


Proceeding Paper

# Using the Intra-Action Review Methodology at European Level to Assess Effectiveness of Measures for Cruise Ship Operations in the COVID-19 Context <sup>†</sup>

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**Abstract:** In response to the COVID-19 pandemic, the European Union Joint Action HEALTHY GATEWAYS developed guidelines for cruise operators and authorities to restart operations and provide common COVID-19 public health preparedness and response standards. In February 2022 under the Joint Action framework, a COVID-19 outbreak onboard a cruise ship was analysed, applying the Intra-Action Review (IAR) methodology at a European level. Participants included national public health authorities and local port health authorities involved in the event response, as well as cruise line representatives. Good practices and challenges observed during the COVID-19 event are presented. Moreover, we documented the lessons learned which provided the basis for proposed revisions to future versions of HEALTHY GATEWAYS guidelines.

**Keywords:** COVID-19; cruise; intra-action review; maritime; preparedness; port; point of entry; SARS-CoV-2; ship; travel



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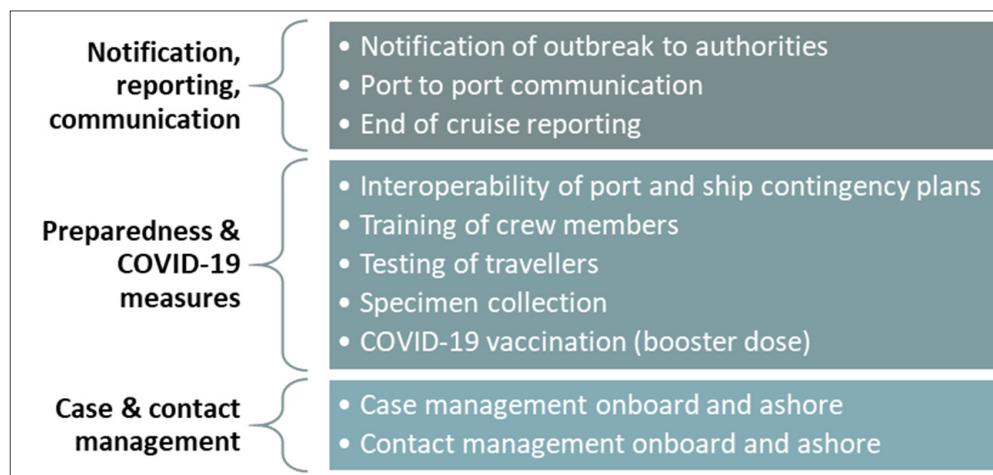
## 1. Introduction

Diverse responses to COVID-19 cases and outbreaks onboard cruise ships worldwide revealed gaps in public health preparedness and response capacities [1–4], and the need for coordinated protocols to prevent, detect and manage COVID-19 events. The European Union Joint Action HEALTHY GATEWAYS produced evidence-based guidelines for cruise operators and public health authorities [5,6] to restart operations, providing a framework for common COVID-19 preparedness and response standards. Guidelines were continuously updated and outlined: essential prerequisites to be addressed in ship contingency plans and aligned with port contingency plans, traveller screening, vaccination, diagnostic testing and event management.

During the pandemic, the World Health Organization (WHO) and European Centre for Disease Prevention and Control (ECDC) prepared guidance for countries to rapidly identify lessons learned and improve their COVID-19 response through intra-action reviews (IAR) [7–9]. We present results from analysing a COVID-19 outbreak onboard a cruise ship using IAR methodology at the European level. The objectives were to: (a) discuss the outbreak among key stakeholders; (b) identify good practices and challenges observed during event response, including solutions; (c) document lessons learned to recommend revisions to HEALTHY GATEWAYS guidelines.

## 2. Material and Methods

A meeting in February 2022 under the HEALTHY GATEWAYS’ framework analysed a COVID-19 outbreak onboard a cruise ship applying modified IAR methodology [7–9]. Rather than focusing on country-level response areas, prevention and response topics (Figure 1) were addressed in the cruise ship context; topics selected were those considered for revision in future versions of HEALTHY GATEWAYS guidelines.



**Figure 1.** Preparedness and response topics under discussion during the IAR.

Nine participants representing two of the four EU MS included in the initial cruise itinerary attended; four nationally competent public health authority representatives and five local representatives from four port health authorities participated. Four cruise line representatives involved in managing the outbreak also attended. Before the meeting, public health authorities provided background information about the event, including the number of travellers, COVID-19 cases, close contacts, vaccination status and where available the Maritime Declarations of Health (MDH). Facilitators pre-constructed an event timeline providing a common picture for participants to discuss the response.

The meeting followed WHO’s debrief format using facilitator-led discussion since its focused scope concentrates on group learning [10]. Participants were introduced to the modified IAR methodology in the first session. During the second session, the event timeline was reviewed and participants discussed whether it correctly reflected the outbreak responses. Facilitators led participants through the response to identify challenges, good practices, their impacts and causal factors.

## 3. Results

The involvement of public health authorities and the cruise line provided a more balanced and well-rounded in-depth discussion about current COVID-19 protocols applied, and how revising protocols could be implemented realistically. Table 1 presents challenges, good practices and proposed revisions to future versions of HEALTHY GATEWAYS guidelines.

**Table 1.** Challenges, good practices and proposed revisions to HEALTHY GATEWAYS guidelines based on IAR.

	Topic	Description
Challenges	Notification, reporting, communication	<ul style="list-style-type: none"> <li>Limited port-to-port communication via existing platforms (EU Common Ship Sanitation Database). Limited time/human resources may have discouraged the completion of long communication forms and signaled the need for training on platform use.</li> </ul>
		<ul style="list-style-type: none"> <li>MDH reported only COVID-19 cases onboard during notification, contrary to IHR requirements. New passenger embarkation and disembarkation took place in almost all ports of call, challenging the definition of voyage start/end for reporting.</li> </ul>
Challenges	Preparedness and COVID-19 measures	<ul style="list-style-type: none"> <li>Concerns regarding relaxation of mask-wearing/physical distancing in communities. Passengers are possibly less likely to follow measures implemented onboard.</li> </ul>
		<ul style="list-style-type: none"> <li>Denied entrance to the port with negative MDH, leading to logistical challenges for repatriation when arriving at an alternate port of call. The possibility of not applying common EU response protocols may lead to varied responses/possible overreactions.</li> </ul>
Good practices	Preparedness and COVID-19 measures	<ul style="list-style-type: none"> <li>Close contacts of cases identified via pre-embarkation screening were denied boarding.</li> </ul>
		<ul style="list-style-type: none"> <li>Cruise line implemented measures to conduct pre-embarkation testing appropriately (requesting passengers arrive early allowing sufficient time for testing, and using certified personnel).</li> </ul>
Good practices	Case and contact management	<ul style="list-style-type: none"> <li>Cruise line applies enhanced measures when an outbreak detected onboard (increased crew testing frequency, prohibiting high-risk activities).</li> </ul>
		<ul style="list-style-type: none"> <li>Asymptomatic COVID-19 cases and close contacts isolated/quarantined onboard for an additional day, allowing disembarkation at the port of residence to reduce repatriation challenges.</li> </ul>
Suggested revisions	All topics	<ul style="list-style-type: none"> <li>Considerations to improve COVID-19 pre-embarkation testing procedures and standardize process via certified personnel, determining time/personnel required to conduct tests.</li> </ul>
		<ul style="list-style-type: none"> <li>Consider COVID-19 pre-embarkation test results as an early indicator (alarm) of the possible outbreak and trigger enhanced measures onboard.</li> </ul>
		<ul style="list-style-type: none"> <li>Increasing frequency of routine COVID-19 testing for crew members and reviewing for passengers when high COVID-19 incidence rate in the community (determining threshold).</li> </ul>
		<ul style="list-style-type: none"> <li>Considerations for establishing the proportion of crew members onboard to have received COVID-19 vaccination booster.</li> </ul>
		<ul style="list-style-type: none"> <li>Considerations for respirator use onboard as many EU MS require in other transport means.</li> </ul>
Suggested revisions	All topics	<ul style="list-style-type: none"> <li>Prohibiting activities and closing areas that are high risk when high COVID-19 incidence rate in the community (determining threshold).</li> </ul>
		<ul style="list-style-type: none"> <li>Disembarkation of COVID-19 cases/close contacts at the port of residence to reduce the burden at the next port.</li> </ul>
		<ul style="list-style-type: none"> <li>Ensure it is clear that cruise ships should report via MDH to the next port all COVID-19 cases onboard from the voyage start, even if cases disembarked or recovered.</li> </ul>

#### 4. Discussion and Conclusions

IARs have been conducted reviewing countries' COVID-19 responses [11] including for points of entry [12,13]. To the best of our knowledge, this is the first application of IAR methodology involving multiple countries reviewing a COVID-19 event onboard a conveyance.

Our findings indicate the role of pre-embarkation testing to prevent infectious travellers from boarding, and as a potential indicator of outbreaks onboard. Rapid antigen detection test (RADT) sensitivity is lower than reverse transcriptase-polymerase chain reaction (RT-PCR) [14–16], with sensitivity also based on training and ability to appropriately conduct tests [17]. This demonstrates the importance of having trained personnel for pre-embarkation testing. Guidelines should include considerations for ensuring this is appropriately conducted, as high traveller volumes undergo testing within short periods.

Accurate MDH completion was both a challenge identified and a lesson learned. A study assessing MDHs submitted to Spanish ports found over one-fifth did not comply with the International Health Regulations model and nearly 40% were incomplete [18]. Guidelines must clearly advise reporting of all COVID-19 cases from the start of the voyage to reflect the epidemiological situation. Providing complete information to port authorities informs risk assessment and timely decision-making.

Limited port-to-port communication was also identified in a study by the European SHIPSAN project [19]. Existing communication platforms for ports [20] can facilitate information exchange during events. To promote uptake by authorities, reporting should be simple with authorities trained on platform use.

IAR methodology allowed stakeholders from different countries, levels and sectors to discuss their shared COVID-19 response and rapidly modify existing guidelines. Regularly conducting multisectoral and multi-country IARs will continue capturing lessons and improve response to future events.

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