

# Outbreak of acute respiratory syndrome associated with a novel coronavirus, China; First cases imported in the EU/EEA; second update

26 January 2020

## Summary

On 31 December 2019, a cluster of pneumonia cases of unknown aetiology was reported in Wuhan, Hubei Province China. On 9 January 2020, China CDC reported a novel coronavirus (2019-nCoV) as the causative agent of this outbreak, which is phylogenetically in the SARS-CoV clade.

As of 26 January 2020, a total of 2 026 laboratory-confirmed 2019-nCoV cases have been reported, 1 988 in China and 38 imported cases from other countries around the world. Fifty six deaths have been reported among the cases. Chinese health authorities have confirmed human-to-human transmission outside Hubei province and 16 healthcare workers are reported to have been infected.

On 24 January 2020, the first imported cases (3) of 2019-nCoV were identified in France.

The rapid increase in the number of reported cases can be partly attributed to the ongoing improved testing protocols and epidemiological investigations of the Chinese authorities; however, since the original source remains unknown and human-to-human transmission has been documented, further cases and deaths are expected. Further cases are also expected among travellers from Hubei Province. Therefore, health authorities in Member States should remain vigilant and strengthen their capacity to respond to such an event.

There are considerable uncertainties in assessing the risk of this event, due to lack of detailed epidemiological analyses.

On the basis of the information currently available, ECDC considers that:

- the potential impact of 2019-nCoV outbreaks is high;
- further global spread is likely;
- there is currently a moderate likelihood of infection for EU/EEA citizens residing in or visiting Wuhan, Hubei province, China;
- there is a high likelihood of further case importation into countries with the greatest volume of people who have travelled from Wuhan, Hubei Province (i.e. countries in Asia);
- there is a moderate likelihood of further case importation into EU/EEA countries;
- adherence to appropriate infection prevention and control practices, particularly in healthcare settings in EU/EEA countries with direct links to Hubei, means that the likelihood of a case detected in the EU resulting in secondary cases within the EU/EEA is low;
- the impact of the late detection of an imported case in an EU/EEA country without the application of appropriate infection prevention and control measures would be high, therefore in such a scenario the risk of secondary transmission in the community setting is estimated to be very high.

Information on the novel coronavirus 2019-nCoV in China is regularly updated on ECDC's website [here](#) and WHO's website [here](#).

This risk assessment is based on published information available as of 26 January 2020, 09:00.

## Event background

On 31 December 2019, the Wuhan Municipal Health Commission in Wuhan City, Hubei province, China reported a cluster of 27 pneumonia cases of unknown aetiology, including seven severe cases, with a common reported link to Wuhan's Huanan Seafood Wholesale Market (a wholesale fish and live animal market selling different animal species) [1]. The market was closed to the public on 1 January 2020. According to the Wuhan Municipal Health Commission, samples from the market tested positive for the novel coronavirus. Cases showed symptoms such as fever, dry cough, dyspnoea, and radiological findings of bilateral lung infiltrates [2].

On 9 January 2020, China CDC reported that a novel coronavirus (2019-nCoV) had been detected as the causative agent for 15 of the 59 pneumonia cases [3]. On 10 January 2020, the first novel coronavirus genome sequence was made publicly available [4]. The sequence was deposited in the GenBank database (accession number MN908947) [5] and was uploaded to the Global Initiative on Sharing all Influenza Data (GISAID). Preliminary analysis showed that the novel coronavirus (2019-nCoV) clusters with the SARS-related CoV clade and differs from the core genome of known bat CoVs.

Since 31 December 2019 and as of 26 January 2020 – 9.00AM GMT, overall, 2 026 laboratory-confirmed cases of novel coronavirus (2019-nCoV) infection, and 56 deaths were reported [6,7] (Table 1 and 2, Figure 1 and 2). Sixteen healthcare workers are reported to be infected, all from Wuhan [8,9]. According to media, one healthcare worker has died from the infection [10]. The cases have been reported from China (1 988), Japan (3), Malaysia (4), Nepal (1), South Korea (3), Singapore (4), Taiwan (6), Thailand (5), Vietnam (2), Canada (1), US (2), Australia (4), and France (3). All cases reported outside of China, except one in Vietnam, had recent travel history to China and/or Wuhan province prior to onset. One case in Vietnam had no recent travel history to China prior to onset. This case is a relative of the other case in Vietnam who travelled to Wuhan [11].

Of the 56 reported deaths, all in China, 52 were from Hubei province, one from Heilongjiang province, one from Hebei province, one from Henan province and one from Shanghai. For the 24 cases for whom more detailed information was available, the age ranged from 36 to 89 years (median 71.5 years), male to female ratio was 2:1. Ten of the 24 deceased had different underlying conditions such as chronic renal insufficiency, tuberculosis and diabetes. [12,13]. The first reported death occurred on 9 January 2020, and the most recent reported deaths occurred on 23 January 2020 [12,13].

### **In EU/EEA,**

On 24 January 2020, French authorities reported the first three cases in Europe [14,15]. According to the French authorities and media quoting health authorities, the confirmed cases are:

- A 48-year-old male, with recent travel history to Wuhan. He asked for medical care on 23 January and was isolated on 24 January. The patient is currently hospitalized in Bordeaux.
- Two cases with recent travel history to Wuhan. These two cases are linked and are hospitalized in Paris.

For these three cases, all necessary measures, including prompt isolation, and contact tracing are being implemented.

**Table 1. Distribution of laboratory-confirmed cases and deaths of 2019-nCoV by place of reporting, as of 26 January 2020 – 09.00 GMT**

Places reporting cases	Confirmed cases	Deaths
<b>America</b>	<b>3</b>	<b>0</b>
Canada	1	0
United States of America	2	0
<b>Asia</b>	<b>2016</b>	<b>56</b>
China	1988	56
Japan	3	0
Malaysia	4	0
Nepal	1	0
Republic of Korea	3	0
Singapore	4	0
Taiwan	6	0
Thailand	5	0
Vietnam	2	0
<b>Europe</b>	<b>3</b>	<b>0</b>
France	3	0
<b>Oceania</b>	<b>4</b>	<b>0</b>
Australia	4	0
<b>Total</b>	<b>2026</b>	<b>56</b>

**Table 2. Distribution of laboratory-confirmed cases and deaths of 2019-nCoV by place and specific area of reporting, as of 26 January 2020 – 09.00 GMT**

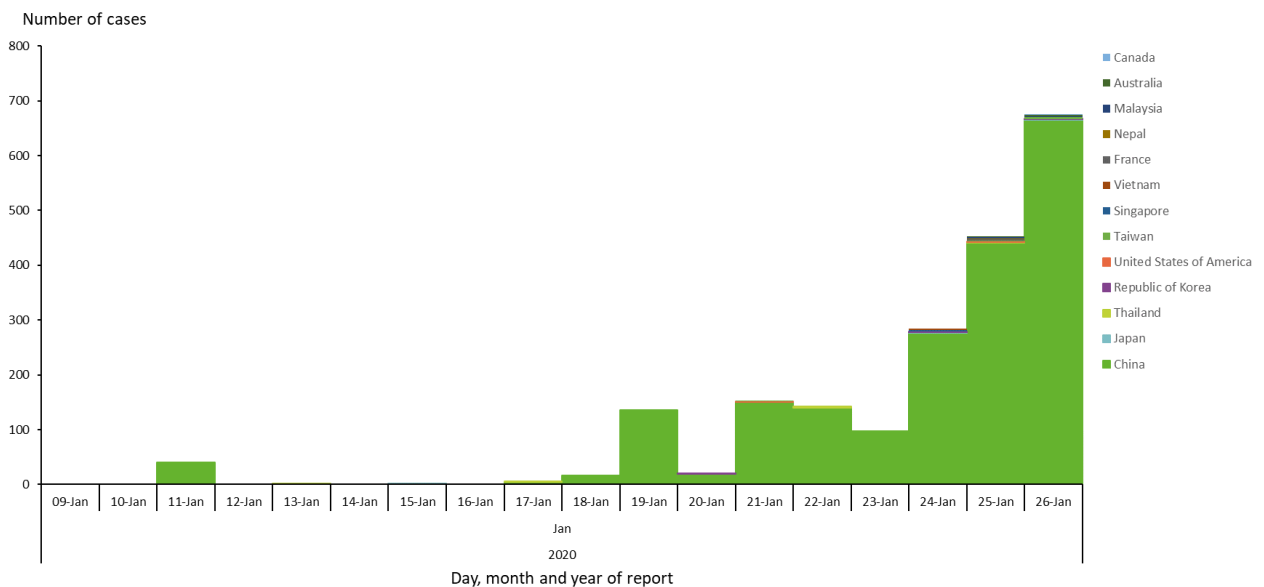
Reporting Continent	Places reporting cases	Specific areas	Confirmed cases	Deaths
America	United States of America	Washington	1	0
	United States of America	Illinois	1	0
	Canada	Ontario	1	0
Europe	France	Ile de France	2	0
	France	Sud-Ouest	1	0
Asia	China	Hong Kong	5	0
	China	Macau	5	0
	China	Anhui	60	0
	China	Beijing	54	0
	China	Chongqing	75	0
	China	Fujian	18	0
	China	Gansu	7	0
	China	Guangdong	98	0
	China	Guangxi Zhuangzu	33	0
	China	Guizhou	5	0
	China	Hainan	20	0
	China	Hebei	13	1
	China	Heilongjiang	15	1
	China	Henan	83	1
	China	Hubei	1052	52
	China	Hunan	69	0
	China	Jiangsu	31	0
	China	Jiangxi	26	0
	China	Jilin	4	0
	China	Liaoning	19	0
	China	Nei Mongol	7	0
	China	Ningxia Huizu	4	0
	China	Shaanxi	20	0
	China	Shandong	39	0
	China	Shanghai	40	1
	China	Shanxi	9	0
	China	Sichuan	44	0
	China	Tianjin	13	0
	China	Xinjiang Uygur	4	0
	China	Yunnan	11	0
	China	Zhejiang	104	0
	China	Qinghai	1	0
	Japan	Kanagawa	3	0
	Malaysia	Johor	4	0
	Nepal	Central	1	0
	Republic of Korea	Inchon	3	0
	Singapore	Central Singapore	4	0
	Taiwan	Taipei	6	0
	Thailand	Bangkok	5	0

	Vietnam	Ho Chi Minh City	2	0
Oceania	Australia	New South Wales	3	0
Oceania	Australia	Victoria	1	0

**Figure 1. Geographical distribution of laboratory confirmed cases (n= 2 026) of 2019-nCoV, as of 26 January 2020 – 09.00 GMT[7]**



**Figure 2. Distribution of laboratory confirmed cases (n= 2 026) of 2019-nCoV, as of 26 January 2020 – 09.00 GMT[7], by date of reporting.**



### Public health measures in China

Wuhan had first implemented exit screening at the Wuhan Tianhe International Airport (before its closure on 23 January 2020). Strengthened screening measures were also implemented in railway stations and long-distance bus stations for the entry and exit of the city. Public transport was disinfected on a daily basis before its suspension starting from 22 January 2020. Private vehicles are checked for live birds and wild animals and people are advised against group activities. People with fever are registered, provided with brochures and masks, and referred to the medical institutions. A list of designated medical institutions in Wuhan was published on 20 January 2020.

On 23 January 2020, China's Hubei Province activated level 2 public health emergency response, which includes activities such as quarantine, case reporting and material supply to control pneumonia caused by 2019-nCoV.

Offices for pneumonia control are set up at various levels across the province. Local governments should provide designated hospitals to receive suspected and confirmed cases, and should cover all related treatment expenses.

On 22 and 23 January 2020, all public transport was suspended, and public places such as markets, internet cafes, cinemas, entertainment parks and cultural sites were closed and group activities cancelled in Wuhan and Huanggang cities. As of 24 January 2020, the same measures were taken in at least 10 cities close to Wuhan, affecting more than 20.5 million people.

### **Flight connections from Wuhan**

According to the International Air Transport Association (IATA) data from 2018, the five destination countries receiving most passengers from Wuhan in decreasing order are: Thailand, Hong Kong Special Administrative Region, Japan, Taiwan and the Republic of Korea [16]. Several countries around the world had implemented entry-screening activities for all incoming travellers from Wuhan. These countries includes Hong Kong [17], India [18], Indonesia [19], Malaysia [20], Myanmar [21], the Philippines [22], Singapore [23], Taiwan [24], Thailand [25], the United States [26], Russia [27] and Vietnam [28].

Before its closure on 23 January 2020, the airport of Wuhan had direct flight connections with some EU cities: Paris (France) with six weekly flights, and London (the United Kingdom) and Rome (Italy) with three weekly flights.

# Disease background

## Coronavirus infections (including SARS and MERS)

Coronaviruses were identified in the mid-1960s and are known to infect humans and a variety of animals (including birds and mammals). Since 2002, two coronaviruses infecting animals have evolved and caused outbreaks in humans: SARS-CoV (2002, *Betacoronavirus*, subgenus *Sarbecovirus*), and MERS-CoV (2012, *Betacoronavirus*, subgenus *Merbecovirus*) [2]. In 2002–2003, SARS-CoV affected 8 096 people, causing severe pulmonary infections and 774 deaths (case fatality ratio: 10%) [29,30]. Bats were the likely origin of the virus, which spread further to Himalayan palm civets, Chinese ferret badgers and raccoon dogs sold for food at the wet markets of Guangdong, China. MERS-CoV was identified in 2012 in Saudi Arabia and since then the majority of human cases have been reported from the Arabian Peninsula. Human-to-human- transmission, particularly in healthcare settings, has been the main route of transmission. However, dromedary camels are important animal reservoirs of the virus. The case fatality ratio of MERS-CoV infections is estimated at 35% [31,32].

## Novel coronavirus (2019-nCoV) infections

In December 2019, a novel coronavirus (2019-nCoV) was first isolated from three patients with pneumonia, connected to the cluster of acute respiratory illness cases from Wuhan, China. Genetic analysis revealed that it is closely related to SARS-CoV and genetically clusters within the genus *Betacoronavirus*, forming a distinct clade in lineage B of the subgenus *Sarbecovirus* together with two bat-derived SARS-like strains [33,34]. The origin of the virus is not clear yet. Similar to SARS-CoV, a recent study confirmed that Angiotensin Converting Enzyme 2 (ACE 2), a membrane exopeptidase, is the receptor used by 2019-nCoV for entry into the human cells [35].

The virus was initially isolated in bronchoalveolar lavage fluid samples [34]. RNA of the virus was detected in blood samples in six out of 41 cases in a study of the clinical features of the infection [36]. So far, it remains unknown if the virus is excreted in faeces or urine.

Information on the epidemiological and clinical characteristics of the infection caused by 2019-nCoV is accumulating. A media statement by a senior expert in China suggests that the mean incubation period observed in the current outbreak is seven days, with a range between 2–12 [37]. A preliminary  $R_0$  estimate of 1.4–2.5 was presented in a statement in the meeting of the International Health Regulations Emergency Committee regarding the outbreak [38,39]. However, these estimates are still uncertain and are expected to be updated as more information becomes available.

In a first report of the clinical features of the infection, most patients presented with fever, cough, and myalgia or fatigue [36]. Neither upper respiratory tract symptoms (such as sore throat and nasal congestion) nor diarrhoea were common. Among the 41 patients in this study, more than half developed dyspnoea after a median of eight days from the onset of symptoms and 13 (32%) were admitted to the intensive care unit. Invasive mechanical ventilation was required in four (10%) patients and extracorporeal membrane oxygenation (ECMO) in two (5%). Computed tomography imaging of the chest identified in almost all cases bilateral abnormalities, such as ground-glass opacities in the milder cases and consolidation in the cases admitted to the ICU [36].

So far, according to the WHO situation report of 25 January, among the laboratory-confirmed cases, 18% are seriously or critically ill. The case fatality rate among hospitalised patients is 14% including only fatal and recovered cases in the denominator [40]. However, these estimates should be interpreted with caution since these figures are preliminary and the situation is constantly evolving.



# ECDC risk assessment for the EU/EEA

## General assessment

As the outbreak is linked to a novel coronavirus, there are many unknowns regarding for instance the virulence/pathogenicity of the virus, the mode of transmission, the reservoir and the source of infection. So far, the epidemiological data available are limited and therefore there are significant uncertainties in this risk assessment.

Initially, the majority of the cases reported had exposure to Wuhan's Huanan Seafood Wholesale Market. Later, it was reported that cases were concentrated around two districts of the city hosting large seafood markets [37]. To date, there is evidence that visiting a seafood market in Wuhan is not the only risk factor.

Human-to-human transmission has been demonstrated; several family clusters in China and outside China (i.e. Vietnam) and cases among health-care workers have been reported [37,41]. In addition, Chinese authorities presented evidence to the WHO Emergency Committee that sustained (4<sup>th</sup> generation) human-to-human transmission is documented in Wuhan and second generation cases have been documented outside Wuhan. At this stage, it is difficult to quantify the extent of human-to-human transmission. To date there are 936 cases reported outside of Hubei province in China and it is increasingly likely that sustained human-to-human transmission is occurring in Wuhan and in Hubei province, and possibly in other provinces in China.

Chinese authorities reported an estimated reproductive number ( $R_0$ ) of 1.4-2.5 to WHO's Emergency committee, which suggests transmissibility similar to SARS (pre-intervention  $R_0= 2-3$ ) and higher than MERS ( $R_0=0.7$ ).

Preliminary modelling work supports the reproductive number estimated by the Chinese authorities [42,43]. Analysis has also been made of the number of moderately severe cases in Wuhan and the importation risk to cities within and outside China [44,45]. Data availability is limited and, to date, the analysis has focused on mobility patterns, not taking into account human-to-human transmission. Phylogenetic analysis implies that the most recent common ancestor was from early December 2019, indicating that historical sustained transmission in the human population is unlikely [46].

Without implementation of appropriate infection prevention and control measures at the point of care for persons under investigation, there is a moderate likelihood of outbreaks in destination countries.

Reported case fatality rates range from 4% in the Statement of the WHO Emergency Committee [39] to 14% when only recovered cases and deaths are included in the denominator and 15% in the publication of a small case series of hospitalised patients [36,40]. However, it is unlikely that these case series had full outcomes available and it is unclear what the testing indications were, therefore inferring severity assessments from these estimates is not meaningful at this stage. Among the 1 287 cases reported to WHO from China on 25 January, 237 had dyspnoea or other defined severe symptoms.

To limit the epidemic, Chinese authorities have implemented a number of extraordinary social distancing measures like cancellation of New Lunar Year celebrations, closure of movie theatres and entertainment parks, in addition to limiting mass transportation, including the closure of Wuhan airport, and enforcing strict exit screening from a number of large cities in Hubei province.

The scale of these measures is unprecedented and while their effectiveness and collateral effects are difficult to predict, they are expected to limit the immediate likelihood of further spread of the virus via travellers returning from Wuhan city or Hubei province. The impact of such measures on the transmission dynamics inside these cities is also difficult to predict. Maintaining appropriate healthcare services, including safe care of 2019-nCoV patients will be challenging in these circumstances.

## Risk for travellers, importation and further spread in the EU/EEA

Before the closure of Wuhan airport on 23 January 2020, three EU airports had direct flight connections to Wuhan and there were indirect flight connections to other EU/EEA airports. More than 300 000 arrivals from cities in China are expected in EU/EEA Member States during the month of January, similar to other months of the year. An important proportion of these arrivals will occur during the week before and after the Chinese New Year on 25 January 2020.

While the vast majority of cases are reported from Wuhan, the risk of infection is not only limited to Wuhan but to any affected area, where cases are being detected. The epicentre of the outbreak remains in Wuhan, Hubei province. Currently, there is a moderate likelihood of infection for EU/EEA citizens in Hubei province. The likelihood of infection for EU/EEA citizens in other Chinese provinces and other places that reported cases is low but the likelihood would increase should the number of reported cases increase and should sustained human-to-human transmission occur in those provinces.

On Friday 24 January, France reported the detection of three confirmed cases with exposure to Wuhan. Despite the closure of Wuhan airport, additional imported cases in the EU/EEA can be expected. First, the airport was closed only recently and considering an incubation period of up to twelve days, infected individuals might develop symptoms in the coming days. Second, imported cases may arrive via airports in other cities where circulation of the virus might be ongoing.

In order to prevent secondary transmission in the community and healthcare settings, EU/EEA countries should ensure that timely and rigorous infection prevention and control measures (IPC) are applied around cases. Assuming that cases are detected in a timely manner and that rigorous IPC measures are applied, the likelihood of sustained human-to-human transmission in community settings in the EU/EEA is considered low. To support this assertion, it must be highlighted that systematic implementation of infection prevention and control measures were effective in controlling both SARS-CoV and MERS-CoV.

It cannot be excluded that secondary transmission may occur, for instance among close family members. Should cases be detected at a late stage or should there be evidence that asymptomatic or mild cases are able to transmit the virus, the likelihood of further limited human-to-human transmission in community settings would be considered very high [47].

The impact of the late detection of an imported case in an EU/EEA country without the application of appropriate infection prevention and control measures would be high, therefore in such a scenario the risk of secondary transmission in the community setting is estimated to be very high [47].

## Risk of transmission on aircrafts

No cases of 2019-nCoV have been reported to have been infected on-board an aircraft.

The assessment of possible transmission of 2019-nCoV on an aircraft needs to be undertaken on a case-by-case basis. This individual risk assessment should take into account the index case classification, the symptoms and disease severity during the flight, and the timing of possible contact tracing in relation to the flight.

Detailed information about the timing of contact tracing in relation to the flight and the extent of contact tracing is available in the Risk assessment guidelines for infectious diseases transmitted on aircrafts (RAGIDA) Middle East Respiratory Syndrome Coronavirus [48].

## Risk of healthcare-associated transmission

Sixteen healthcare workers have been reported to have been infected in Wuhan in connection with this outbreak, many from the same healthcare facility [9]. Without further information, we assume that these healthcare workers did not have other exposure and that these are cases of healthcare-associated infections. Based on the evidence from the SARS and MERS outbreaks, the likelihood of healthcare-associated transmission, following management of a confirmed case is considered low, provided that appropriate IPC measures are applied for staff patients and visitors [49]. Risk of infection for healthcare staff involved in aerosol-generating procedures without appropriate personal protection equipment (PPE) is considered high [50].

## Options for response

The options for response might change when more epidemiological and clinical data become available.

## Testing guidance for 2019-nCoV in the EU/EEA

ECDC has developed a guidance document on Laboratory testing of suspected cases of novel coronavirus (2019-nCoV) using RT-PCR for the EU/EEA Member States, addressing questions on how to identify suspected cases and when to initiate testing [51-53].

Member States should review the national laboratory diagnostic capacity for coronaviruses and the procedures for transporting samples [54]. ECDC launched a survey through EVD-LabNet on 21 January to assess the EU/EEA Member States laboratory capacity to diagnose 2019-nCoV cases. Responses are currently being collected.

## Surveillance

On 22 of January, the World Health Organization published an [interim guidance for global surveillance of novel coronavirus infection \(2019-nCoV\)](#) [55]. The guidance includes a case definition for suspect, probable and confirmed cases, and an interim case reporting form [55]. The case definition for suspect cases is based on the current information available on the outbreak and may be subject to revision depending on new data becoming available.

For surveillance at the European level, ECDC and the WHO Regional Office for Europe request countries to report probable and confirmed cases of 2019-nCoV infections using the global case definition within 24 hours of identification. EU/EEA countries should notify probable and confirmed cases of 2019-nCoV through the Early Warning and Response System (EWRS) through their nominated contact points. ECDC has published a [guidance](#) for reporting of cases in EU/EEA. ECDC and the WHO Regional Office for Europe are coordinating the rapid reporting of data as requested in the WHO case reporting form in collaboration with their surveillance networks in Member States.

## Travel-related measures

Travellers between Wuhan, China and EU/EEA countries are limited in numbers, and Wuhan airport is closed since 23 January 2020. However, even if still limited, human-to-human transmission outside Wuhan has already been reported. Therefore, it remains possible that imported cases of 2019-nCoV who travelled through other international airports will be detected.

Travellers planning to visit China should avoid wet markets or places where live or dead animals are handled and to avoid contact with sick persons, in particular those with respiratory symptoms. They should also practice good hand hygiene, and avoid contact with animals, their excretions or droppings. Travellers who develop acute respiratory symptoms within 14 days of returning from Hubei province (or other affected areas) should be advised to seek immediate medical attention and indicate their travel history to the healthcare specialist. National authorities in China are advising against non-essential travel to Wuhan. US CDC has also increased the travel health advisory level to 3 and advises travellers to avoid non-essential travel to Hubei Province [56].

In addition, due to the current high activity of the seasonal influenza epidemic in China, travellers should receive seasonal influenza vaccination at least two weeks prior to travel to prevent severe influenza disease, in accordance with the respective national recommendations.

EU/EEA countries should review their procedures for informing incoming and outgoing passengers from/to Hubei, China of the situation concerning 2019-nCoV at their Points of Entry (PoE), providing also advice for persons who develop 2019-nCoV compatible symptoms after their return, according to the national planning [54,57]. Member States may consider guiding these cases to a particular call centre or healthcare facility, depending on their planning.

## Entry/Exit screening of travellers

WHO and the Emergency Committee under IHR emphasised to China the need to re-inforce exit screening from the affected areas.

In general, evidence in peer-reviewed literature does not support entry screening as an efficient measure for detecting incoming travellers with infectious diseases, especially in this case where the symptoms of the disease are very common and the timeline coincides with the increased activity of seasonal influenza in Europe and China [58-62]. However, several exported 2019-nCoV-cases in Asian countries until now were detected through entry screening procedures at destination airports. Therefore, a targeted approach focussing on passengers from direct incoming flights from affected areas may be considered in the respective countries to facilitate early identification [63]. The closure of Wuhan airport on 23 January will make entry screening measures targeted at direct flights increasingly ineffective over coming days, as the likelihood of arrival of infected passengers on direct flights is decreasing.

In addition, Member States are urged to review their procedures for in-country transportation, isolation and management of high consequence infectious disease cases, including staffing and laboratory support [54].

## Contact tracing

EU/EEA countries should review their procedures for contact tracing and contact follow-up for at least 14 days.

A close contact of a probable or confirmed 2019-nCoV case is defined as a family member or healthcare worker providing direct patient care or anyone who had prolonged (>15 minutes) face-to-face contact with a probable or confirmed symptomatic case in any closed setting. This would include contacts in an aircraft as described above.

Quarantine for asymptomatic contacts is not recommended. However, all close contacts of probable and confirmed 2019-nCoV cases should be followed-up and monitored for the development of symptoms until 14 days after the last exposure. Close contacts should be provided with instructions how to seek medical advice if they develop symptoms such as fever, cough or difficulty breathing.

Ideally, close contacts should have a baseline serum sample collected and stored, which can be used for comparison of paired sera if required later.

## Infection prevention and control

Healthcare providers should be informed of the ongoing outbreak. According to current knowledge, the clinical signs and symptoms of disease include fever, coughing and difficulty breathing with the radiological findings of pneumonia [36]. Patients can present with mild, moderate, or severe illness including severe pneumonia, ARDS, sepsis and septic shock. Travellers returning from China with a stay in Hubei province and symptoms of acute respiratory infection should be identified for testing and reported promptly to the respective public health authorities [53].

There is limited information available at present to provide detailed guidance on appropriate infection prevention and control practices. However, the evidence of human-to-human transmission and the report of infections among healthcare staff in Wuhan reinforces the recommendation for rigorous compliance with IPC measures, as specified in [WHO interim guidance](#). These include placement of suspected and confirmed cases in single rooms, implementation of contact and droplet precautions, and airborne precautions when performing aerosol generating procedures or interventions [64-66]. Although there is so far no evidence of airborne transmission, we recommend that a cautious approach is preferred for all patient contacts, with placement of patients in airborne isolation rooms with negative pressure and use of FFP2 or FFP3 respirators with appropriate fit testing.

There is currently no specific treatment or vaccine against coronavirus caused respiratory illness and in particular against 2019-nCoV. WHO has published [interim guidance on clinical management](#) of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected.

## Novel coronavirus and substances of human origin (SoHO) safety

The potential for transmission of the 2019-nCoV through substances of human origin (SoHO) is unknown. Possible viraemia during the disease incubation period, during possible asymptomatic course of infection, or after symptom resolution are also unknown and remain a concern in relation to the safety of SoHO. Therefore, until more information is available on the epidemiology and pathogenesis of this infection, SoHo safety authorities in the EU/EEA countries may follow the recommendation used for SARS-CoV and MERS-CoV. This implies a precautionary deferral from donation of blood, cells and tissues donors for 21 days after possible exposure to a confirmed case or after returning from Hubei province, China [67,68].

Additionally, recovering confirmed cases of 2019-nCoV should be deferred as donors for at least 28 days after symptom resolution and completion of therapy, due to the present uncertainty regarding possible persistence of viremia and/or viral shedding in body fluids. Potential organ donors at risk of being infected should be laboratory-tested for the presence of the virus. Lipid-enveloped RNA viruses such as the novel coronavirus (2019-nCoV) should be readily removed and/or inactivated during manufacturing of plasma derivatives [69,70].

## Limitations

This assessment is undertaken based on facts known to ECDC at the time of publication. There is a substantial level of uncertainty regarding the epidemiological characteristics of the nCoV-2019. There is limited epidemiological and clinical information on the cases of 2019-nCoV identified so far (e.g. infection sources, aetiological agent, risk factors for infection, risk factors for severe illness, extent of person-to-person transmissibility, transmission modes, effective preventive measures, and clinical presentation and evolution). Therefore, the level of uncertainty of this risk assessment is high.

Given these limitations, ECDC will revise the current risk assessment as soon as more information becomes available.

## Source and date of request

ECDC internal decision, 24 January 2020.

## Consulted experts

ECDC experts (in alphabetic order): Cornelia Adlhoch, Agoritsa Baka, Eeva Broberg, Sergio Brusin, Bruno Ciancio, Dragoslav Domanovic, Laura Espinosa, Céline Gossner, Josep Jansa, Katrin Leitmeyer, Grazina Mirinaviciute, Teymur Noori, Pasi Penttinen, Diamantis Plachouras, Emmanuel Robesyn.

## Disclaimer

ECDC issues this risk assessment document based on an internal decision and in accordance with Article 10 of Decision No 1082/13/EC and Article 7(1) of Regulation (EC) No 851/2004 establishing a European centre for disease prevention and control (ECDC). In the framework of ECDC's mandate, the specific purpose of an ECDC risk assessment is to present different options on a certain matter. The responsibility on the choice of which option to pursue and which actions to take, including the adoption of mandatory rules or guidelines, lies exclusively with the EU/EEA Member States. In its activities, ECDC strives to ensure its independence, high scientific quality, transparency and efficiency.

This report was written with the coordination and assistance of an Internal Response Team at the European Centre for Disease Prevention and Control. All data published in this risk assessment are correct to the best of our knowledge at the time of publication. Maps and figures published do not represent a statement on the part of ECDC or its partners on the legal or border status of the countries and territories shown.

## References

1. Wuhan City Health Committee (WCHC). Wuhan Municipal Health and Health Commission's briefing on the current pneumonia epidemic situation in our city 2019 [updated 31 December 2019/14 January 2020]. Available from: <http://wjw.wuhan.gov.cn/front/web/showDetail/2019123108989>.
2. European Centre for Disease Prevention and Control (ECDC). Risk assessment: Outbreak of acute respiratory syndrome associated with a novel coronavirus, Wuhan, China; first update 2020 [updated 22 January 2020]. Available from: <https://www.ecdc.europa.eu/en/publications-data/risk-assessment-outbreak-acute-respiratory-syndrome-associated-novel-coronavirus>.
3. News X. Experts claim that a new coronavirus is identified in Wuhan 2020 [14 January 2020]. Available from: [http://www.xinhuanet.com/2020-01/09/c\\_1125438971.htm](http://www.xinhuanet.com/2020-01/09/c_1125438971.htm).
4. Holmes E. Initial genome release of novel coronavirus 2020 [14 January 2020]. Available from: <http://virological.org/t/initial-genome-release-of-novel-coronavirus/319>.
5. GenBank. Wuhan seafood market pneumonia virus isolate Wuhan-Hu-1, complete genome 2020 [16 January 2020]. Available from: <https://www.ncbi.nlm.nih.gov/nuccore/MN908947>.
6. China CDC. Tracking the epidemic 2020. Available from: <http://weekly.chinacdc.cn/news/TrackingtheEpidemic.htm#NHCJan25>.
7. European Centre for Disease Prevention and Control (ECDC). Novel coronavirus in China 2020 [24 January 2020]. Available from: <https://www.ecdc.europa.eu/en/novel-coronavirus-china>.
8. WHO Regional Office for Western Pacific (WO WPRO). Novel Coronavirus (2019-nCoV) Twitter Message 2020 [updated 20 January 2020]. Available from: <https://twitter.com/WHOWPRO/status/1219478541865144320>.
9. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *The Lancet*. 2020.
10. New York Post. Doctor at hospital in Wuhan dies after treating patients with coronavirus 2020 [updated 25 January 2020]. Available from: <https://nypost.com/2020/01/25/doctor-at-hospital-in-wuhan-dies-after-treating-patients-with-coronavirus/>.
11. WHO. 2019-nCoV Situation report - 4 [updated 24 January 2020]. Available from: [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200124-sitrep-4-2019-ncov.pdf?sfvrsn=9272d086\\_2](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200124-sitrep-4-2019-ncov.pdf?sfvrsn=9272d086_2).
12. National Health Commission of the People's Republic of China. Epidemic situation of new coronavirus infection on January 23, 2020. Available from: <http://www.nhc.gov.cn/yjbj/s3578/202001/5d19a4f6d3154b9fae328918ed2e3c8a.shtml>.
13. Hubei Provincial Health Committee. [updated 24 January 2020]. Available from: [http://wjw.hubei.gov.cn/fbjd/dtyw/202001/t20200124\\_2014626.shtml](http://wjw.hubei.gov.cn/fbjd/dtyw/202001/t20200124_2014626.shtml).
14. Franceinfo. Coronavirus: Three cases confirmed in Paris and Bordeaux, the first in Europe [French] 2020 [updated 25 January 2020].
15. Health. FMo. Three cases of infections by 2019-nCoV in France 2020 [updated 25 January 2020]. Available from: <https://solidarites-sante.gouv.fr/actualites/presse/communiqués-de-presse/article/trois-cas-d-infection-par-le-coronavirus-2019-ncov-en-france-429100>.
16. Bogoch I, Watts A, Thomas-Bachli A, Huber C, Kraemer M, Khan K. Pneumonia of Unknown Etiology in Wuhan, China: Potential for International Spread Via Commercial Air Travel *Journal of Travel Medicine*. 2020.
17. The Straits Times. Wuhan pneumonia outbreak: Hong Kong steps up response as more cases reported 2020 [updated 4 January 2020]. Available from: <https://www.straitstimes.com/asia/east-asia/wuhan-pneumonia-outbreak-hong-kong-raises-response-level-as-more-cases-reported>.
18. WION. News on travel advisory from Indian government 2020 [updated 19 January 2020]. Available from: <https://www.youtube.com/watch?v=99yHaYQmxfk>.

19. Yulisman L. Indonesia tightens screening at entry points following Wuhan virus outbreak, watching travellers from Singapore closely 2020 [updated 15 January 2020]. Available from: <https://www.straitstimes.com/asia/se-asia/indonesia-tightens-screening-at-entry-points-following-wuhan-virus-outbreak-watching>.
20. Carvalho M. Passengers from Wuhan to be screened due to outbreak of respiratory illness 2020 [updated 04 January 2020]. Available from: <https://www.thestar.com.my/news/nation/2020/01/04/passengers-from-wuhan-to-be-screened-due-to-outbreak-of-respiratory-illness>.
21. Soe APK. Myanmar intensifies screening of travellers over China pneumonia outbreak 2020 [updated 09 January 2020]. Available from: <https://www.mmtimes.com/news/myanmar-intensifies-screening-travellers-over-china-pneumonia-outbreak.html>.
22. BusinessMirror. Pneumonia outbreak prompts fever check at PHL airports 2020. Available from: <https://businessmirror.com.ph/2020/01/06/pneumonia-outbreak-prompts-fever-check-at-phl-airports/>.
23. TheStraitsTimes. Pneumonia outbreak prompts fever check at PHL airports 2020 [17 January 2020]. Available from: <https://www.straitstimes.com/singapore/ministry-of-health-issues-advisory-on-viral-pneumonia-outbreak-in-chinas-wuhan>.
24. TaiwanToday. CDC implements extra inspection measures for Wuhan flights 2020. Available from: <https://taiwantoday.tw/news.php?unit=2,6,10,15,18&post=168773>.
25. TheStarOnline. Thailand on alert after pneumonia outbreak in China and HK 2020 [17 January 2020]. Available from: <https://www.thestar.com.my/news/regional/2020/01/05/thailand-on-alert-after-pneumonia-outbreak-in-china-and-hk>.
26. Centers for Disease Control and Prevention (CDC). Novel Coronavirus in China 2020 [17 January 2020]. Available from: <https://wwwnc.cdc.gov/travel/notices/watch/novel-coronavirus-china>.
27. Wellbeing FSfSitFoPoCRaH. About cases of pneumonia in the People's Republic of China 2020 [17 January 2020]. Available from: [https://www.rospotrebnaozor.ru/about/info/news/news\\_details.php?ELEMENT\\_ID=13434](https://www.rospotrebnaozor.ru/about/info/news/news_details.php?ELEMENT_ID=13434).
28. VNExpressInternational. Vietnam to screen visitors amid China pneumonia scare 2020 [17 January 2020]. Available from: <https://e.vnexpress.net/news/news/vietnam-to-screen-visitors-amid-china-pneumonia-scare-4038669.html>.
29. European Centre for Disease Prevention and Control (ECDC). Facts about severe acute respiratory syndrome (SARS) Stockholm2018 [14 January 2020]. Available from: <https://www.ecdc.europa.eu/en/severe-acute-respiratory-syndrome/facts>.
30. WHO. SARS (Severe Acute Respiratory Syndrome) Geneva [14 January 2020]. Available from: <https://www.who.int/ith/diseases/sars/en/>.
31. Hui DS, Azhar EI, Kim Y-J, Memish ZA, Oh M-d, Zumla A. Middle East respiratory syndrome coronavirus: risk factors and determinants of primary, household, and nosocomial transmission. *The Lancet Infectious Diseases*. 2018;18(8):e217-e27.
32. Park J-E, Jung S, Kim A, Park J-E. MERS transmission and risk factors: a systematic review. *BMC Public Health*. 2018 May 02;18(1):574.
33. WHO. WHO Statement Regarding Cluster of Pneumonia Cases in Wuhan, China Geneva2020 [updated 9 January 2020]. Available from: <https://www.who.int/china/news/detail/09-01-2020-who-statement-regarding-cluster-of-pneumonia-cases-in-wuhan-china>.
34. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A Novel Coronavirus from Patients with Pneumonia in China, 2019. *New England Journal of Medicine*. 2020.
35. Letko M, Munster V. Functional assessment of cell entry and receptor usage for lineage B  $\beta$ -coronaviruses, including 2019-nCoV. *bioRxiv*. 2020:2020.01.22.915660.
36. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*. 2020.
37. people.cn. #New coronavirus pneumonia latency 2020 [updated 21 January 2020]. Available from: <https://s.weibo.com/weibo?q=%23%E6%96%B0%E5%9E%8B%E5%86%A0%E7%8A%B6%E7%97%85%E6%AF%92%E8%82%BA%E7%82%8E%E6%BD%9C%E4%BC%8F%E6%9C%9F%23&from=default>.
38. Read JM, Bridgen JRR, Cummings DAT, Ho A, Jewell CP. Novel coronavirus 2019-nCoV: early estimation of epidemiological parameters and epidemic predictions. *medRxiv*. 2020.
39. WHO. Statement on the meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV) 2020 [updated 23 January 2020]. Available from: [https://www.who.int/news-room/detail/23-01-2020-statement-on-the-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-\(2019-ncov\)](https://www.who.int/news-room/detail/23-01-2020-statement-on-the-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov)).
40. Wu P, Hao X, Lau EHY, Wong JY, Leung KSM, Wu JT, et al. Real-time tentative assessment of the epidemiological characteristics of novel coronavirus infections in Wuhan, China, as at 22 January 2020. *Eurosurveillance*. 2020;25(3):2000044.
41. Health Commission of Guangdong Province. Our province actively responds to pneumonia epidemic of new coronavirus infection 2020 [20 January 2020]. Available from: [http://wsjkw.gd.gov.cn/zwyw\\_yqxx/content/post\\_2876926.html](http://wsjkw.gd.gov.cn/zwyw_yqxx/content/post_2876926.html).
42. Read JM, Bridgen JR, Cummings DA, Ho A, Jewell CP. Novel coronavirus 2019-nCoV: early estimation of epidemiological parameters and epidemic predictions. *medRxiv*. 2020:2020.01.23.20018549.

43. Imai N, Cori A, Dorigatti I, Baguelin M, Donnelly CA, Riley S, et al. Report 3: Transmissibility of 2019-nCoV 2020 [updated 24 January 2020]. Available from: <https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/news--wuhan-coronavirus/>.
44. Imai N, Dorigatti I, Cori A, Riley S, Ferguson N. Estimating the potential total number of novel Coronavirus (2019-nCoV) cases in Wuhan City, China 2020 [17 January 2020]. Available from: <https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/news--wuhan-coronavirus/>.
45. Leung K, Wu J, Leung G. Nowcasting and forecasting the Wuhan 2019-nCoV outbreak 2020 [21 January 2020]. Available from: [https://files.sph.hku.hk/download/wuhan\\_exportation\\_preprint.pdf](https://files.sph.hku.hk/download/wuhan_exportation_preprint.pdf).
46. Rambaut A. Preliminary phylogenetic analysis of 11 nCoV2019 genomes, 2020-01-19 2020 [21 January 2020]. Available from: <http://virological.org/t/preliminary-phylogenetic-analysis-of-11-ncov2019-genomes-2020-01-19/329>.
47. European Centre for Disease Prevention and Control (ECDC). Operational tool on rapid risk assessment methodology: ECDC; 2019. Available from: <https://www.ecdc.europa.eu/sites/default/files/documents/operational-tool-rapid-risk-assessment-methodology-ecdc-2019.pdf>.
48. European Centre for Disease Prevention and Control (ECDC). Risk assessment guidelines for infectious diseases transmitted on aircraft (RAGIDA) Middle East Respiratory Syndrome Coronavirus (MERS-CoV) [updated January 2020].
49. WHO. Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Interim Guidance Geneva2020. WHO/2019-nCoV/IPC/v2020.1:[Available from: [https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected).
50. European Centre for Disease Prevention and Control (ECDC). Risk assessment guidelines for diseases transmitted on aircraft Part 2: Operational guidelines for assisting in the evaluation of risk for transmission by disease. Stockholm 2009.
51. WHO. Laboratory testing for 2019 novel coronavirus (2019-nCoV) in suspected human cases 2020 [17 January 2020]. Available from: <https://www.who.int/health-topics/coronavirus/laboratory-diagnostics-for-novel-coronavirus>.
52. Corman V, Bleicker T, Brünink S, Drosten C, Landt O, Koopmans M, et al. Diagnostic detection of Wuhan coronavirus 2019 by real-time RTPCR 2020 [17 January 2020]. Available from: [https://www.who.int/docs/default-source/coronaviruse/wuhan-virus-assay-v1991527e5122341d99287a1b17c111902.pdf?sfvrsn=d381fc88\\_2](https://www.who.int/docs/default-source/coronaviruse/wuhan-virus-assay-v1991527e5122341d99287a1b17c111902.pdf?sfvrsn=d381fc88_2).
53. European Centre for Disease Prevention and Control (ECDC). Laboratory testing of suspect cases of 2019 nCoV using RT-PCR 2020 [17 January 2020]. Available from: <https://www.ecdc.europa.eu/en/publications-data/laboratory-testing-suspect-cases-2019-ncov-using-rt-pcr>.
54. European Centre for Disease Prevention and Control (ECDC). Health emergency preparedness for imported cases of high-consequence infectious diseases 2019 [17 January 2020]. Available from: <https://www.ecdc.europa.eu/en/publications-data/health-emergency-preparedness-imported-cases-high-consequence-infectious-diseases>.
55. WHO. Global Surveillance for human infection with novel coronavirus (2019-nCoV) 2020 [21 January 2020]. Available from: [https://www.who.int/docs/default-source/coronaviruse/20200121-global-surveillance-for-2019-ncov.pdf?sfvrsn=9d82f528\\_4&download=true](https://www.who.int/docs/default-source/coronaviruse/20200121-global-surveillance-for-2019-ncov.pdf?sfvrsn=9d82f528_4&download=true).
56. Centers for Disease Control and Prevention (CDC). Novel Coronavirus in Hubei Province, China 2020 [updated 23 January 2020]. Available from: <https://wwwnc.cdc.gov/travel/notices/warning/novel-coronavirus-wuhan-china>.
57. WHO. Risk communication and community engagement readiness and initial response for novel coronaviruses (nCoV) 2020 [17 January 2020]. Available from: [https://www.who.int/publications-detail/risk-communication-and-community-engagement-readiness-and-initial-response-for-novel-coronaviruses-\(ncov\)](https://www.who.int/publications-detail/risk-communication-and-community-engagement-readiness-and-initial-response-for-novel-coronaviruses-(ncov)).
58. Huizer Y, Swaan C, Leitmeyer K, Timen A. Usefulness and applicability of infectious disease control measures in air travel: a review. *Travel medicine and infectious disease*. 2015;13(1):19-30.
59. European Centre for Disease Prevention and Control (ECDC). Entry and exit screening measures 2014 [17 January 2020]. Available from: <https://www.ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/Ebola-outbreak-technicalreport-exit-entry-screening-13Oct2014.pdf>.
60. John RKS, King A, De Jong D, Bodie-Collins M, Squires SG, Tam TW. Border screening for SARS. *Emerging infectious diseases*. 2005;11(1):6.
61. Gunaratnam PJ, Tobin S, Seale H, Marich A, McNulty J. Airport arrivals screening during pandemic (H1N1) 2009 influenza in New South Wales, Australia. *Medical Journal of Australia*. 2014;200(5):290-2.
62. Shu P-Y, Chien L-J, Chang S-F, Su C-L, Kuo Y-C, Liao T-L, et al. Fever screening at airports and imported dengue. *Emerging infectious diseases*. 2005;11(3):460.
63. WHO. Updated WHO advice for international traffic in relation to the outbreak of the novel coronavirus 2019-nCoV 2020 [updated 24 January 2020]. Available from: <https://www.who.int/ith/2020-24-01-outbreak-of-pneumonia-caused-by-new-coronavirus/en/>.
64. WHO. Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected 2020 [17 January 2020]. Available from: [https://www.who.int/internal-publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-\(ncov\)-infection-is-suspected](https://www.who.int/internal-publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected).

65. WHO. Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected 2020 [17 January 2020]. Available from: [https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected).
66. WHO. Infection prevention and control of epidemic-and pandemic prone acute respiratory infections in health care. WHO guidelines 2014 [17 January 2020]. Available from: [https://www.who.int/csr/bioriskreduction/infection\\_control/publication/en/](https://www.who.int/csr/bioriskreduction/infection_control/publication/en/).
67. Joint United Kingdom (UK) Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee J. Guidelines for the blood transfusion services, SARS [16 January 2020]. Available from: <https://www.transfusionguidelines.org/dsg/wb/guidelines/sa006-sars>.
68. US Food and Drug Administration (FDA). Revised Recommendations for the Assessment of Donor Suitability and Blood Product Safety in Cases of Suspected Severe Acute Respiratory Syndrome (SARS) or Exposure to SARS 2003 [17 January 2020]. Available from: <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/revised-recommendations-assessment-donor-suitability-and-blood-product-safety-cases-suspected-severe>.
69. Lamarre A, Talbot PJ. Effect of pH and temperature on the infectivity of human coronavirus 229E. Canadian journal of microbiology. 1989;35(10):972-4.
70. Bucknall RA, King LM, Kapikian AZ, Chanock RM. Studies with human coronaviruses II. Some properties of strains 229E and OC43. Proceedings of the Society for Experimental Biology and Medicine. 1972;139(3):722-7.