDC	n/a	<a href="#">Interim Guidance for Businesses and Employers to Plan and Respond to 2019 Novel Coronavirus (2019-nCoV), February 2020</a>

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US CDC	n/a	<a href="#">Interim Guidance for Emergency Medical Services (EMS) Systems and 911 Public Safety Answering Points (PSAPs) for 2019-nCoV in the United States</a>
US CDC	18-Feb-2020	<a href="#">Interim Guidance for Ships on Managing Suspected Coronavirus Disease 2019</a>