



EU HEALTHY GATEWAYS JOINT ACTION
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PREPAREDNESS AND ACTION AT POINTS OF ENTRY
(PORTS, AIRPORTS, GROUND CROSSINGS)



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Interim advice for preparedness and response to cases of COVID-19 at points of entry in the European Union (EU)/EEA Member States (MS)

Public health measures at points of entry

Version 3

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Summary of recent changes

The current update includes the following changes:

- Name of disease changed to “Coronavirus Disease 2019 (COVID-19)” replacing “2019-nCoV”
- Updated advice in response to a confirmed case of COVID-19 on board a cruise ship
- Updated advice in case of an outbreak of COVID-19 with on-going transmission on board a cruise ship

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Introduction

This interim advice was prepared after a request from the European Commission's Directorate-General for Health and Food Safety (DG SANTE). An ad-hoc working group was established with members from the EU HEALTHY GATEWAYS joint action consortium. Names and affiliations of the working group members are listed at the end of the document.

The working group produced the following advice, considering current evidence, the temporary recommendations from the World Health Organization (WHO) (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance>) and the technical reports of the European Centre for Disease Prevention and Control (ECDC) (<https://www.ecdc.europa.eu/en/coronavirus/guidance-and-technical-reports>) about COVID-19 (as of 19 February 2020).

The scope of the advice provided in this document is to assist public health authorities in developing their short-term and long-term national and local preparedness plans. It further contains useful advice for the air and the maritime transport sectors.

This version of advice addresses issues of air and maritime transportation. There are also rail connections between China and Europe. The working group will address issues for ground crossings in the future version of the advice.

1. Strengthening measures at points of entry for detection of acute respiratory infection due to COVID-19

a. Strengthening measures for detection of ARI due to COVID-19 on board aircrafts arriving from affected area²

It is advised that EU MS identify the airlines operating direct or indirect flight connections with affected areas, as well as their flight schedules.

These airlines can be requested by EU MS: i) before landing in an EU airport, to arrange for completion of the Public Health Passenger Locator Form (PLF) for all travellers on board the aircraft arriving from affected areas, who have ARI symptoms during the flight and their contacts as described in the following paragraph (IHR 2005, Article 23)⁵ (EU MS may decide to ask for completion of the PLF not only from symptomatic travellers and contacts, but from all individuals on board the aircraft), ii) to raise awareness of their cabin crew staff about the detection of ARI (fever and sudden onset of respiratory infection with one or more of the following symptoms: shortness of breath, cough or sore throat) among the travellers and finally, iii) remind their crew staff about the procedures for informing air traffic control that a suspect case of a communicable disease is on board, so that the public health authority at the destination can be advised in a timely manner (IHR 2005, Articles 28 and 38)⁵.

Symptomatic travellers and their contacts will disembark the aircraft according to instructions received from the competent authorities in order to minimize the risk of spreading the disease. Symptomatic travellers will be assessed for their condition and exposure at the designated facility of the airport and if they fulfil the definition of a suspect case, will be transferred to a hospital. Management of contacts will take place in accordance with instructions from the public health authority as described in paragraph 3.

Public Health Passenger Locator Form

Completion of the PLF can be requested for the adult persons on board the aircraft arriving on a direct or indirect flight connection from an affected area, who have developed symptoms of ARI (fever or feeling feverish and sudden onset of respiratory infection with one or more of the following symptoms: shortness of breath/breathing difficulties, cough or sore throat)⁶ and all other persons on board. EU MS may decide to ask for completion of the PLF not only from symptomatic travellers and contacts, but from all individuals on board the aircraft. The completed PLFs can be collected and delivered to the competent staff upon arrival at the airport.

The PLF has been developed by a working group established by WHO to facilitate rapid collection of passenger contact information that can be used for case investigation and contact tracing⁷.

²

Affected areas are defined by WHO in the latest statement of the International Health Regulations (2005) Emergency Committee regarding the outbreak of COVID-19 published in: <https://www.who.int/>.

Information collected should be handled according to the legal framework for protection of personal data.

ECDC has published guidelines for contact tracing of passengers in the event that a case of MERS-CoV is identified and assessed to have been infectious during flight⁸. Guidance regarding contact tracing is also provided by the EU AIRSAN project in the document “Contact Tracing – Collaboration between the Public Health and the Aviation Sector”⁹. Guidance from ECDC about “Public health management of persons having had contact with novel coronavirus cases in the European Union” can be downloaded at the following link: <https://www.ecdc.europa.eu/en/publications-data/public-health-management-persons-having-had-contact-novel-coronavirus-cases>

The EU HEALTHY GATEWAYS joint action has gathered PLFs in different languages from the joint action consortium, as well as those posted in the CAPSCA website. The PLF in different languages can be downloaded at the following link:

https://www.healthygateways.eu/Portals/0/plcdocs/Passenger_public_health_locator_forms.zip

The PLF can be completed in English or another language that persons of the authorities who will use the information in the completed PLF can understand.

Health Part of the Aircraft General Declaration

An EU MS can request the submission of the Health Part of the Aircraft General Declaration from aircrafts arriving from an affected area directly or through indirectly connecting flights from affected areas, when there is a suspected case of infectious disease on board the aircraft (IHR 2005, Article 38)⁵. The Health Part of the Aircraft General Declaration can be downloaded at the following link: https://www.who.int/csr/ihr/Annex9_en.pdf

Educate cabin crew

Crews should be trained to: a) recognise the signs and symptoms of ARI (fever and sudden onset of respiratory infection with one or more of the following symptoms: shortness of breath, cough or sore throat); b) understand hygiene measures that prevent the spread of ARI: hand washing, respiratory etiquette during coughing and sneezing, social distancing, waste disposal, use of medical masks, elimination of handshaking; c) recognise and report individuals with symptoms so that this information is sent to the next airport using the *Health Part of the Aircraft General Declaration*; d) properly use Personal Protective Equipment (PPE) such as masks and gloves.

Equipment and supplies

Aircrafts should carry universal precaution kits including as per International Civil Aviation (ICAO): dry powder that can convert small liquid spills into a sterile granulated gel, germicidal disinfectant for surface cleaning, skin wipes, face/eye mask (separate or combined), gloves (disposable) and a protective apron³.

³ <https://www.icao.int/MID/Documents/2013/capsca-mid3/ICAOHealthRelatedSARPsandguidelines.pdf>

b. Strengthening measures for detection of ARI due to COVID-19 on board ships arriving from affected area

Maritime Declaration of Health

EU MS are advised to require the submission of the Maritime Declaration of Health (MDH) from all arriving ships that have visited a port in an affected country within the previous 30 days. Captains should be requested to note in the MDH the ports that have been visited in the affected areas and to report any case of disease which is suspected to be of an infectious nature, or report zero cases if there is no infection on board the ship, as required in the IHR 2005 Article 37⁵.

Surveillance of infectious diseases should take place on board at the ship hospital accommodation/medical centre. The competent authority of the next port of call must always be informed if a suspect case of an infectious disease or death has occurred on board (IHR 2005, Article 28)⁵. In accordance with the International Health Regulations (2005), to determine if the necessary capacity for transportation, isolation, laboratory diagnosis and care of the suspect case/cluster of cases of COVID-19 is available at the port. The ship may be asked to proceed to another port in close proximity if this capacity is not available, or if warranted by the medical status of the suspect case/cluster of cases of COVID-19.

It is important that all arrangements are conducted as quickly as is feasible to minimise the stay of the symptomatic suspect case/cases on board the ship.

Education, hygiene measures and supplies

It is advised that EU MS identify the ships arriving from an affected area and request that the ship operators: a) raise awareness among crew about the detection of ARI due to COVID-19; b) permanently keep ships free of sources of infection or contamination, in accordance with IHR 2005, Article 24⁵; and c) have available on board adequate medical supplies and equipment to respond to an outbreak as described in the WHO (2007) recommended medicines and equipment by the *International Medical Guide for Ships* 3rd edition.

c. Enhancing measures for detection of ARI due to COVID-19 at medical facilities at the point of entry (port and airport)

Staff at the medical facilities and/or the public health authority staff of the point of entry should receive up-to-date information regularly about COVID-19 (e.g. outbreak evolving, symptoms, epidemiology), so as to be alerted and consider the possibility of persons presenting with ARI to have been exposed to an affected area of travellers who may seek medical advice at the medical facility.

Staff should be trained to implement the contingency plan at the point of entry and should be familiar with the communication plan, who to contact in case a suspected traveller fulfilling the epidemiological criteria has been identified and the Standard Operating Procedures (SOPs) included in the contingency plan should be followed.

WHO advises that the suspect patient should be asked to wear a medical mask as soon as they are identified and be evaluated in a private room with the door closed, ideally in an isolation room if available. Any person entering the room should apply standard precautions, contact precautions, droplet precautions and airborne precautions^{10,11}. If not enough respirators are available (e.g. for airborne precautions), droplet precautions should be applied (e.g. medical mask). In this specific case, the limitations and risks connected to its use should be assessed on a case-by-case basis.

Healthcare workers in contact with a suspect case of COVID-19 should wear PPE for contact, droplet and airborne transmission of pathogens: FFP2 or FFP3 respirator tested for fitting, eye protection (e.g. goggles or face shield), a long-sleeved water-resistant gown and gloves¹². Disposable PPE should be treated as potentially infectious material and disposed of in accordance with the relevant rules. Non single-use PPE should be decontaminated in accordance with the manufacturer's instructions.

Medical staff should keep at least 1-meter distance between suspected patients and other patients. All patients should be asked to practice respiratory etiquette, covering their nose and mouth while coughing or sneezing with a tissue. Hand hygiene should take place after contact with respiratory secretions¹³.

Detailed advice can be found at: [https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-\(ncov\)-infection-is-suspected](https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected) and <https://www.ecdc.europa.eu/en/publications-data/infection-prevention-and-control-care-patients-2019-ncov-healthcare-settings>.

2. Information strategies for prevention of respiratory infections at points of entry

Health information to travellers arriving from or departing to affected area

Informative materials (leaflets, banners, posters, electronic slides etc.) can be prepared and distributed to travellers arriving from or departing to affected areas.

The materials should include information about: symptoms, hygiene advice (hand washing, coughing and sneezing etiquette, disposal of dirty tissues, social distancing etc.), special considerations for persons vulnerable to ARI complications⁴, promptly seeking medical advice if relevant symptoms develop within 14 days after visiting affected area and informing the health care provider about their history of travel to affected areas, who to contact for medical advice, and avoiding close contact with live or dead farm or wild animals for persons visiting affected areas.

WHO advises the following for the general public:

- a) Frequently clean hands by using soap and water or an alcohol-based hand rub;

⁴ Preliminary information suggests that older adults and people with underlying health conditions may be at increased risk for severe disease from COVID-19: <https://wwwnc.cdc.gov/travel/notices/alert/novel-coronavirus-china>

- b) When coughing and sneezing cover mouth and nose with a tissue or a flexed elbow – throw tissue away immediately and wash hands;
- c) Avoid close contact with anyone who has fever and cough;
- d) Seek medical care if persons develop fever, cough and difficulty breathing and share previous travel history with the health care provider;
- e) When visiting live markets in areas currently experiencing cases of COVID-19, avoid direct unprotected contact with live animals and surfaces in contact with animals;
- f) The consumption of raw or undercooked animal products should be avoided. Raw meat, milk or animal organs should be handled with care, to avoid cross-contamination with uncooked foods, as per good food safety practices¹⁴.

WHO infographics are available at the following link: <https://www.who.int/health-topics/Coronavirus>

The ECDC brochure providing advice for travellers is available at the following link: <https://www.ecdc.europa.eu/en/publications-data/advice-travellers-outbreak-novel-coronavirus-2019-ncov>

Staff at the point of entry

Public health authorities, travel health clinics, travel companies, travel agencies and conveyance operators should receive up-to-date information about COVID-19. Trained staff to implement the contingency plan described in paragraph 3 should be available, as well as a stockpile of supplies.

It is advised that non-public health staff and other service providers at points of entry such as security, police, port state control, harbour pilots and cleaning services receive up-to-date information about the COVID-19 outbreak.

3. Contingency plan at airports and ports

Contingency plans for acute respiratory infections should be in place and the SOPs included in the plan should be followed when identifying a traveller who fulfils the criteria of a suspect case as follows:

According to ECDC, the definition of a suspect case requiring diagnostic testing is as follows¹⁵:

Patients with acute respiratory infection (sudden onset of at least one of the following: cough, sore throat, shortness of breath) requiring hospitalisation or not, **AND** in the 14 days prior to onset of symptoms, met at least one of the following three epidemiological criteria: were in close contact with a confirmed or probable case of COVID-19; **or** had a history of travel to [areas with presumed ongoing community transmission](#); **or** worked in or attended a health care facility where patients with COVID-19 were being treated.

When the clinical and epidemiological criteria of a suspect case are fulfilled, then the patient should be transferred directly to the health care facility or placed in a designated facility at the point of

entry for temporary isolation until transferred to the health care facility. The PLF should be collected before disembarkation of travellers. Guidance on establishing public health assessment interview spaces at points of entry can be found in the WHO Handbook for the Management of Public Health Events in Air Transport https://www.who.int/ihr/publications/9789241510165_eng/en/.

The WHO Interim guidance for “Management of ill travellers at Points of Entry – international airports, seaports and ground crossings – in the context of COVID-19 outbreak” can be found at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/points-of-entry-and-mass-gatherings>

Contact tracing on aircrafts

It is advised that contact tracing activities begin immediately after a suspect case of COVID-19 is identified on board without waiting for the laboratory results. The contacts of a possible or confirmed case should be assessed for their exposure and classified.

A contact in an aircraft is any person sitting within two seats (in any direction) of the suspect case of COVID-19, travel companions or persons providing care, and crew members serving in the section of the aircraft where the index case was seated, if severity of symptoms or movement of the case indicate more extensive exposure, passengers seated in the entire section or all passengers on the aircraft may be considered close contacts¹⁶.

An algorithm (Annex 1) that can be used by the public health authorities for decision making in response to an event of a suspect case of COVID-19 on board an aircraft can be downloaded from: https://www.healthygateways.eu/Portals/0/plcdocs/Flow_chart_Aircrafts_4_2_2020.pdf

Contact tracing on ships

All persons on board a ship should be assessed for their exposure and classified as close contacts (high risk exposure) or casual contacts (low risk exposure). Two different definitions of contacts should be used depending on the number of confirmed cases identified on board.

For the purpose of beginning contact tracing immediately and avoiding delays of travels, the following definitions have been developed to be applied on board ships, adapting the definitions by WHO and ECDC^{16,17}:

- A. If only one case or a cluster of a few cases (e.g. persons sharing the same cabin) have been identified on board, then the following definitions of contacts should be applied:

Close contact (high risk exposure):

- a person who has stayed in the same cabin with a suspect/confirmed COVID-19 case;
- a cabin steward who cleaned the cabin of a suspect/confirmed COVID-19 case;
- a person who has had close contact within one meter, or was in a closed environment with a suspect/confirmed COVID-19 case (for passengers this may include participating in common activities on board or ashore, participating in the same immediate travelling group, dining at the same table; for crew members this may include working together in the same area of the ship or friends having face to face contact);

- a healthcare worker or other person providing direct care for a COVID-19 suspect/confirmed case.

Casual contact (low risk exposure):

Casual contacts are difficult to define on board a confined space such as a cruise ship, therefore, it is advised to consider as casual contacts all travellers on board the ship who do not fulfill the criteria for the definition of a close contact.

- B. If an outbreak on board a cruise ship occurs as a result of on-going transmission on board the ship (more than one case not staying in the same cabin), the assessment of exposure should be done among crew members and among passengers. If it is difficult to identify who the close contacts are, then all travellers on board could be considered as close contacts having had high risk exposure. However, this may be modified depending on the risk assessment of individual cases and their contacts conducted by the public health authorities.

A flow diagram (Annex 2) for the management of a suspect case and contacts, as well as the procedures of free pratique from the time of identification of a suspect case, until the ship will be allowed to depart can be downloaded from the following link:

https://www.healthygateways.eu/Portals/0/plcdocs/Flow_chart_Ships_3_2_2020.pdf

Management of contacts

The passenger or crew member that meets the definition of a suspect case if possible should be asked to provide information about the places that he/she visited and about his/her contacts, including the period from one day before the onset of symptoms on board the ship or ashore. This information will be used to identify the closed contacts.

Management of the close contacts

All travellers that fulfill the definition of a “close contact” should be asked to complete the Passenger/Crew Locator Forms (PLFs) (a word version can be downloaded from: <https://www.healthygateways.eu/LinkClick.aspx?fileticket=U133sZdEEH0%3d&tabid=98&portalid=0>) and be listed with their contact details and information regarding the places where they will be staying for the following 14 days. All close contacts should remain on board the ship in their cabins or at a facility ashore (in case the ship has docked at the turnaround port and if feasible), in accordance with instructions received by the competent authorities, until the laboratory results for the suspect case are available.

If the laboratory results of the suspect case are positive, then all close contacts should be quarantined ashore and not allowed to travel internationally, unless this has been arranged following the WHO advice for repatriation. Considerations for quarantine measures are given in the WHO travel advice¹⁸: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/travel-advice>. The above quarantine measures are all subject to the requirements of the local competent health authority.

According to the ECDC technical report, quarantine measures will include: active monitoring by the public health authorities for 14 days from last exposure, daily monitoring for COVID-19 symptoms (including fever of any grade, cough or difficulty breathing), avoiding social contact, avoiding travel, and remaining reachable for active monitoring¹⁶. The close contacts should immediately inform the health services in the event of any symptom appearing within 14 days. If no symptoms appear within 14 days of their last exposure, the contact person is no longer considered to be at risk of developing COVID-19¹⁶. Implementation of these specific precautions may be modified depending on the risk assessment of individual cases and their contacts conducted by the public health authorities.

Management of the casual contacts

If the laboratory results of the suspect case are positive, then casual contacts should be provided with the following information and advice:

- 1) All casual contacts should be requested to complete PLFs with their contact details and the locations where they will be staying for the following 14 days. Implementation of these precautions may be modified depending on the risk assessment of individual cases and their contacts conducted by the public health authorities. Further instructions may be given by the health authorities.
- 2) Information should be provided to all casual contacts as follows:
 - Details of symptoms and how the disease can be transmitted.
 - They should be asked to self-monitor for COVID-19 symptoms, including fever of any grade, cough or difficulty breathing, for 14 days from their last exposure.
 - They should be asked to immediately self-isolate and contact health services in the event of any symptom appearing within 14 days. If no symptoms appear within 14 days of their last exposure, the contact person is no longer considered to be at risk of developing COVID-19¹⁶.

The port health authority, after conducting an inspection and risk assessment according to IHR (2005) Article 27 will decide on the health measures to be taken on board the ship. In the event that the affected cruise ship where the COVID-19 confirmed case was identified calls at a port other than the turn-around port, the authority may decide in consultation with the ship owner and if feasible, to end the cruise if health measures (cleaning and disinfection) cannot be satisfactorily completed while travellers are on board the ship. Infectious waste should be disposed of in accordance with the port authorities' procedures. The next cruise can start when the thorough cleaning and disinfection has been satisfactorily completed. If on-going transmission occurred on board the ship, cruise lines are advised to explore the possibility of starting the next cruise with new crew, if this is feasible.

Standard Operating procedures

The contingency plan at the PoE should have SOPs for:

- Interviewing symptomatic travellers (questionnaire asking for name, gender, date of birth, telephone, email address, country of residence, patient symptoms, date of first symptom)

onset, human exposures in the 14 days before illness onset, if patient travelled within the last 14 days domestically or internationally, countries visited, if the patient visited China and had exposure to animals in the 14 days before illness onset, if animals were handled, nature of contact with animals, contact with anyone with suspect or confirmed COVID-19, if patient attended festival or mass gathering, if patient exposed to person with similar illness, location of exposure, if patient visited or was admitted to inpatient health, if patient visited outpatient treatment facility, if patient visited traditional healer, patient occupation (specify location/facility), if patient visited live animal market)

- Case management at the point of entry^{6,12,13,19}
- Contact tracing (relevant advice can be found at EU HEALTHY GATEWAYS advice for ship operators, at ECDC guidelines for MERS-CoV and for COVID-19^{8,16})
- Communication and reporting plan at the local point of entry level, intermediate level and national level
- Cleaning and disinfection for the point of entry facilities and instructions for use of PPE by Point of Entry (PoE) staff. Environmental persistence of SARS-CoV-2 is currently unknown. SARS-CoV may survive in the environment for several days. MERS-CoV may survive >48hours at 20°C, 40% relative humidity comparable to an indoor environment, on plastic and metal surfaces²⁰ and SARS-CoV up to 7 days²¹
- Use of equipment (e.g. diagnostic body temperature measuring devices) according to manufacturer instructions, including calibration and checks for accuracy
- Transportation of symptomatic persons to a health care facility
- Public health observation, temporary isolation space

Training materials for preparedness and response at ports and at airports

The training materials of the following training courses that were conducted in the framework of the EU HEALTHY GATEWAYS joint action in 2019, are available to the EU MS:

- Training of the trainers' course "Preparedness and response to public health events at airports"
- Training of the trainers' course "Preparedness and response to public health events at ports"

The training materials of the training courses are available to the EU MS and access can be given by the EU HEALTHY GATEWAYS joint action (contact email: info@healthygateways.eu).

4. Entry screening

Evidence for effectiveness of entry screening based on past experience

As it has been described in WHO technical guidance during past public health events, entry or exit screening measures are generally conducted as a two-step process: primary screening and secondary screening^{22,23}. Primary screening includes an initial assessment by personnel, who may not necessarily have public health or medical training. Activities include visual observation of travellers for signs of the infectious disease, measurement of travellers' body temperature, and completion of a questionnaire by travellers asking for presence of symptoms and/or exposure to the infectious agent. Travellers who have signs or symptoms of the infectious disease, or have been potentially exposed to the infectious agent, are referred to secondary screening. Secondary screening should be carried out by personnel with public health or medical training. It includes an in-

depth interview, a focused medical and laboratory examination and second temperature measurement²⁴.

A systematic review of the literature and a survey were conducted in the framework of a training course that was organised by DG SANTE in 2019 about entry/exit screening border measures²⁴. The review examined structures and processes currently in place in EU MS and worldwide, as well as the strengths, limitations and lessons learnt from applying entry/exit screening at points of entry (ports, airports, ground crossings). The following are summary conclusions that have been extracted from the literature review and concern the lessons learnt from entry and exit screening measures applied during the Influenza Pandemic (H1N1), SARS and 2014-2015 Ebola Virus Disease (EVD) outbreak. It should be noted that the conclusions may not be directly applicable to the 2019-nCoV acute respiratory disease outbreak.

1. Evidence clearly showed **ineffectiveness of entry screening measures to identify cases** during past public health emergencies:
 - a. Entry screening measures for SARS did not detect any confirmed SARS cases in Australia, Canada and Singapore²⁵⁻³⁰.
 - b. Thousands of arriving travellers were screened, but no confirmed case was identified.
 - c. Entry screening measures in various countries worldwide during 2009 Influenza Pandemic (H1N1) showed zero or extremely low percentages of confirmed cases out of the total numbers of travellers that passed through entry screening measures in various countries worldwide^{25,26 31 27-30}.
2. There is **poor evidence for only a short delay of a few days in introducing cases** of 2009 Influenza Pandemic (H1N1) to countries implementing entry screening measures.
 - a. One study indicated the delay of introduction of 2009 Influenza Pandemic (H1N1) to the countries implementing entry screening by about one week, but there were limitations in the methodology used³².
3. **Limitations** of entry screening:
 - a. False declarations by passengers about exposure and disease signs and symptoms²⁷.
 - b. Antipyretic drugs can be used by travellers to conceal fever²⁷.
 - c. Questionnaires asking about exposure and thermal scanning machines, were nonspecific for SARS²⁹.
 - d. The frequency of SARS among international passengers arriving or departing was low resulting in low positive predictive value²⁹.
 - e. The de facto point of entry into the healthcare system for travellers with serious infectious diseases was found to be the in-country, acute care facilities (hospitals, clinics, and physicians' offices) and not the airports²⁹.
 - f. Language barriers - flight announcements about screening measures and requests for declaring exposures were not understood by passengers²⁷.
4. **Adverse effects** of entry and exit screening
 - a. High cost of screening measures²⁷⁻²⁹.
 - b. Investing in screening measures reduces the resources from other effective measures^{29,30}.
 - c. May give to the public a false sense of security³³.

5. However, evidence demonstrated that **several beneficial “secondary” effects** of entry/exit screening measures implementation have been reported:
 - a. Obtaining contact information of travellers to be used if needed for contact tracing or public health observation purposes^{34,35}.
 - b. Educating and informing the traveller passing through the screening points about the public health risks and prevention measures³⁴.
 - c. Linking the traveller with public health authorities for the duration of the incubation period to facilitate health monitoring and prompt referral for care if they became ill³⁴.
 - d. Facilitating rapid and appropriate clinical care for ill travellers³⁴.
 - e. Maintaining confidence that air travel is safe³⁴.
 - f. Enabling humanitarian and public health organisations to sustain travel to affected areas by regular commercial airline flights, maintaining continued flow of passenger traffic and resources needed for the response to the affected region³⁶⁻³⁸.
 - g. During the large EVD outbreak of 2013-2016 in West Africa, exit screening in EVD affected countries, laid the foundation for future reconstruction efforts related to borders and travel, including IHR core capacities (e.g. regional surveillance systems, cross-border coordination)³⁶.
 - h. May have helped dissuade ill persons from travelling by air³⁹.
 - i. Preserving public confidence^{27,29,40}.
 - j. Relieving political and social pressure and limiting negative economic consequences from travel and trade restrictions²⁷.
 - k. Help avoiding major economic, social and international impact which even a single imported SARS case may have³⁰.

The detailed literature review report can be downloaded from:

https://res.mdpi.com/d_attachment/ijerph/ijerph-16-04638/article_deploy/ijerph-16-04638-v2.pdf

Measures causing travel or trade restriction - legal obligations of EU MS

On the 30th of January 2020, the WHO Director-General declared that the outbreak of 2019-nCoV acute respiratory disease constitutes a Public Health Emergency of International Concern (PHEIC) and issued the temporary recommendations to all countries⁴¹. WHO does not recommend any travel or trade restriction based on the current information available.

According to the IHR 2005 Article 43, if a country have decided to implement public health measures including refusal of entry or departure of international travellers, baggage, cargo, containers, conveyances (aircrafts, ships trains etc.), goods, and the like, or their delay, for more than 24 hours, then the country must inform WHO within 48 hours about the public health rationale and justification of such measures⁵. WHO will review the justification and may request that the country reconsider their measures. WHO is required to share with other States Parties the information about measures and the justification received.

Moreover, according to Decision 1082/2013/EU, Articles 7, 9 *“When notifying an alert, the national competent authorities and the Commission shall promptly communicate through the Early Warning and Response System (EWRS) any available relevant information in their possession that may be*

useful for coordinating the response such as [...] public health measures implemented or intended to be taken at national level⁴². Where a Member State intends to adopt public health measures to combat a serious cross-border threat to health, it shall, before adopting those measures, inform and consult the other Member States and the Commission on the nature, purpose and scope of the measures, unless the need to protect public health is so urgent that the immediate adoption of the measures is necessary (Decision 1082/2013/EU, Articles 9, 11)”⁴².

Lessons learned during past PHEIC demonstrated that additional health measures beyond the WHO temporary recommendations harmed populations in affected areas by delaying missions for medical support, preventing access to supplies, food, and medical equipment, causing economic damages to affected countries and spreading fear and stigma.

Advice to EU MS about screening measures at borders

WHO issued temporary recommendations for exit screening at international airports and ports of the People’s Republic of China, with the aim of early detection of symptomatic travellers for further evaluation and treatment, while minimizing interference with international traffic⁴¹.

WHO indicates the following about entry screening: *“Advice for entry screening in countries/areas without transmission of the novel coronavirus 2019-nCoV that choose to perform entry screening: The evidence from the past outbreaks shows that effectiveness of entry screening is uncertain, but it may support risk communication strategy by providing information to travellers from affected countries/areas to reduce the general risk of acute respiratory infections, and to seek medical attention early if they develop symptoms compatible with the infection. During the current outbreak with the novel coronavirus 2019-nCoV, a number of exported cases were detected through entry screening implemented by some countries. Symptomatic cases may be detected through temperature screening at Point of Entry, for whom medical examination and laboratory tests will be conducted for confirmation. Temperature screening to detect potential suspect cases at Point of Entry may miss travellers incubating the disease or travellers concealing fever during travel and may require substantial investments. A focused approach targeting direct flights from affected areas could be more effective and less resource demanding. Currently the northern hemisphere (and China) is in the midst of the winter season when Influenza and other respiratory infections are prevalent. When deciding implementation of entry screening, countries need to take into consideration that travellers with signs and symptoms suggestive of respiratory infection may result from respiratory diseases other than 2019-nCoV, and that their follow-up may impose an additional burden on the health system. National policy and capacities should be taken into account during the decision-making process. If entry screening is implemented, temperature screening should always be accompanied by dissemination of risk communication messages at Points of Entry. This can be done through posters, leaflets, electronic bulletin, etc., aiming at raising awareness among travellers about signs and symptoms of the disease, and encouragement of health care seeking behavior, including when to seek medical care, and report of their travel history. Countries implementing temperature screening are encouraged to establish proper mechanism for data collection and analysis, e.g. numbers of travellers screened and confirmed cases out of screened passengers, and method of screening. Public health authorities should reinforce collaboration with airline operators for case management on board an aircraft and reporting, should a traveller with respiratory disease symptoms is detected, in*

accordance with the IATA guidance for cabin crew to manage suspected communicable disease on board an aircraft”.

The latest Rapid Risk Assessment from ECDC advises that “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. 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.”¹.

The scientific evidence demonstrates ineffectiveness of entry screening measures to stop the spread of disease as previously described. However, entry screening can support informative strategies to travellers and in combination with measures described in paragraphs 1, 2 and 3 can contribute to early identification and appropriate management of imported cases. Health measures should not cause unnecessary delays and should not interfere with international traffic and trade.

The decision should be taken by the EU MS after consideration of country-specific factors. To facilitate the decision making process, an **algorithm** following 5 steps has been developed in the framework of the training course organised by DG SANTE in January 2019. The decision making algorithm can be downloaded from: https://www.healthygateways.eu/Portals/0/plcdocs/15-Algorithm_EE_V4.pdf. Information currently available about the 2019-nCoV acute respiratory disease from WHO, ECDC, US CDC, as well as past experience from SARS-CoV and MERS-CoV can be used in applying the algorithm. It should be noted that currently there is limited knowledge about the 2019-nCoV acute respiratory disease and therefore, it is expected that in this initial stage decision making will involve significant uncertainty.

Training materials for entry and exit screening

DG SANTE organised the training programme ‘Evidence-based best practices on entry/exit screening for infectious diseases in humans’ to support countries participating in the Health Programme, to improve and better coordinate preparedness and response measures for serious cross-border health threats.

On 30-31 January 2019, the training course took place in Luxembourg, organized by DG SANTE and the Consumers, Health, Agriculture and Food Executive Agency (Chafea), with the support of the consortium of University of Thessaly (UTH), Robert Koch Institute (RKI) and the National Institute for Public Health and the Environment (RIVM).

The overall aim of the course was to build capacities and to foster cooperation between the public health/medical border authorities from EU MS, EU border control agencies and international organisations. The training course was designed in order to foster exchange of knowledge and practices on entry/exit screening for infectious diseases in humans and health measures at border

controls (at air, water and land border crossings), and to contribute to the implementation of Decision 1082/2013/EU and the International Health Regulations 2005 (IHR).

The training materials of the training course are available to the EU MS and access can be given by the EU HEALTHY GATEWAYS joint action (contact email: info@healthygateways.eu).

The EU HEALTHY GATEWAYS joint action is operating in an emergency mode and is available to provide technical or training support to EU MSs on issues related to health measures at points of entry.

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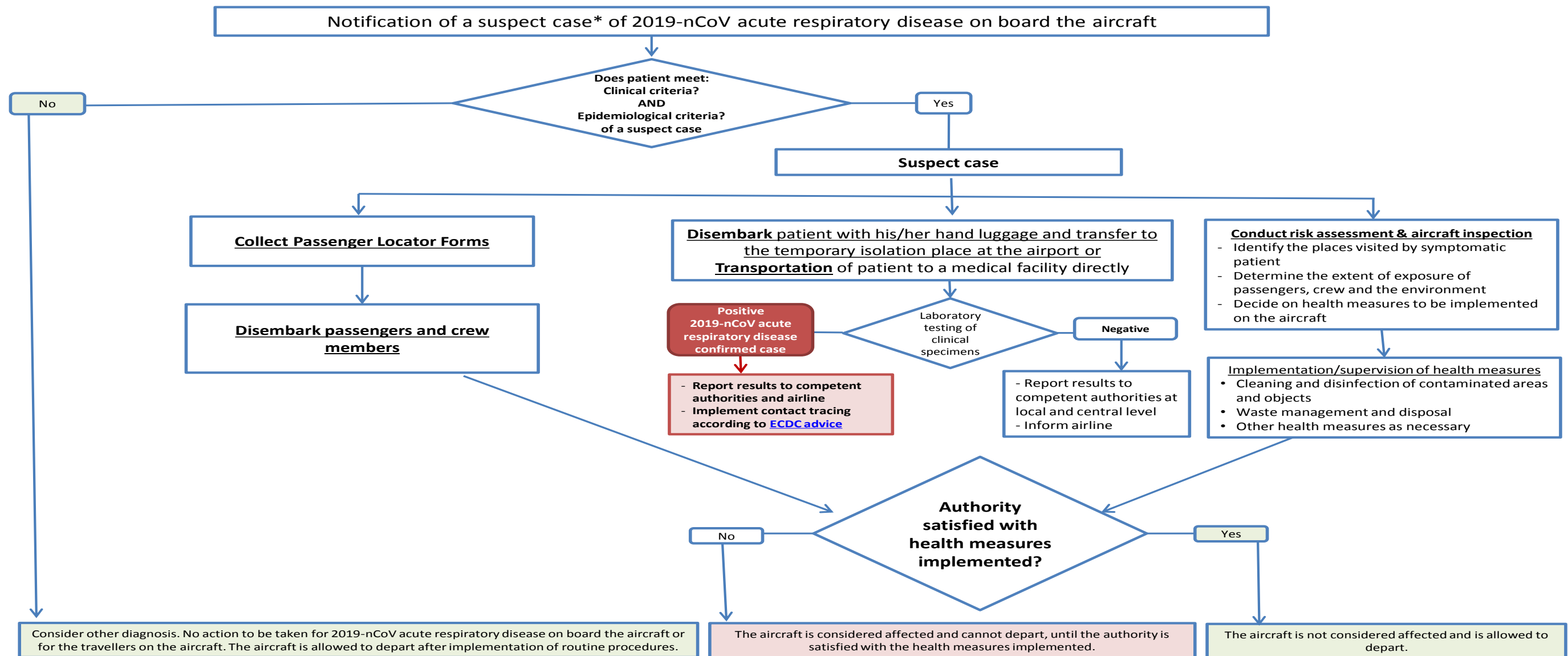
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The working group thanks the Cruise Lines International Association and its members for their input to the chapter about cruise ship travel.

For any questions or support related to the points of entry, please email info@healthygateways.eu

Annex 1 https://www.healthygateways.eu/Portals/0/plcdocs/Flow_chart_Aircrafts_4_2_2020.pdf

Algorithm for decision making in response to an event of a suspect case of 2019-nCoV acute respiratory disease on board an aircraft

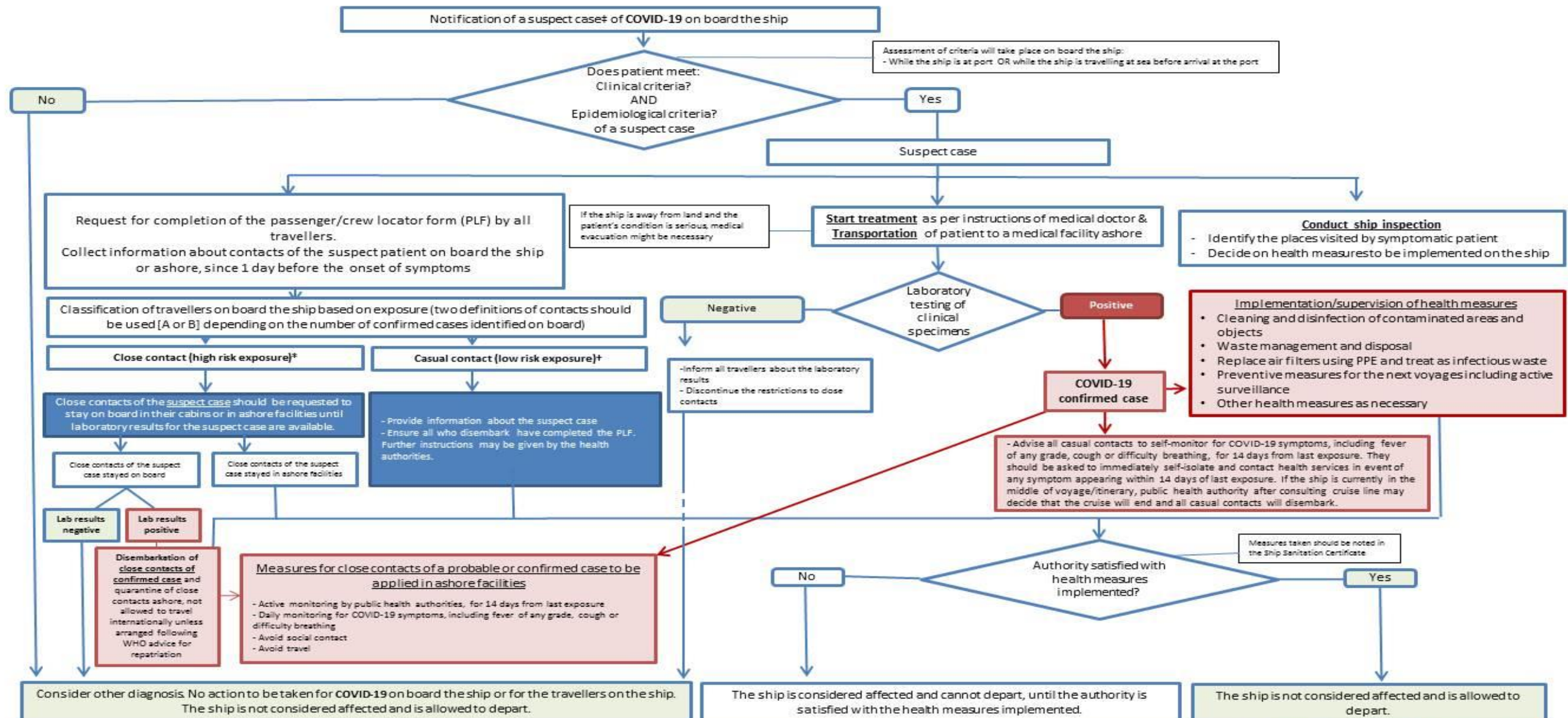


***Suspect case:**

Patients with acute respiratory infection (sudden onset of at least one of the following: cough, sore throat, shortness of breath) requiring hospitalisation or not, AND in the 14 days prior to onset of symptoms, met at least one of the following three epidemiological criteria: were in close contact with a confirmed or probable case of 2019-nCoV acute respiratory disease ; or had a history of travel to areas with presumed ongoing community transmission of 2019-nCoV acute respiratory disease; or worked in or attended a health care facility where patients with 2019-nCoV acute respiratory disease were being treated.

Annex 2 https://www.healthygateways.eu/Portals/0/plcdocs/Flow_chart_Ships_3_2_2020.pdf

Algorithm for decision making in response to an event of a suspect case of COVID-19 on board ships



#Suspect case:

Patients with acute respiratory infection (sudden onset of at least one of the following: cough, sore throat, shortness of breath) requiring hospitalisation or not, AND in the 14 days prior to onset of symptoms, met at least one of the following three epidemiological criteria: were in close contact with a confirmed or probable case of COVID-19; or had a history of travel to areas with presumed ongoing community transmission; or worked in or attended a health care facility where patients with COVID-19 were being treated.

A. If only one case or a cluster of a few cases (e.g. persons sharing the same cabin) have been identified on board, then the following contact definitions should be applied:

***Close contact (high risk exposure):**

- a person who has stayed in the same cabin with a suspect/confirmed COVID-19 case;
- a cabin steward who cleaned the cabin of a suspect/confirmed COVID-19 case;
- a person who has had close contact within one meter or was in a closed environment with a suspect/confirmed COVID-19 case (for passengers this may include participating in common activities on board or ashore participating in the same immediate travelling group; dining at the same table; for crew members this may include working together in the same ship area or friends having face to face contact);
- a healthcare worker or other person providing direct care for a COVID-19 suspect/confirmed case

†Casual contact (low risk exposure):

Casual contacts are difficult to define on board a confined space such as a cruise ship therefore, it is advised to consider as casual contacts all travellers on board the ship who do not fulfill the criteria of the close contact definition.

B. If an outbreak on board a cruise ship occurs, as a result of on-going transmission on board the ship (more than one case not staying in the same cabin):

The assessment of exposure should be done among crew members and among passengers. If it is difficult to identify who the close contacts are, then all travellers on board could be considered as close contacts* having had high risk exposure. However, this may be modified depending on the risk assessment of individual cases and their contacts conducted by the public health authorities



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(PORTS, AIRPORTS, GROUND CROSSINGS)



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References

1. European Centre for Disease Prevention and Control. 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, 2020.
2. World Health Organization. Emergencies preparedness, response - Recommended procedures for prevention and management of probable cases of SARS on International Cruise Vessels. 4 June 2003 2003. <https://www.who.int/csr/sars/travel/vessels/en/> (accessed 21/01/2020).
3. World Health Organization. Summary of SARS and air travel. 23 May 2003 2003. <https://www.who.int/csr/sars/travel/airtravel/en/> (accessed 21/1/2020).
4. World Health Organization. WHO Statement Regarding Cluster of Pneumonia Cases in Wuhan, China. 09 January 2020 2020. <https://www.who.int/china/news/detail/09-01-2020-who-statement-regarding-cluster-of-pneumonia-cases-in-wuhan-china> (accessed 10/1/2020).
5. World Health Organization. International health regulations (2005). Third ed. Geneva; 2016.
6. European Centre for Disease Prevention and Control. Laboratory testing of suspect cases of 2019 nCoV using RT-PCR 16 Jan 2020 2020. <https://www.ecdc.europa.eu/en/publications-data/laboratory-testing-suspect-cases-2019-ncov-using-rt-pcr> (accessed 20/01/2020).
7. World Health Organization. Strengthening health security by implementing the International Health Regulations (2005). Public health passenger locator card. 2020. https://www.who.int/ihr/ports_airports/locator_card/en/ (accessed 22 January 2020).
8. European Centre for Disease Prevention and Control. Risk assessment guidelines for infectious diseases transmitted on aircraft (RAGIDA). Middle East Respiratory Syndrome Coronavirus (MERS-CoV). January 2020 Stockholm: ECDC, 2020.
9. AIRSAN – Coordinated action in the aviation sector to control public health threats. Contact Tracing - Collaboration between the Public Health and the Aviation Sector; 2015.
10. European Centre for Disease Prevention and Control. LEAFLET - Advice to healthcare workers: management of patients with 2019-nCoV infection 2020. <https://www.ecdc.europa.eu/en/publications-data/advice-healthcare-workers-management-patients-2019-ncov-infection> (accessed 31/01/2020).
11. European Centre for Disease Prevention and Control. . Infection prevention and control for the care of patients with 2019-nCoV in healthcare settings. Stockholm, 2020.
12. European Centre for Disease Prevention and Control. ECDC TECHNICAL REPORT. Infection prevention and control for the care of patients with 2019-nCoV in healthcare settings
Stockholm ECDC, 2020.
13. World Health Organization. Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected. Interim guidance. 28 January 2020 2020. https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2.
14. World Health Organization. Updated WHO advice for international traffic in relation to the outbreak of the novel coronavirus 2019-nCoV. 27 January 2020. 2020. <https://www.who.int/ith/2020-27-01-outbreak-of-Pneumonia-caused-by-new-coronavirus/en/> (accessed 27 January 2020).
15. European Centre for Disease Prevention and Control. Case definition and European surveillance for human infection with novel coronavirus (2019-nCoV). 2020. <https://www.ecdc.europa.eu/en/case-definition-and-european-surveillance-human-infection-novel-coronavirus-2019-ncov>.

16. European Centre for Disease Prevention and Control. Public health management of persons having had contact with cases of novel coronavirus in the European Union. Stockholm: ECDC, 2020.
17. World Health Organization. Global Surveillance for human infection with novel coronavirus (2019-nCoV). Interim guidance v3 2020.
18. World Health Organization. Key considerations for repatriation and quarantine of travellers in relation to the outbreak of novel coronavirus 2019-nCoV. 11 February 2020 2020. https://www.who.int/ith/Repatriation_Quarantine_nCoV-key-considerations_HQ-final11Feb.pdf?ua=1 (accessed 13/2/2020).
19. World Health Organization. Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Interim guidance, 2020.
20. van Doremalen N, Bushmaker T, Munster VJ. Stability of Middle East respiratory syndrome coronavirus (MERS-CoV) under different environmental conditions. *Euro Surveill* 2013; **18**(38).
21. European Centre for Disease Prevention and Control. Interim guidance for environmental cleaning in non-healthcare facilities exposed to SARS-CoV-2. Stockholm: ECDC, 2020.
22. World Health Organization. Technical note for Ebola virus disease preparedness planning for entry screening at airports, ports and land crossings, 2014.
23. World Health Organization. Handbook for management of public health events on board ships. 2016.
24. Mouchtouri VA, Christoforidou EP, An der Heiden M, et al. Exit and Entry Screening Practices for Infectious Diseases among Travelers at Points of Entry: Looking for Evidence on Public Health Impact. *Int J Environ Res Public Health* 2019; **16**(23): 4638.
25. Gunaratnam PJ, Tobin S, Seale H, Marich A, McAnulty J. Airport arrivals screening during pandemic (H1N1) 2009 influenza in New South Wales, Australia. *Med J Aust* 2014; **200**(5): 290-2.
26. Hale MJ, Hoskins RS, Baker MG. Screening for influenza A(H1N1)pdm09, Auckland International Airport, New Zealand. *Emerg Infect Dis* 2012; **18**(5): 866-8.
27. Samaan G, Patel M, Spencer J, Roberts L. Border screening for SARS in Australia: what has been learnt? *Med J Aust* 2004; **180**(5): 220-3.
28. Selvey LA, Antao C, Hall R. Entry screening for infectious diseases in humans. *Emerg Infect Dis* 2015; **21**(2): 197-201.
29. St John RK, King A, de Jong D, Bodie-Collins M, Squires SG, Tam TW. Border screening for SARS. *Emerg Infect Dis* 2005; **11**(1): 6-10.
30. Wilder-Smith A, Paton NI, Goh KT. Experience of severe acute respiratory syndrome in Singapore: importation of cases, and defense strategies at the airport. *J Travel Med* 2003; **10**(5): 259-62.
31. ECDC. Technical Report: Infection prevention and control measures for Ebola virus disease, Entry and exit screening measures; 2014.
32. Cowling BJ, Lau LL, Wu P, et al. Entry screening to delay local transmission of 2009 pandemic influenza A (H1N1). *BMC Infect Dis* 2010; **10**: 82.
33. Arwady MA, Bawo L, Hunter JC, et al. Evolution of ebola virus disease from exotic infection to global health priority, Liberia, mid-2014. *Emerg Infect Dis* 2015; **21**(4): 578-84.
34. Brown CM, Aranas AE, Benenson GA, et al. Airport exit and entry screening for Ebola--August-November 10, 2014. *MMWR Morb Mortal Wkly Rep* 2014; **63**(49): 1163-7.
35. Fujita M, Sato H, Kaku K, et al. Airport quarantine inspection, follow-up observation, and the prevention of pandemic influenza. *Aviat Space Environ Med* 2011; **82**(8): 782-9.
36. Cohen NJ, Brown CM, Alvarado-Ramy F, et al. Travel and Border Health Measures to Prevent the International Spread of Ebola. *MMWR Suppl* 2016; **65**(3): 57-67.
37. ECDC. Public health emergency preparedness for cases of viral haemorrhagic fever (Ebola) in Belgium: a peer review – 16–19 March 2015. Stockholm; 2015.
38. Frieden TR, Damon IK. Ebola in West Africa-CDC's Role in Epidemic Detection, Control, and Prevention. *Emerg Infect Dis* 2015; **21**(11): 1897-905.

39. Bell DM, World Health Organization Working Group on I, Community Transmission of S. Public health interventions and SARS spread, 2003. *Emerg Infect Dis* 2004; **10**(11): 1900-6.
40. Tan CC. SARS in Singapore--key lessons from an epidemic. *Ann Acad Med Singapore* 2006; **35**(5): 345-9.
41. World Health Organization. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV). 2020. [https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-\(2019-ncov\)](https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov)) (accessed 31/01/2020).
42. EUROPEAN COUNCIL. DECISION No 1082/2013/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 October 2013 on serious cross-border threats to health and repealing Decision No 2119/98/EC. *Official Journal of the European Union* 2013.