

RAPID RISK ASSESSMENT

Outbreak of acute respiratory syndrome associated with a novel coronavirus, China: first local transmission in the EU/EEA – third update

31 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 30 January 2020 09:00, more than 7 000 laboratory-confirmed 2019-nCoV cases have been reported worldwide, mainly in China, but also with more than 70 imported cases from other countries around the world. Details on the epidemiological update for 2019-nCoV can be found on ECDC's website.

So far, one hundred and seventy deaths associated with this virus have been reported. On 20 January, Chinese health authorities confirmed human-to-human transmission outside of Hubei province. Sixteen healthcare workers are reported to have been infected.

On 24 January 2020, the first three cases of 2019-nCoV imported into the EU/EEA were identified in France and one additional case was reported on 29 January 2020. On 28 January, a cluster of four locally-acquired cases, with indirect links to Wuhan, was reported from Germany. On 29 January, Finland reported an imported case from Wuhan.

China CDC assesses the transmissibility of this virus to be sufficient for sustained community transmission without unprecedented control measures. Further cases and deaths in China are expected in the coming days and weeks. Further cases or clusters are also expected among travellers from China, mainly Hubei province. Therefore, health authorities in the EU/EEA 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;
- the likelihood of infection for EU/EEA citizens residing in or visiting Hubei province is estimated to be high;
- the likelihood of infection for EU/EEA citizens in other Chinese provinces is moderate and will increase;
- there is a moderate-to-high likelihood of additional imported cases in the EU/EEA;
- the likelihood of observing further limited human-to-human transmission within the EU/EEA is estimated as very low to low if cases are detected early and appropriate infection prevention and control (IPC) practices are implemented, particularly in healthcare settings in EU/EEA countries;

Suggested citation: European Centre for Disease Prevention and Control. Outbreak of acute respiratory syndrome associated with a novel coronavirus, China: first local transmission in the EU/EEA – third update. 31 January 2020. ECDC: Stockholm; 2020.

- assuming that cases in the EU/EEA are detected in a timely manner and that rigorous IPC measures are applied, the likelihood of sustained human-to-human transmission within the EU/EEA is currently very low to low;
- the late detection of an imported case in an EU/EEA country without the application of appropriate infection prevention and control measures would result in the high likelihood of human-to-human transmission, therefore in such a scenario the risk of secondary transmission in the community setting is estimated to be high.

What is new in this update

- Increasing number of cases and deaths, in particular in China.
- First cluster of autochthonous transmission in EU/EEA.
- China CDC estimates for transmissibility.
- Entry screening guidance.
- Contact tracing guidance.
- Findings from studies on initial cases.
- Recommendation for reviewing pandemic preparedness plans in EU/EEA.

Information on the novel coronavirus 2019-nCoV in China is being regularly updated on <u>ECDC's website</u>, the European Commission <u>website</u> and WHO's <u>website</u>.

This risk assessment is based on published information available as of 30 January 2020, 09:00.

Event background

For an event background please visit ECDC's website <u>here</u> and for the most recent information on the current situation regarding novel coronavirus 2019-nCoV please visit the following <u>page</u>.

For detailed information regarding the cases detected in the EU/EEA as of 30 January, please visit the following <u>page</u> on ECDC's website.

Disease background

For information on coronavirus infections (including SARS and MERS) please visit the following <u>page</u> on ECDC's website.

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 [1,2]. 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 [3].

The virus was initially isolated in bronchoalveolar lavage fluid samples [2]. RNA of the virus has also been detected in blood samples [4]. So far, it is still unknown whether the virus is excreted in faeces or urine. In a report of a family cluster including six cases, RT-PCR was negative in urine and stool samples [5].

Information on the epidemiological and clinical characteristics of the infection caused by 2019-nCoV is accumulating. The Chinese Center for Disease Control and Prevention estimates the incubation period to be between three and seven days, with a range of up to 14 days [6]. Their current estimate is that R_0 is between 2 and 3 [6]. However, these estimates are still uncertain and are expected to be updated as more information becomes available.

In a first study of the clinical features of the infection (published 24 January 2020), most of the 41 hospitalised patients presented with fever, cough, and myalgia or fatigue [4]. Diarrhoea was uncommon. More than half of the patients developed dyspnoea after a median of eight days from the onset of symptoms and 13 (32%) were admitted to an intensive care unit (ICU). 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 and sub segmental areas of consolidation in the milder cases, and lobular and sub segmental consolidation in cases admitted to ICU [4].

So far, according to the WHO situation report of 27 January 2020, among the laboratory-confirmed cases, 17% are classified as severe [7]. In the same report, China accounts for 80 fatalities.

Reported case fatality rates range from 4% in the Statement of the WHO Emergency Committee [8], 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 [4,9]. A more recent study of 99 cases hospitalised between 1 January and 20 January, reported that as of 25 January 31% had been discharged, 11% had died, and 58% were still admitted with final outcomes unknown at this time [10].

Risk assessment questions

What do we know about this outbreak associated with the novel coronavirus (2019-nCoV) in terms of mode of transmission, transmissibility, severity of disease and case fatality rates?

Are there risk groups that have a higher susceptibility to (or probability of) severe disease following infection?

What is the likelihood of infection for EU/EEA citizens residing in or visiting Hubei province or other provinces in China where cases are being reported?

What are the most likely routes of introduction into EU/EEA Members States?

What are the probabilities of introduction, exposure, infection and further transmission in the EU/EEA?

What treatment and control measures are available, and how effective are they?

ECDC risk assessment for the EU/EEA

General assessment

Many unknowns remain regarding the virulence/pathogenicity of the novel coronavirus, the mode of transmission, the reservoir and the source of infection. So far, the detailed epidemiological data available are still limited and therefore there are significant uncertainties in this risk assessment.

This assessment is based on an evaluation of the limited evidence available and expert knowledge, following the ECDC rapid risk assessment methodology [11].

There is clear evidence that visiting seafood markets in Wuhan is not the only risk factor for novel coronavirus infection. Human-to-human transmission is currently evident in and outside China (e.g. Vietnam, Taiwan[12], Germany) and cases among healthcare workers have been reported [13,14]. Sustained human-to-human transmission is likely to be occurring in the majority of provinces in China, although this cannot be accurately quantified with the epidemiological data available.

The reproductive number (R_0) has been estimated to be 2.2 (95% CI 1.4 to 3.9) [15]. This implies transmissibility similar to SARS (pre-intervention R_0 = 2-3) and higher than MERS (R_0 =0.7). The mean incubation period is estimated to be 5.2 days (95% CI, 4.1 to 7.0), with the 95th percentile of the distribution at 12.5 days, which supports using 14 days as a operational definition for contact tracing and monitoring.

Modelling work supports the estimates of the reproductive number [16-18] and the incubation period made by the Chinese authorities. Analysis has also been made of the number of moderately severe cases in Wuhan and the importation risk to cities within and outside of China [19,20]. 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 late November or early December 2019, indicating that historical sustained transmission in the human population is unlikely [21-23].

Estimates of severity and case fatality rate should be interpreted with caution at this stage. In a published case series of the first 99 hospitalised cases, 17 (17%) patients developed acute respiratory distress syndrome and, 11 (11%) patients died of multiple organ failure, while the majority of the cases remain hospitalised and final outcomes are as yet unknown [10].

In a published report on a family cluster, one 10-year-old asymptomatic case was described with clear radiological signs of pneumonia and positive RT-PCR in nasopharyngeal and throat swab samples. However, the report did not describe any possible onward transmission from this case [5]. The recent cluster of four locally-acquired cases in Germany might be linked to a case that was asymptomatic during their stay in Germany. However, investigations are still ongoing for this event. According to China CDC, no evidence of asymptomatic transmission has been seen in field investigations. However, the possibility of asymptomatic cases being infectious would decrease the

effectiveness of any screening measures based on symptoms, even though transmission dynamics are most likely to be driven by ambulant cases with severe symptoms.

To limit the epidemic, Chinese authorities have implemented a number of extraordinary social distancing measures, such as the cancellation of Lunar New Year celebrations and the closure of cinemas and theme parks. In addition, public transportation systems have been shut down, Wuhan Tianhe airport was closed on 23 January, and strict exit screening has been enforced from a number of large cities in Hubei province. As of 24 January 2020, all public transport was suspended in at least 10 cities close to Wuhan, affecting more than 20.5 million people. Chinese tour operators have cancelled all group tours and temporarily postponed the selling of airline tickets and hotel packages. On 26 January, the authorities ordered a temporary ban on the trade in wild animals throughout China.

The scale of these measures is unprecedented and the economic costs of such measures to the Chinese economy are considerable. Although the effectiveness and collateral effects of these measures are difficult to predict, they are expected to limit the immediate likelihood of further spread of the virus via travellers returning from Hubei province and China in general. 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 under such circumstances.

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

More than 300 000 arrivals on direct flights, not accounting for indirect connections, from cities in China were expected in EU/EEA Member States during the month of January, similar to other months of the year. A significant proportion of these arrivals would normally occur between 19 January and 5 February 2020. The impact on international travel volumes of the current travel restrictions in China are difficult to assess at present.

While the vast majority of cases are being reported from Hubei province, the risk of acquiring infection is not only limited to Hubei but to any area where cases are being detected. However, the epicentre of the outbreak remains in Wuhan, Hubei province. The likelihood of infection for EU/EEA citizens residing in or visiting Hubei province, is estimated to be high. The likelihood of infection for EU/EEA citizens in other Chinese provinces is moderate and will increase as the number of reported cases increases, or if sustained human-to-human transmission occurs in these provinces.

The number of cases reported outside of China is rising. All of the secondary cases have a direct or indirect epidemiological link to Wuhan. To date, the likelihood of EU/EEA citizens in countries other than China being infected is considered very low to low, depending on the ability of the country to detect and manage cases.

On 28 January 2020, Germany reported the detection of four locally-acquired cases. All four are the result of secondary transmission and have an indirect epidemiological link to Wuhan [24]. On 29 January, France reported the detection of a fourth confirmed case with an epidemiological link to Wuhan. On 29 January, Finland reported its first imported case from Wuhan.

There is a moderate-to-high likelihood of additional cases being imported into the EU/EEA. This likelihood is partly due to the fact that although Wuhan Tianhe airport was closed on 23 January 2020, the incubation period of up to fourteen days means that infected individuals might yet develop symptoms in the coming days. In addition, Wuhan city authorities estimate that five million residents travelled out of the city prior to travel restrictions and imported cases may continue to arrive via airports in other cities where community transmission of the virus might be ongoing.

Sustained human-to-human transmission has been described in Hubei province and is increasingly likely outside of Hubei. Assuming that cases are detected in the EU/EEA in a timely manner and that rigorous IPC measures are applied, the likelihood of sustained human-to-human transmission within the EU/EEA is currently very low to low. Should cases be detected at a late stage and ICP measures not implemented, the likelihood of sustained human-to-human transmission within the EU/EEA is currently very low to low.

The late detection of an imported case (e.g. an asymptomatic or mild case) in an EU/EEA country without the application of appropriate infection prevention and control measures would result in the high likelihood of human-to-human transmission; therefore, in such a scenario the risk of secondary transmission in the community setting is estimated to be high. If, however, asymptomatic cases and cases with mild symptoms do not play an extensive role in the transmission of the virus, and if imported cases are detected at an early stage and IPC measures implemented, the likelihood of observing further limited human-to-human transmission within the EU/EEA would be very low to low.

Further information is needed to assess the role of potential asymptomatic cases and cases with mild symptoms in the dynamics of the outbreak in order to address current uncertainties concerning the level of risk of sustained human-to-human transmission, and the effectiveness of control measures focussing on symptomatic case detection. If asymptomatic or mild cases are able to transmit the virus, this would indicate that detection of individuals who pose an infectious risk could not be based only on clinical history and examination. Moreover, in

the absence of widespread screening with laboratory tests there would be an increased likelihood of further limited human-to-human transmission within the EU/EEA, particularly among family members and in healthcare settings.

Systematic implementation of infection prevention and control measures were important in controlling both SARS-CoV and MERS-CoV. The impact of sustained transmission within the EU/EEA would be high. The risk of having sustained human-to-human transmission in the EU/EEA is therefore considered to be moderate, if cases are detected in a timely manner and rigorous IPC measures are applied. The risk of sustained human-to-human transmission in the EU/EEA is a timely manner and IPC measures are not detected in a timely manner and IPC measures are not applied rigorously.

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.

Risk of healthcare-associated transmission

Sixteen healthcare workers are reported to have been infected in Wuhan in connection with this outbreak, many from the same healthcare facility [25]. 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 implemented for staff, patients and visitors [26]. Risk of infection for healthcare staff involved in aerosol-generating procedures without appropriate personal protection equipment (PPE) is considered high [27].

Options for response

The options for response might change when more epidemiological and clinical data become available. During the current phase, it is important for EU/EEA countries to focus on containment measures that prevent and/or limit secondary transmission in the community and healthcare settings. Should the epidemiological situation evolve to signal significant and sustained community transmission in locations outside of Hubei province, containment measures will become increasingly ineffective in limiting introduction of community transmission in EU/EEA countries, although such measures might delay local introductions by some days or weeks.

To this end, during this phase of containment, countries should ensure early detection, laboratory confirmation, appropriate management and isolation of <u>suspected</u>, <u>probable and confirmed cases</u> under appropriate IPC conditions, along with rigorous contact tracing and follow-up of contacts. When local transmission chains are established, public health resources will be better used to focus on mitigation measures.

Testing guidance and reporting of 2019-nCoV in the EU/EEA

ECDC has updated the guidance document on laboratory testing of suspected cases of novel coronavirus (2019nCoV) using RT-PCR for the EU/EEA Member States, addressing issues such as how to identify suspected cases and when to initiate testing [28-30].

Member States should review the national laboratory diagnostic capacity for coronaviruses and the procedures for transporting samples [31]. On 21 January, ECDC launched a survey through EVD-LabNet to assess the EU/EEA Member States laboratory capacity to diagnose 2019-nCoV cases. Responses are currently being collected and preliminary results are expected to be shared next week.

For the National Influenza Centers, WHO has established a mechanism to support rapid shipment of diagnostic samples to be tested for 2019-nCoV from a country to the 2019-nCoV "WHO referral" laboratories through the Global Influenza Surveillance and Response System (GISRS) Shipping Fund Project (SFP) (personal communication).

On 22 January 2020, WHO published an <u>interim guidance for global surveillance of novel coronavirus infection</u> (2019-nCoV) [32]. The guidance includes a case definition for suspected, probable and confirmed cases, and an interim case reporting form [32]. The case definition for suspected 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, the European Commission, ECDC and WHO's Regional Office for Europe ask countries to report probable and confirmed cases of 2019-nCoV infections using the global case definition within 24 hours of identification. Countries in the EU/EEA should notify probable and confirmed cases of 2019-nCoV without delay through the Early Warning and Response System (EWRS), including IHR notification. The more detailed case

reporting forms are collected for all the countries in the WHO European Region through The European Surveillance System (TESSy) [33]. ECDC and WHO's 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

Travel volumes between China and EU/EEA countries are in the range of 300–400 000 passengers per month arriving on direct flights, not accounting for indirect flight arrivals. Given this level of movement, it remains possible that imported cases of 2019-nCoV will be detected for as long as significant community transmission is occurring in China.

Travellers visiting China should be advised to avoid contact with sick persons, in particular those with respiratory symptoms and fever. Travellers should also avoid wet markets or places where live or dead animals are handled. They should also practice good hand hygiene, and avoid contact with animals, their excretions or droppings.

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

Travellers who develop acute respiratory symptoms within 14 days of returning from China should be advised to seek immediate medical attention and indicate their travel history to the healthcare specialist. Local and national authorities in China have current travel restrictions in place for Wuhan, other cities in Hubei and other provinces. US CDC has also increased the travel health advisory level to 3 and advises travellers to avoid non-essential travel to China [34]. Several EU/EEA countries have issued or are considering travel advice for travellers to China.

EU/EEA countries should review their procedures for informing incoming and outgoing passengers from/to China of the situation concerning 2019-nCoV at their Points of Entry (PoE), also providing advice for persons who develop 2019-nCoV-compatible symptoms after their return, in accordance with national planning [31,35]. ECDC has published a <u>template leaflet</u> for travel advice relating to 2019-nCoV. 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-enforce exit screening from the affected areas.

Entry screening for 2019-nCoV involves the use of thermal scanning and/or symptom screening. 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 [36-40]. However, some imported 2019-nCoV cases in Asian countries have been detected through entry screening procedures at destination airports.

Modelling work by ECDC has assessed the effectiveness of entry screening in detecting travellers infected with nCoV to be low. Approximately 75% of cases from affected Chinese cities would arrive at their destination in the incubation period and remain undetected, even if the efficacy of the screening test to detect symptomatic individuals were 80% for both exit and entry screening.

Contact tracing

EU/EEA countries should review their procedures for contact tracing and contact follow-up, and may wish to refer to guidance that ECDC has published on these activities [41].

Extensive contact tracing is recommended in assessing the contacts of the first probable and confirmed cases detected in EU/EEA countries in order to strengthen the evidence base on the characteristics and transmission pattern of the disease.

A close contact of a probable or confirmed 2019-nCoV case is defined as a person living in the same household as a 2019-nCoV case, a person who has had face-to-face contact or stayed in a closed environment with a 2019-nCoV case, a healthcare worker or other person providing direct care for a 2019-nCoV case, or laboratory workers handling 2019-nCoV specimens.

Furthermore, aircraft passengers sitting two seats in all directions around a 2019-nCoV case, travel companions or persons providing care, and crew members serving the section of the aircraft where the index case was seated [42] would be considered a close contact. If severity of symptoms or movement of the case indicates more extensive exposure, passengers seated in the entire section or all passengers on the aircraft can be considered close contacts. For the initial cases in this outbreak, ECDC recommends extensive contact tracing in order to gather a stronger evidence base for transmission, or lack of transmission, on-board aircraft.

Close contacts of probable and confirmed 2019-nCoV cases should be actively monitored for the development of symptoms until 14 days after the last exposure. They should avoid social contact and travel.

All contacts, including casual contacts, should be provided with instructions on 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 during healthcare

Further secondary transmission may occur in EU/EEA countries among close contacts, for instance close family members. 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 when dealing with suspect cases, from the first suspicion of 2019-nCoV.

Healthcare providers should be informed of the ongoing outbreak. According to current knowledge, the clinical signs and symptoms of severe disease include fever, coughing or difficulty breathing, with the radiological findings of pneumonia [4]. Upper respiratory tract symptoms and diarrhoea may also be present. Patients can present with mild, moderate, or severe illness including severe pneumonia, acute respiratory distress syndrome (ARDS), sepsis and septic shock. Travellers returning from China who develop symptoms of acute respiratory infection within 14 days of travel should be identified for testing and reported promptly to the respective public health authorities [30].

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. <u>WHO's</u> <u>interim guidance</u> recommends 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 [43-45]. Although there is no evidence of airborne transmission so far, ECDC recommends a cautious approach 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. ECDC has published a <u>leaflet</u> entitled 'Advice to healthcare workers: management of patients with 2019-nCoV infection'.

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

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 [31].

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 a 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 China.

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 current 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 the manufacturing of plasma derivatives [46,47].

First few hundred cases

Public health authorities should encourage and support detailed epidemiological studies of the first case series encountered in Europe. In addition to the notifications using the WHO case reporting form on TESSy, the PREPARE network encourages data collection on European cases to further assess the clinical characteristics and effectiveness of treatment options using a standardised protocol [48]. A similar protocol and further guidance is provided by WHO through the ISARIC collaboration [49]. WHO has also published a household transmission investigation protocol for 2019-nCoV infection [50].

Preparedness for sustained community transmission in EU/EEA

Based on the evolution of the epidemic in China and the detection of cases and one cluster with autochthonous transmission in EU/EEA, public health authorities are encouraged as a precautionary measure to review their preparedness for community transmission of novel respiratory and high consequence pathogens. All EU/EEA Member States have pandemic preparedness plans, which will be well-suited for use in such a scenario. Consideration should be given to convening a multi-sectoral pandemic planning committee, as described in national plans.

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 2019-nCoV. There is limited epidemiological and clinical information on the cases of 2019-nCoV identified so far (e.g. infection sources, 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, 28 January 2020.

Consulted experts

ECDC experts (in alphabetic order): Agoritsa Baka, Eeva Broberg, Sergio Brusin, Bruno Ciancio, Dragoslav Domanovic, Céline Gossner, Josep Jansa, Helen Johnson, Katrin Leitmeyer, Hanna Merk, Thomas Mollet, 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. World Health Organization. WHO Statement Regarding Cluster of Pneumonia Cases in Wuhan, China Geneva 2020 [updated 9 January 2020 and 14 January 2020]. Available from: <u>https://www.who.int/china/news/detail/09-01-2020-who-statement-regarding-cluster-of-pneumonia-cases-in-wuhan-china</u>
- 2. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A Novel Coronavirus from Patients with Pneumonia in China, 2019. 24 January 2020. New England Journal of Medicine.
- 3. Letko M, Munster V. Functional assessment of cell entry and receptor usage for lineage B β-coronaviruses, including 2019-nCoV. bioRxiv. 22 January 2020. 915660.
- 4. 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. 24 January 2020.
- 5. Chan JF-W, Yuan S, Kok K-H, To KK-W, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. The Lancet. 24 January 2020.
- Chinese Center for Disease Control and Prevention. Epidemic update and risk assessment of 2019 Novel Coronavirus 28 January 2020 [cited 29 January 2020]. Available from: <u>http://www.chinacdc.cn/yyrdgz/202001/P020200128523354919292.pdf</u>
- World Health Organization (WHO). Novel Coronavirus (2019-nCoV) Situation Report 7 2020 [28 January 2020]. Available from: <u>https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200127sitrep-7-2019--ncov.pdf?sfvrsn=98ef79f5_2
 </u>
- World Health Organization (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: <u>https://www.who.int/news-room/detail/23-01-2020-statement-on-themeeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-ofnovel-coronavirus-(2019-ncov)
 </u>
- 9. 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.
- 10. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. The Lancet. 29 January 2020.
- 11. European Centre for Disease Prevention and Control (ECDC). Operational tool on rapid risk assessment methodology: ECDC; 2019. Available from: <u>https://www.ecdc.europa.eu/sites/default/files/documents/operational-tool-rapid-risk-assessment-methodolgy-ecdc-2019.pdf</u>
- 12. Taiwan Centers for Disease Control. Central Epidemic Command Center (CECC) announces 1 indigenous case of 2019 novel coronavirus (2019-nCoV) infection in Taiwan. Health agencies proceeds with prevention measures 2020 [29 January 2020]. Available from: https://www.cdc.gov.tw/En/Bulletin/Detail/aUHeydo4xe02EGThyPhckQ?typeid=158
- 13. 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_ygxx/content/post_2876926.html.
- 14. People.cn. #New coronavirus pneumonia latency 2020 [updated 21 January 2020]. Available from: <u>https://s.weibo.com/weibo?q=%23%E6%96%B0%E5%9E%8B%E5%86%A0%E7%8A%B6%E7%97%85</u> <u>%E6%AF%92%E8%82%BA%E7%82%8E%E6%BD%9C%E4%BC%8F%E6%9C%9F%23&from=default</u>
- 15. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia. The New England Journal of Medicine. 29 January 2020.
- 16. Read JM, Bridgen JR, Cummings DA, Ho A, Jewell CP. Novel coronavirus 2019-nCoV: early estimation of epidemiological parameters and epidemic predictions. medRxiv. 23 January 2020.20018549.
- 17. 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: <u>https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/news--wuhan-coronavirus/</u>
- 18. Leung G, Wu J. Real-time nowcast and forecast on the extent of the Wuhan CoV outbreak, domestic and international spread. 2020. Media Conference 27 January 2020. Li Ka Shing Faculty of Medicine, University of Hong Kong.
- 19. 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/
- 20. Leung K, Wu J, Leung G. Nowcasting and forecasting the Wuhan 2019-nCoV outbreak 2020 [21 January 2020]. Available from: <u>https://files.sph.hku.hk/download/wuhan_exportation_preprint.pdf</u>

- 21. 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
- 22. Rambaut A. Phylogenetic analysis of nCoV-2019 genomes 27-Jan-2020 2020 [cited 29 January 2020]. Available from: <u>http://virological.org/t/phylodynamic-analysis-of-ncov-2019-genomes-27-jan-2020/353</u>
- 23. Andersen K. Clock and TMRCA based on 27 genomes Novel 2019 coronavirus 2020 [cited 29 January 2020]. Available from: <u>http://virological.org/t/clock-and-tmrca-based-on-27-genomes/347</u>
- 24. Bayerisches Landesamt fur Gesundheit und Lebensmittelsicherheit. Neuartiges Coronavirus 2019-nCoV in Wuhan 2020 [cited 29 January 2020]. Available from: <u>https://www.lgl.bayern.de/gesundheit/infektionsschutz/infektionskrankheiten_a_z/coronavirus/2019_ncov.</u> <u>htm#erster</u>
- 25. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. The Lancet. 24 January 2020.
- 26. World Health Organization (WHO). Infection prevention and control during healthcare when novel coronavirus (nCoV) infection is suspected. Interim Guidance. Geneva 2020. WHO/2019nCoV/IPC/v2020.1. Available from: <u>https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected</u>
- 27. Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797-e.
- 28. World Health Organization (WHO). Laboratory testing for 2019 novel coronavirus (2019-nCoV) in suspected human cases 2020 [17 January 2020]. Available from: <u>https://www.who.int/publications-detail/laboratory-testing-for-2019-novel-coronavirus-in-suspected-human-cases-20200117</u>
- 29. 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: <u>https://www.who.int/docs/default-source/coronaviruse/wuhan-virus-assay-v1991527e5122341d99287a1b17c111902.pdf?sfvrsn=d381fc88_2</u>
- 30. European Centre for Disease Prevention and Control (ECDC). Case definition and European surveillance for human infection with novel coronavirus (2019-nCoV) [30 January 2020]. Available from: <u>https://www.ecdc.europa.eu/en/case-definition-and-european-surveillance-human-infection-novel-coronavirus-2019-ncov</u>
- 31. 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
- 32. World Health Organization (WHO). Global Surveillance for human infection with novel coronavirus (2019nCoV) 2020 [21 January 2020]. Available from: <u>https://www.who.int/docs/default-</u> <u>source/coronaviruse/20200121-global-surveillance-for-2019-ncov.pdf?sfvrsn=9d82f528_4&download=true</u>
- 33. European Centre for Disease Prevention and Control (ECDC). 2019 novel coronavirus (nCoV) disease data Reporting Protocol. Version 1, 27 January 2020.
- 34. US Centers for Disease Control and Prevention (CDC). 2019 Novel Coronavirus, Wuhan, China Information for Travelers 2020 [cited 2020 29 January 2020]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/travelers/index.html
- 35. World Health Organization (WHO). Risk communication and community engagement readiness and initial response for novel coronaviruses (nCoV) 2020 [17 January 2020]. Available from: <u>https://www.who.int/publications-detail/risk-communication-and-community-engagement-readiness-and-initial-response-for-novel-coronaviruses-(-ncov)</u>
- 36. 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.
- 37. European Centre for Disease Prevention and Control (ECDC). Entry and exit screening measures 2014 [30 January 2020]. Available from: <u>https://www.ecdc.europa.eu/sites/default/files/media/en/publications/Publications/Ebola-outbreak-technicalreport-exit-entry-screening-13Oct2014.pdf</u>
- 38. 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.
- 39. Gunaratnam PJ, Tobin S, Seale H, Marich A, McAnulty J. Airport arrivals screening during pandemic (H1N1) 2009 influenza in New South Wales, Australia. Medical Journal of Australia. 2014;200(5):290-2.
- 40. 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.

- 41. European Centre for Disease Prevention and Control (ECDC). Public health management of persons having had contact with novel coronavirus cases in the European Union 2020 [cited 30 January 2020]. Available from: https://www.ecdc.europa.eu/en/publications-data/public-health-management-persons-having-had-contact-novel-coronavirus-cases
- 42. 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) 2020 [updated January 2020]. Available from: https://www.ecdc.europa.eu/sites/default/files/documents/infectious-diseases-transmitted-on-aircrafts-ragida-risk-assessment-guidelines.pdf
- 43. World Health Organization (WHO). Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected 2020 [30 January 2020]. Available from: <u>https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected</u>
- 44. World Health Organization (WHO). Infection prevention and control during healthcare when novel coronavirus (nCoV) infection is suspected 2020 [17 January 2020]. Available from: <u>https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected</u>
- 45. World Health Organization (WHO). Infection prevention and control of epidemic-and pandemic prone acute respiratory infections in healthcare. WHO guidelines 2014 [17 January 2020]. Available from: https://www.who.int/csr/bioriskreduction/infection_control/publication/en/
- 46. 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.
- 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.
- 48. Platform for European Preparedness Against (Re-)emerging Epidemics. Press release European response to outbreak with novel Coronavirus in China 2020 [cited 29 January 2020]. Available from: https://www.prepare-europe.eu/News/News-items/ID/1209
- 49. International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC). Novel coronavirus (nCoV) acute respiratory infection clinical characterisation data tool 2020 [cited 29 January 2020]. Available from: https://isaric.tghn.org/site_media/medialibrary/2020/01/ISARIC_nCoV_CRF_V1.2_28Jan2020.pdf
- 50. World Health Organization (WHO). Household transmission investigation protocol for 2019-novel coronavirus (2019-nCoV) infection 2020 [cited 29 January 2020]. Available from: <u>https://www.who.int/publications-detail/household-transmission-investigation-protocol-for-2019-novel-coronavirus-(2019-ncov)-infection</u>