

An implementation guide for the management of COVID-19 on board cargo ships and fishing vessels

Interim guidance
23 December 2021



1. Introduction

Ship personnel, whether working on ships engaged in cargo transport or fishing, typically work in close contact environments and are therefore susceptible to the transmission of SARS-CoV-2. A COVID-19 outbreak presents special risks for crew and officers making extended voyages without calling at any port and lacking access to shoreside medical facilities. Such an outbreak puts their safety and well-being at risk and may affect their ability to safely navigate and operate the ship (1).

In this document, the term “ship personnel” refers to individuals who work on one of two types of vessels:

- a cargo ship that is not a passenger ship
- a fishing vessel that is any ship or boat, of any nature whatsoever, irrespective of the form of ownership, used or intended to be used for the purpose of commercial fishing (2) of fish, whales, seals, walrus or other living resources of the sea, defined in the International Convention for the Safety of Life at Sea (3).

1.1. Methods

This implementation guide builds on the information provided in the World Health Organization (WHO) interim guidance “Technical considerations for implementing a risk-based approach to international travel in the context of COVID-19” (4) and represents an updated version of the previous interim guidance “Promoting public health measures in response to COVID-19 on cargo ships and fishing vessels” (5) published on 25 August 2020. It incorporates updated WHO guidance across several technical areas, including surveillance, public health and social measures, infection prevention and control (IPC), testing, quarantine, ventilation, clinical management, vaccination, risk communication, and community engagement.

The following organizations were consulted during the development of this implementation guide: the International Maritime Organization (IMO); the International Labour Organization (ILO); the United Nations Conference on Trade and Development (UNCTAD); and the WHO Collaborating Centre for the International Health Regulations – Points of Entry, the Department of Hygiene and Epidemiology of the University of Thessaly in Greece. All non-UN contributors were required to sign a Declaration of Interest and a Confidentiality Understating form.

1.2. Target audience

This implementation guide is intended for individuals, organizations and government authorities with public health roles and responsibilities on board cargo ships and fishing vessels navigating in international waters or within national territorial waters.

The target audience of this implementation guide includes:

- ship owners and operators
- ship officers and crew
- International Health Regulations (IHR) national focal points
- government officials and representatives of nongovernmental organizations who regularly communicate and coordinate with cargo ships and fishing vessels (on issues such as immigration, security and customs)
- public health professionals involved in disease surveillance, health communication, emergency preparedness and response, and environmental health on board cargo ships and fishing vessels
- representatives of nongovernmental and private organizations working on cargo ships and fishing vessels

2. COVID-19 contingency management plans

All ships¹ and fishing vessels should have a written COVID-19 contingency management plan (6). Following its implementation, the plan should be tested regularly and updated as required. The plan should include the following areas:

a. Surveillance and reporting

- Onboard surveillance must include immediate reporting to port health authorities of any case of suspected, probable or confirmed SARS-CoV-2 infection as well as overall case counts and the number of persons requiring hospitalization or medical evacuation. It must also include regular on-board screening of crew, such as through monitoring of COVID-19 signs and symptoms and temperature checks. The WHO Maritime Declaration of Health set out in the International Health Regulations (IHR) (2005) and/or other country reporting requirements may be used for reporting.

b. Isolation and quarantine

- The COVID-19 contingency management plan should include provisions to isolate suspected, probable or confirmed cases individually until disembarkation, and as per WHO's recommended criteria for discharging patients from isolation (7).
- A strategy to provide quarantine space for contacts of cases for a recommended duration of 14 days should also be determined (8).
- Individuals in quarantine or isolation must be provided with food and utensils, hygiene facility services, provisions for waste management, soap and warm water or an alcohol-based hand rub, educational materials, and laundry services.

c. Case management

- Either on-board or remote access to a health provider with clinical expertise in the management of acute infectious diseases should be available for all ship personnel at all times.
- For cases that are managed on board and present high risk factors for severe disease (e. g. older age (> 60 years), overweight/obesity, hypertension, diabetes, cardiac disease, chronic lung disease, cerebrovascular disease, dementia, mental disorders, chronic kidney disease, immunosuppression (including HIV), cancer, smoking, pregnancy and post partum period up to 6 weeks or experience persistent COVID-19 symptoms, it is advisable to keep pulse oximeters onboard to assess oxygen saturation in their blood. This will support the early identification of low oxygen levels in crew with initially mild or moderate COVID-19 or silent hypoxia, when a patient does not appear to be short of breath but his or her oxygen levels are lower than expected (9). For confirmed COVID-19, an oxygen level between 90-94% is abnormal and can be an early sign of severe disease; an oxygen level of less than 90% is an indication of severe disease and requires urgent care (7).
- Monitor if there is any sign of worsening like difficulty breathing (at rest or while speaking), confusion or altered mental status, loss of speech or mobility or the appearance of any emergency sign: obstructed or absent breathing, severe respiratory distress, cyanosis, shock, coma or convulsions. If any of them is present, case management should include protocols for shoreside transport to health care facilities.

d. IPC

- Adherence to IPC measures such as proper use of personal protective equipment (PPE), physical distancing and administrative controls, including appropriate ventilation and room occupancy limits, is essential, irrespective of the vaccination status of those on board.
- Enhanced cleaning and disinfection procedures should be carried out in the event of a suspected, probable or confirmed case on board. Any chemical disinfectants should be verified as effective against SARS-CoV-2. In medical facilities and areas where persons are in isolation or quarantine, high-touch areas that should be cleaned and disinfected more frequently include, but are not limited to, doors and windows and their handles, kitchen and food preparation areas, countertops, bathroom surfaces, toilets and taps, touchscreen personal devices, keyboards of computers and work surfaces (10).
- Ideally, food and utensils will be left outside the accommodations of individuals with suspected, probable or confirmed COVID-19 to avoid face-to-face contact and promote contactless protocols.
- Medical masks and an alcohol-based hand rub should be made available to individuals with suspected, probable or confirmed cases and their carers and physical contacts. See below for further advice on the use of masks.
- Regular training for IPC measures, including use of PPE, should be in place.

e. Communication with authorities

- Communication must be enabled between the ship or fishing vessel and the competent authorities at port, the flag State and the shipowner (e.g. direct from the master or skipper to the doctor via telephone, video conference or through the maritime telemedical assistance service [TMAS]).
- Procedures must be in place to collect information about and contact details from all persons who are boarding the ship to facilitate communication with them if needed during the 14 days after they disembark.
- Communication protocols should be established for shoreside operations to advise officers if any shore personnel develop any signs or symptoms within 14 days of having boarded.

¹ For very small coastal fishing vessels with two or three crew members and no overnight accommodations, a simplified COVID-19 contingency management plan may be sufficient.

f. Training

- Crew members should familiarize themselves with the ship's COVID-19 contingency management plan and WHO's guidance for IPC (11). They should also be familiar with the signs and symptoms of COVID-19 and how to self-monitor for their early identification (12).
- Crew members should receive formal training on the following:
 - proper use of masks and the importance of physical distancing practices
 - hygiene rules, including how to wash hands with soap and water or use a 60-80% alcohol-based hand rub, etiquette for coughing and sneezing, and the proper disposal of used tissues
 - how SARS-CoV-2 is transmitted (13).
- The crew member designated to take charge of medical care on board the ship should stay informed and updated about any new COVID-19 evidence and guidance (11) and be familiar with WHO's clinical management guidance (7). This person should be trained to understand groups at risk for severe COVID-19 including people 60 years of age or older or anyone with an underlying noncommunicable disease (such as diabetes, hypertension, cardiac disease, chronic lung disease, cerebrovascular disease, dementia, mental disorders, chronic kidney disease, immunosuppression, obesity and cancer), which have been associated with higher COVID-19 mortality (7).

3. Procedures on board cargo ships and fishing vessels in the context of the COVID-19 pandemic

3.1. Pre-embarkation

a. Port State requirements

Ship personnel who have travelled from abroad should be aware that the country of embarkation may have implemented specific COVID-19 international travel-related measures for incoming travellers and plan accordingly to comply with them. For example, this may include quarantine and/or testing with nucleic acid amplification tests (NAATs), such as real-time reverse-transcription polymerization chain reaction (RT-PCR), or antigen-detecting rapid diagnostic tests (Ag-RDTs).

b. Ship requirements

Ships and fishing vessels should always respect a seafarer's human rights and dignity when implementing a risk-based approach to establishing a protocol of quarantine and/or testing, irrespective of potential exposure to the SARS-CoV-2 virus, prior to the embarkation of new crew. The positive benefits of quarantine in reducing SARS-CoV-2 transmission must be balanced against the related risks of infringement of human rights, psychosocial and economic harm, disruption to travel and trade, reductions in the movement of essential goods and workforce mobility (4).

Ship personnel may not be able to complete a quarantine period prior to boarding the ship. In these situations, arrangements should be made for them to complete quarantine period on board the vessel, if required. Should the quarantine period be shortened, assigning the individual to tasks where they do not have close contacts with other ship personnel should be considered (14).

Crew members, where possible, should not share accommodations during the quarantine period. A risk-based approach should be applied whenever the shortening of the 14-day quarantine period is being considered, particularly with regard to emerging variants of concern (8).

c. Preboarding screening

Pre-boarding screening for all persons is recommended to detect any suspected cases. Pre-boarding screening may include the use of testing, self-reporting, visual observation and/or temperature measurement with non-touch thermometers.

The pre-boarding screening should be conducted as a risk mitigation measure regardless of vaccination or recovery status because vaccinated individuals may still become infected with the virus and transmit it to others while on board the vessel.

If logistically feasible, the ship or fishing vessel may make arrangements with the port to have embarking personnel tested prior to embarkation since it is more practical to have the seafarer quarantined shoreside than on the ship while waiting for results (6). An individual who tests positive for SARS-CoV-2 should not be permitted to board the ship or fishing vessel and should contact the local health authorities for additional direction and care.

Negative results from pre-travel testing cannot guarantee that ship personnel are free from infection at the time of travel, since they may have been tested before they became infected or during the period when viral load is not yet sufficient to be detectable (15). For this reason, all IPC measures should continue to be respected by all ship personnel regardless of whether a negative test result has been received.

A pre-boarding questionnaire should include the following (16):

Within the past 14 days:

- Have you experienced a fever higher than 38 °C or have you felt feverish, or a sudden onset of a cough, general weakness/fatigue, headache, muscle aches, sore throat, head cold, shortness of breath, anorexia/nausea/vomiting, diarrhoea or altered mental status?
- Have you been in direct physical contact with someone suspected or confirmed of having COVID-19?
- Have you been within 1 metre of someone with suspected or confirmed COVID-19 for longer than 15 minutes?
- Have you provided direct care for someone with suspected or confirmed COVID-19 without wearing the proper PPE?
- Do you have any other reason to suspect you may be infected with SARS-CoV-2?

If the port authorities implement pre-boarding screening or health monitoring of port workers, the results could be shared with the master or skipper (with the consent of the personnel) to avoid duplication of measures on the ship. In some instances, these pre-boarding measures may be contained in the port's COVID-19 contingency management plan, which could also be requested by the master, skipper or crew for review.

While in port crew members will interact with various non-crew members such as port workers, local regulatory and inspection authority representatives and suppliers of provisions. It is advisable to limit, as far as possible, the number of interactions between crew and non-crew members in the port to only those that are essential for the continued operation and supply of the ship. Controlled access to the ship or fishing vessel at the gangway helps to minimize the number of persons boarding. Ensure that shore personnel move only into the relevant areas of the ship where they are required to conduct their duties. Shore personnel, where possible and safe, should use outer walkways rather than gaining access through the crew's quarters and move through well-ventilated passageways whenever possible. Additionally, information should be provided by port health authorities to shore personnel about basic protective measures against COVID-19, following WHO's advice (14).

3.2. Preventive measures on board the cargo ship or fishing vessel

a. General measures

Where possible and reasonable administrative controls such as limiting room occupancy, barriers, shields, and directional arrows should be implemented to reduce opportunities for crowding in enclosed environments.

b. Hand hygiene and respiratory etiquette

Hand hygiene stations, such as handwashing facilities and dispensers for 60-80% alcohol-based hand rub, should be located in prominent places around the ship and be accessible to all staff, contractors, and visitors, along with communication materials that promote hand hygiene (11). Crew are to cover coughs and sneezes, and if feeling unwell, notify their supervisor and self-isolate until assessed by the medical team aboard or ashore.

Adhere to WHO's principles when practicing hand hygiene and respiratory etiquette (11).

c. Physical distancing

Crew members should remain at least 1 metre apart from one another and from shore personnel whenever possible. If there is space in the crew mess or other communal areas, seats and work stations can be arranged so that crew members are at least 1 metre apart.

In situations in which physical distancing of at least 1 metre cannot be fully implemented, the master or skipper should consider whether that activity needs to continue, and if it does, take all mitigating actions possible to reduce the risk of transmission between crew and shore personnel; for example, by staggering times for activities, minimizing face-to-face interactions, placing crew side by side to work or having them work facing away from one another rather than face to face (8) and ensuring consistent mask use and opening windows where possible.

d. Use of masks

WHO advises the use of masks as part of a comprehensive package of prevention and control measures to limit the spread of SARS-CoV-2. A mask alone, even when it is used correctly, is insufficient to provide adequate protection. Other IPC measures include hand hygiene, physical distancing of at least 1 metre, avoidance of touching one's face, respiratory etiquette, adequate ventilation in indoor settings, testing, contact tracing, quarantine and isolation and vaccination. Together these measures are critical to prevent human-to-human transmission of SARS-CoV-2 (17).

Employers have a responsibility to provide at no cost suitable and sufficient PPE, conduct training and monitor safe use among its workers (17)

For any mask type, appropriate use, storage and cleaning or disposal are essential to ensure that they are as effective as possible and to avoid an increased transmission risk (17).

General recommendations for mask usage.

- While onboard a cargo ship or fishing vessel personnel are at a higher risk of negative outcomes from COVID-19 because of limited access to medical assistance. They are therefore advised, irrespective of vaccination status, to always wear a well-fitting mask that covers the nose and mouth while working indoors with others, regardless of whether physical distancing of 1 metre can be maintained.
- While outdoors it is advisable to wear a well-fitting mask that covers the nose and mouth, irrespective of vaccination status, when physical distancing of 1 metre cannot be maintained (17).

- Suspected, probable, or confirmed cases of SARS-CoV-2 infection should be isolated, regardless of whether they are vaccinated or not or are awaiting viral test results. If they must be in the presence of others for medical attention or under other extenuating circumstances, they should wear a medical mask (17).
- Ship personnel are advised to comply with all local mask-wearing requirements while at port, in the local community, in transit to or from the vessel and while on shore leave.
- Non-medical masks² and disposable medical masks (if availability of Type II medical masks for health workers has been ensured)³ are acceptable options for use by seafarers (17). If these options are not available, other types of well-fitting non-medical masks*** are an acceptable option (consistent with national policies)⁴.

3.3. Environmental measures

a. Ventilation

Ventilation is the process of supplying outdoor air to and removing indoor air from a space, for the purpose of controlling air contaminant levels, potentially accompanied by humidity and/or temperature, by natural or mechanical means (18). Modern ships typically use mechanical ventilation and forced air to create conditions suitable for working on board. Mechanical ventilation is often achieved by a recirculating heating, ventilation and air conditioning system (HVAC) (19).

Inadequately ventilated indoor spaces and spaces with a poorly maintained HVAC system may enhance the risk of SARS-CoV-2 transmission in spaces where ship personnel and or visitors spend prolonged periods of time together in close proximity (18).

Indoor ventilation has three basic elements:

- ventilation rate – the volume of outdoor air that is provided into the space
- airflow direction – the overall airflow direction, which should be from clean zones to dirty zones; and
- air distribution or airflow pattern – the external air should be delivered to each part of the space in an effective and efficient manner and the airborne pollutants generated in each part of the space should also be removed in an effective and efficient manner.

Technical recommendations to assess and improve mechanical and natural ventilation systems are detailed in the WHO Roadmap to improve and ensure good indoor ventilation in the context of COVID-19 (18). It includes different key areas such as the minimum ventilation rate, air mixing, occupancy and ventilation, recirculation, heat recovery, maintenance and management).

If the room in which an individual quarantined does not have a separate ventilation system, consider using natural ventilation if feasible and safe to do so. Otherwise return grilles or supply grilles within the isolation area should be sealed to avoid air mixing. For mechanical systems, increase the percentage of outdoor air, using economizer modes of HVAC systems operations and potentially as high as 100%. Before increasing outdoor air percentage, verify compatibility with HVAC system capabilities for both temperature and humidity control and compatibility with outdoor/indoor air quality (18).

b. Cleaning and disinfection

Fomite transmission is considered a possible mode of transmission for SARS-CoV-2, given consistent findings of environmental contamination in the vicinity of people infected with SARS-CoV-2 and the fact that other coronaviruses and respiratory viruses can be transmitted this way (10) (20).

In accordance with WHO's guidance about IPC measures to be used during health care when COVID-19 is suspected, medical facilities, cabins and quarters occupied by patients and close contacts of a confirmed COVID-19 case should be cleaned and disinfected daily, and cleaning and disinfection should be carried out again after cases and close contacts have disembarked (11).

In addition, high-touch surfaces on board the ship should be identified as priorities for disinfection. These include doors and windows and their handles, kitchen and food preparation areas, countertops, bathroom surfaces, toilets and taps, crew laundry, recreation rooms, common passageways, touchscreen personal devices, keyboards on personal computers and work surfaces.

Surfaces should always be cleaned with soap and water or a detergent to remove organic matter first, followed by disinfection. Apply a disinfectant solution. In non-health care settings, sodium hypochlorite (bleach) may be used at a recommended concentration of 0.1% (1000 ppm). Alternatively, alcohol with 70-90% concentration may be used for surface disinfection (7). Preparation and application of disinfectants must follow manufacturer's instructions to protect the safety and health of all personnel (11).

To date, there is no epidemiological information to suggest that contact with goods or products shipped from countries affected by the COVID-19 pandemic have been the source of COVID-19 in humans. Special environmental protocols for shipping containers are not required (20).

² complying with the ASTM F3502 standard or CEN Working Agreement 17553 or those that meet WHO essential parameters

³ complying with EN 14683 Type I, ASTM F2100 Level 1, YY/T 0969, YY 0469 (or equivalent)

⁴ including homemade multi-layered masks

3.4. Managing suspected COVID-19 cases and their contacts

Many shipping and fishing companies now have a high-level plan for addressing COVID-19. The first step for the crew member designated to take charge of medical care on board the ship is to determine whether a situation may be serious and necessitate reaching out for immediate shoreside medical support and advice or whether it can wait until the ship reaches the next port of call. Depending on the jurisdiction, the master, skipper or crew member designated as being in charge of medical care on the ship is encouraged to ask for shoreside telemedical or radio medical assistance when triaging suspected cases and determining next steps.

COVID-19 testing with either nucleic acid amplification tests (NAATs) or antigen-detecting rapid diagnostic tests (Ag-RDTs) in most instances does not occur onboard the vessel, due to operational challenges associated with the procurement of tests as well as challenges in regards to the training of designated staff on how to collect samples, use test kits, read and interpret test results, and store kits. In these instances, arrangements must be made to establish agreements with shoreside facilities at the various ports of call to conduct NAATs or Ag-RDTs as required during a vessel's journey.

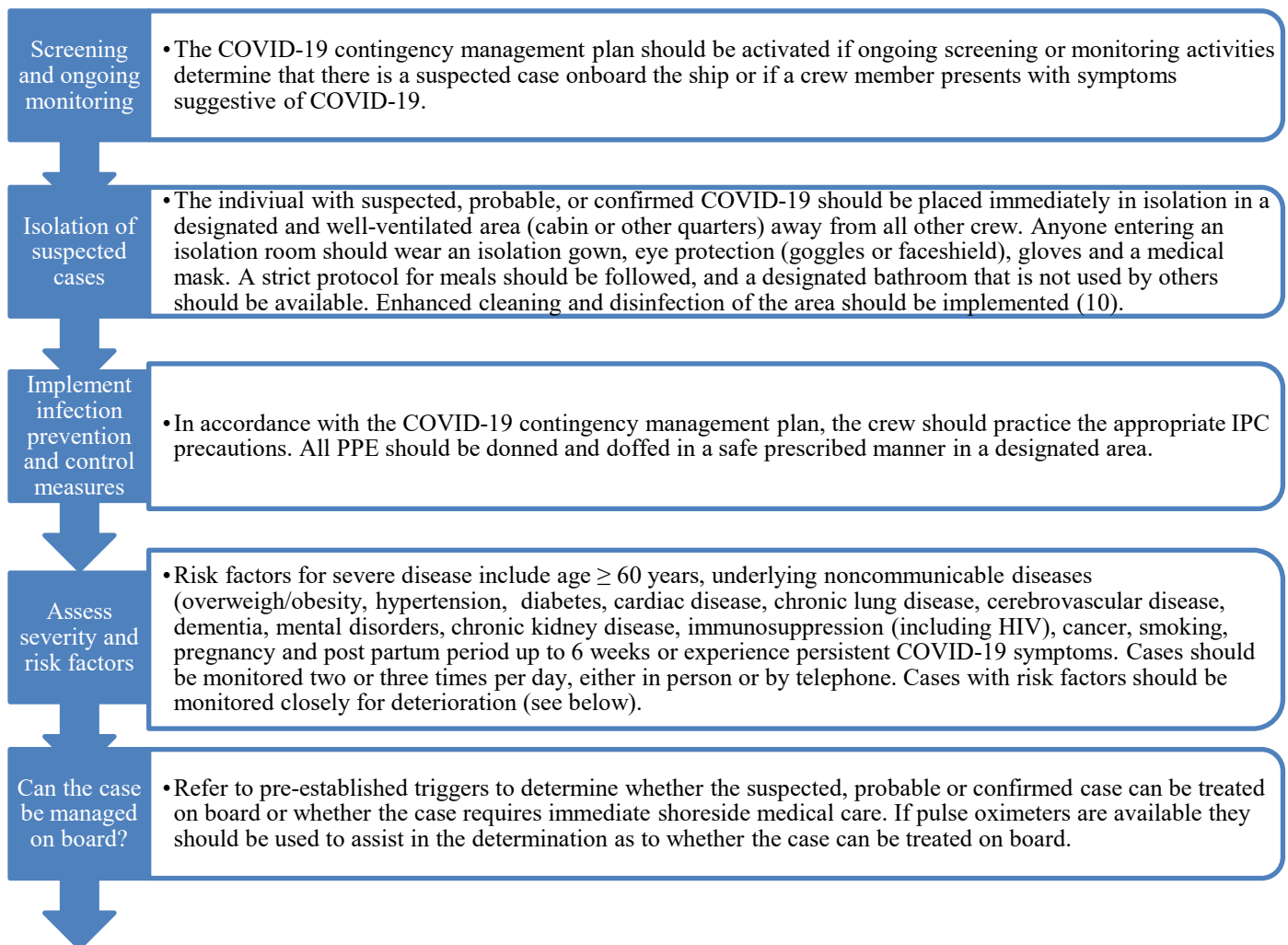
Nonetheless, in some situations testing during the journey may occur on board the vessel, provided that the vessel is able to procure Ag-RDTs, and train designated staff on how to collect the sample, use the test kits, read and interpret test results and store kits. Ag-RDTs should be used for crew meeting the case definition for COVID-19 and to test asymptomatic individuals at high risk of infection, including contacts. Ag-RDTs should be confirmed with NAATs ashore when possible (results in < 24 hours) or re-tested with Ag-RDT if not. WHO recommends that SARS-CoV-2 Ag-RDTs meet or exceed the minimum performance requirements of $\geq 80\%$ sensitivity and $\geq 97\%$ specificity be used (21).

a. Managing suspected, probable and confirmed COVID-19 cases

A precautionary approach should be employed by the ship or fishing vessel when managing a suspected, probable and confirmed COVID-19 case.

Fig. 1 summarizes a pathway for identifying and managing a suspected, probable or confirmed case of COVID-19 on board a ship (7).

Fig. 1. Pathway for identifying and managing a suspected, probable or confirmed case of COVID-19 on board a ship



b. Triggers for further treatment

The decision about whether to monitor a patient on board the ship or to transfer them immediately to a shoreside medical facility for further treatment should be made on a case-by-case basis. This decision will depend on the clinical presentation, requirement for supportive care, risk factors and conditions on the ship.

Use pre-established triggers to decide when to contact TMAS and determine whether the suspected case can be treated on board or if the case requires immediate shoreside medical care.

Sign of worsening such as difficulty breathing (at rest or while speaking), confusion or altered mental status, loss of speech or mobility or the appearance of any emergency signs: obstructed or absent breathing, severe respiratory distress, cyanosis, shock, coma or convulsions . air; should trigger a call to TMAS and transfer to a shoreside medical facility. In any case of doubt, TMAS should be contacted.

During the disembarkation of suspected cases, efforts should be made to minimize the exposure of other persons and environmental surfaces. Suspected cases should be provided with a medical mask to reduce the chance of transmission. Staff involved in transporting the suspected case should follow strict IPC measures (including the use of medical masks, gowns, gloves and eye protection) (22).

c. Managing contacts of COVID-19 cases

To avoid delays in implementing health measures, contact tracing and the management of contacts should occur as soon as a suspected, probable, or confirmed case has been identified.

WHO defines a contact as a person who has experienced any one of the following exposures during the two days before and the 14 days after the onset of symptoms of a probable or confirmed case (12):

- face-to-face contact with someone who has a confirmed or probable SARS-CoV-2 infection within 1 metre and for more than 15 minutes
- direct physical contact with someone with a confirmed or probable SARS-CoV-2 infection
- direct care for an individual with a confirmed or probable SARS-CoV-2 infection without using appropriate PPE
- other situations and conditions, as indicated by local risk assessments.

For all contacts of individuals with suspected, probable or confirmed SARS-CoV-2 infection, WHO continues to recommend quarantine in a designated facility or in a separate room for a duration of 14 days from the last contact with the confirmed or probable case to minimize risk of onward transmission. If local requirements allow a shorter period of quarantine, additional requirements, such as SARS-CoV-2 testing, may apply (8).

WHO advises that any adjustment in the quarantine period of contacts from 14 days balances the public health risks and benefits against its social and economic impact. Shortening the quarantine period will result in a larger proportion of contacts becoming infectious after leaving quarantine, but conversely may lead to greater compliance and result in a reduction of transmission. Testing throughout and/or at the end of a shortened quarantine can improve confidence that a contact leaving quarantine is not infected, particularly when the quarantine period is less than 14 days; but this relies on the availability and accuracy of tests and rapid turnaround of the test result before the end of the quarantine (8). It is unlikely that a cargo ship or fishing vessel would have the capacities to conduct onboard testing; therefore, the frequency and type of testing during the quarantine period would be reliant on the availability of testing capacities at each port of call and agreements between the shipping company and shoreside facilities to conduct COVID-19 testing.

Health authorities may consider that contacts who have recent (within past 3-6 months) SARS-CoV-2 infection or who have received full COVID-19 vaccination may be at lower risk of further infection and therefore may be exempt from quarantine (8).

Should crew members be quarantined onboard the ship those in quarantine should be adequately supported. This support includes:

- provision of food, water, and hygiene,
- access to communication,
- adequate ventilation,
- the implantation and maintenance of IPC measures, and
- ensuring the requirements for monitoring the health of quarantined persons can be met during quarantine period.

If quarantine in appropriate facilities is not possible for operational reasons, the seafarer should be assigned to tasks where they do not have close contact with other seafarers, if possible. If a contact develops any signs or symptoms, the contact should wear a medical mask and be treated as a suspected case.

d. Access to medical facilities

Pursuant to Regulation 4.1, paragraph 3, of the Maritime Labour Convention (2006), States must ensure that seafarers on board ships in their territory who are in need of immediate medical care are given access to the State's medical facilities on shore (23). Pursuant to Article 29 of the Work in Fishing Convention, States shall adopt laws, regulations or other measures requiring that fishing boat personnel have the right to medical treatment ashore and the right to be taken ashore in a timely manner for treatment

in the event of serious injury or illness (2). As such, the exceptional measures adopted by some governments to contain the COVID-19 pandemic cannot be invoked as valid reasons for not complying with this international obligation.

Some States are failing to comply with international regulations and reducing or denying access to medical assistance to ship personnel for matters related and unrelated to COVID-19 (24). To address the possibility of non-compliance, ship owners or representatives should in advance of their arrival enter into agreements with the competent authorities at their ports of call as part of the ship's COVID-19 contingency management plan to ensure that ill ship personnel will be allowed to disembark and receive the required medical care as per the international regulations and conventions previously discussed.

It should be noted that Articles 19, 20 and Annex 1B of the IHR (2005) require each country to designate ports that will develop the capacity to provide medical assessment and treatment of ill travellers (25).

e. Obligations of operators

In accordance with the IHR (2005), the master or skipper of the ship must immediately inform the competent health authority at the next port of call about any suspected, probable or confirmed case of COVID-19. Ships on international voyages must complete a Maritime Declaration of Health and send it to the competent authority, in accordance with local requirements at the port of call.

In addition, shipping and fishing vessel operators are advised to regularly monitor crew while in port to determine whether they develop any symptoms associated with COVID-19, and they should adhere to the reporting requirements of the local health authority and report any changes in the health of crew members.

3.5. Leaving the ship

a. Public health measures for shoreside visits

Whether shoreside visits can occur is contingent on several factors, including the requirements of the State, and the health status of crew members. Therefore, temporary restrictions on shore leave may be necessary under certain situations. Exceptions should be provided for when a crew member is disembarking as part of a crew changeover or to receive medical attention.

If shoreside visits are permitted, personnel are advised to follow the public health and social measures recommended by national authorities in the context of COVID-19 (26). The COVID-19 epidemiological situation will be different at each port of call. Consequently, the types of PPE needed, physical distancing measures and the availability of hand hygiene facilities will also vary. The master or skipper should be informed about the situation and measures required in each port of call. Information may be obtained by communicating with port health authorities using established communication channels. WHO's website provides information about the status of transmission worldwide at <https://covid19.who.int/>.

Additional measures to be taken during shoreside visits include proper food hygiene practices (27), including in live markets where transmission may occur from animals to humans (28).

b. Public health measures throughout the journey, from home to ship and from ship to home

Throughout the journey from home to ship and from ship to home, ship personnel will have interactions that may pose a risk for person-to-person transmission. They will be in close proximity to a large number of travellers, to transport staff at transport hubs when on board transport conveyances and at hotels. Moreover, ship personnel may need to use facilities that are used by the travelling public, such as sanitary facilities, elevators and restaurants. Ship personnel should continue to maintain at least a 1 metre distance from others, avoid crowded or poorly ventilated spaces, regardless of status of vaccination or past infection, wear well-fitted masks and practice respiratory etiquette and hand hygiene.

To mitigate risks throughout the journey, from home to ship and from ship to home, when possible, the shipowner should coordinate with the State authorities to implement protocols for transfers between the port and the accommodations where ship personnel will stay. General recommendations for crew while staying at onshore accommodations include:

- The crew must comply with relevant public health regulations and policies.
- Ideally, there should be one crew member per room, and the room must be sanitized prior to occupancy.
- The crew, taking account of the above, and insofar as is practicable, should regularly self-monitor for symptoms including fever.
- Crew members experiencing symptoms suggestive of COVID-19 during a layover or transit should:
 - report the symptoms to their employer and seek assistance from a medical doctor
 - cooperate with the assessment and any possible further monitoring for COVID-19 in accordance with the evaluation procedure implemented by the State (for example, having an assessment in the hotel room or in an isolation room within the hotel or at an alternative location).

3.6. Repatriation of ship personnel

Repatriation of crew members, access to medical care and crew changes have been curtailed in many countries during the pandemic. In addition, severely ill ship personnel have been denied access to medical facilities because of border measures, with impacts to their mental and physical health (29).

WHO, IMO and ILO have released joint statements reminding port States that in accordance with the Maritime Labour Convention (2006) they must ensure that seafarers in need of medical attention are granted access to medical facilities ashore. The joint statements also address maritime challenges such as those associated with facilitating crew changes, access to vaccinations and issuance of ship sanitation certificates and medical certificates (30) (31). In addition, the ILO C.188 Work in Fishing Convention specifies internationally binding requirements addressing ship personnel access to medical services aboard and ashore (2).

3.7. Vaccination

Despite the development of COVID-19 vaccines approved by WHO for emergency use listing (EUL) and the roll-out of vaccinations in most countries, ship personnel continue to face challenges gaining access to vaccination (32) (33). These include:

- the storage and transportation requirements of some vaccines, which make it difficult for most vessels and some ports to store them onboard
- the two-dose regime of most COVID-19 vaccines, which may impact the availability and timeliness of both doses as ship personnel travel from port to port
- limited information related to the safety and efficacy of mixing different types of vaccines in the two-dose regime
- limited vaccine supplies or challenges in the vaccine distribution and access in some regions
- lack of documentation such as vaccine certificates and complex registration processes
- prioritization of vaccines for the local population.

In the context of mobility and international travel, WHO recommends that Member States do not require proof of COVID-19 vaccination as the only pathway for entry to or exit from a country (4).

The WHO Strategic Advisory Group of Experts (SAGE) on Immunization has developed a roadmap for prioritizing the use of COVID-19 vaccines in the context of limited supply. The group has identified seafarers as a priority group in Stage II (where there is limited vaccine availability for 11-20% of the national population) (34). This roadmap specifies that governments need to prioritize seafarers, along with other essential workers, for vaccination as soon as possible to facilitate their safe movements across borders and avoid situations where seafarers are stranded at sea.

In countries where national deployment vaccination plans (NDVP) are being developed or updated, it is of paramount importance to obtain an accurate number of ship personnel and share it with policy-makers and partners involved in the NDVP development to facilitate vaccination of ship personnel. The key stakeholders and health facilities that provide COVID-19 vaccination services for ship personnel should be identified and assessed for readiness, vaccination capacity, policy and protocols. Ship operators should continue to strengthen their communications and collaboration with national health authorities.

It is important to note that most fully vaccinated people have some level of protection against SARS-CoV-2 infection and COVID-19 disease, and are less likely to infect someone else. However, vaccines do not confer 100% immunity, nor they prevent transmitting the virus to others, and breakthrough infections may occur.

3.8. Management of a dead body

All measures taken when managing a dead body should respect the dignity of the dead as well as cultural and religious traditions (35).

Based on current knowledge, the likelihood of transmission when handling the remains of an individual who died of COVID-19 is low. Nonetheless, any person managing a dead body must adhere to strict IPC measures including hand hygiene, use of PPE and cleaning and disinfection (35).

3.9. Communication, including and risk communication

Clear and timely communication between the ship, including the shipowner and its agents, and shore-based organizations intending to board the ship is essential. This is the only way to effectively identify issues and manage differences in requirements relating to mitigating the risk to all personnel.

If there are differences in expectations between ship and shore requirements, these differences should be resolved by all parties to their mutual satisfaction prior to the ship arriving in port. This process can be used to address risks effectively, possibly through the agreement and adoption of equivalent measures, and to ensure that misunderstandings, misplaced expectations and the associated frustration of the ship's crew and shore-based personnel are avoided (6).

It is critical to keep ship personnel informed about COVID-19 through risk communication. Recommended measures include the following:

- Display posters, videos and message boards to increase awareness of COVID-19 among crew and promote safe individual practices, including proper mask use. Engage with crew members to provide feedback on the preventive measures and their effectiveness (36).
- Provide information about prevailing regulations and local public health and social measures before shoreside visits.

- Ensure personnel are provided routinely with information about the risk of COVID-19, the importance of getting vaccinated when possible, getting information from reliable official sources, such as government agencies and WHO, and emphasizing the importance of counteracting rumours and misinformation.

3.10. Mental health

Ship personnel may spend prolonged periods of time onboard, and this may lead to increased levels of stress, depression, isolation from their social support systems and other adverse mental health and psychosocial impacts (37). These adverse impacts have been compounded during the COVID-19 pandemic due to a global decrease in the availability of mental health services, uncertainty about country-specific health measures and certain States being non-compliant with international regulations on facilitating disembarkation of ship personnel.

Ship personnel are subject to unique stressors associated with the pandemic.

- Some may come from countries with serious COVID-19 outbreaks and may not be able to communicate with family for extended periods of time.
- Ship personnel may have to extend their contracts and stay on board longer than expected due to travel restrictions established by some governments.
- The vaccine the seafarer received may not be recognized by other countries on their itinerary.
- Shoreside medical facilities have in some instances denied support for ship personnel on matters related and unrelated to COVID-19, leading to stress due to uncertainty about when medical care will be available.
- Medical facilities' supplies and trained personnel on board ships may be limited.
- There may be difficulties in procuring supplies for restocking in some ports.
- The social stigma associated with COVID-19 and the labelling of certain population and ethnic groups may cause additional stress.
- Shore leave is critical for maintaining mental health. During the pandemic, ship personnel have had to manage disappointment and stresses arising from lack of shore leave.
- Some ship personnel may experience financial stress because they are unable to board a ship and receive their wages during crew changes because of the health measures in place.
- Ship personnel often come from different countries and may have cultural or language differences that limit opportunities for providing or receiving support during times of stress (38).

In the absence of face-to-face mental health services, the use of remotely delivered mental health and psychosocial support services – such as through telephone helplines or video resources, or digitally accessed services, including self-help – should be promoted alongside risk communication messaging about mental health. Several telemedicine, email and other support services are available in many different languages that are implemented or delivered by ship personnel's trade unions or other organizations. Resources for self-help should be made available and accessible on the ship.

WHO has developed a series of messages and other guidance that can be used to support mental health and psychosocial well-being. This guidance on mental health and psychosocial considerations includes information about (38):

- useful versus unhelpful coping strategies
- how to build awareness of and ensure access to mental health and psychosocial support systems
- the need for effective communication and to provide accurate information
- how to stay connected with and maintain social networks
- how to engage in basic self-care (health promotion) activities
- how to seek periodic information updates from health professionals and the WHO website and avoid gossip and rumours.

The following tools are examples of industry guidance that focuses on mental health and psychosocial support, identifying risks and providing information and strategies on how to maintain a healthy mental state and cope with stressors.

- The International Seafarers' Welfare and Assistance Network has developed training materials that can be accessed online (39). These resources provide a broad overview of the mental and psychosocial risks associated with being a seafarer and detail tools that can be employed to assist in recognizing and managing these risks.
- The International Chamber of Shipping has developed guidance that addresses the handling of a mental health crisis in seafarers (40).

It is important to ensure that tools for addressing mental health and the psychosocial aspects of well-being are available as part of an essential orientation for all staff on the ship, and it is also important to ensure that all staff have access to confidential mental health and psychosocial support services, including through remote services, as needed. Mental health is an integral part of health and, therefore, standard health care services available to ship personnel and protected by shipowners should include mental health services.

3.11. Digital tools and mobile applications

Several Member States and international organizations have developed a wide range of mobile applications, some of which can provide real-time information about COVID-19 and allow crew members to stay up to date with the most recent regional and global developments. Other digital tools allow for recording proof of COVID-19 vaccination or laboratory diagnosis of previous infection.

Ship operators and personnel are encouraged to keep informed of the digital tools that are being used in countries along a journey. This can be achieved by visiting official government websites or having the ship's representatives contact national authorities directly in advance of the ship's arrival. Self-assessment and self-monitoring applications are available to assist medical staff and crew members in diagnosing and managing cases and contacts.

It is important to note, however, that these digital tools have limitations including incomplete evidence on their efficacy; the possibility that privacy, security or breaches may occur; the potential for the further marginalization of disadvantaged groups; and potentially large development, management, and maintenance costs of the application.

For ship personnel, as for all other people, digital tools and mobile applications should not be viewed as stand-alone solutions to public health measures but rather incorporated into an overall strategy to mitigate and respond to the COVID-19 pandemic (41).

4. Other relevant international regulations and guidance

4.1. International Health Regulations (2005)

The purpose of the IHR (2005) is “to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade” (25).

4.2. The Maritime Labour Convention (2006)

The Maritime Labour Convention (2006) is an international agreement established by the ILO that enshrines a seafarer's rights with respect to conditions of work (23). The Convention has now been ratified by 97 ILO member States representing more than 91 % of the world merchant shipping fleet. Public health recommendations found in this guidance document respect the provisions of the five Titles of the Maritime Labour Convention (2006).

The rights set out in the Convention must be taken into account when port health authorities seek to control and mitigate the effects of the pandemic, including by ensuring that seafarers have proper PPE; access to medical care while ashore; and are, more generally, protected in matters of safety, health and medical care, including having access to mental health care (42).

4.3. International Safety Management Code

In accordance with the IMO's International Safety Management Code and other applicable regulatory instruments, shipping companies are required to assess all identified risks to their ships and personnel and establish appropriate safeguards, as are normally documented in their safety management systems (43).

The IMO's main task is to develop and maintain a comprehensive regulatory framework for shipping, which includes addressing safety, environmental concerns, legal matters, technical cooperation, maritime security and the efficiency of shipping. The following guidance document references several IMO publications about COVID-19, including specific letters that address maritime activities and ways to perform them safely in light of the risks presented by COVID-19:

<http://www.imo.org/en/MediaCentre/HotTopics/Pages/Coronavirus.aspx>.

4.4. Work in Fishing Convention, 2007 (No. 188)

The Work in Fishing Convention is an international agreement established by the ILO that has the objective of ensuring that personnel have decent conditions of work on board fishing vessels with regard to minimum requirements for work on board; conditions of service; accommodation and food; occupational safety and health protection; medical care and social security. The Convention has been ratified by 18 member States, including several with important fishing fleets.

The rights set out in the Convention must be taken into account when port health authorities seek to control and mitigate the effects of the pandemic, including availability of proper PPE, access to medical care ashore and protection in matters of safety, health and medical care (2).

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WHO continues to monitor the situation closely for any changes that may affect this implementation guide. Should any factors change, WHO will issue a further update. Otherwise, this interim guidance document will expire 2 years after the date of publication.

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WHO reference number: WHO/2019-nCoV/Non-passenger_ships/2021.1