Asia-Pacific Economic Cooperation

Centers for Disease Control

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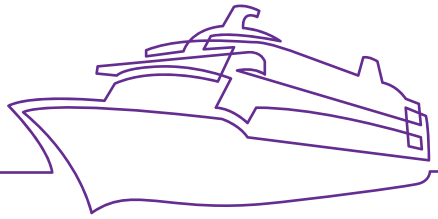

Asia-Pacific Economic Cooperation

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WELCOME MESSAGE

It is my great pleasure to welcome you to the Managing Infectious Diseases on Cross-Border Cruise Ships in the Post-COVID-19 Era: Application of Digital Technology conference.

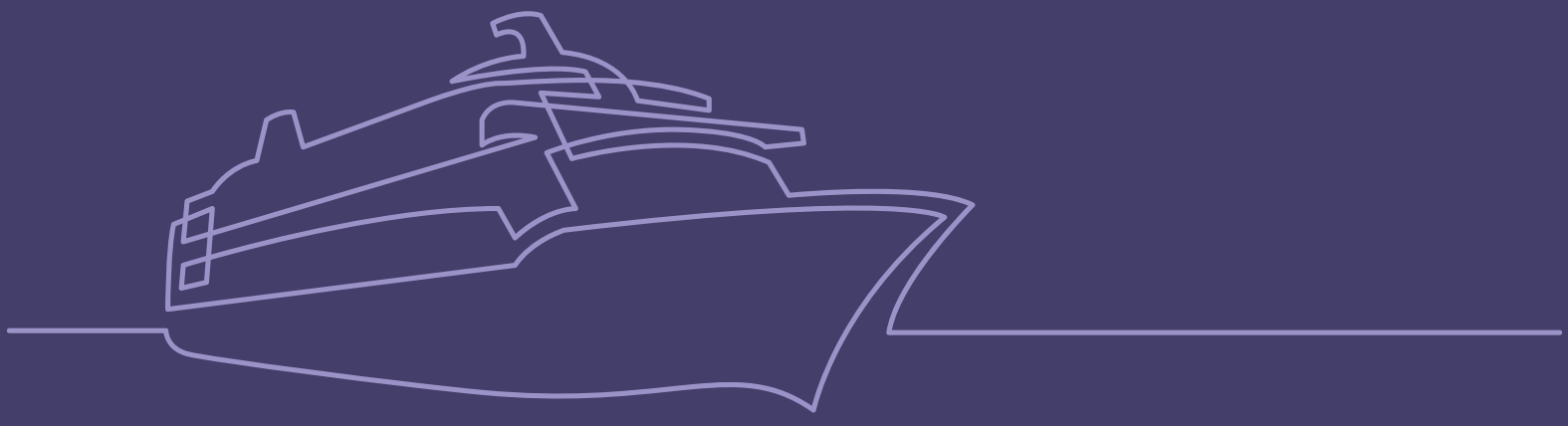
It is widely recognized that the cruise industry has been almost at a standstill since the beginning of the COVID-19 pandemic. Therefore, accelerating the revitalization of business activity in the cruise industry in the APEC region and bringing it back to pre-pandemic levels in the post-COVID-19 era is a top priority. To achieve this goal, Chinese Taipei hosts this conference to provide APEC economies with a platform to share and exchange experiences in effective epidemic prevention practices on cruise ships.

This conference will include interactive sessions that focus on establishing a dialogue platform on cruise cooperation in the areas of cruise sanitation inspections and management, response to public health events on cruise ships, and the application of digital technology to strengthen prevention and control on cruise ships, and other relevant areas. In addition, it will include a site visit to the Port of Keelung.

Thank you for your participation in this event. I hope you will find this conference stimulating and enjoyable and have a wonderful time in Taipei and Keelung.

Jen-Hsiang Chuang
Director-General
Centers for Disease Control, Ministry of Health and Welfare
Chinese Taipei

Program



PROGRAM 24 AUGUST 2023

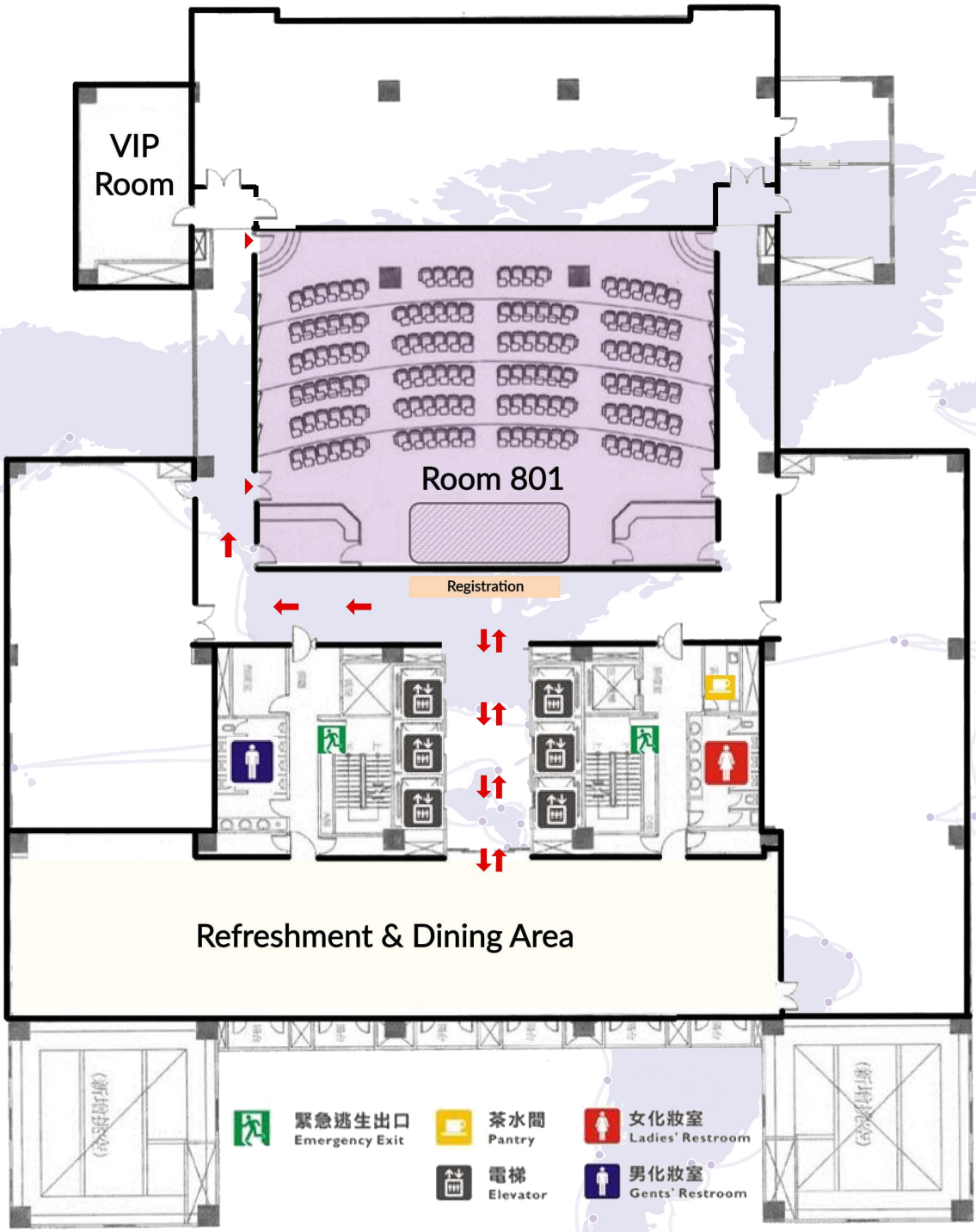
Time	Subject	Moderator / Speaker
08:30-09:30	Registration	
09:30-09:40	Opening Remarks	**Jih-Haw Chou** Deputy Minister, Ministry of Health and Welfare Chinese Taipei
09:40-09:50	Group Photo (Invited Guests)	
09:50-10:20	**Keynote Speech** Post-COVID-19 era: Global and regional cooperation on cruise ship preparedness and management of infectious diseases	**Moderator** **Jen-Hsiang Chuang** Director-General, Centers for Disease Control, Ministry of Health and Welfare Chinese Taipei **Speaker** **Christos Hadjichristodoulou** Professor of Hygiene and Epidemiology, Medical Faculty, University of Thessaly, Greece President of the EU SHIPSAN ASSOCIATION Coordinator of the Horizon Europe project HEALTHY SAILING
10:20-10:40	Coffee Break	
10:40-12:10	**Session I:** **Cruise Cooperation Dialogue Platform: Cruise Sanitation Inspections and Management**	**Moderator** **Shu-Huai Tseng** Deputy Director-General, Centers for Disease Control, Ministry of Health and Welfare, Chinese Taipei
	CDC Vessel Sanitation Program, FY2023 Update (20 mins)	**Luis O. Rodriguez** Acting Chief, Vessel Sanitation Program, Centers for Disease Control and Prevention, The United States
	Experience from SHIPSAN and EU Healthy Gateways (20 mins)	**Barbara Mouchtouri** Manager of EU Projects (SHIPSAN, SHIPSAN TRAINET, SHIPSAN ACT) and EU HEALTHY GATEWAYS joint action Associate Professor of Hygiene and Epidemiology, Faculty of Medicine, University of Thessaly, Greece
	Cruise Sanitation Inspections and Management in the Post-Pandemic Era: An Australian Perspective (20 mins)	**Paul K. Armstrong** Director, Communicable Disease Control Directorate, WA Department of Health, Australia
	The Current Situation and Future Development of Cruise Industry Post-Pandemic (15 mins)	**Sally Riu** Secretary General, Association for Cruises Development of Taiwan, Chinese Taipei
	Panel discussion	
12:10-13:30	Lunch Break	

Time	Subject	Moderator / Speaker
13:30-15:30	**Session II: Cruise Cooperation Dialogue Platform: Experiences of Responding to Public Health Events on Cruise Ships**	**Moderator** **Hsiu-Hsi Chen** Distinguished Professor, Institute of Epidemiology and Preventive Medicine, National Taiwan University Chinese Taipei
	Singapore's Cruise Experience During COVID (15 mins)	**Pream Raj S/O Sinnasamy** Senior Assistant Director, Communicable Diseases Division, Ministry of Health, Singapore
	Alternative Yacht Quarantine (AYQ) during COVID-19 pandemic in Thailand 2020-2022 (15 mins)	**Rome Buathong** Director of Division of International Communicable Disease Control Port and Quarantine, Department of Disease Control, Ministry of Public Health, Thailand
	Responding to Public Health Events on Cruise Ships: PHILIPPINES' experience during COVID and post-COVID pandemic (15 mins)	**Edgar O. Maala** Quarantine Medical Officer, Officer-in-Charge (OIC), Quarantine Service Division, Bureau of Quarantine The Philippines
	Responding to COVID-19 Public Health Events on Cruise Ships — Experience from Chinese Taipei (15 mins)	**Yung-Ching Lin** Chief Medical Officer, Office of Preventive Medicine, Centers for Disease Control, Ministry of Health and Welfare, Chinese Taipei
	Cruise Quarantine Changes in the Republic of Korea due to COVID-19 - Focusing on Sustainability (15 mins)	**Jinuk Park** Deputy Director, Division of Quarantine Policy, Korea Disease Control and Prevention Agency, Korea
	Quarantine Experience of DIAMOND PRINCESS in Japan, 2020 (15 mins)	**Kyoko Umeda** Manager, Quarantine and Sanitation Control Division, Yokohama Quarantine Station, Ministry of Health, Labour and Welfare, Japan
	Panel discussion	
15:30-15:50	Coffee Break	

Time	Subject	Moderator / Speaker
15:50-17:10	**Session III: Strengthening Prevention and Control on Cruise Ships: Application of Digital Technology**	**Moderator** **Jang-Hwa Leu** Director General, Administration for Digital Industries, Ministry of Digital Affairs, Chinese Taipei
	Development of Artificial Intelligence Applications to tackle COVID-19 pandemic by Taiwan AI Labs (15 mins)	**Ethan Tu** Founder, Taiwan AI Labs, Chinese Taipei
	Experience in Promoting Digital COVID-19 Certificate (15 mins)	**I-Ming Parng** Director General, Department of Information Management, Ministry of Health and Welfare, Chinese Taipei
	Digital Applications to prevent communicable disease on board cruise vessel–Field experiences with focus on HVAC system (10 mins)	**Pierfrancesco Lepore** Vice President Medical Services, Medical Department, MSC CRUISE MANAGEMENT (UK) Ltd.
	Using Digital Technology to Promote the Prevention and Control of Infectious Diseases on Cruise Ships (10 mins)	**Jenny Lim** Regional Vice President, Fleet Hotel Operation, Norwegian Cruise Line
	Panel discussion	
17:10-17:20	Closing Remarks	**Jen-Hsiang Chuang** Director-General, Centers for Disease Control, Ministry of Health and Welfare, Chinese Taipei

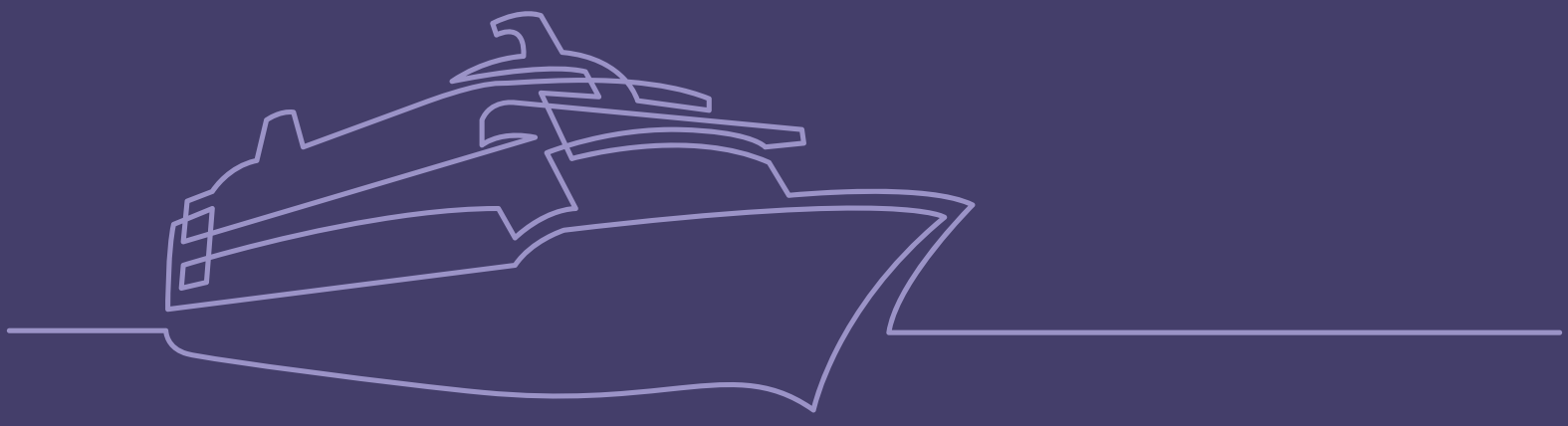
25 August 2023

Time	Subject	Moderator / Speaker
08:40-09:30	Shuttle to the Port of Keelung	
09:30-09:40	Registration (Invited Guests)	
09:40-12:00	**Session IV:** **Site Visit to the Port of Keelung**	**Moderator** **I-Ching Song** Vice President, Port of Keelung Taiwan International Ports Corp. Ltd., Chinese Taipei
	The Cruise Market of Keelung Port in the post-Covid-19 Era (10 mins)	**Huei-Hsuan Liu** Manager, Stevedoring and Warehousing Business Division, Port of Keelung Taiwan International Ports Corp. Ltd., Chinese Taipei
	Practical Experience in Cruise Quarantine and Inspection of Ships at the Port of Keelung (10 mins)	**Pei-Chun Chuang** Section Chief, Taipei Regional Center, Centers for Disease Control, Ministry of Health and Welfare, Chinese Taipei
	The Inbound Passenger Clearance Flow and the Custom, Immigration, Quarantine & Safety (CIQS) Inspection (20 mins)	**Port of Keelung** **CIQS, Chinese Taipei**
	Site visit at the Port of Keelung	**Yu-Ting Chang** Manager, Occupational Safety and Health Division, Port of Keelung Taiwan International Ports Corp. Ltd., Chinese Taipei
	Lunch	
	Shuttle to Taipei	



CHANG YUNG-FA FOUNDATION
International Convention Center
8th Floor Plan

Keynote Speech



Jen-Hsiang Chuang | Moderator

- Director-General
  Centers for Disease Control,
  Ministry of Health and Welfare
- Chinese Taipei

Educational Background

- PhD, Biomedical Informatics, Columbia University, USA
- MS, Public Health, National Yang-Ming University
- MD, Medical School, National Yang-Ming University

Professional Career

- Associate Professor, Biomedical Informatics, National Yang-Ming University, Chinese Taipei
- Director, Epidemic Intelligence Center, Centers for Disease Control, Ministry of Health and Welfare, Chinese Taipei

Publications

- Iuliano AD, Roguski KM, Chang HH, et al. Estimates of global seasonal influenza-associated respiratory mortality: a modelling study. Lancet. 2017 Dec 14. pii: S0140-6736(17)33293-2.
- Tsao HM, Chang CM, Chuang JH, Liu DP, Pan ML, Wang DW*. Toward Automatic Reporting of Infectious Diseases. Stud Health Technol Inform. 2017;245:808-812.
- Chen CC, Chuang JH, Wang DW, Wang CM, Lin BC, Chan TC*. Balancing geo-privacy and spatial patterns in epidemiological studies. Geospat Health. 2017;12(2):573.
- Lo YC*, Tsai MS, Sun HY, Hung CC, Chuang JH*. National Trend and Characteristics of Acute Hepatitis C among HIV-Infected Individuals: A Matched Case-Control Study-Taiwan, 2001-2014. PloS one. 2015; 10(10):e0139687.
- van Panhuis WG, Choisy M, Xiong X, et al. Region-wide synchrony and traveling waves of dengue across eight countries in Southeast Asia. Proc Natl Acad Sci U S A. 2015. pii: 201501375.

Christos Hadjichristodoulou | Speaker

- Professor of Hygiene and Epidemiology, Medical Faculty, University of Thessaly
- President of the EU SHIPSAN ASSOCIATION
- Coordinator of the Horizon Europe project HEALTHY SAILING
- Greece

Educational Background

- Intervention epidemiology in the European Programme on Intervention Epidemiology Training (European Programme for Intervention Epidemiology Training-EPIET). 1996-1997.
- PhD Thesis, University of Crete, 1997. Thesis Title: "Epidemiological investigation, surveillance and prevention of brucellosis in livestock region of Greece with the help of computerized mapping. Grade "Excellent".
- Residency in Pediatrics, 1993, A' Pediatrics Clinic of the University of Athens.
- Medical Degree, 1987, University of Athens Medical School (9/1981 to 6/1987), Grade Very Good 8/10.
- High School Diploma, 1979, Pancyprian Gymnasium grade "Excellent" 19/20.

Professional Career

Professor of Hygiene and Epidemiology at the School of Medicine of the University of Thessaly (UTH) in Larissa, Greece. He is the Director of the University's Department of Hygiene and Epidemiology, Director of the Peripheral Public Health Laboratory of Thessaly and the scientific coordinator of the 2 year post graduate training program in applied public health and environmental hygiene. He is also the Head of the WHO Collaborating Center for the International Health Regulations: points of entry. Moreover, he is the Coordinator of the Horizon Europe project (101069764) HEALTHY SAILING (2022-2025) focused on prevention, mitigation and management of infectious diseases on cruise ships and passenger ferries, which brings together a diverse network of partners from universities, industry and public health authorities.

Christos Hadjichristodoulou was the Coordinator of the EU HEALTHY GATEWAYS Joint

Action focused on preparedness and response at points of entry including ports, airports, and ground crossings (2018-2022), the EU SHIPSAN ACT Joint Action (2013-2016) and of the "Integrated surveillance and control programme for West Nile virus and malaria in Greece" (2013-2016). He was the Project leader of the SHIPSAN TRAINET project (2008-2011) and the Scientific Coordinator of the SHIPSAN project (2006-2008). He was also the scientific coordinator of the project "Environmental Health Surveillance for the Athens 2004 Olympic Games". He held the post of the Director of the National Center for Surveillance and Intervention in Greece (December 1997 until February 2000).

Finally, he has collaborated in a number of projects as a technical advisor with HQ WHO Lyon Office. Christos Hadjichristodoulou has over 270 publications in peer review journals in public health topics.

Publications

- Hatzianastasiou S, Mouchtouri VA, Pavli A, Tseroni M, Sapounas S, Vasileiou C, Dadouli K, Kyritsi M, Koureas M, Prezerakos P, Speletas M, Panagiotakopoulos G, Tsiodras S, **Hadjichristodoulou C**. COVID-19 Outbreak on a Passenger Ship and Assessment of Response Measures, Greece, 2020. Emerg Infect Dis. 2021 Jul;27(7):1927-1930.
- Mouchtouri VA, Dirksen-Fischer M, **Hadjichristodoulou C**. Health measures to travellers and cruise ships in response to COVID-19. J Travel Med 2020; 27(3).
- Varvara A Mouchtouri , Hannah C Lewis , **Christos Hadjichristodoulou** ; EU SHIPSAN ACT Joint Action Partnership. A Systematic Review for Vaccine-Preventable Diseases on Ships: Evidence for Cross-Border Transmission and for Pre-Employment Immunization Need. 2019 Jul 30;16(15):2713.
- Varvara A Mouchtouri , Eleni Verykouki , Dumitru Zamfir , Christos Hadjipetris , Hannah C Lewis , **Christos Hadjichristodoulou** ; EU SHIPSAN ACT partnership 4. Gastroenteritis outbreaks on cruise ships: contributing factors and thresholds for early outbreak detection. Euro Surveill 2017 Nov;22(45):16-00576.
- Varvara A Mouchtouri, Christopher L R Bartlett, Arthur Diskin, **Christos Hadjichristodoulou.** Water Safety Plan on cruise ships: a promising tool to prevent waterborne diseases. Sci Total Environ. 2012 Jul 1;429:199-205

Post-COVID-19 era: Global and regional cooperation on cruise ship preparedness and management of infectious diseases

Christos Hadjichristodoulou

COVID-19 pandemic affected heavily the cruise industry and revealed weaknesses of both public health authorities and the industry in detection and coordinated response to new emerging diseases. Experiences from the Diamond Princess COVID-19 outbreak and other events demonstrated that pre-defined and interoperable contingency plans on ships and at ports are essential to ensure effective management of public health events. The COVID-19 pandemic demonstrated lack of synergistic, harmonized approaches for response at regional, intercountry and global levels. An integrated approach addressing expected and new emerging infectious diseases is essential, as well as incorporating evidence-based COVID-19 prevention, mitigation and management measures into routine operations. Syndromic surveillance supported by rapid diagnosis can help in early threat detection onboard cruise ships, considering also the epidemiological situation on land. Moreover, a common database, including communication network platform for information exchange between ports and national authorities from different countries, can help to better manage public health events on board cruise ships and conduct of cruise ship inspections using common standards. Training and exercises can be conducted for event management on board ships so as to increase response capacities and promote a harmonized approach. Ships can adopt a risk-based approach for decision making and in order to set evidence-informed thresholds for health measures introduction. Since the start of the pandemic, the European Union Joint Action “HEALTHY GATEWAYS” (EUHG) (2018-2022) developed several evidence-based advice documents supporting governmental authorities and ship operators to safely restart cruise operations in Europe, including a tool for port public health emergency contingency planning incorporating a cruise restart process map. These advice documents provided a framework for shared protocols, to achieve common standards for COVID-19 preparedness and response onboard cruise ships in EUMS. Lessons learned during the 2020-2021 cruise season will be carried forward in a new European Union project “HEALTHY SAILING” (2022-2025) to improve the quality of passenger shipping services, facilitate recovery from the COVID-19

pandemic and make passenger shipping, including cruising, safer and more resilient. The European HEALTHY SAILING project will establish a global expert panel providing a forum for exchanging of opinions, knowledge, scientific evidence and effective policies and practices and can help in harmonization of preparedness and response approaches at regional and international levels.

Managing Infectious Diseases on Cross-Border Cruise Ships in the Post-COVID-19 Era: Application of Digital Technology
24-25 August 2023
Chinese Taipei

Healthy GateWays

EU HEALTHY GATEWAYS Joint Action
Preparedness and action at points of entry (ports, airports, ground crossings)
Joint Action 04-2017 / Grant Agreement Number: 801493

Post-COVID-19 era: Global and regional cooperation on cruise ship preparedness and management of infectious diseases

Prof Christos Hadjichristodoulou
EU HEALTHY GATEWAYS Joint Action Coordinator
President of EU SHIPSAN scientific association
Department of Hygiene and Epidemiology, Medical Faculty, University of Thessaly
Greece

The EU HEALTHY GATEWAYS Joint Action has received funding from the European Union, in the framework of the Third Health Programe (2014-2020).

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To give a bit of History !!! On 3rd February 2020:

Diamond Princess anchored at Yokohama Port, Japan

and

EU Joint Action HEALTHY GATEWAYS **published advice on COVID-19 prevention & control for ship operators**


INTERIM ADVICE
FOR PREPAREDNESS AND RESPONSE TO CASES OF 2019-nCoV ACUTE RESPIRATORY DISEASE AT POINTS OF ENTRY IN THE EUROPEAN UNION (EU)/EEA MEMBER STATES (MS)

Advice for ship operators for preparedness and response to the outbreak of 2019-nCoV acute respiratory disease

Version 2
3 February 2020

Measures advised for:

1. Ensuring **early detection** of SARS-CoV-2 onboard
2. Case management → **disembarkation of first possible COVID-19 case**
3. Contact management → contact tracing, **disembarkation of close contacts of confirmed case and quarantine in facilities ashore**
4. Supplies & equipment onboard, record-keeping, active surveillance, cleaning & disinfection

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COVID-19 outbreak on the Diamond Princess cruise ship

- The cruise ship had 3,711 passengers and crew members onboard
- There were eight decks for passenger cabins and eight decks for crew cabins.
- **≈712 people became infected**
  - 328 cases were asymptomatic
- **9 people died**
- **Rt= 3,04-15.00**

"despite it was preferable to disembark 3,000-4,000 passengers from Diamond Princess, it was not feasible due to a lack of facilities, safe procedures, laboratory capacity and unknowns in the disease epidemiology. The outbreak evolved because crew was continue working when passengers were isolated on-board, resulting in 712 cases"

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Lessons learned from the Diamond Princess outbreak

- Among passengers, **the highest attack rate was observed in the 20 to 29 years of age group**, and this might be because of frequent contacts among young people, which could be a driving force of the disease's spread
- **The attack rate among food service workers was higher than among other occupations among the crew**, which supports the hypothesis that the disease spread through cocktail and wine parties
- **Passengers and crew aged over 50 years were more likely to develop symptoms, especially individuals over 80 years of age**.
- **Airborne transmission** was suspected & internal air re-circulation was stopped to reduce the possible risk of airborne transmission

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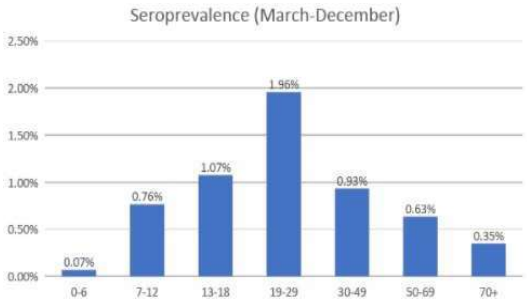
Most affected age group -*"drivers"*

Age group "19-29" years old seems to be presented as the most affected age group again.

This is supported, too, by our seroprevalence study (March to December 2020) in which age group "20-29" seems to be the most affected



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COVID-19 Outbreak on a Passenger Ship and Assessment of Response Measures, Greece, 2020

Sophia Hatzianastasiou,[1] Varvara A. Mouchtouri,[1] Androula Pavli, Maria Tseroni, Spyros Sapounas, Charalampos Vasileiou, Katerina Dadouli, Maria Kyritsi, Michalis Koureas, Panagiotis Prezerakos, Matthaios Speletas, Georgios Panagiotakopoulos, Sotirios Tsiodras,[2] Christos Hadjichristodoulou[2]

- 128 (33.4%) COVID-19 cases (46.1% asymptomatic) among 383 persons onboard a passenger ship
  - passenger ship: 2,500-passenger and 1,606-bed capacity
- For 21 days, the ship sailed without any disembarkations or embarkations until the first suspected COVID-19 case was reported
- **Rt=2,6**

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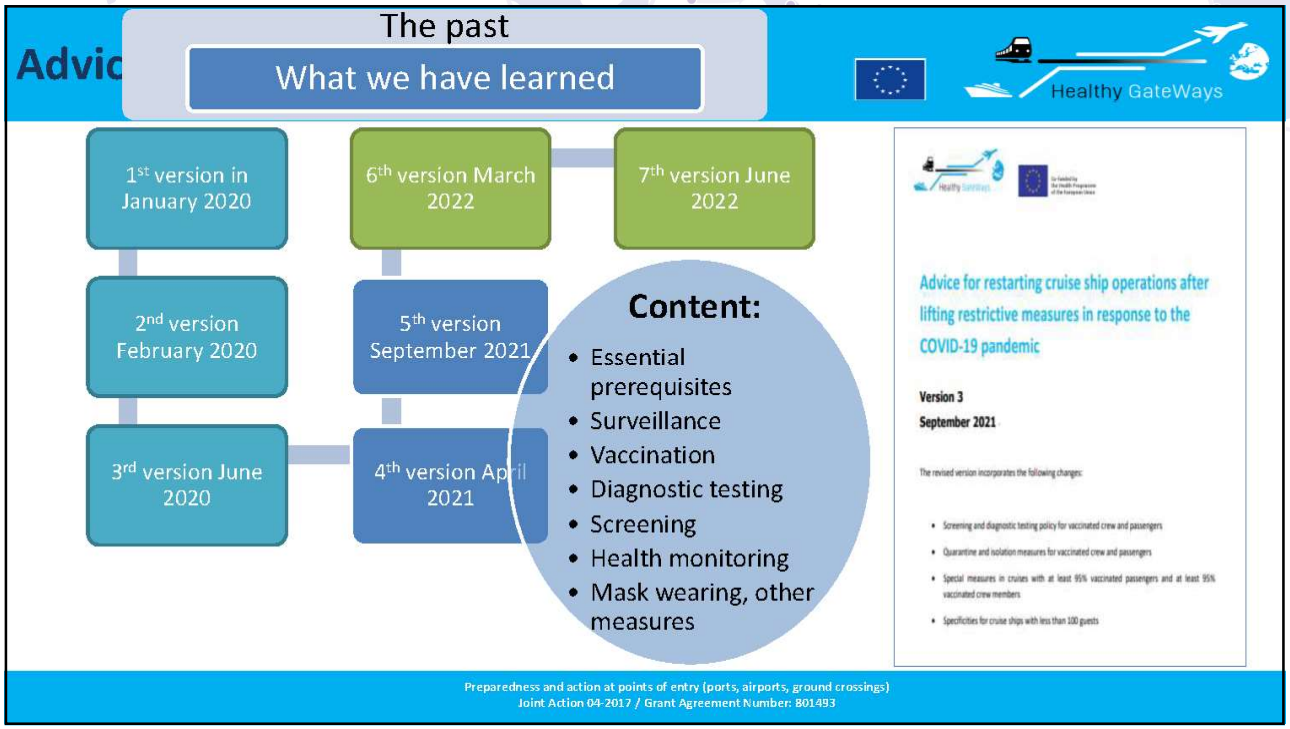
COVID-19 Outbreak on a Passenger Ship and Assessment of Response Measures, Greece, 2020

- Travelers who tested positive were isolated on-board
  - except the first case-patients, who were hospitalized, and 2 travelers who were isolated in hotels designated by the government of Greece for that purpose
- All travelers onboard who tested negative were considered contacts and quarantined individually in quarantine facilities ashore (hotels designated by the Greek government), except 36 crew members who tested negative but quarantined in separate decks and facilities onboard to ensure safe ship operation.
- No deaths occurred
- 7 patients were hospitalized, including the 1st patient, who was intubated
- No further cases among the negative were recorded



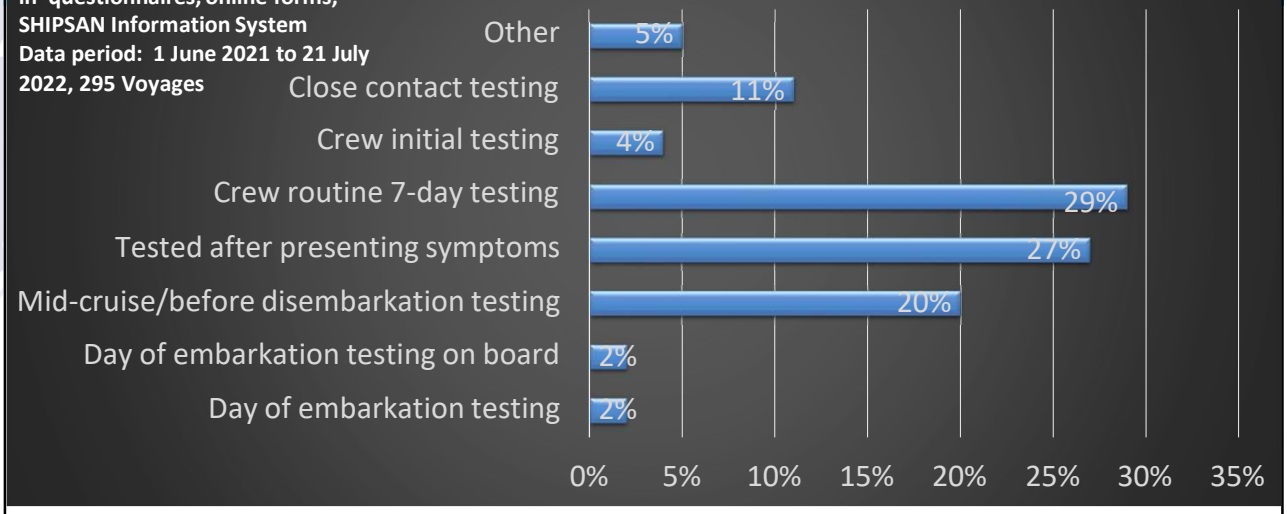
COVID-19 incidence rates in 2021-2022

- Cases were identified in 40% of voyages (118 /295) and 60% among crew members (467/776)
- Incidence rate (N=249 voyages)

Pax and Crew	Crew	Passengers
0.17 cases per 1000 person-days	0.28 cases per 1000 crew-days	0.11 cases per 1000 passenger-days

Detection of cases through RADT - Percentage over the total number of cases

COVID-19 case reported by cruise ships in questionnaires, online forms, SHIPSAN Information System
Data period: 1 June 2021 to 21 July 2022, 295 Voyages



Preparedness and action at points of entry (ports, airports, ground crossings)
Joint Action 04-2017 / Grant Agreement Number: 801493

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Study of the effectiveness of mask use and physical distancing on cruise ships

Group 1 with face mask

Period: 03/07/2021 - 23/10/2021
59 voyages
Total number of passengers on board:75.920
Total passengers-days on board : 542.350

Measures

- Testing of crew members the day of embarkation
- routine testing of crew members
- testing of passengers the day of embarkation
- routine testing of passengers
- testing of passengers by the third day of the cruise
- daily contactless temperature measurement
- health screening questionnaire at the start of the cruise
- **buffet service only under strict measures**
- **mandatory physical distancing of at least 1.5 m**
- **mandatory use of face mask at all times when outside of the cabins in indoor spaces**
- **vaccination of crew members and passengers were strongly recommended (not mandatory)**

Group 2 without face mask

Period: 03/07/2021 - 06/11/2021
22 voyages
Total number of passengers on board: 9.655
Total passengers-days on board : 75.855

Measures

- Testing of crew members the day of embarkation
- routine testing of crew members
- testing of passengers the day of embarkation
- routine testing of passengers
- testing of passengers by the third day of the cruise
- daily contactless temperature measurement
- health screening questionnaire at the start of the cruise
- **buffet service allowed to operate as normal**
- **physical distancing recommended**
- **use of face mask recommend**
- **crew and passengers were fully vaccinated**

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Study of the effectiveness of mask use and physical distancing on cruise ships

- **Group 1 (masks + physical distancing)**

11 passenger cases
0,02 cases per 1000 person-days

Group 2 (no masks + no physical distancing)

33 passenger cases
0,44 cases per 1000 person-days

Incidence rate ratio estimate: 0,046 (95 % CI: 0,023 – 0,091)

Face mask use and physical distancing measures reduced the risk of infection by 95.4%

Source: University of Thessaly, Unpublished data

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Incidence rate aboard cruise ships in comparison with EU land based cases (data from ECDC)

Standardized Incidence Ratios during the study period for passengers and crew members

Population group	Observed cases	Expected cases	Standardized Incidence Ratio	95% CI	P-value
Group 1(Passengers)	11	285	0.039	0.019-0.069	<0.001*
Group 1 (Crew)	5	189	0.026	0.009-0.062	<0.001*
Group 2(Passengers)	33	39	0.838	0.577-1.177	0.350
Group 2(Crew)	3	45	0.066	0.013-0.193	<0.001*

Group 1: following the regular protocol, Group 2: following the regular protocol, except from the requirement for passengers to wear mask and to maintain physical distancing * Statistically significant at 0.001 level

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What public health measures proved to be effective in preventing COVID-19 cases and outbreaks onboard ?

- A systematic review and epidemiological studies are ongoing to answer this question
- Preliminary results indicate :
  - Pre embarkation screening of passengers
  - Pre embarkation screening and quarantine of crew members
  - Regular testing of crew members
  - Face mask
  - Isolation and contact tracing
  - Improving ventilation systems
  - ……

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What about the role of Points of entry

EU HEALTHY GATEWAYS joint action countries conducted COVID-19-focused IARs to analyse responses at their points of entry

1. Netherlands (national) – March 2021
- COVID-19 public health response at ports

2. Netherlands (national) – March 2021
- COVID-19 public health response at airports

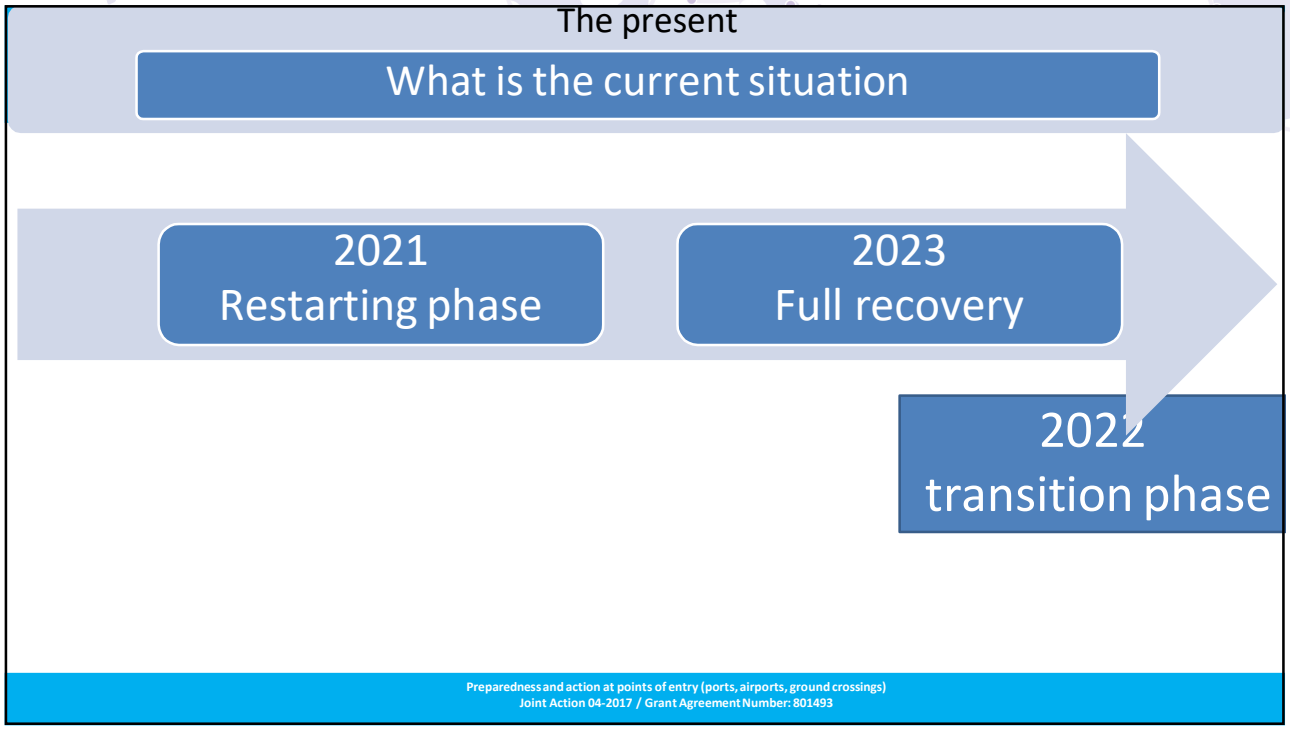
3. Greece (local) – December 2021
- COVID-19 public health response at local port

4. Austria (local) – 2022
- COVID-19 public health response at local airports

5. European meeting using IAR methodology – February 2022
- Assess and update COVID-19 advice documents by analysing COVID-19 event

Examples of key findings from IARs:

- Need to facilitate communication between ports, including EU MS and non-EU MS since public health events occur onboard cruise ships calling both in a single itinerary
- Need to establish shared protocols between EU MS and non-EU MS with common standards for COVID-19 public health response at cruise ports



Preparedness and action at points of entry (ports, airports, ground crossings)
Joint Action 04-2017 / Grant Agreement Number: 801493

The present

What is the current situation

- Accumulating evidence to inform cruise ship COVID-19 protocols to be used in every day routine operations
- Working to develop protocols for COVID-19
  - Making cruise industry resilient, enabling uninterrupted safe operation in all possible future epidemiological scenarios with flexible and easily adoptable protocols

The challenges

1. Lack of evidence to inform guidelines and policies
2. The high rate of asymptomatic COVID-19 infections on board hinders early detection of outbreaks
3. Unreportable infections on board
4. Raising awareness, improve knowledge and compliance with health and hygiene measures among crew and passengers
5. Effective protocols applied to resume operations in 2021 are of high cost and are considered to discourage people from cruising

What we propose …

1. Common protocols for:
   - Preparedness and management of extraordinary events on board cruise ships and ferries, to ensure compatibility of protocols when ships sail between countries
   - Standards for preventing and responding to extraordinary events
2. Safeguarding healthy tourism and cruising throughout the region

Preparedness and action at points of entry (ports, airports, ground crossings)
Joint Action 04-2017 / Grant Agreement Number: 801493

What we propose …

3. Ensuring cooperation for the application of common protocols for all types of ships between countries in the region
4. Common protocols for port responses to extraordinary emergency events on cruise ships

Preparedness and action at points of entry (ports, airports, ground crossings)
Joint Action 04-2017 / Grant Agreement Number: 801493

What we propose …

Healthy GateWays

5. Operation of a Common Database, including communication network platform for information exchange between ports and national authorities from different MED countries, in case of extraordinary events on board cruise ships

6. Conduct of cruise ship inspections using common standards

What we propose …

Healthy GateWays

7. Training and exercises for event management on board ships, to increase response capacities and promote a harmonized approach

Preparedness and action at points of entry (ports, airports, ground crossings)
Joint Action 04-2017 / Grant Agreement Number: 801493

What are the options?

- Options for surveillance for early warning:
  - Syndromic surveillance for symptomatic cases (COVID-19 like illness)
  - Voluntary pre-embarkation self-testing
  - Random sampling and RADT of pax
  - Crew regular RADT
  - Monitoring of other parameters such as medicine requests, sewage surveillance, absenteeism from activities

What are the options?

- Risk based approach for decision making by the ship
- Setting evidence- informed thresholds and algorithms
  - Epidemiological indicators on board
  - Vulnerability of population on board
  - Vaccination status and prior infection history of population on board
  - Global and local epidemiological situation, VOC

Preparedness and action at points of entry (ports, airports, ground crossings)
Joint Action 04-2017 / Grant Agreement Number: 801493

What are the options?

Healthy GateWays

- Behavioural aspects in health measures implementation, rising awareness, improving knowledge and compliance among pax and crew
- Designing ships and train staff to deal with all possible scenarios on board until shore-side support can be settled
- Protocols validated for their effectiveness

Overall aim for cooperation

Healthy GateWays

Safeguarding the health of communities, ensuring economic growth and sustainable development

Preparedness and action at points of entry (ports, airports, ground crossings)
Joint Action 04-2017 / Grant Agreement Number: 801493

Considerations and lessons learned

1. Should we wait until solid evidence is available **or** take a proactive approach and prepare advice documents in advance, based on existing evidence and update advice regularly?
2. We must balance the consequences of being proactive and providing advice early with regularly updating and changing this advice, which could confuse stakeholders and the general public
3. Due to urgency, evidence collected during the pandemic often times has not been peer-reviewed, resulting in poor-quality research published even in highly respected journals
4. Global coordination on advice should be achieved
   - e.g. following the suggestion of US CDC to establish an **international interagency group** for coordinating global efforts and providing advice globally
5. Contradictory evidence among different groups of experts or organizations should be avoided

We should not miss opportunities

- Large future pandemics are expected
- Investing to public health preparedness and response to be considered as a priority to allow economic growth and business continuation
- Cooperation:
  - intra-governmental (local, intermediate, national)
  - Inter-governmental (regional, international)
  - Multi-sectorial: shipping companies, port operators, governments, communities

Preparedness and action at points of entry (ports, airports, ground crossings)
Joint Action 04-2017 / Grant Agreement Number: 801493

Looking forward

Consider lessons learned during the pandemic and incorporate evidence-based COVID-19 prevention, mitigation and management measures into routine operations to:

- prevent COVID-19 in the short-term
- prepare for future health threats

New EU Project (2022-2025)

New EU Project (2022-2025)

HEALTHY SAILING

Prevention, mitigation and management of infectious diseases on cruise ships and passenger ferries

Coordinator: Laboratory of Hygiene and Epidemiology, University of Thessaly, Greece

24 consortium members: universities, governmental public health and research institutes, scientific NGO, ship companies and engineer companies

General Objective:

To improve the quality of passenger shipping services, facilitate recovery from the COVID-19 pandemic, and make the passenger shipping sector safer, more resilient, competitive and efficient.

Funded by the European Climate, Infrastructure and Environment Executive Agency (CINEA)

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Approach

HEALTHY SAILING

Funded by the European Union

1. Establishing **comprehensive scientific evidence-base** for mechanisms facilitating onboard spread of infection:
   - *Epidemiological studies*
   - *Literature reviews*
   - *Risk assessment and mathematical modeling to predict dispersion of respiratory droplets/aerosols*

2. Developing **evidenced-informed guidelines** for:
   - *Medical operations and specificities/needs of expedition vessels*
   - *Ventilation systems*
   - *Measures for COVID-19 prevention, mitigation, management in routine operations*
   - *Vaccination of passengers and crew*

3. Enhancing **awareness, knowledge, behavioral change** through:
   - *Blended learning toolkit enriched with hands-on training for crew, passengers and stakeholders (augmented reality/gaming)*
   - *Technology-induced behavioral change in hand hygiene tool kit*
   - *Guidelines with communication approaches (including risk communication)*

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Approach

HEALTHY SAILING

Funded by the European Union

4. Supporting **early health threat detection** via:
   - *Syndromic surveillance for infection disease*
   - *Integrated health e-surveillance IT system*
   - *Intelligent Immune IT System (health measures decision support)*
   - *Inventory of fast diagnostic laboratory methods*
   - ***Study for facilitated access to ship medical facilities (healthcare on board)***
   - ***Waste surveillance on board***

5. Facilitating **healthy environments** through:
   - *Toolkit for systematic monitoring of surface cleaning and disinfection*
   - *Artificial Intelligence Water Safety Plan decision support tool*

6. Controlling infection spread beyond ship into **ports and communities** by:
   - *Establishing the framework of an international committee for best practice exchange*
   - *Toolkit for predicting needs of port response capacities*
   - *Integrated e-pass based on a one-ID concept for fast embarkation*

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HEALTHY SAILING

Funded by the European Union

- Thank you for giving me the opportunity to present in this excellent conference
- Thank you for giving me the opportunity to meet and collaborate with great scientists from all over the world
- Thank you for the great hospitality

謝謝

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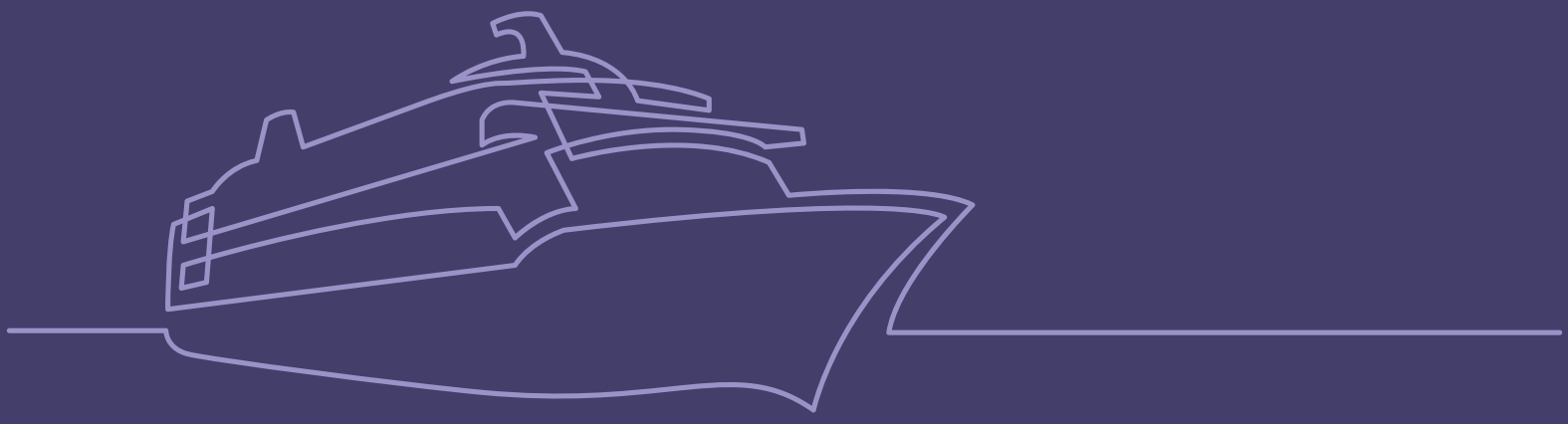
Porto

Session I
Cruise Cooperation Dialogue Platform: Cruise Sanitation Inspections and Management



Shu-Hui Tseng | Moderator

- Deputy Director-General
  Centers for Disease Control,
  Ministry of Health and Welfare
- Chinese Taipei

Educational Background

- Management for International Public Health Program, Centers for Disease Control and Prevention, U.S.A.
- 2012 Ph.D. (Graduate Institute of Clinical Medical Sciences), Chang Gung University
- 1989 M.D., National Yang-Ming University

Professional Career

- 2023-present Deputy Director-General, Centers for Disease Control, Ministry of Health and Welfare
- 2013-2023 Director, Division of Infection Control and Biosafety, Centers for Disease Control, Ministry of Health and Welfare
- 2003-2004 Director, Southern Branch, Centers for Disease Control, Department of Health, Executive Yuan
- 2003 Section Chief, Division of Immunization, Centers for Disease Control, Department of Health, Executive Yuan
- 1994-1997 Attending Physician, Taoyuan Branch, Taipei Veterans General Hospital
- Chief Resident Physician, Taichung Veterans General Hospital
- Resident Physician, Taichung Veterans General Hospital

Publications

- Preventing and controlling intra-hospital spread of COVID-19 in Taiwan - Looking back and moving forward.
  Lin KY, Pan SC, Wang JT, Fang CT, Liao CH, Cheng CY, Tseng SH, Yang CH, Chen YC, Chang SC.
  J Formos Med Assoc. 2023 May 22:S0929-6646(23)00188-2.
- In vitro activity of cefiderocol, cefepime / enmetazobactam, cefepime / zidebactam, eravacycline, omadacycline, and other comparative agents against carbapenem-non-susceptible Pseudomonas aeruginosa and Acinetobacter baumannii isolates associated from bloodstream infection in Taiwan between 2018-2020.
  Liu PY, Ko WC, Lee WS, Lu PL, Chen YH, Cheng SH, Lu MC, Lin CY, Wu TS, Yen MY, Wang LS, Liu CP, Shao PL, Lee YL, Shi ZY, Chen YS, Wang FD, Tseng SH, Lin CN, Chen YH, Sheng WH, Lee CM, Tang HJ, Hsueh PR.
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- Nationwide surveillance of antimicrobial resistance in invasive isolates of Streptococcus pneumoniae in Taiwan from 2017 to 2019.
  Tsai YT, Lee YL, Lu MC, Shao PL, Lu PL, Cheng SH, Ko WC, Lin CY, Wu TS, Yen MY, Wang LS, Liu CP, Lee WS, Shi ZY, Chen YS, Wang FD, Tseng SH, Lin CN, Chen YH, Sheng WH, Lee CM, Tang HJ, Lin CY, Chen YH, Hsueh PR.
  J Microbiol Immunol Infect. 2022 Apr;55(2):215-224.
- Biological Select Agents and Toxins Management in Taiwan: From Past to Present.
  Hsieh LC, Wu WC, Tseng SH.
  Appl Biosaf. 2021 Sep 1;26(3):123-129
- Antimicrobial susceptibility of bacteremic vancomycin-resistant Enterococcus faecium to eravacycline, omadacycline, lipoglycopeptides, and other comparator antibiotics: Results from the 2019-2020 Nationwide Surveillance of Multicenter Antimicrobial Resistance in Taiwan (SMART).
  Tsai HY, Lee YL, Liu PY, Lu MC, Shao PL, Lu PL, Cheng SH, Ko WC, Lin CY, Wu TS, Yen MY, Wang LS, Liu CP, Lee WS, Shi ZY, Chen YS, Wang FD, Tseng SH, Chen YH, Sheng WH, Lee CM, Chen YH, Liao CH, Hsueh PR.
  Int J Antimicrob Agents. 2021 Jul;58(1):106353.

Luis O. Rodriguez | Speaker

- Acting Chief
  Vessel Sanitation Program,
  Centers for Disease Control and Prevention
- The United States

Educational Background

- Environmental Health, Public Health, Global Health

Professional Career

More than 21 years in public health. Assignments with the U.S. Food and Drug Administration (FDA) and the U.S. Centers for Disease Control and Prevention (CDC). Environmental Health Officer with the CDC Vessel Sanitation Program since 2010 and Acting Chief since January 2023.

Publications

- 2022, Data Modernization: Making Environmental Health Services Data More Accessible, Journal of Environmental Health
- 2022, Objective Review Panel – CDC Funding Opportunity, "Modernizing Environmental Public Health Tracking to Advance Health Surveillance"
- 2021, Maritime Surveillance for Acute Gastroenteritis, United States, 2006–2019, Morbidity and Mortality Weekly Report (MMWR)
- 2021, Public Health Branch Incident Management and Support as part of the Federal Government Response during the Emergency Phase of Hurricanes Irma and Maria in Puerto Rico and the US Virgin Islands, Journal of Emergency Management
- 2020, Public Health Responses to COVID-19 Outbreaks on Cruise Ships — Worldwide, February–March 2020, Morbidity and Mortality Weekly Report (MMWR)

CDC Vessel Sanitation Program, FY23 Update

Luis O. Rodriguez

The Vessel Sanitation Program (VSP) at the Centers for Disease Control and Prevention (CDC) assists the cruise ship industry to prevent and control the introduction, transmission, and spread of gastrointestinal (GI) illnesses on cruise ships. VSP operates under the authority of the Public Health Service Act (42 U.S.C. Section 264 Quarantine and Inspection Regulations to Control Communicable Diseases).

VSP accomplishes its mission by

- Inspecting cruise ships in periodic, unannounced operational sanitation inspections.
- Reviewing ship construction plans for compliance with VSP's sanitary design criteria standards.
- Monitoring GI illnesses and investigating or responding to outbreaks.
- Training cruise ship employees on public health practices.
- Providing health education and reliable and current public health information to the cruise ship industry, the traveling public, public health professionals, state and local health authorities, and the media.

VSP operational inspections were suspended during the COVID-19 response and under CDC no-sail and conditional sailing orders, and VSP GI outbreak and surveillance activities continued. This presentation focuses on the resumption of VSP activities to accomplish its mission. Operational inspections resumed on October 1, 2022. VSP is taking a phased approach to other program activities, such as construction inspections, plan and equipment reviews, and training for cruise ship and shipyard staff.

Teaser

The Vessel Sanitation Program (VSP) at the Centers for Disease Control and Prevention assists the cruise ship industry to prevent and control the introduction and spread of gastrointestinal illnesses on cruise ships. Learn how VSP operational inspections and other

activities are resuming after suspension during the COVID-19 response and under CDC no-sail and conditional sailing orders.

Takeaways

- During the COVID-19 response and under CDC no-sail orders, cruise operations ceased, so health inspections were suspended.
- A phased resumption of passenger operations increased public health.
- The phased resumption of health inspections and other outbreak prevention and response activities is ensuring a healthy environment for cruise ship travelers.

Disclaimer

The findings and conclusions in this presentation have not been formally disseminated by the Centers for Disease Control and Prevention and should not be construed to represent any agency determination or policy.

In this presentation you will learn about VSP

- **Mission, scope, and history**
- **Program components**
- **Updates**

2

Mission

Acute gastroenteritis (AGE): Irritation and inflammation of the digestive tract characterized by sudden onset of symptoms of diarrhea and/or vomiting, as well as other constitutional symptoms such as fever, abdominal cramps, headache, or muscle aches

Image from the International Association for Food Protection, modified by VSP staff

3

Jurisdiction

- **Cruise vessels that**
  - Carry 13 or more passengers
  - Have an international itinerary
  - Call on U.S. ports
- **2023**
  - ~400 vessels
    - ~150+ in the U.S.
  - Cruise tourism is rebounding faster than other international tourism*
  - 32 million passengers worldwide*

National Geographic Quest

Length	72 m
Size	91 GRT
Passengers	100
Crew	52

Wonder of the Seas

Length	362 m
Size	235,600 GRT
Passengers	7,084
Crew	2,204

Gross Registered Tons (GRT)
* 2023 Forecast Cruise Lines International Association (CLIA)
Photos from https://www.cruisemapper.com and www.royalcaribbean.com

4

VSP History

1.0
- 1975: VSP was established
- 1986: CDC terminated portions of VSP

2.0
- 1987: A restructured VSP began
- 1988: VSP introduced user fees

3.0
- 2020: VSP goes to Maritime Unit, COVID-19
- 2022: VSP resumed its primary mission

Nearly 50 Years

5

COVID-19 Outbreaks on Cruise Ships

Photo by VSP staff

6

During the COVID-19 Pandemic

Photos by VSP staff

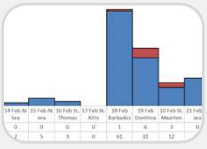
7

VSP's Applied Environmental Public Health Program: Four Core Services

Construction

Training and consultation

Operational inspections



AGE surveillance and outbreak investigations

Publications and References | VSP | CDC
Cruise Ship Outbreak Updates | Vessel Sanitation Program | CDC
Photos and graph by VSP staff. Training and Consultation photo is of VSP staff and cruise ship personnel.

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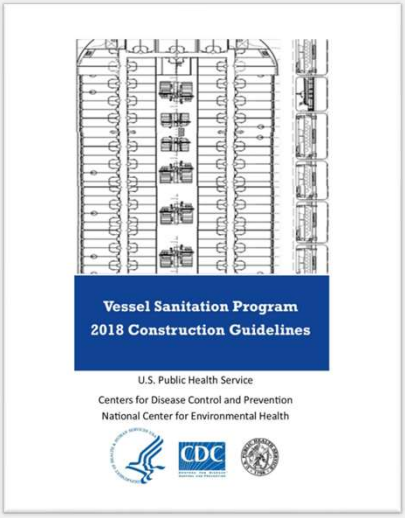
Construction



- **The Guidelines provide a world class framework of consistent construction and design standards that protect passenger and crew health.**

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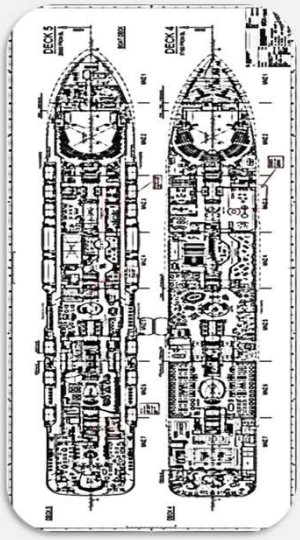
Construction Plan Reviews and Inspections



Images from VSP staff

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Training and Consultation

- This is the education and knowledge piece as well as capacity-building efforts.

Photo by VSP staff

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Operational inspections

- This is where we observe procedures and review records to ensure practices are in place to prevent AGE illness.

Photos by VSP staff

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VSP's Operations Manual

- **The Manual is a world standard on passenger ship sanitation.**
- **Based on**
  - Previous *VSP Operations Manual*
  - Current *Food and Drug Administration (FDA) Model Food Code*
  - *World Health Organization (WHO) Guide to Ship Sanitation*
  - Extensive references and standards

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VSP Operational Inspections by the Numbers
(October 2022 to July 2023)

- **148 ship inspections**
- **>23 U.S. ports**
- **~4,500 inspection hours**
- **~3,500 violations**
  - >600 critical violations
    - 30% - Item 39 (related to pest management)
    - 27% - Item 26 (related to food contact surfaces)
- **Average score: 96**
- **Score range: 100 - 67**
- **Perfect scores: 32**

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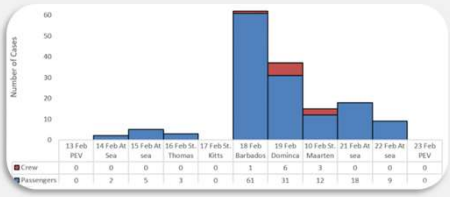
Surveillance and Outbreak Investigations

- This is where we monitor AGE
- Norovirus is the most common causative agent of outbreaks.



Images from VSP staff

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Reporting AGE cases

Infographic image from CDC

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Outbreaks in 2023

Cruise Line	Cruise Ship	Sailing Dates	Causative Agent
Viking Cruises	*Viking Neptune*	6/6 – 6/20	Norovirus
Celebrity Cruises	*Celebrity Summit*	5/15 – 5/25	Norovirus
Holland America	*Nieuw Amsterdam*	5/6 – 5/21	Norovirus
Princess Cruises	*Grand Princess*	3/31 – 4/28	Norovirus
Princess Cruises	*Emerald Princess*	3/17 – 4/1	Norovirus
Royal Caribbean International	*Enchantment of the Seas*	3/23 – 3/31	Norovirus
Royal Caribbean International	*Enchantment of the Seas*	3/11 – 3/23	Norovirus
Celebrity Cruises	*Celebrity Equinox*	3/9 – 3/18	Norovirus
Celebrity Cruises	*Celebrity Constellation*	3/6 – 3/17	Norovirus
Princess Cruises	*Ruby Princess*	2/26 – 3/5	Norovirus
Royal Caribbean International	*Jewel of the Seas*	1/28 – 2/3	Norovirus
Royal Caribbean International	*Brilliance of the Seas*	1/16 – 1/21	Norovirus
P&O Cruises	*Arcadia*	1/3 – 4/13	Norovirus

Cruise Ship Outbreak Updates:
https://www.cdc.gov/nceh/vsp/surv/gilist.htm

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GIS Mapping

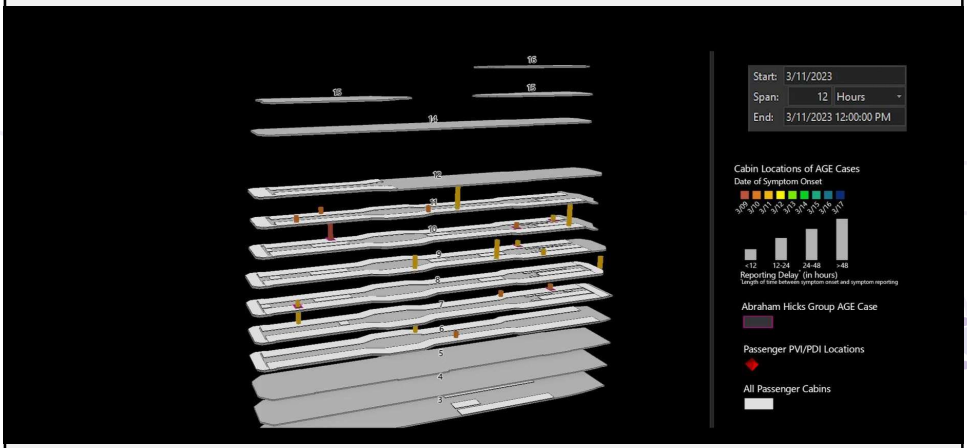

Image from CDC/ATSDR's Geospatial Research, Analysis, and Services Program (GRASP)

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GIS Mapping

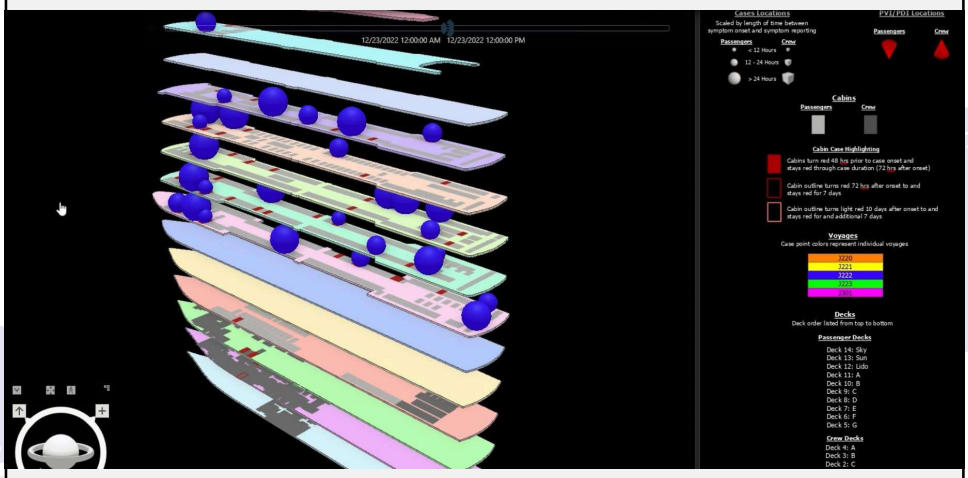

Image from GRASP

19

GIS Mapping

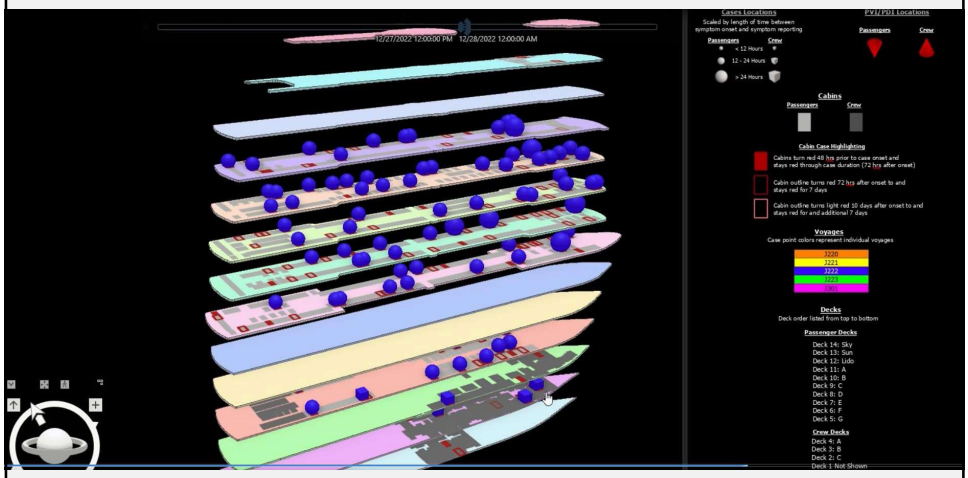

Image from GRASP

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Designing a Healthier Course
www.cdc.gov/nceh/vsp

For more information, contact NCEH
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov
Follow us on Twitter @CDCEnvironment

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Infographic image from CDC

Barbara Mouchtouri | Speaker

- Manager of EU Projects (SHIPSAN, SHIPSAN TRAINET, SHIPSAN ACT) and EU HEALTHY GATEWAYS joint action
- Associate Professor of Hygiene and Epidemiology, Faculty of Medicine, University of Thessaly
- Greece

Educational Background

- PhD Degree: Laboratory of Hygiene and Epidemiology, Department of Medicine, University of Thessaly, Larissa, Greece
  Thesis: "The role of arthropods and rodents in the communicable diseases transmission on ships
- Master of Science: Public Health – Environment and Health. London School of Hygiene and Tropical Medicine – University of London International Programmes, London, United Kingdom
- Degree: School of Health and Welfare Professions, Technological Educational Institute of Athens, Athens, Greece

Professional Career

Associate Professor of Hygiene and Epidemiology at the Laboratory of Hygiene and Epidemiology, University of Thessaly and currently scientific manager of the HEALTHY SAILING HORIZON EUROPE research and innovation project. In the past, manager of several European projects related to health and hygiene in the maritime transport sector including SHIPSAN, SHIPSAN TRAINET and SHIPSAN ACT, which were actions of the European Union General Directorate for Health. She was leading the maritime transport work package of the EU HEALTHY GATEWAYS Joint Action for preparedness and action at points of entry (Grant Agreement No 801493).

She holds an MSc in Public Health from the London School of Hygiene and Tropical Medicine and a PhD in the field of public health on ships and vector borne diseases.

She has held positions as a technical officer in WHO headquarters (International Health

Regulations Capacity Development at points of entry), and as a researcher at the UK Health Protection Agency.

She has 133 scientific publications in peer review journals. She is also the principle author of several EU guidelines related to prevention and control of COVID-19 pandemic in the transport sector, as well as a number of WHO guidelines for the maritime and aviation sectors including COVID-19.

Publications

- Anagnostopoulos L, Kourentis L, Papadakis A, Mouchtouri VA. Re-Starting the Cruise Sector during the COVID-19 Pandemic in Greece: Assessing Effectiveness of Port Contingency Planning. Int J Environ Res Public Health 2022; 19(20).
- Hatzianastasiou S, Mouchtouri VA, Pavli A, Tseroni M, Sapounas S, Vasileiou C, Dadouli K, Kyritsi M, Koureas M, Prezerakos P, Speletas M, Panagiotakopoulos G, Tsiodras S, Hadjichristodoulou C. COVID-19 Outbreak on a Passenger Ship and Assessment of Response Measures, Greece, 2020. Emerg Infect Dis. 2021 Jul;27(7):1927-1930. doi: 10.3201/eid2707.210398. Epub 2021 May 12.
- Mouchtouri VA, Dirksen-Fischer M, Hadjichristodoulou C. Health measures to travellers and cruise ships in response to COVID-19. J Travel Med 2020; 27(3).
- Barbara Mouchtouri, Martin Dirksen-Fischer, Mauro Dionisio, et. al. EU HEALTHY GATEWAYS Advice for cruise ship operators for preparedness and response to an outbreak of COVID-19. April 2022. EU HEALTHY GATEWAYS joint action (Grant agreement Number – 801493); 2022
- Varvara A Mouchtouri , James W Rudge. Legionnaires' Disease in Hotels and Passenger Ships: A Systematic Review of Evidence, Sources, and Contributing Factors. 2015 Sep-Oct;22(5):325-37. doi: 10.1111/jtm.12225. Epub 2015 Jul 29.

European Union projects SHIPSAN and Healthy Gateways: experiences in prevention and control of cross-border health threats

Barbara Mouchtouri

EU SHIPSAN representing over 16 years of work brought together a diverse European network of experts specialized in maritime transport public health. Members of SHIPSAN (2006-2008), SHIPSAN TRAINET (2008-2011) projects and EU SHIPSAN joint action (2013-2016) focusing on maritime transport conducted situation analysis, developed materials and a training network and established in 2018 the EU SHIPSAN Association (European Scientific Association for Health and Hygiene in Maritime Transport) which currently consists of 87 members from 21 countries. EU HEALTHY GATEWAYS joint action (EUHG) that followed (2018-2022) brought together 38 authorities from 29 countries and TCDC and expanded the work to all points of entry. Surveys for best practices and training needs identification, literature reviews and in(tra)-action reviews and site visits were conducted. Focus and expert working groups formulated reached a consensus on health and hygiene standards on ships, resulting in the development and implementation of preparedness guidelines, training and coordinated ship inspections according to European standards and the development of Standard Operating Procedures and model Memorandum of Understandings and tools for ports supporting contingency planning and risk profiling. An inspection grading system methodology was developed, pilot-tested (2018), and applied as of 2019, for inspections conducted against the European Manual for Hygiene Standards and Communicable Diseases Surveillance system. A European passenger ship inspections programme is implemented conducting inspections against the standards of the European Manual for Health and Hygiene Standards developed by SHIPSAN where 31 countries and 12 ports participate. Training is provided using e-learning (>1600 users), webinars (>2500 views), online, face-to-face and on the job training (>1350 port health officers and crew members) at EU and national level. The EU Common Ship Sanitation Database (EUSIS) was used as a tool to share information about public health events on ships and to record Ship Sanitation Certificates. Overall, the 558 inspectors in the EUSIS recorded 33184 Ship Sanitation Certificates, followed up >80 public health events via the port communication form out of which 22 were COVID-19 related, and recorded >4600 hygienic deficiencies.

The European Point of Entry Network (EUPOENET) established includes a registry of >180 public health experts at PoE from European countries that facilitates rapid communication and notification for cross-border health threats at PoE and exchange of knowledge, information and good practices among experts. Consortium members compiled best practices implemented at their designated ports into a web-based, searchable catalogue and developed SOPs for mosquito surveillance and control. A tool was produced for development/ assessment of contingency plans (ports). The agile network of experts supported EU's COVID-19 response by rapidly developing 16 technical guidance documents out of which 11 were applicable to the maritime sector. The network provided >40 expert consultations and conducted 3 site visits and short seminars to ports of non-EU MS. Two national level IAR focused on COVID-19 public health response at ports and a European level meeting using IAR methodology to update EUHG COVID-19 advice were conducted. EU SHIPSAN Association continues the work of SHIPSAN and EUHG by coordinating the development of EU level inspection schedule on board cruise ships and inland vessels in 25 European ports in 11 MS and conducting trainings to port health authorities and crew members.

EU SHIPSAN ASSOCIATION
SHIPSAN
European Scientific Association for Health and Hygiene in Maritime Transport

Experience from SHIPSAN and EU Healthy Gateways

Barbara Mouchtouri
Associate Professor of Hygiene and Epidemiology
Vice-president of EU SHIPSAN scientific association
Laboratory of Hygiene and Epidemiology
Medical School, University of Thessaly, Greece

Managing Infectious Diseases on Cross-Border Cruise Ships in the Post-COVID-19 Era: Application of Digital Technology
24-25 August 2023
Chinese Taipei

History of collaboration

Hellenic Vessel Sanitation Programme 2003

shipsan
2006 - 2008

SHIPSAN TRAINET
2008 - 2011

SHIPSAN ACT
AIRSAN
2013 - 2016
2013-2015

Healthy GateWays
2018-2022

SHIPSAN: Situation analysis and needs assessment
Participating countries: **15 EUMS**

SHIPSAN TRAINET: Development of materials and establishment of training network
Participating countries: **19 EUMS**

SHIPSAN ACT Joint Action for all types of threats in maritime transport
- Cargo ships
- Inland navigation vessels
- Fishing vessels
- Passenger ships

Participating countries: **24 EUMS**

Joint Action for all Points of Entry
- Ground – Air - Maritime

Participating countries:
38 authorities 28 countries

Two decades of activities and results contributed to:
- ***Protecting health of travellers*** *(passengers and crew) and* ***EU citizens*** *from cross border transmission of diseases*
- ***Coordinating and harmonizing preparedness and response at European level*** *required in the transport sector, especially in maritime as ships sail between countries*
- ***Strengthening the EU's capacity*** *to respond to health threats coming from or affecting the transport sector*

EU HEALTHY GATEWAYS Consortium

2018 → 2022 (48 months)
Funded by the European Union's Third Health Programme (2014-2020)

Preparedness and action at Point of Entry (PoE)

(ports, airports, ground crossings)

2018-2019

Inter-epidemic mode

Our Partnership

38 authorities
29 countries + TCDC

January 2020-April 2022 (28 months)

Emergency mode in response to COVID-19	Joint Action available to respond to specific requests from EC, provide technical or training support to EU MS for health measures at PoE
	Supported governmental authorities' response at points of entry and the transport sector's resumption of operations

The four pillars of SHIPSAN

Research	Guideline development	Training	Practice
State of the Art Report	European Manual for Hygiene Standards and Communicable Diseases Control on passenger ships	Face to face; European and national	Integrated Inspection Programme
Epidemiological studies	Guidelines for chemical and radiological incidents on ships	E-learning; sunchronous and asynchronous	EU SHIPSAN ACT Information System SIS
	Ad-hoc for PHEIC	On the job	Web-based risk assessment tool for cargo ships
		Blended learning: Vocational programme for the industry	

Information systems / web-based platforms

EU POENET (web-based network for points of entry)

- European **Network of Professionals** with **180+ registered experts** in public health & transport (as of 05/2022)
- Expert **communication platform for health threats** - air, maritime, ground crossing transport
- EU HG **bibliography tool** (maritime, air)
- Catalogues of **best practices on core capacities implementation** (all PoE)
- Web-based **training resources catalogue** (all PoE) compiles **150+** international, European, national resources specific to PoE including ports and public health threats

E-learning training platform with 2000+ registered users (05/22)

EU SHIPSAN ASSOCIATION SHIPSAN

Inspection Activities

- Operation of **European Inspection Program for ships** according to the European Manual

Scheduling of inspections with the use of **Target Factor since 2019**

- **31 ports & 12 countries**

Available in 7 languages: English, Bulgarian, Greek, German, Italian, Spanish, Mandarin

https://www.shipsan.eu/Home/EuropeanManual.aspx

- Application of **grading system**

2018	2019
• Pilot testing of grading system	• Official grading of inspection

Grade A	• 57 inspections
Grades: B, C or D	• 16 inspections

Information systems / web-based platforms

EU Common Ship Sanitation Database

(previously EU SHIPSAN Information System)

DATABASE FOR RECORDING SHIP INSPECTIONS ACCORDING TO THE EUROPEAN MANUAL	**404** inspections **4614** deficiencies identified 2013-2020
SHIP SANITATION CERTIFICATE DATABASE	**578** registered inspectors from **19** EUMS & **2** Non-EUMS **35328** SSCs on the database *(until 15/06/2022)*
COMMUNICATION NETWORK PLATFORM	**84 Events** on board **73 ships** were recorded *(reporting period: August 2011 – until 09/02/2022)*
MARTIME DECLARATION OF HEALTH (MDH) DATABASE	Web service receive automatically data from NSW Pilot-tested in 2 EU MS (Greece, Spain)
FOCUSED INSPECTIONS FOR COVID-19	Database for recording focused inspection on ships based on the advice documents on COVID-19

List of countries with Ministerial Circulars or similar legal documents or code of practice documents:

- **11 EU MS**: Belgium, Estonia, Greece, Germany, Malta, Spain, Cyprus, Lithuania, Slovak Republic, the Netherlands
- **6 EU MS in progress**: Bulgaria, Croatia, Iceland, Ireland, Romania, and Slovenia

https://sis.shipsan.eu

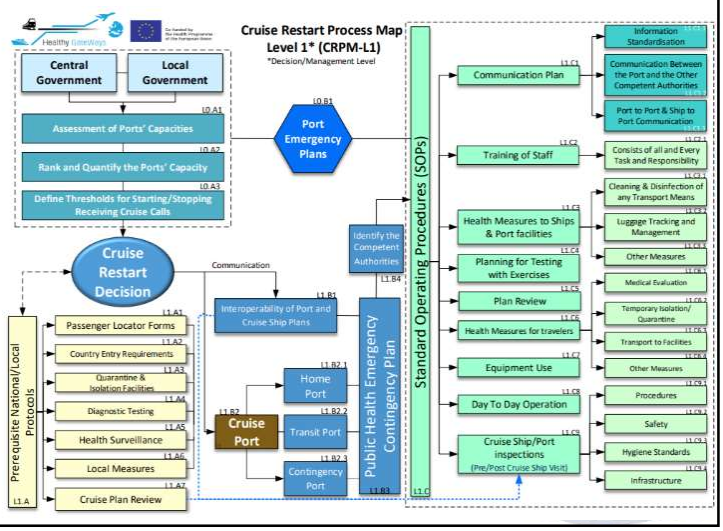
Preparedness tools and guidance

Tool for contingency plan development and assessment for ports

- Annex 1: Template - Generic public health emergency contingency plan for designated ports
- Annex 2: Cruise Restart Process Map (CRPM)
- Annex 3: Explanatory notes CRPM
- Annex 4: Template - Adapted COVID-19-specific public health port emergency contingency plan

Cruise Restart Process Map (CRPM)

- Provides the path, the processes and procedures that a port/local authority needs to follow in order for a cruise ship to be able to safely revisit the port
- Assist the competent authorities to develop the essential capacities



Preparedness tools and guidance

Guidelines for inter-country communication and information flow in outbreak investigations on ships and public health event management

Point of entry risk assessment profile tool - Focus on ports and infectious diseases

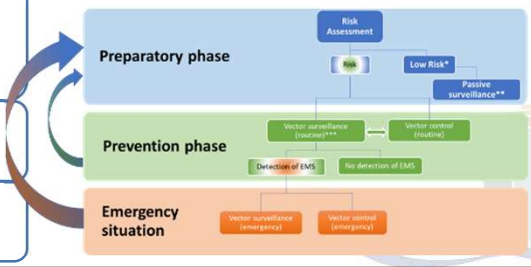
Searchable catalogue of best practices implemented at ports

SOPs for vector surveillance & control at PoE - Focus on ports/airports and mosquitos

Model MoU describing cooperation among authorities at ports that must be involved in response to public health events

Tool for **assessing chemical preparedness** at PoE

Guidance for addressing **chemicals & incidents** at PoE



Training – maritime

Improving competencies of PHO and crew and preparedness and response at ports

Pool of trainers: 90 trainers from 20 countries

Face to face

European level: **9** courses focused on maritime transport for port health officers and crew members

National level: **8** courses for port health officers

E-learning synchronous & asynchronous

- Webinars about 1350 enrolled
- **E-learning training course for PHO**
- **3 Online courses for Crew**

On the job

- **>110** port health officers from **43** ports, **17** countries
- New focused inspections for training purposes

Guidance and scenarios for designing **table-top/simulation exercises at ports** to test local public health emergency contingency plans

Training of the trainers' course - Preparedness and response to public health events at ports (March 2019)

Target audience	• Persons working at competent authorities at central level • Experts representing port health authorities
Participants	• 35 from 19 European countries • 9 from non European countries • 15 presenters, facilitators and observers

Healthy GateWays

HEALTHY GATEWAYS RESPONSE TO COVID-19 PANDEMIC

Summary of results from emergency mode operation

ADVICE / GUIDANCE

- Provided **>40 consults** to EU MS and requests from DG MOVE, DG SANTE, DG NEAR, DG RTD & industry
- At European Commission request, developed **17 evidence-based guidance documents** on COVID-19 preparedness and response for all transport sectors → **12 focused on maritime** → focus on **cruise travel** and **ports**

https://www.healthygateways.eu/Novel-coronavirus#Interim

DISSEMINATION AND UPTAKE	Referenced by EC documents, WHO and industry
	All HEALTHY GATEWAYS COVID-19 guidance documents combined were **downloaded >58,000 times**

CLIA Europe and MedCruise organizing wide-reaching webinars

- **500 participants**
- **30 European**
- **25 non- European countries**

Summary of results from emergency mode operation

OPERATIONAL ACTIVITIES

- **EU digital Passenger Locator Forms** (EU dPLF) – all transport sectors including cruise and ferry
- Conducted **in-action reviews (IARs)** at local, national, EU level to analyse COVID-19 responses at ports & lessons learned
- **Focused inspections for COVID-19 conducted - A checklist was also created to facilitate inspections**

Summary of results from emergency mode operation

TRAINING

- **Site visits & short seminars in non-EU counties** reviewing existing port protocols, procedures and plans
- **Webinar series** on public health event management at PoE with **14 live** webinars - **9 relevant to the maritime sector** - nearly **2000 views** live & recorded *(05/2022)*
- **European level multi-sectorial TTE** - 63 observers & 30 players from 5 EUMS & 2 shipping companies
- **E-learning course** on how to perform **focused inspection on COVID-19** prevention and control for resuming cruise ship voyages in the EU

Summary of results from emergency mode operation

RESEARCH ACTIVITIES

- Over **5 scientific publications** have been produced exploring the experiences, challenges, and needs of European PoE and lessons learned from managing the COVID-19 outbreak.
- **Research protocol pilot testing** for lifting physical distancing and face mask wearing measures in fully vaccinated passengers on two cruise ships
- A **PoE interview study** conducted in 2020 interviewed 24 national and local professionals from PoE from 11 countries and identified experiences on preparedness actions, response operations and best practices from the COVID-19 pandemic.

From restart to recovery: lessons learned

- **HEALTHY GATEWAYS guidance provided framework for shared protocols, to achieve common standards for COVID-19 response at ports & on board cruise ships in EU MS**
- The JA's **focus on exchange of knowledge and experiences, promoting and facilitating uptake of best practices, and the multiplier effects of training and exercise activities have supported the integration of activities into national frameworks.**
- Experiences, lessons learned and infrastructure developed **must form the foundation of best practices and be exploited to improve preparedness and response capacities** at POE for future public health event.

EU HEALTHY GATEWAYS Joint Action

Sustainability of EU HEALTHY GATEWAYS activities Roadmap for the way forward as of May 2022

- Secretariat support services for continuing activities assigned to newly established ***Public health observatory in means of transport and points of entry*** (under UTH)
- Continuation of specific EU HG activities (order of priority)

New EU Project (2022-2025)

Funded by the European Union

HEALTHY SAILING

Prevention, mitigation and management of infectious diseases on cruise ships and passenger ferries

Coordinator: Laboratory of Hygiene and Epidemiology, University of Thessaly, Greece

24 consortium members: universities, governmental public health and research institutes, scientific NGO, ship companies and engineer companies

General Objective:

To improve the quality of passenger shipping services, facilitate recovery from the COVID-19 pandemic, and make the passenger shipping sector safer, more resilient, competitive and efficient.

Funded by the European Climate, Infrastructure and Environment Executive Agency (CINEA)

19

Funded by the European Union

Approach

1. Establishing **comprehensive scientific evidence-base** for mechanisms facilitating onboard spread of infection:
   - *Epidemiological studies*
   - *Literature reviews*
   - *Risk assessment and mathematical modeling to predict dispersion of respiratory droplets/aerosols*
2. Developing **evidenced-informed guidelines** for:
   - *Medical operations and specificities/needs of expedition vessels*
   - *Ventilation systems*
   - *Measures for COVID-19 prevention, mitigation, management in routine operations*
   - *Vaccination of passengers and crew*
3. Enhancing **awareness, knowledge, behavioral change** through:
   - *Blended learning toolkit enriched with hands-on training for crew, passengers and stakeholders (augmented reality/gaming)*
   - *Technology-induced behavioral change in hand hygiene tool kit*
   - *Guidelines with communication approaches (including risk communication)*

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HEALTHY SAILING

Funded by the European Union

Approach

4. Supporting **early health threat detection** via:
   - *Syndromic surveillance for infection disease*
   - *Integrated health e-surveillance IT system*
   - *Intelligent Immune IT System (health measures decision support)*
   - *Inventory of fast diagnostic laboratory methods*
   - ***Study for facilitated access to ship medical facilities (healthcare on board)***

5. Facilitating **healthy environments** through:
   - *Toolkit for systematic monitoring of surface cleaning and disinfection*
   - *Artificial Intelligence Water Safety Plan decision support tool*

6. Controlling infection spread beyond ship into **ports and communities** by:
   - *Establishing the framework of an international committee for best practice exchange*
   - *Toolkit for predicting needs of port response capacities*
   - *Integrated e-pass based on a one-ID concept for fast embarkation*

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Acknowledgements

Consortium of HEALTHY GATEWAYS

PARTNERS / AFFILIATED ENTITIES

1. UTH, **Greece** *(Coordinator, Leader of WP7)*
2. MoH, **Austria**
3. MoCA, MoH-BA, **Bosnia and Herzegovina**
4. MoH-HPDPD, RHI-Varna, **Bulgaria**
5. CIPH, **Croatia**
6. UKE, **Germany** *(Leader of WP4 & Co-leader of WP6)*
7. MINSAL, ISS, **Italy** *(Leader of WP3)*
8. NVSC, **Lithuania** *(Co-Leader of WP5)*
9. EHD, **Malta**
10. NCPH, **Moldova**
11. RIVM, **Netherlands** *(Leader of WP9)*
12. NIPH-NIH, **Poland** *(Co-Leader of WP5)*
13. DGS, **Portugal**
14. IPHS **Serbia**
15. NIJZ **Slovenia** *(Leader of Work Package 2 and Co-leader of WP8)*
16. FOHM, **Sweden** *(Co-leader of WP6)*
17. UKHSA, **United Kingdom** *(Leader of WP8)*

COLLABORATING STAKEHOLDERS

1. DG GS, **Belgium**
2. MoH, **Cyprus**
3. CMSS, **Denmark**
4. HB, **Estonia**
5. **HTO, Finland**
6. City of Porvoo, Environmental Health, **Finlan**
7. MoH, **France**
8. UNIWA, **Greece**
9. BPI, **Greece**
10. HSE, **Ireland**
11. SEMS, **Latvia**
12. **DoH, Norway**
13. GIS, **Poland**
14. PHA SK, **Slovak Republic**
15. MINDOP SK, **Slovak Republic**
16. MSSSI, **Spain**
17. ISCIII, **Spain**
18. FOHP, **Switzerland**
19. TCDC

Our Partnership

2018 → 2022 (48 months)
38 authorities 28 countries

EU HEALTHY GATEWAYS Consortium, General Assembly , Hamburg, Germany, 2019

Paul K. Armstrong | Speaker

- Director
  Communicable Disease Control,
  Western Australia Department of Health,
  Australia
- Australia

Educational Background

- BE(Min), MB.BS, FRACP (Inf Dis), AFPHM, M Appl Epid

Professional Career

- Director, Communicable Disease Control Directorate, Department of Health, Western Australia (2009-present)
- Director, Biopreparedness Unit, NSW Department of Health (2006-2009)
- Medical Epidemiologist, Communicable Diseases Branch, NSW Department of Health (2003-2006)
- Epidemiology Registrar, Centre for Disease Control, Darwin, Northern Territory (NT) for Master of Applied Epidemiology (MAE), (2001- 2003)
- Medical Registrar/Advanced Trainee in Infectious Diseases, NSW (1995-2001)

Publications

- Successful Control of an Onboard COVID-19 Outbreak Using the Cruise Ship as a Quarantine Facility, Western Australia, Australia. Codreanu TA, Ngeh S, Trewin A, Armstrong PK. *Emerg Infect Dis*. 2021 May;27(5):1279-1287. doi: 10.3201/eid2705.204142.
- Delusions of Certainty: Commercial Vessel COVID-19 Risk Stratification. Codreanu TA, Armstrong PK. *Prehosp Disaster Med*. 2021 Aug;36(4):481-485. doi: 10.1017/S1049023X2100056X. Epub 2021 Jun 4. PMID: 34085619
- SARS-CoV-2 infections among Australian passengers on the Diamond Princess cruise ship: a retrospective cohort study. Walker LJ, Codreanu TA, Armstrong PA, Goodwin S,

Trewin A, Spencer E, Colquhoun SM, Stephens DM, Baird R, Douglas NM, Cribb D, Owen R, Kelly P, D. Kirk MD. *PLoS One.* 2021 Sep 7;16(9):e0255401. doi: 10.1371/journal.pone.0255401. eCollection 2021

- The healthy crew, clean vessel and set departure date triad: Successful control of outbreaks of COVID-19 on board four cargo vessels. Codreanu TA, Pingault N, O'Loughlin E, Armstrong PK, Scalley B. *Prehosp Disaster Med.* 2021 Oct;36(5):611-620. doi: 10.1017/S1049023X21000686. Epub 2021 Jul 9
- A seven-year review of Staphylococcus aureus bloodstream infection (SAB) surveillance data in Western Australian health services (2011 to 2017). November 2018. *Infect Dis Health*: S14DOI:10.1016/j.idh.2018.09.056

Cruise sanitation inspections and management in the post-pandemic era: an Australian perspective

Paul Armstrong

In Australia, cruising is a popular past-time by world standards and has significant economic benefits. In light of the threat posed by COVID-19, the Australian government banned the entry of international cruise ships from entering Australian ports from 18 March 2020 to 17 April 2022. This presentation describes Australia's experience with the cruise industry during the COVID-19 pandemic, focusing on the systems established since the lifting of the ban, and how we might learn from these to make post-pandemic cruise ship travel safer with respect to all infectious diseases.

Cruise ships are a highly susceptible environment for the occurrence and rapid spread of many types of infectious diseases, as they are essentially congregate living settings with large numbers of travellers living, dining, and socialising in close proximity for significant periods. The cruise industry was an early casualty of the pandemic, when existing systems for the prevention and control of infectious diseases were found to be inadequate in the face of a novel virus that was readily transmissible and sometimes severe.

International cruise ships arriving into Australian waters must submit a Pre-Arrival Report 12 to 96 hours prior to arrival at the first port in Australia, as a condition for being granted pratique and to allow assessment of the biosecurity risk, including that posed by infectious diseases. Upon lifting of the international cruise ship ban, a new requirement was that cruise ships abide by the Eastern Seaboard and Western Australian Cruise Protocols (ESWACP).

The ESWACP was developed in consultation with the cruise industry to mitigate the risk of COVID-19 in passengers and crew. It includes recommendations regarding vaccination, screening, shore excursions, on-board public health and social measures, testing protocols, case and contact management, and on-board healthcare. The stringency of the recommendations rises in line with three "outbreak threshold tiers", defined by the percentage of passengers and crew who test positive for COVID-19 in in the previous 7 days

- Tier 1 'baseline': <3%; Tier 2: 3-10%; Tier 3: >10%. The ships' health teams are required to submit a standardized report prior to entering each Australian port.

Data were analysed for cruise ship movements in the state of Western Australia for the 9-month period 24 October 2022 to 24 July 2023. 39 of 67 (58%) cruise vessels were in the small cruise ship category (less than 500 passengers and crew), with a further 24% carrying 2000-3000 passengers and crew. The average number of crew and passengers for each cruise was 1040. There were 5 cruise ships that experienced COVID-19 outbreaks that put them into Tier 2 status and two experienced Tier 3 outbreaks. The risk of Tier 2 and 3 outbreaks decreased over time.

As we emerge from the pandemic, we need to take forward the positive legacies of the experience with the aim to reduce the risk of all infectious diseases on cruise ships. In formulating future policies, we need to balance public health goals against society's expectations and the cost and inconvenience to passengers and the cruise industry in general.

CRUISE SANITATION INSPECTIONS AND MANAGEMENT IN THE POST-PANDEMIC ERA: AN AUSTRALIAN PERSPECTIVE

Managing Infectious Diseases on Cross-Border Cruise Ships in the Post-COVID-19 Era: Application of Digital Technology

Chinese Taipei
24-25 August 2023

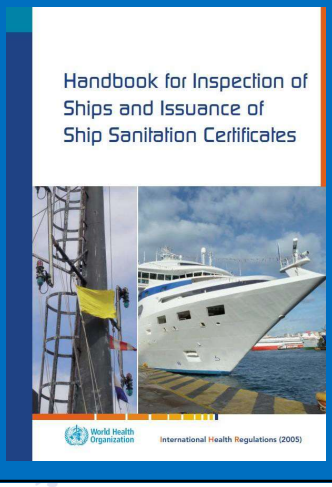
Dr Paul Armstrong
Director, Communicable Disease Control Directorate (CDCD)
Western Australia Department of Health
Chief Human Biosecurity Officer (WA)
Dr Alex Shivarev, Public Health Registrar CDCD

OUTLINE

- **Ship sanitation inspections**
- **Context:**
  - **cruising in Australia**
  - **risk of infectious diseases on cruise ships.**
- **Australia's experience with cruise ships *during* the pandemic**
- **Australia's approach to sanitation *post*-pandemic, with a focus on Western Australia.**

SHIP SANITATION INSPECTIONS

- **International regulations**
  - International Health Regulations (IHR) (2005) requirement for a 6-monthly ship sanitation certificate, guided by World Health Organisation (WHO) guidelines (2011)
- **Jurisdiction-specific schemes**
- **Outbreak investigation**



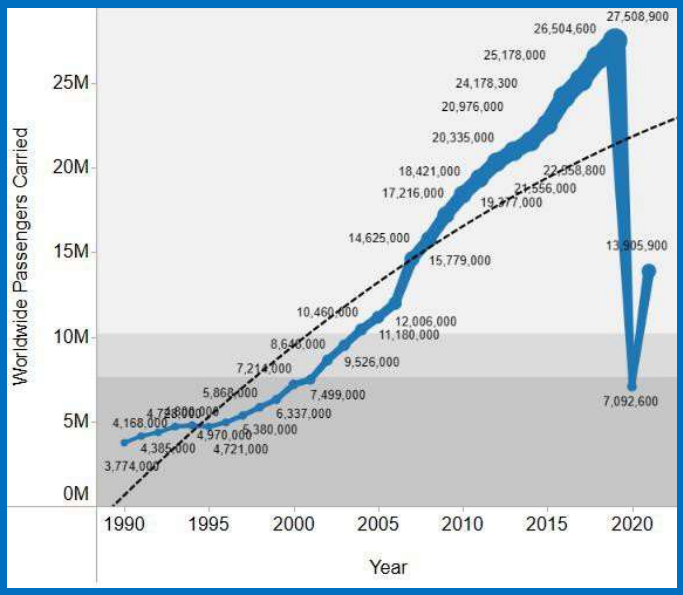
BACKGROUND:
CRUISE INDUSTRY STATISTICS FOR AUSTRALIA

- In 2018:
  - 54% of Australia's population went on a cruise (average trip = 8.8 days)
  - Australasia received 200,000 international cruise visitors, from 145 different countries
- In 2018 – 2019:
  - a total of 1,240 cruise ships docked in Australia's 47 ports
  - 3.8 million passenger and crew visit days
  - the cruise market in Australia added US$3.4 billion to the economy

Source: cruiseagency.com.au/news/australian-cruise-industry-statistics/

Source: Geoscience Australia MP 02/343.20

Worldwide cruise ship passengers carried, 1990-2021



Source: cruisemarketwatch.com/growth/

RISK OF INFECTIOUS DISEASES ON CRUISE SHIPS

- **Cruise ships are high risk for *occurrence* of infectious disease outbreaks. Why?**
  - High population density (physical distancing a challenge)
  - Encouragement of social interaction
  - Communal eating
  - Passengers may join a cruise ship from varying international locations which may have varying risk
  - Length of cruises enable multiple generations of outbreaks
  - Crew cabins are often small and accommodate multiple people
  - Sub-optimal ventilation systems (aerosol transmission)
  - Crew stay on ships much longer than passengers, and can perpetuate a cycle of outbreaks.

RISKS *FROM* INFECTIOUS DISEASES ON CRUISE SHIPS

- **Cruise ships are high risk for *severe outcomes* from infectious disease outbreaks.**
  - High average age of guests
  - Limited medical facilities

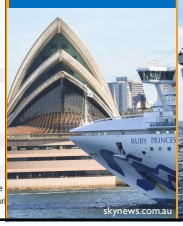
AUSTRALIA'S EXPERIENCE DURING THE COVID-19 PANDEMIC

30 Jan 2020
WHO declares a PHEIC (characterised as a pandemic on 11 March 2020)

19 Feb 2020
Outbreak aboard the Diamond Princess, Yokohoma, Japan; 166 passengers repatriated to Australia.

18 Mar 2020
Biosecurity emergency declared; international cruise ships forbidden from entering Australian ports

19 Mar 2020
Outbreak on Ruby Princess cruise ship – (>600 cases; 28 deaths)



25 Mar 2020
Outbreak on Artania cruise ship managed using the ship as a quarantine facility (49 cases amongst crew; pax repatriated)

Mar 2020 to Apr 2022
Cruise ship ban continues

17 April 2022
International cruise ship ban lifted

INTERNATIONAL CRUISE SHIP ARRIVALS

- **Pre-Arrival Report**
  - Submitted between 12 hours and 96 hours prior to arrival at the first port in Australia
  - Pre-condition of being granted pratique
  - Allows assessment of human, plant and animal biosecurity risk
  - Assesses risk of 'Listed Human Diseases', respiratory and gastrointestinal disease
- **Human Health Update**
  - Must be submitted if any change in the health status of passengers and crew after first port of entry


Australian Government
Department of Agriculture and Water Resources

Pre-Arrival Report (PAR)
MARS quick reference guide

Biosecurity

Pre-arrival reporting assists the department to assess the condition of a vessel prior to its arrival in Australia. The required information informs the department of any potential biosecurity risks associated with human, animal and plant health, waste and ballast water for each vessel during its voyage in Australia.

What must you do

Vessel masters entering Australia must submit a request through MARS to enter a First Point of Entry. The Pre-Arrival Report (PAR) is the form completed by a vessel master or agent to notify the department of a vessels' impending arrival at a First Point of Entry. *For entry to a Non-First Point, see the Non-First Point of Entry quick reference guide.*

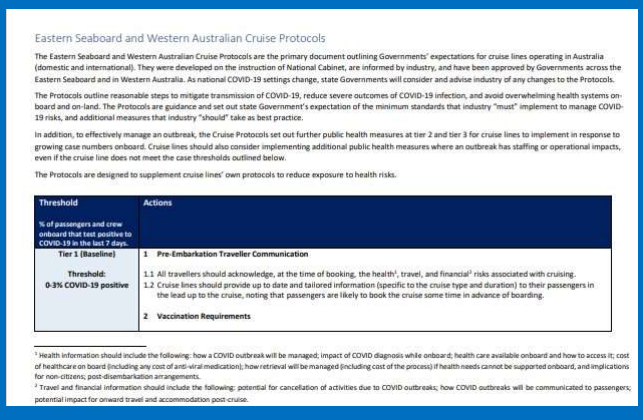
When to do it

All commercial vessels intending to arrive in Australia are required to submit a PAR 96—12 prior to arrival for each voyage in Australia. Any changes in circumstances must be reported to the department as soon as practicable as a revised PAR. Vessels returning to Australia shortly after departure due to unforeseen circumstances or changes in itinerary may also need to submit a new PAR.

How to do it

From the MARS home screen, the PAR can be accessed either from the **Submit Applications** drop down menu or by clicking on the **Pre-Arrival Report** shortcut. A PAR may be completed manually in MARS by direct data entry or by uploading an XML data file. Both options are described in the steps below. *For detailed steps on how to submit a PAR, refer to the MARS User Guide.*

GUIDELINES FOR INDUSTRY


Eastern Seaboard and Western Australian Cruise Protocols

The Eastern Seaboard and Western Australian Cruise Protocols are the primary document outlining Governments' expectations for cruise lines operating in Australia (domestic and international). They were developed on the instruction of National Cabinet, are informed by industry, and have been approved by Governments across the Eastern Seaboard and in Western Australia. As national COVID-19 settings change, state Governments will consider and advise industry of any changes to the Protocols.

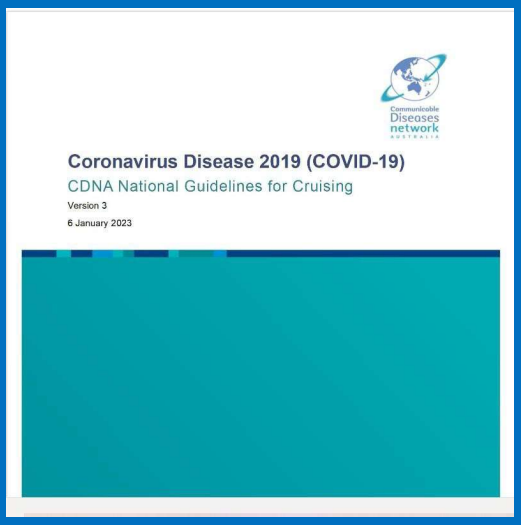
The Protocols outline reasonable steps to mitigate transmission of COVID-19, reduce severe outcomes of COVID-19 infection, and avoid overwhelming health systems on-board and on-land. The Protocols are guidance and set out state Government's expectation of the minimum standards that industry "must" implement to manage COVID-19 risks, and additional measures that industry "should" take as best practice.

In addition, to effectively manage an outbreak, the Cruise Protocols set out further public health measures at tier 2 and tier 3 for cruise lines to implement in response to growing case numbers onboard. Cruise lines should also consider implementing additional public health measures where an outbreak has staffing or operational impacts, even if the cruise line does not meet the case thresholds outlined below.

The Protocols are designed to supplement cruise lines' own protocols to reduce exposure to health risks.

Threshold % of passengers and crew onboard that test positive to COVID-19 in the last 7 days.	Actions
Tier 1 (Baseline) Threshold: 0-3% COVID-19 positive	1 Pre-Embarkation Traveller Communication 1.1 All travellers should acknowledge, at the time of booking, the health[1], travel, and financial[2] risks associated with cruising. 1.2 Cruise lines should provide up to date and tailored information (specific to the cruise type and duration) to their passengers in the lead up to the cruise, noting that passengers are likely to book the cruise some time in advance of boarding. 2 Vaccination Requirements

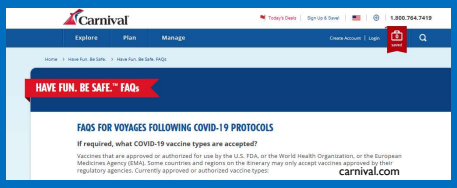
[1] Health information should include the following: how a COVID outbreak will be managed; impact of COVID diagnosis while onboard; health care available onboard and how to access it; cost of healthcare on board (including any cost of anti-viral medication); how retrieval will be managed (including cost of the process) if health needs cannot be supported onboard, and implications for non-citizens; post-disembarkation arrangements.
[2] Travel and financial information should include the following: potential for cancellation of activities due to COVID outbreaks; how COVID outbreaks will be communicated to passengers; potential impact for onward travel and accommodation post-cruise.


Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Cruising
Version 3
6 January 2023

TIER I (BASELINE)
THRESHOLD: 0-3% COVID-19 POSITIVE

- **Communication to passengers:**
  - regular pre- and post-embarkation *communication* on COVID-19 risk.
- **Vaccination:**
  - pax >12 yrs must have had *two COVID-19 vaccinations*
  - crew must have had primary course *+ boosters*
- **Screening**
  - pax to be *screened for symptoms* prior to boarding
  - all symptomatic pax must have *negative RAT test*.



TIER I (BASELINE)
THRESHOLD: 0-3% COVID-19 POSITIVE

- **Shore excursions:**
  - *COVID-safe plans* for each shore excursion
  - *masks* for indoor use and crowded outdoor settings.
- **On board public health measures:**
  - *pax should wear masks* when embarking and disembarking, in public indoor spaces, and crowded outdoor spaces, onboard
  - *crew should wear masks* whilst working indoors
  - consider *capacity limits* on indoor venues where physical distancing is not possible.

TIER I (BASELINE)
THRESHOLD: 0-3% COVID-19 POSITIVE

- **Testing protocols:**
  - *pre-embarkation testing* (PCR <48 hours OR RAT <24 hours)
  - *crew to be tested every 14 days* (50% every 7 days).
- **On board health care:**
  - *free initial medical assessments* for symptoms of COVID-19
  - *free access to COVID-19 tests* (PCR and RAT) and COVID-19 anti-viral medication
  - must have capacity to provide *critical care level support* for COVID-19 cases.

TIER I (BASELINE)
THRESHOLD: 0-3% COVID-19 POSITIVE

- **Case and contact management:**
  - cases must *isolate* until asymptomatic (min. 5 days)
  - cruise lines must provide *isolation accommodation* for guests and crew
  - for 7 days, *close contacts* must wear a mask, RAT test daily, and eat in separate dining areas.
- **Disembarkation:**
  - cruise lines must provide *administrative support* for transport and accommodation for pax to complete their isolation period.

TIER 2
THRESHOLD: 3-10% COVID-19 POSITIVE

- **Additional measures to Tier 1:**
  - crew to wear *masks outdoors* where physical distancing cannot be maintained
  - *increase testing frequency* of all crew upon reaching Tier 2 to once every 7 days
  - in consultation with the local health authority, consider introducing *regular testing of passengers* on board, prior to shore excursion, and at the end of a cruise.

TIER 3
THRESHOLD: >10% COVID-19 POSITIVE

- **Additional measures to Tier 1 and 2:**
  - *pax* to wear *masks outdoors* where physical distancing cannot be maintained
  - in consultation with the local health authority, *strongly recommend introducing regular testing* of pax on board, prior to shore excursion, and at the end of a cruise.


MSC cruises Press Office

REPORTING OF CASES UNDER THE EASTERN SEABOARD AND WESTERN AUSTRALIAN CRUISE PROTOCOLS

- Cruise lines must report COVID-19 cases to the jurisdictional health authorities:
  - 12 - 24 hrs prior to arrival to a port

  OR

  - or as required by the specific jurisdiction
- Downloadable reporting form.

Cruise vessel reporting template for acute respiratory and gastrointestinal infection

Vessel name:		Voyage number:			
Voyage commencement date (dd/mm/yyyy):		Voyage commencement port:			
Voyage end date (dd/mm/yyyy):		Voyage end port:			
Estimated date of arrival next port (dd/mm/yyyy)		Voyage next port:			
Name of international ports visited during this voyage		Dates of international ports visited			
Report completed by:	Full name:				
	Role / Title:				
Date report submitted (dd/mm/yyyy):		Closest seaport at time of submission (city and country)			
	Total Number of Travellers on Board		Crew	Contractors	Guests

Do you have any known suspected or confirmed cases of COVID-19 aboard the vessel?
☐ Yes
☐ No

Do you have any known suspected or confirmed cases of Influenza aboard the vessel?
☐ Yes
☐ No

Do you have any known suspected cases of Acute Gastroenteritis aboard the vessel?
☐ Yes
☐ No

If you have selected 'No' to all of these questions, you are declaring that there are no known suspected or confirmed positive COVID-19 or Influenza cases or Acute Gastroenteritis cases aboard the vessel. You do not have to complete any further questions.

If you have selected 'Yes' proceed to complete the next question.

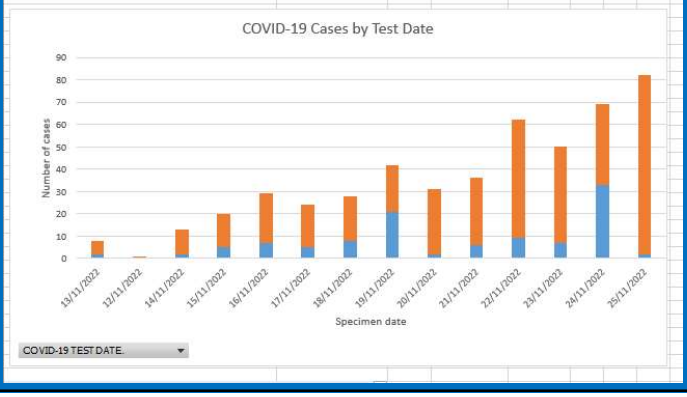
Do you have ANY new testing, results, or other information to report today/since last report?
☐ Yes

DEMOGRAPHICS														COVID/Influenza VACCINATION			
FAMILY NAME	FIRST NAME	GENDER	DATE OF BIRTH (DD/MM/YY)	MOBILE NUMBER (Guest only)	COUNTRY OF RESIDENCE	GUEST / CREW / CONTRACTOR	CABIN NUMBER	NUMBER OF PEOPLE IN CABIN	If crew: CREW DEPT.	Is case linked to known case (Y / N / Unknown)	If linked, Family name of known case	If linked, first name of known case	INTERNATIONAL TRAVEL IN LAST 7 DAYS (Y/N)	COVID-19 FULLY VACCINATED	COVID-19 BOOSTER DOSE	DATE OF LAST COVID-19 VACCINE (DD/MM/YY)	RECEIVED CURRENT SEASONAL FLU VACCINATION (Y/N)

SYMPTOMS AND SIGNS Respiratory & Gastro-intestinal				DIAGNOSIS							ISOLATION		
DATE OF SYMPTOM ONSET (leave blank if asymptomatic)	COVID-19/ARI/ILI SYMPTOMS (Y/N)	ACUTE GASTRO-ENTERITIS SYMPTOMS (Y/N)	SEVERE DISEASE (e.g. hypoxic, resp distress, hospitalisation) (Y/N)	COVID-19 TEST DATE (DD/MM/YY)	TYPE OF COVID-19 TEST (RAT/PCR)	COVID-19 RESULT	OTHER RESP PATHOGEN TEST DATE (if no other test - leave blank)	RESP RESULT (Flu A Pos / Flu B Pos) or neg result	REASON FOR TEST	ACUTE GASTRO-ENTERITIS (AGE) (Y/N)	ISOLATION START DATE (DD/MM/YY)	RELEASE FROM ISOLATION (DD/MM/YY)	COMMENTS

COVID-19 outbreak status

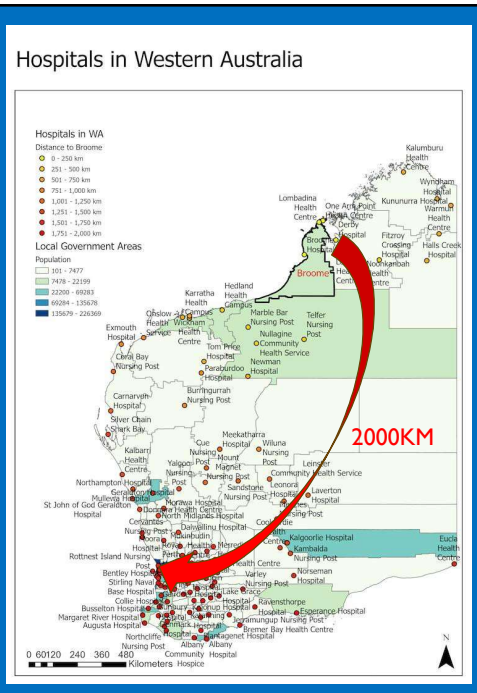
Current voyage only	Guests	Crew	Contractors	TOTAL
# cases detected	508	111	0	619
# cases released from isolation	111	31	0	142
# current active cases	397	80	0	477
Critical Outbreak Thresholds				
Case Rate:	[illegible]	8.2%	0.0%	[illegible]
Operational Compromise:	Nil or Minor impact to staffing and/or resources. No impact to critical services.			

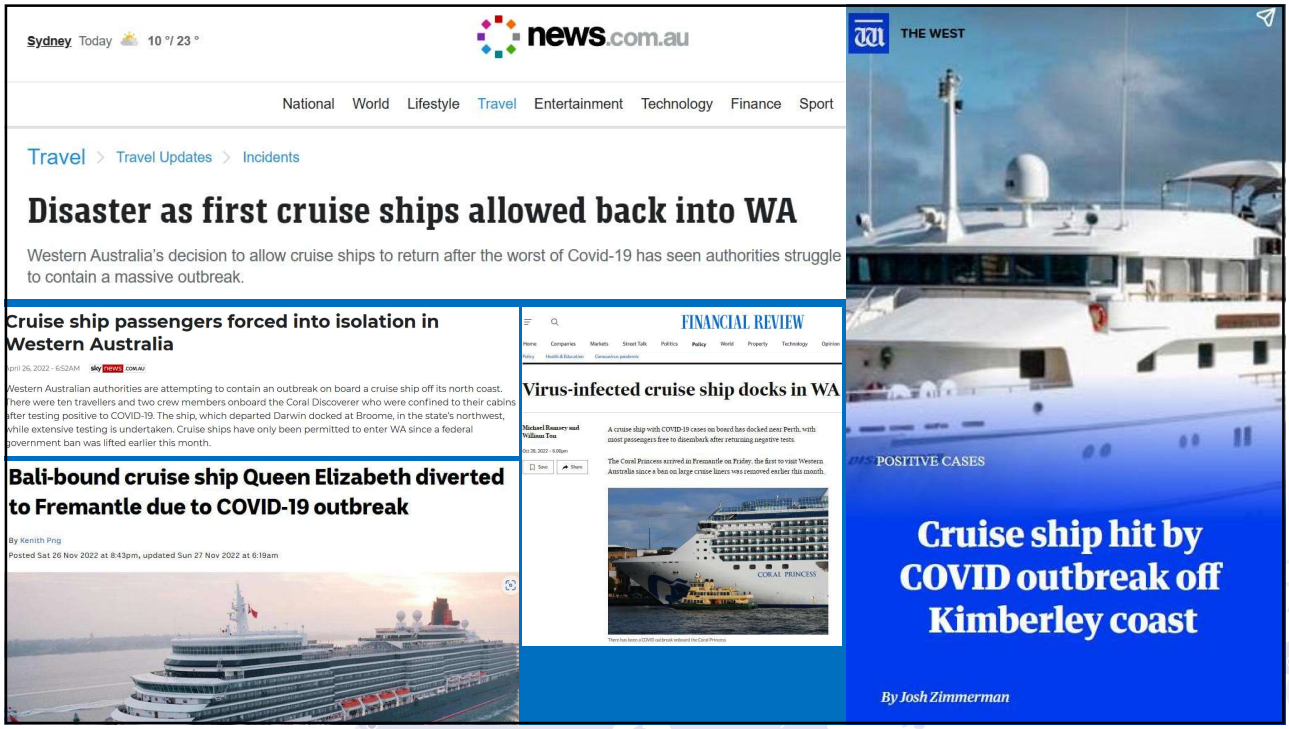


THE WESTERN AUSTRALIA EXPERIENCE

- In 2019, there were 106 cruise ship visits to WA
- International and state borders were closed for much of the pandemic, state borders reopening in March 2022 when vaccination rates were very high, above 90%.
- 17 April 2022 - small cruise ships with less than 350 passengers and crew resumed sailing in WA
- October 2022 - larger cruise ships were permitted to return
- WA abided by the *Eastern Seaboard and Western Australian Cruise Protocols* with some minor variations due to local circumstances (which were allowed under the Protocol).

Fremantle Port





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Disaster as first cruise ships allowed back into WA

Western Australia's decision to allow cruise ships to return after the worst of Covid-19 has seen authorities struggle to contain a massive outbreak.

Cruise ship passengers forced into isolation in Western Australia

Western Australian authorities are attempting to contain an outbreak on board a cruise ship off its north coast. There were ten travellers and two crew members onboard the Coral Discoverer who were confined to their cabins after testing positive to COVID-19. The ship, which departed Darwin docked at Broome, in the state's northwest, while extensive testing is undertaken. Cruise ships have only been permitted to enter WA since a federal government ban was lifted earlier this month.

Bali-bound cruise ship Queen Elizabeth diverted to Fremantle due to COVID-19 outbreak

By Kenith Png

Posted Sat 26 Nov 2022 at 8:43pm, updated Sun 27 Nov 2022 at 6:19am

FINANCIAL REVIEW

Virus-infected cruise ship docks in WA

A cruise ship with COVID-19 cases on board has docked near Perth, with most passengers free to disembark after returning negative tests.

The Coral Princess arrived in Fremantle on Friday, the first to visit Western Australia since a ban on large cruise liners was removed earlier this month.

CORAL PRINCESS

THE WEST

POSITIVE CASES

Cruise ship hit by COVID outbreak off Kimberley coast

By Josh Zimmerman

CRUISING IN WESTERN AUSTRALIA 24 OCTOBER 2022 – 24 JULY 2023

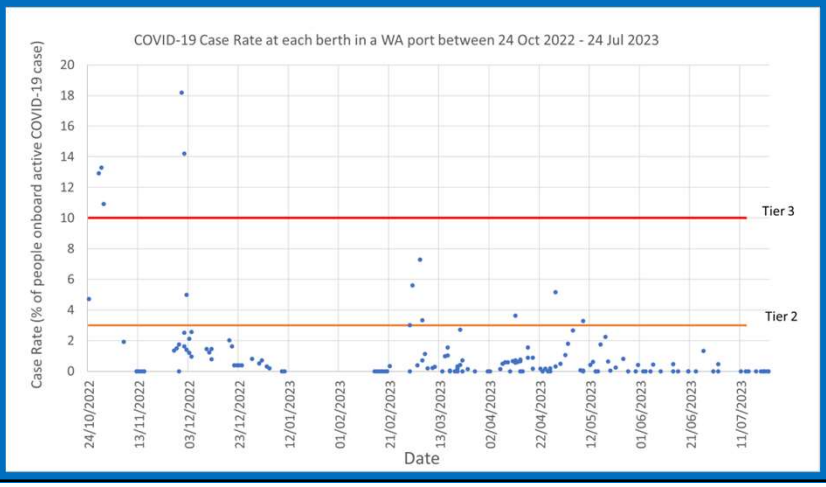
- **67 unique voyages:**
  - 61 domestic arrivals
  - 6 international arrivals
- **22 different vessels**
- **7 cruise line operators**
- **Vessels berthed in WA ports 147 times**

CRUISING IN WESTERN AUSTRALIA 24 OCTOBER 2022 – 24 JULY 2023

Vessel size (crew and passenger)	Number of voyages
0-499 people	39
500-999 people	4
1000-1999 people	4
2000 – 2999	16
3000 – 3999	3
>4000	1
Total	67

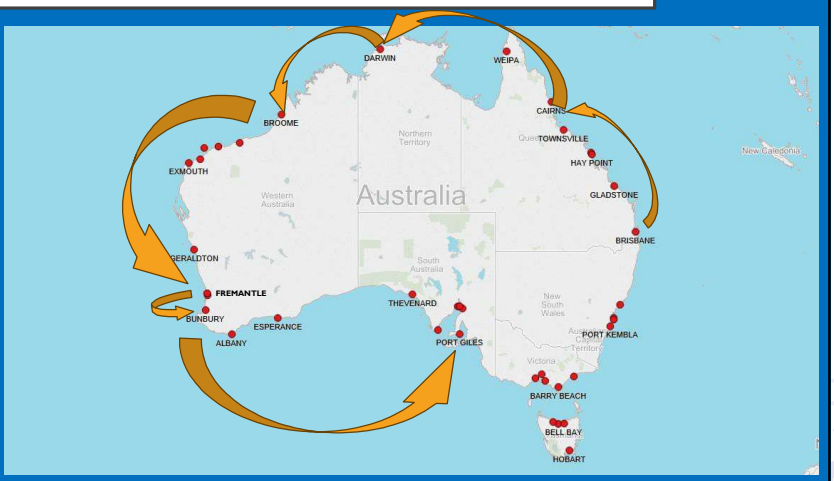
	Number	Average
Passenger	46 033	687
Crew	23 633	353
Both (Passengers and crew)	69 666	1040

Outbreak threshold	Number of voyages	Size
Tier 1 (<3%)	60	-
Tier 2 (3-10%)	5	2 vessels large (2000-2999 passengers/crew) 3 vessel small (0-499 passengers/crew)
Tier 3 (>10%)	2	Both vessels large (2000-2999 passengers/crew)
Total	67	



CASE STUDY: COVID-19 OUTBREAK ON A LARGE CRUISE VESSEL

- First large cruise ship to enter WA waters after lifting of the ban
- 2000 pax; 900 crew
- On initial reporting on 24 October 2022, the ship reported:
  - 98 active cases in pax (4.9%)
  - 2 active cases in crew (0.2%)
  - (overall, 3.4% active cases in cases/crew)
  - 34 close contacts
- Places the ship in Tier 2 status



CASE STUDY: COVID-19 OUTBREAK ON A LARGE CRUISE VESSEL

- **PUBLIC HEALTH MANAGEMENT**

TIER 2

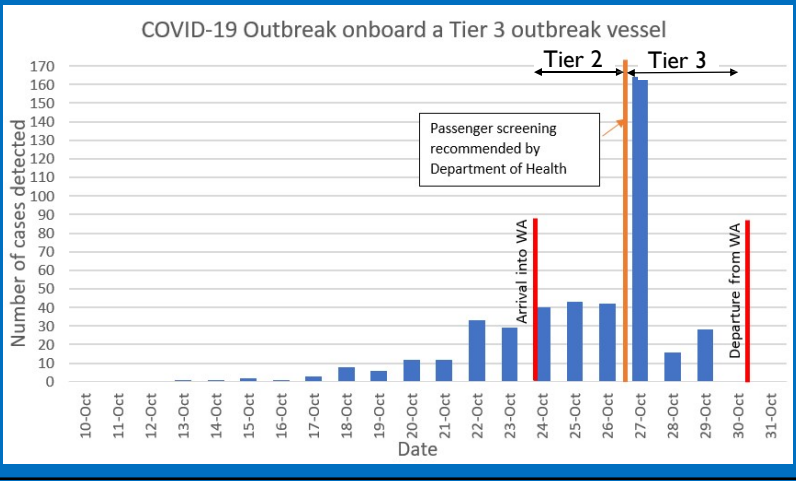
- The vessel's COVID-19 plans reviewed
- Screening of pax prior to any shore excursions in rural settings
- Third-party tour operators and transport providers to be updated.

TIER 3

- Screening of pax prior to any shore excursions in capital city setting + mask wearing on shore.

COMMUNICATIONS

- Daily internal meetings
- Regular contact with ship's doctor
- Media interest



CONCLUSIONS

- Infectious diseases are a particular risk on cruise ships
- The COVID-19 pandemic caused massive disruption to the cruise ship industry
- Need to take forward the positive legacies from the pandemic to reduce the risk of *all* infectious diseases
- Need to balance public health goals against the cost and inconvenience to passengers and the cruise industry

Sally Riu | Speaker

- Secretary General
  Association for Cruises Development of Taiwan
- Chinese Taipei

Educational Background

- Taipei Medical University, College of Management-Master's Program in Advanced Management in Biotechnology (Currently Enrolled)
- Shih Hsin School of Journalism-Department of Tourism Promotion

Professional Career

- Secretary-General, Association for Cruises Development of Taiwan - 2022-Present
- General Manager, Lion Travel Cruise Development Department - 2023-Present
- Vice President, Sales Department, Genting Cruise Lines Taiwan - 2013-2022
- Assistant Vice President, Sales Department, Star Cruises - 2011-2013

The Current Situation and Future Development of Cruise Industry Post-Pandemic

Sally Riu

Opportunities & Recovery: 67% of non-cruise passengers express willingness to try cruises in the future, hinting at vast growth potential. Such growth not only signifies industry strengthening but also ensures employment opportunities globally. Safety upgrades on cruises and fully booked activities showcase industry rebound.

Impact of COVID-19: The pandemic resulted in significant losses for the cruise industry, with global total losses in 2020 estimated at over $77 billion. This impacted employment, consumer confidence, increased operational costs, and led to new operational models and bankruptcies.

Post-pandemic Era in Asian Cruise Operations: Stricter health protocols have introduced heightened uncertainty. Many international cruise lines reduced their operations, and Asian operators face challenges.

Cruise Activities in Asia: East Asia experienced a drastic reduction in cruise convening, while places like Singapore witnessed resurgence. Malaysia and India also observed substantial cruise activities, pointing to a shifting landscape of the Asian cruise market.

Economic Benefits: The contribution of cruises to local economies is immense. The recovery phase of the cruise industry provided 930,000 job opportunities, showcasing its resilience.

Future Trends:

- **Ship Construction:** Despite the pandemic, new ships are being introduced in the Asian market.
- **Technology:** Cruise companies are adopting contactless technological solutions to enhance safety and passenger convenience.
- **Sustainability:** The industry is pivoting towards eco-friendly operations.

Conclusive Perspective: The future of cruising emphasizes health, safety, environmental sustainability, and regional collaboration. Learning from past challenges, the industry is innovating, collaborating, and reasserting its values, setting standards for a brighter future.

THE CRUISE INDUSTRY'S CURRENT STATE AND FUTURE

FOR

THE MANAGING INFECTIOUS DISEASES ON CROSS-BORDER CRUISE SHIPS IN THE POST-COVID-19 ERA: APPLICATION OF DIGITAL TECHNOLOGY

Sally Riu
Secretary general, Association for Cruises Development of Taiwan

ACDT 台灣遊輪產業發展協會 Association for Cruises Development of Taiwan

THE CRUISE INDUSTRY'S CURRENT STATE AND FUTURE

ACDT 台灣遊輪產業發展協會 Association for Cruises Development of Taiwan

1. About cruises-Opportunity and Dawn
2. The Impact of the COVID-19 Pandemic on the Cruise Industry
3. Post-Pandemic Situation of the Asian Cruise Industry
4. The proportion of calls within all of Asia is indicative
5. Future Trends in Cruise Development
6. Conclusion and Sharing

ABOUT CRUISES-OPPORTUNITY AND DAWN

- **CLIA research finds 67% of non-cruisers are open to sailing in the future, indicating immense growth potential for the cruise industry. This potential growth will strengthen the industry and ensure job security for hundreds of thousands of people globally.**

ABOUT CRUISES-OPPORTUNITY AND DAWN

- The cruise industry, hard-hit by COVID-19, is recovering.
- The sell-out of Miami's Cruise360 event highlights cruise industry resurgence.
- Cruise operators are enhancing safety with improved hygiene, preventive measures, and vaccine mandates.
- Major cruise firms are resuming global sailings, indicating a return to normalcy.
- Eased border controls and rising travel desire mark positive trends for the cruise industry.

STARTING FROM THAT DAY

On February 6, 2020, the Central Epidemic Command Center announced the immediate prohibition of international cruise ships docking at our nation's ports. Over 1700 passengers of the Pisces, a Star Cruises ship that departed from Chinese Taipei on February 4, will undergo testing on February 8. Only after these tests can a decision be made as to whether they will be allowed to disembark...

THE IMPACT OF THE COVID-19 PANDEMIC ON THE CRUISE INDUSTRY

- **Business Losses and Shutdowns**: According to the Cruise Lines International Association (CLIA), the global suspension of cruises due to the COVID-19 pandemic in 2020 resulted in an estimated total loss of over **$77 billion**. For example, Royal Caribbean International reported an operational loss of **$5.7 billion** for 2020.
- **Employment Issues**: CLIA states that the global cruise industry directly and indirectly provides **over a million employment** opportunities, so the shutdown could lead to widespread job losses.

THE IMPACT OF THE COVID-19 PANDEMIC ON THE CRUISE INDUSTRY

- **Damage to Passenger Confidence**: An example would be the incident with the "Diamond Princess," which severely eroded passenger confidence in cruise travel. The ship was quarantined off Japan in early 2020, with over 700 people onboard testing positive for COVID-19.
- **Increased Operating Costs:** For instance, Norwegian Cruise Line Holdings has invested **$150 million** in enhancing the health and sanitation facilities of its ships.
- **New Operating Models and Regulations**: For example, companies like Royal Caribbean International and Disney Cruises have implemented measures such as passenger capacity limitations and mandatory social distancing.
- **Industry Consolidation and Bankruptcies**: Pullmantur Cruises and Genting Cruises Line, for instance, are cruise companies that filed for bankruptcy due to the COVID-19 pandemic.

POST-PANDEMIC SITUATION OF THE ASIAN CRUISE INDUSTRY

Asian Cruise Deployment and Capacity The pandemic notably impacted deployments, with East Asia hit hard.

- **Covid-19 rules and protocols brought increased uncertainty and risk to deployments.**

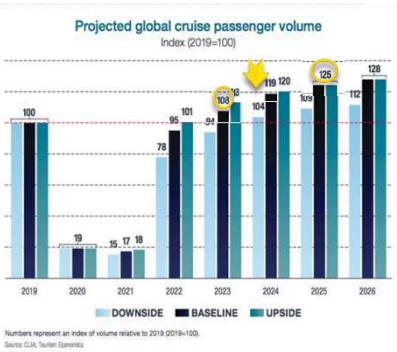
1. Host nations implemented occupancy restrictions (typically 50%)
2. Strict cross-border travel controls on foreign tourists
3. Tight health protocols in various Asian countries
4. Travelers' hesitancy to confront risks and health/visa requirements

- **Majority of international cruise lines retracted**

1. Asian operations of Princess, Costa, and NCL were closed
2. RCI continued operations solely ex. Singapore

- **Asian cruise operators weakened**

1. Genting's Dream and Star, servicing multiple SE and East Asian markets, closed in 2020.
2. Japan's trio of lines - Nippon Maru, Asuka II - limited to domestic cruising.
3. Mainland China's operators reduced to CMG/Viking. Astro-Ocean idle. Bohai, Diamond, etc. have ceased to exist.



Source: CLIA; Tourism Economics

THE PROPORTION OF CALLS WITHIN ALL OF ASIA IS INDICATIVE

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- **The notable silence in East Asia**

1. The absence of activity in Mainland China is particularly noticeable, as it had recorded a peak of 1,156 calls in 2017.
2. There were no calls in South Korea, which had 737 in 2017.
3. Chinese Taipei saw only 1 call, a stark contrast to its 304 in 2019.
4. Hong Kong had only 4 calls, a significant drop from 255 in 2019.

- **The resurgence of Singapore**

1. Singapore had a successful return with 293 calls, compared to a peak of 400 in 2019. A whopping 95% of these were turnaround calls.

- **Neighboring Malaysia's involvement**

1. With 289 calls compared to 561 in 2019, Malaysia saw substantial cruise activity, 99% of which were transit calls, thanks to its proximity to Singapore.

- **The significant stride forward for India**

1. India recorded 219 calls, compared to 284 in 2019, due to the successful operations of a home-grown cruise line with 77 turnarounds in Mumbai and 34 in Chennai.

CRUISE INDUSTRY - ECONOMIC BENEFITS

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USD $750

In a 7-day voyage, the average spending per passenger in port cities.

4,800,000

In 2021, passengers from the Asia-Pacific region accounted for nearly 13% of global cruise travelers.

930,000

During the post-pandemic period, the global cruise-related industries have released job opportunities following the resumption of sailing.

FUTURE TRENDS AND DEVELOPMENTS

Construction and Launch of New Ships

Some companies have not halted the construction of new ships during the pandemic.

For instance, Royal Caribbean and Carnival are planning to launch new ships in the Asian market.

- 72 new ships were manufactured in 2021.
- The average cost of building a cruise ship is $600M.
- There were 65 ocean cruise lines as of 2022.
- The three leading cruise companies made 85% of the global revenue in 2021.

LEADING CRUISE COMPANIES	MARKET SHARE
Carnival Cruise	45%
Royal Caribbean Group	25%
Norwegian Cruise Line	15%

FUTURE TRENDS AND DEVELOPMENTS

Touchless Tech for Safe and Seamless Travel

Cruise companies are also strengthening their digital services, such as using mobile apps for booking, offering contactless boarding and spending, etc., to improve the safety and convenience of passengers.

- Digital check-ins and boarding passes that rely on biometric technology
- Radio Frequency Identification (RFID) technology
- Voice-activated artificial intelligence
- Designated cruise line apps

Source: CLIA; Tourism Economics

FUTURE TRENDS AND DEVELOPMENTS

Environmental Sustainability

As more and more passengers are concerned about environmental issues, cruise companies are also seeking more eco-friendly operation methods. For example, some new cruise ships are adopting more energy-efficient designs and more environmentally friendly fuels.

Minimizing the ships' carbon emissions both while docked and sailing

Allocating resources in cutting-edge environmental technologies on board

Collaborating with urban areas and harbors to manage destinations sustainably

EXAMPLES OF THE SUSTAINABLE CRUISE LINES

Carnival Corporation

Towards Carbon Neutrality Carnival Corporation, the world's leading cruise company, aims for net carbon-neutral ship operations and zero-emissions ships by 2050. This goal will be achieved partly through greener fuels like liquefied natural gas (LNG). Currently, several of Carnival's owned brands, including AIDA Cruises, Costa Cruises, Carnival Cruise Line, and P&O Cruises, operate ships using LNG. Competitors like Disney Cruise Line and MSC Cruises are following suit. However, the effectiveness of this cleaner fuel relies on the supply chain, with limited ports for refueling. For example, P&O Cruises' new Iona will only initially sail to specific destinations. Sustainability in cruising depends on both ports and shipping lines.

Virgin Voyages

Virgin Voyages has achieved carbon-neutral direct emissions through carbon offsets and innovative technology. The company's ship, Scarlet Lady, uses a system that recycles engine cooling water to generate electricity, powering the equivalent of 750 average American homes. Additional sustainability efforts include banning single-use plastics, eliminating buffets to reduce food waste, providing reusable water bottles, and sourcing sustainably for seafood and coffee. Even the balcony hammocks support women's empowerment in rural Thailand.

EXAMPLES OF THE SUSTAINABLE CRUISE LINES

ACDT 台灣遊輪產業發展協會

Royal Caribbean

Royal Caribbean, Celebrity Cruises, and Silversea Cruises, has unveiled a "Destination Net Zero" strategy with a goal to reach net-zero emissions by 2050. This commitment will be pursued through initiatives like designing more efficient ship hulls, enhancing onboard energy efficiency, investing in a Kansas wind farm, developing alternative fuels, and reviewing the supply chain. Additionally, the group collaborates with the World Wildlife Fund (WWF) to diminish environmental impact and support ocean conservation.

Silversea Cruises

Silversea Cruises has revealed "Project Evolution," set to launch in 2023, which includes implementing groundbreaking hydrogen fuel cell technology. This innovation will enable the ships to rely entirely on fuel cells for power while in port—a first in the cruise industry. The vessels will utilize three power sources: dual fuel engines using LNG as the primary fuel, batteries, and fuel cells. Waste processing systems will be optimized for efficiency, minimizing onboard waste. Moreover, Silversea will collaborate with the Meyer Werft shipyard in Germany to work towards carbon-neutral shipbuilding.

EXAMPLE 1 : NCLH SUSTAINABILITY STRATEGY AND APPROACH

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Reducing Environmental Impact
- Combat climate change
- Protect our oceans
- Minimize waste to landfills
- Conserve fresh water
- Increase our sustainable sourcing

Sailing Safely
- Protect health and safety
- Provide a clean and safe environment

Empowering People
- Promote diversity, equity & inclusion
- Recruit, retain and develop talent
- Engage team members
- Support employee well-being

Strengthening Our Communities
- Support and invest in local communities
- Provide disaster relief

Operating with Integrity and Accountability
- Practice good governance
- Get results the right ways
- Respect human rights
- Protect personal data and respect privacy

EXAMPLE 2 : MSC SUSTAINABILITY PROGRAM

PLANET
- MSC is fully engaged in addressing climate change and enhancing ocean biodiversity. The company aims to fast-track its transition to net-zero emissions by 2050, working in collaboration with industry-leading technology firms, shipyards, and fuel providers to expand the horizons of possibilities.

PEOPLE
- MSC emphasizes a people-focused approach, employing tens of thousands of individuals of various nationalities across the globe. Safety and well-being of passengers and crew are the company's top priority. Recognizing the vital role the crew plays in guest experience, the company understands and supports their well-being.

PROCUREMENT
Procurement at MSC Cruises involves the annual sourcing of thousands of diverse items required for operations, ranging from engine parts to hand soap, and crew uniforms to food and drink. This process is carried out with thoughtful consideration and responsibility.

CONCLUSION AND SHARING

Thank you

Please contact us：

Association for Cruises Development of Taiwan (ACDT)

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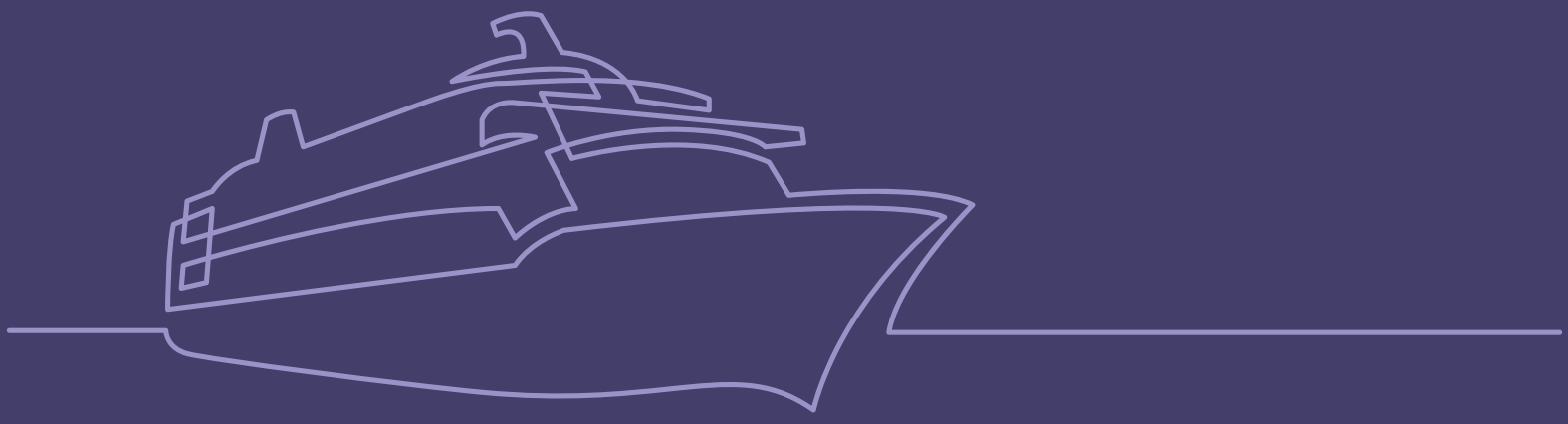
Porto

Session II
Cruise Cooperation Dialogue Platform: Experiences of Responding to Public Health Events on Cruise Ships



Hsiu-Hsi Chen | Moderator

- Distinguished Professor
  Institute of Epidemiology and Preventive Medicine, National Taiwan University
- Chinese Taipei

Educational Background

- Ph.D. in Biostatistics, Biostatistics Unit of Medical Research Council (MRC), Institute of Public Health, Cambridge University, UK1995

Professional Career

- Associate Dean, CPH(CEPH accredited), National Taiwan University-2020
- Director, MPH Program, National Taiwan University-2020

Publications

- Chen CM, Jyan HW, Chien SC, Jen HH, Hsu CY, Lee PC, Lee CF, Yang YT, Chen MY, Chen LS, Chen HH, Chan CC. Containing COVID-19 among 627,386 persons in contact with the diamond princess cruise ship passengers who disembarked in Taiwan: big data analytics. Journal of Medical Internet Research, 2020, 22.5: e19540.
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Pream Raj S/O Sinnasamy | Speaker

- Senior Assistant Director
  Communicable Diseases Division,
  Ministry of Health
- Singapore

Educational Background

- Master of Public Health, National University of Singapore
- Bachelor of Science, The University of Melbourne, Australia

Professional Career

- Nov 2018 to Dec 2022, Adjunct Lecturer, Specialist Diploma in One Health
  Temasek Polytechnic, Singapore
- Jan 2020 to Feb 2022, Contact Tracing and Epidemiology Centre, Ministry of Health, Singapore
- June 2011 to current, Ministry of Health, Singapore
  - Oct 2017 to current
    Senior/Assistant Director, Surveillance, Epidemiology and Response Branch
  - Jul 2015 to Aug 2016
    Public Health Officer, Public Health Intelligence Branch
  - Jun 2011 to Jun 2015
    Public Health Officer, Surveillance and Response Branch

Publications

- SARS-CoV-2 Infection among Travelers Returning from Wuhan, China. The New England Journal of Medicine; 382:1476–1478.
- A large common-source outbreak of norovirus gastroenteritis in a hotel in Singapore, 2012. Epidemiology and Infection; 145: 535–544.
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Singapore's Cruise Experience During COVID

Pream Raj S/O Sinnasamy

COVID-19 was a trying period for all, and probably the biggest crisis of modern history. The impact was far-reaching, with all sectors and segments of society affected. The cruise industry was battered, coming to a standstill for a long period, affecting the livelihoods of many, and costing the economy millions of dollars.

To assist with the safe re-opening of the cruise industry in Singapore, Bluetooth-based technology was developed and adapted for the cruise setting, to aid contact tracing and the monitoring of safe management measures onboard the ships. This enabled us to ensure that the cruises were operating in a safe manner, and both speed up and enhance contact tracing. Collectively, these efforts ensured the safety of both passengers and crew, and helped instil confidence in the public.

However, despite the usefulness of such technologies, we also have to be cognisant of its limitations, such as its inability to account for transmission risk from environmental contamination, and missing contacts with repeated exposures due to issues with refresh rates and compliance to carrying the Bluetooth devices. Hence, it is important to maintain relevant manual competencies, including contact tracing, to plug these gaps.

Rome Buathong | Speaker

- Director
  Division of International Communicable Disease Control Port and Quarantine,
  Department of Disease Control,
  Ministry of Public Health THAILAND
- Thailand

Educational Background

- Doctor of Medicine (MD.) from Thammasat University (Bangkok)
- Master in International Health (MIH) from VU University (Amsterdam)

Professional Career

Specialties in Preventive Medicine (Epidemiology and Travel Medicine).

Publications

- Buathong, R.; Hunsawong, T.; Wacharapluesadee, S.; Guharat, S.; Jirapipatt, R.; Ninwattana, S.; Thippamom, N.; Jitsatja, A.; Jones, A.R.; Rungrojchareonkit, K.; et al. Homologous or Heterologous COVID-19 Booster Regimens Significantly Impact Sero-Neutralization of SARS-CoV-2 Virus and Its Variants. Vaccines 2022, 10, 1321. https://doi.org/10.3390/ vaccines10081321
- Buathong R, Chaifoo W, Iamsirithaworn S, Wacharapluesadee S, Joyjinda Y, Rodpan A, Ampoot W, Putcharoen O, Paitoonpong L, Suwanpimolkul G, Jantarabenjakul W, Petcharat S, Bunprakob S, Ghai S, Prasithsirikul W, Mungaomklang A, Plipat T, Hemachudha T. Multiple clades of SARS-CoV-2 were introduced to Thailand during the first quarter of 2020. Microbiol Immunol. 2021 Oct;65(10):405-409. doi: 10.1111/1348-0421.12883. Epub 2021 Sep 1. PMID: 33835528; PMCID: PMC8251142.
- Okada P, Buathong R, Phuygun S, Thanadachakul T, Parnmen S, Wongboot W, Waicharoen S, Wacharapluesadee S, Uttayamakul S, Vachiraphan A, Chittaganpitch M, Mekha N, Janejai N, Iamsirithaworn S, Lee RT, Maurer-Stroh S. Early transmission patterns of coronavirus disease 2019 (COVID-19) in travellers from Wuhan to Thailand, January

2020. Euro Surveill. 2020 Feb;25(8):2000097. doi: 10.2807/1560-7917.ES.2020.25.8.2000097. PMID: 32127124; PMCID: PMC7055038.

- Wacharapluesadee S, Buathong R, Iamsirithawon S, Chaifoo W, Ponpinit T, Ruchisrisarod C, Sonpee C, Katasrila P, Yomrat S, Ghai S, Sirivichayakul S, Okada P, Mekha N, Karnkawinpong O, Uttayamakul S, Vachiraphan A, Plipat T, Hemachudha T. Identification of a Novel Pathogen Using Family-Wide PCR: Initial Confirmation of COVID-19 in Thailand. Front Public Health. 2020 Oct 7;8:555013. doi: 10.3389/fpubh.2020.555013. PMID: 33134237; PMCID: PMC7579402.
- Phumee A, Buathong R, Boonserm R, Intayot P, Aungsananta N, Jittmittraphap A, Joyjinda Y, Wacharapluesadee S, Siriyasatien P. Molecular Epidemiology and Genetic Diversity of Zika Virus from Field-Caught Mosquitoes in Various Regions of Thailand. Pathogens. 2019 Mar 6;8(1):30. doi: 10.3390/pathogens8010030. PMID: 30845707; PMCID: PMC6470891.

Alternative Yacht Quarantine (AYQ) during COVID-19 pandemic in Thailand 2020-2022

Rome Buathong

Thailand reported its first confirmed cases of COVID-19 in early January 2020. April 2020 all borders were closed. The State Quarantine sites were established for Thais and foreigners with a requirement for quarantine period of 14 days and do respiratory samples testing for RT-PCR at least 2 times. Pre-requirement for both Thai citizens and foreigners before departure to Thailand were 1) approved letter by MOFA either Certificate of Entry (COE) or Thailand Pass QR codes, 2) paid confirmed quarantine facilities 3) health insurance (coverage 100,000 USD) and 4) negative or not detected SARS-COV-2 by RT-PCR not exceed 72 hours before departure 5) fit to fly certificate by MD. All ports (air, sea and land) had the same principle which were regulated by the State of Emergency Decree (during April 2020 till September 2022). During the vaccination existing, Thailand gradually opened the borders by shortening quarantine period among those vaccinated travelers or had privilege freedom in the islands such as Phuket and Samui Sandbox. The travel by cruise ship is totally ceased but for yacht (2-4 passengers) or super yacht (less than 12 passengers) was possibility.

On 27 November 2020, Thailand initiated Alternative Yach Quarantine (AYQ) protocol for quarantine in the yacht in the specified period in Phuket. The requitements were 1) legal yacht 2) met safety standard of infrastructure 3) AIS system with capable tracking for 24 hours 4) enough space and supplement for living during quarantine 5) having Thai agency with contracted local hospital for RT-PCR testing (1-3 times upon period) and treatment while positive COVID-19 and 6) valid COE by MOFA.

During 27 November 2020 to 30 April 2022, totally 170 yachts and 648 people were granted for AYQ in Phuket port. Overall, 19 persons (2.93%) in 10 yachts (5.88%) were positive RT-PCR for COVID-19. The confirmed cases were referral to treatment in the contracted hospitals. The closed contacts were quarantined either on yacht or hotel.

The infection rate among persons in AYQ program was acceptable (< 5%) and practical with feasibility. This is the alternative method of quarantine. But the method was not able to apply for cruise ship with massive passengers due to consume man power. The key factor for successful mission were clear protocol from the national and feasibility to apply, proactive private stakeholders, rapid problem solving under the provincial committee (chair by the governor) and acknowledged local people. But there still had the problems and limitations including weather and sea tidal interfere the officer's activities, signal interference or lost and then required direct observation, broken infrastructure with interfere living during quarantine on the yacht and must transfer to hotel quarantine.

1

Alternative Yacht Quarantine (AYQ) during COVID-19 pandemic in Thailand 2020-2022

ROME BUATHONG, MD. MIH. FETP.
DIRECTOR OF DIVISION OF INTERNATIONAL COMMUNICABLE DISEASE CONTROL PORT AND QUARANTINE
DEPARTMENT OF DISEASE CONTROL

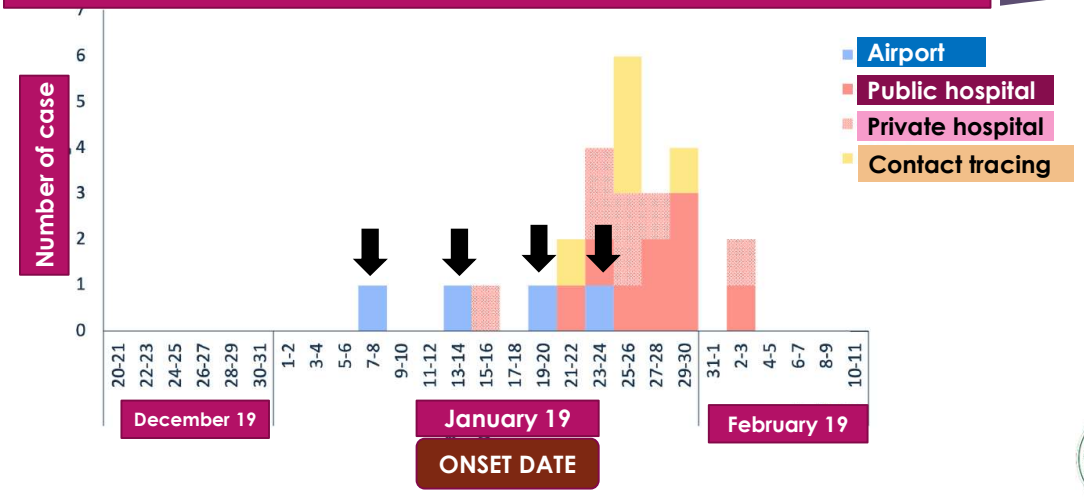
2

Background

- Thailand reported its first confirmed cases of COVID-19 outside China Mainland in **8th January 2020** at Suvarnabhumi Airport.
- **January - March 2020**, travellers from designated countries of COVID-19 required **report themselves at port health** and were **ordered to quarantine at home**
- **Late March 2020** which **dramatic increasing number** of COVID-19 from abroad then **all borders were closed** by the State of Emergency Decree.

4

Epidemic curve defined by place of detection



Background

- **April to July 2020** the mainly inbound travelers were **repatriated Thai citizens.**
- **July 2020**, some group foreigners were allowed entry into the Kingdom such as family with Thai, work permit, having resident or business person
- **The pre-requirement included**

  1) approved letter by MOFA either Certificate of Entry (COE) for air/sea/land or later additional Thailand Pass for air travel maximize

  2) paid confirmed quarantine facilities

  3) health insurance (coverage 100,000 USD) and

  4) negative or not detected SARS-COV-2 by RT-PCR not exceed 72 hours before departure.

  5) Fit to fly certificate from MD

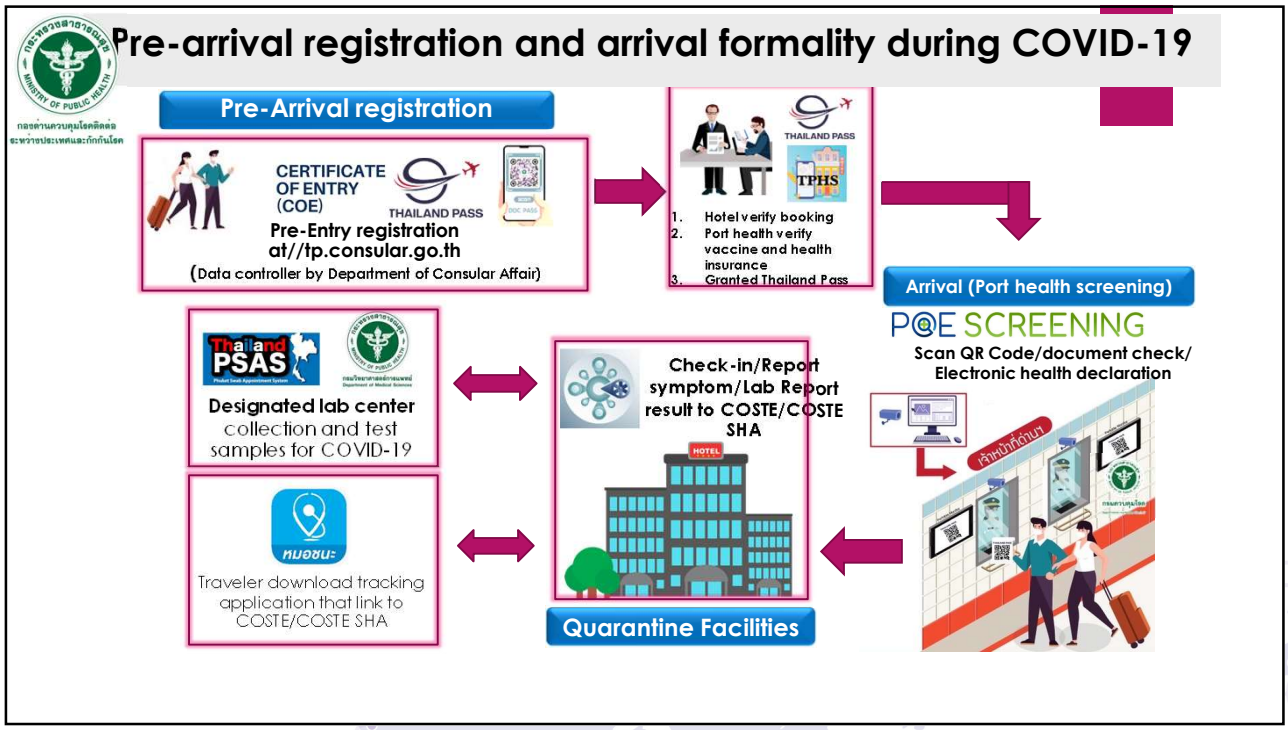
Background

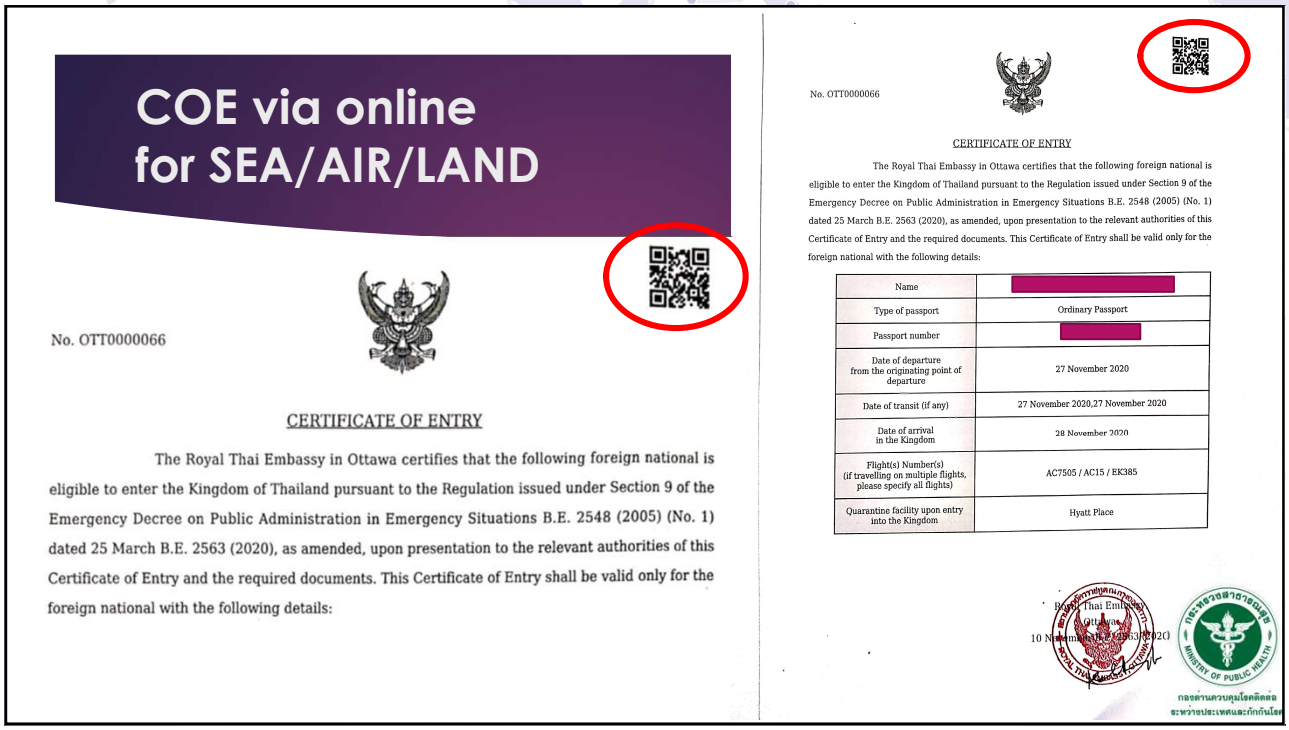
- The quarantine facilities were classified by

  1. State vs Private management (under approved by the MOPH)

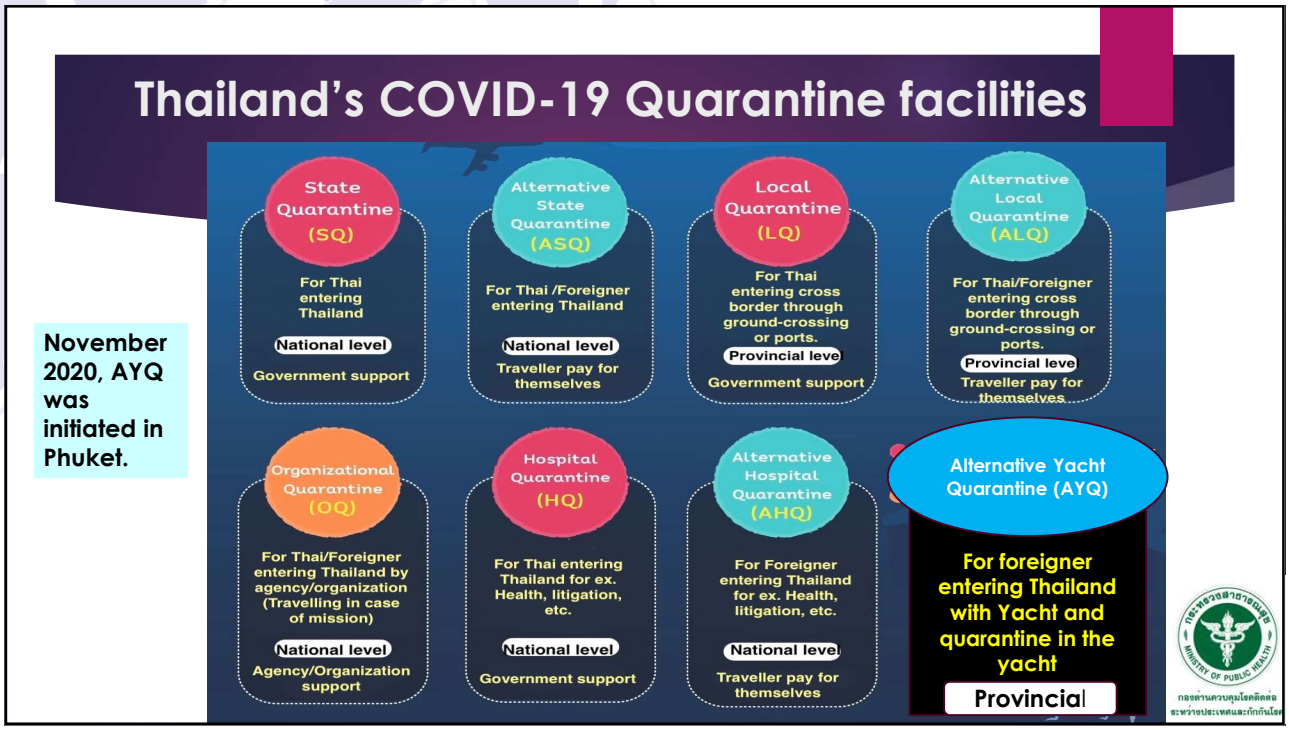
  2. National vs Provincial

  3. Special quarantine facilities such as Organizational Quarantine (OQ) and Alternative Yacht Quarantine (AYQ)
- While effective vaccines against COVID-19 were available, **Sandbox program** or **shortening quarantine** were introduction from **June 2021**


Pre-arrival registration and arrival formality during COVID-19
Pre-Arrival registration
CERTIFICATE OF ENTRY (COE)
THAILAND PASS
Pre-Entry registration at//tp.consular.go.th
(Data controller by Department of Consular Affair)
THAILAND PASS
TPHS
1. Hotel verify booking
2. Port health verify vaccine and health insurance
3. Granted Thailand Pass
Arrival (Port health screening)
POE SCREENING
Scan QR Code/document check/ Electronic health declaration
Thailand PSAS
Designated lab center collection and test samples for COVID-19
หมอชนะ
Traveler download tracking application that link to COSTE/COSTE SHA
Check-in/Report symptom/Lab Report result to COSTE/COSTE SHA
HOTEL
Quarantine Facilities


COE via online for SEA/AIR/LAND
No. OTT0000066
CERTIFICATE OF ENTRY
The Royal Thai Embassy in Ottawa certifies that the following foreign national is eligible to enter the Kingdom of Thailand pursuant to the Regulation issued under Section 9 of the Emergency Decree on Public Administration in Emergency Situations B.E. 2548 (2005) (No. 1) dated 25 March B.E. 2563 (2020), as amended, upon presentation to the relevant authorities of this Certificate of Entry and the required documents. This Certificate of Entry shall be valid only for the foreign national with the following details:
No. OTT0000066
CERTIFICATE OF ENTRY
The Royal Thai Embassy in Ottawa certifies that the following foreign national is eligible to enter the Kingdom of Thailand pursuant to the Regulation issued under Section 9 of the Emergency Decree on Public Administration in Emergency Situations B.E. 2548 (2005) (No. 1) dated 25 March B.E. 2563 (2020), as amended, upon presentation to the relevant authorities of this Certificate of Entry and the required documents. This Certificate of Entry shall be valid only for the foreign national with the following details:
Name
Type of passport
Ordinary Passport
Passport number
Date of departure from the originating point of departure
27 November 2020
Date of transit (if any)
27 November 2020,27 November 2020
Date of arrival in the Kingdom
28 November 2020
Flight(s) Number(s) (if travelling on multiple flights, please specify all flights)
AC7505 / AC15 / EK385
Quarantine facility upon entry into the Kingdom
Hyatt Place
Royal Thai Embassy Ottawa


THAILAND PASS
AIR TRAVEL
Mr.
Departure from
United States of America
Arrival Date
21 July 2022
Valid for Entry from
21 July 2022
Valid for Entry until
24 July 2022
Submitted at
18 July 2022
Thailand Pass ID
62d4e367c7d50d94672fdd6a
Quarantine
THAILAND PASS
AIR TRAVEL
Mr.
Departure from
Singapore
Arrival Date
01 May 2022
Valid for Entry from
01 May 2022
Valid for Entry until
04 May 2022
Submitted at
28 April 2022
Thailand Pass ID
626ac2307d68868cc817bfd0
SandBox
THAILAND PASS
AIR TRAVEL
Ms.
Departure from
Vietnam
Arrival Date
17 April 2022
Submitted at
15 April 2022
Duration of stay
Less than 5 days
Thailand Pass ID
625948e73940929e2b1bf1c7
Test & Go
Thailand Pass for AIR Travel ONLY


Thailand's COVID-19 Quarantine facilities
November 2020, AYQ was initiated in Phuket.
State Quarantine (SQ)
For Thai entering Thailand
National level
Government support
Alternative State Quarantine (ASQ)
For Thai /Foreigner entering Thailand
National level
Traveller pay for themselves
Local Quarantine (LQ)
For Thai entering cross border through ground-crossing or ports.
Provincial leve
Government support
Alternative Local Quarantine (ALQ)
For Thai/Foreigner entering cross border through ground-crossing or ports.
Provincial leve
Traveller pay for themselves
Organizational Quarantine (OQ)
For Thai/Foreigner entering Thailand by agency/organization (Travelling in case of mission)
National level
Agency/Organization support
Hospital Quarantine (HQ)
For Thai entering Thailand for ex. Health, litigation, etc.
National level
Government support
Alternative Hospital Quarantine (AHQ)
For Foreigner entering Thailand for ex. Health, litigation, etc.
National level
Traveller pay for themselves
Alternative Yacht Quarantine (AYQ)
For foreigner entering Thailand with Yacht and quarantine in the yacht
Provincial

Fit Criteria for Alternative Yacht Quarantine (AYQ)

11

1. Legal registration of Yacht (2-4 passengers) or Super Yacht (< 20 passengers)

YACHTS

เรือสำราญและกีฬาขนาดเล็ก มีขนาดความยาวน้อยกว่า 30เมตร ขับเคลื่อนโดยใบและเครื่องยนต์ เจ้าของเดินเรือด้วยตนเอง โดยเฉลี่ย 2-4 คน

Asia Pacific Superyachts

SUPERYACHTS

เรือสำราญและกีฬาขนาดใหญ่ มีขนาดความยาวตั้งแต่ 30เมตรขึ้นไป

มีคนประจำเรือตั้งแต่ 5 -20 คน และรองรับผู้โดยสารไม่เกิน 12 คน

Asia Pacific Superyachts

กองด่านควบคุมโรคติดต่อระหว่างประเทศและพักกันโรค

Fit Criteria for Alternative Yacht Quarantine (AYQ)

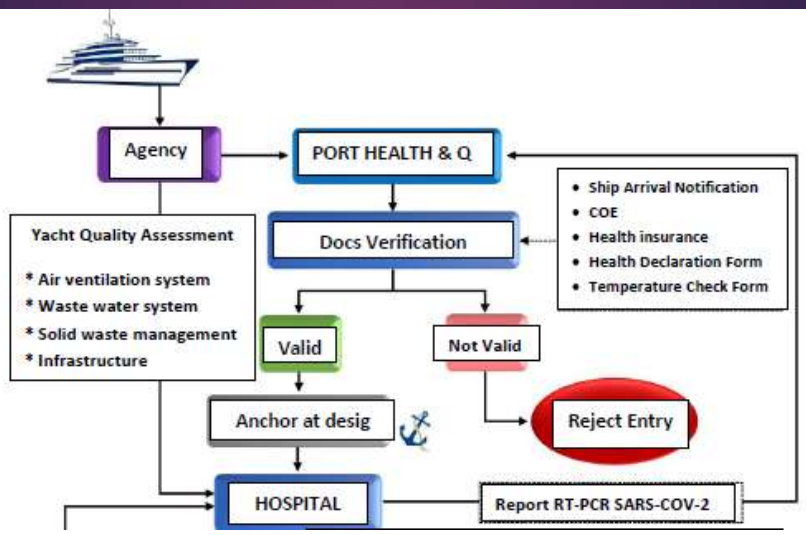
12

1. Legal registration of Yacht (2-4 passengers) or Super Yacht (< 20 passengers)
2. Met safety standard of infrastructure
3. AIS system with capable tracking for 24 hours
4. Enough space and supplement for living during quarantine
5. Having Thai agency with contracted hospital for RT-PCR testing and treatment while positive COVID-19
6. Valid COE by MOFA

กองด่านควบคุมโรคติดต่อระหว่างประเทศและพักกันโรค

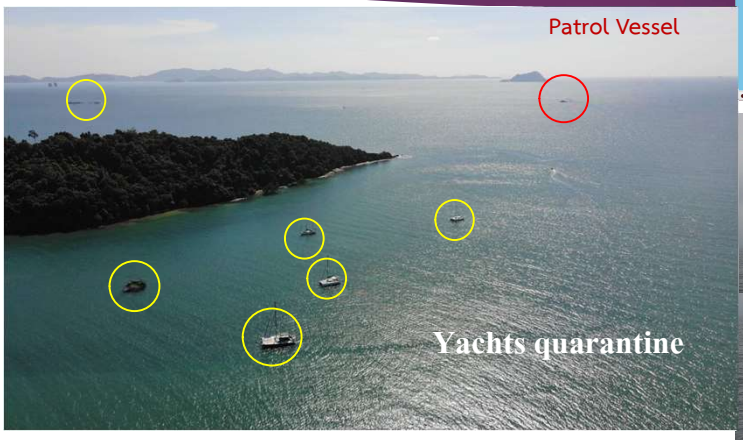
Protocol

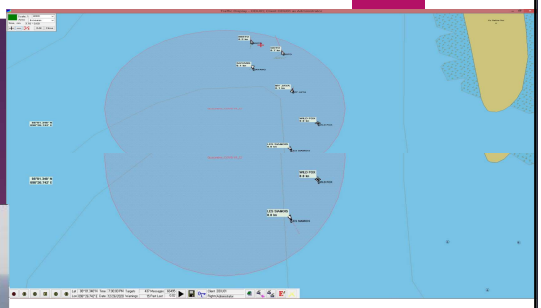
13



กองด่านควบคุมโรคติดต่อ
ระหว่างประเทศและกักกันโรค

Monitoring while Quarantine

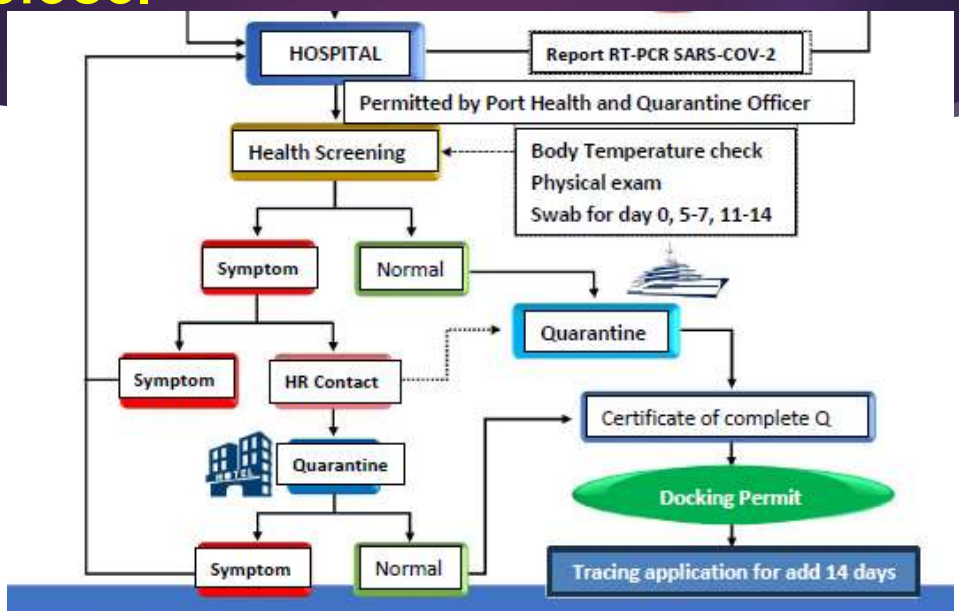




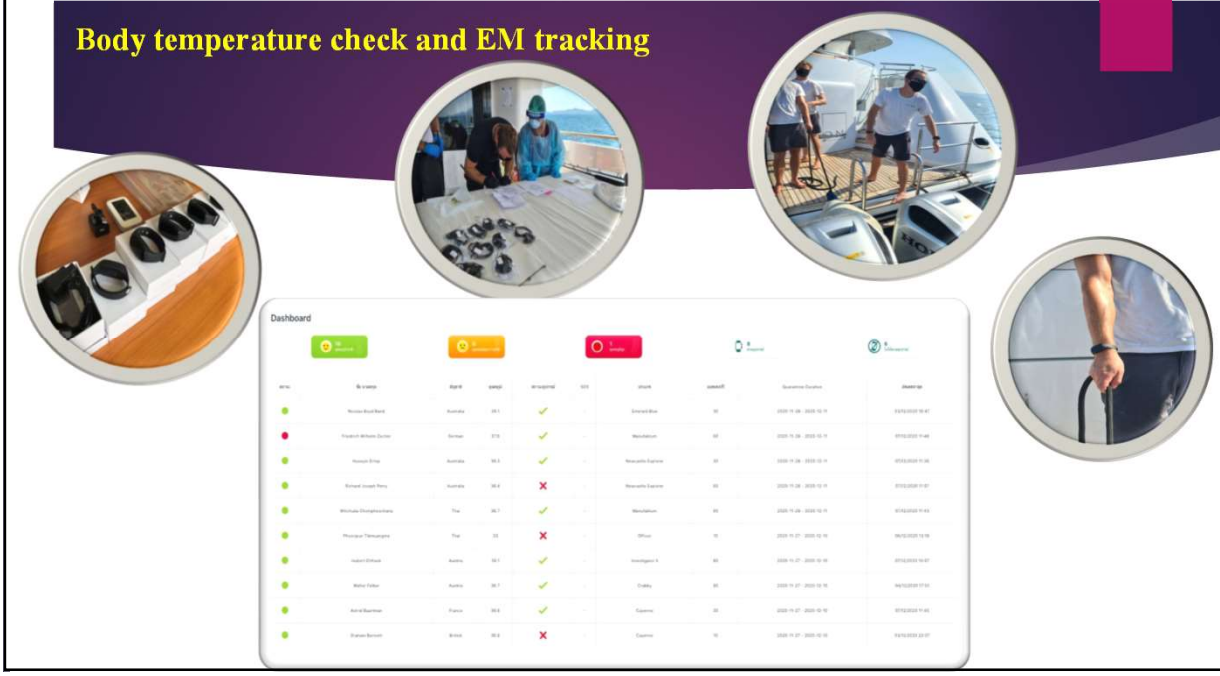
กองด่านควบคุมโรคติดต่อ
ระหว่างประเทศและกักกันโรค

Protocol

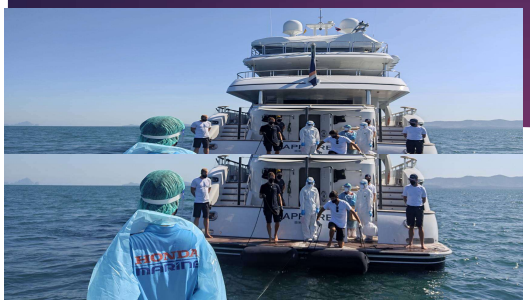
15

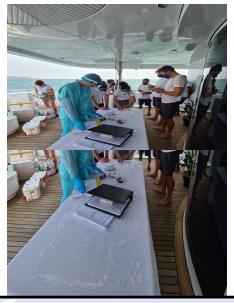
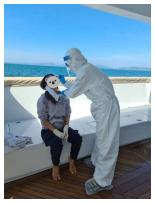


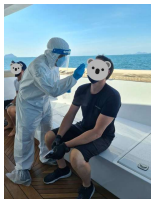
Body temperature check and EM tracking



Rt-PCR : Day 0 , 2-5 ,12-14






กองด่านควบคุมโรคติดต่อระหว่างประเทศและกักกันโรค

18

Results

- During 27 November 2020 to 30 April 2022, totally 170 yachts and 648 people were granted for AYQ in Phuket port.
- Overall, 19 persons (2.93%) in 10 yachts (5.88%) were positive RT-PCR for COVID-19.
- The confirmed cases were referral to treatment in the contracted hospitals.
- The closed contacts were quarantined either on yacht or hotel.

กองด่านควบคุมโรคติดต่อระหว่างประเทศและกักกันโรค

Total Number of Pre-arrival Registration

At the End of Registration Period

System	Passenger Number			
	AIR	LAND	SEA	Total
COE	103,671	1,281	648	105,600
Thailand Pass	3,350,270	202,421	-	3,552,691

Discussions

20

- The infection rate of COVID-19 among people in AYQ is **acceptable** (<5%).
- The Protocol was practical with feasibility. Hence, this is the alternative method of quarantine by SEA travel.
- This kind of quarantine promoted the local economic.
- But the method was not able to apply for cruise ship with massive passengers due to consume man power.

21

Discussions

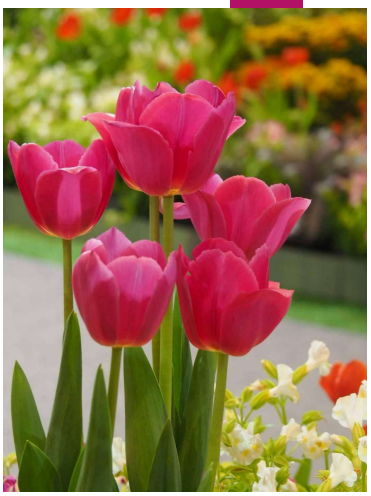
- The key factor for **successful mission** were
  1. **Clear protocol** from the **national**
  2. **Feasibility to apply**,
  3. **Proactive private stakeholder**
  4. **Rapid problem solving under the provincial committee** (chair by the governor) and
  5. **Acknowledged local people**.

22

Discussions

- But there still had **the problems and limitations** including
  1. **Weather and sea tidal** interfere the officer's activities.
  2. **Signal interference** or **lost** and then required direct observation.
  3. **Broken infrastructure in the yacht** with interfere living during quarantine on the yacht and must transfer to the hotel quarantine instead.





Thanks

Edgar O. Maala | Speaker

- Quarantine Medical Officer
  Officer-in-Charge (OIC),
  Quarantine Service Division,
  Bureau of Quarantine
- The Philippines

Educational Background

- Doctor of Medicine

Professional Career

- Quarantine Officer (2002 - present)
- University professor
- Family medicine practitioner

Responding to Public Health Events on Cruise Ships: PHILIPPINES' experience during COVID and post-COVID pandemic

Edgar O. Maala

Recently, global tourism has been strongly affected by the COVID 19 pandemic. The cruise ship business which has contributed greatly to the tourism industry has been seriously affected as well. To begin cruise tourism again in the post COVID era requires that some concerns be addressed like different cross border measures amongst Asian nations and difficulties caused by the lingering effects of the pandemic.

The COVID pandemic initiated a transformation resulting in the implementation and adoption of changes in public health interventions. As a result, a new perspective to healthcare delivery developed with emphasis on preventive measures, surveillance, and substantial technological dependence which can be adopted in cruise ships. There are concerns on the challenges to meet the capacity to do rapid test for serious viral infectious diseases, the fast-tracked implementation of new technologies, the mental health concerns, and the protection of privacy and personal data during an epidemic in a cruise ship.

In the Philippines, national and international laws serve as basis for COVID protocols. These protocols have already been eased up. This does not mean, however, that we have removed all COVID control measures nor does it mean that COVID is no longer considered a public health threat. The risk that a COVID variant may again escalate transmission or another infectious disease develops similarly shall always be a possibility in a cruise ship. We have imposed protocols similar to our airports of entry and additional process to monitor movement of passengers, crew and visitors at nominated cruise destinations all over the country. The management of infectious disease on board cruise ships using digital technology in the prevention, detection, surveillance, risk assessment, and case management of illness in the Philippines is limited by the technological gaps in acquired skills, economic and educational potential for new innovations.

We appreciate opportunities for international cooperation with respect to information sharing and management on cross border travel and adopting best practices in preventing outbreaks on cruise ships.

Responding to Public Health Events on Cruise Ships:

PHILIPPINES' experience during COVID and post-COVID pandemic

EDGAR O. MAALA, MD MPA
Presenter
PHILIPPINES

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

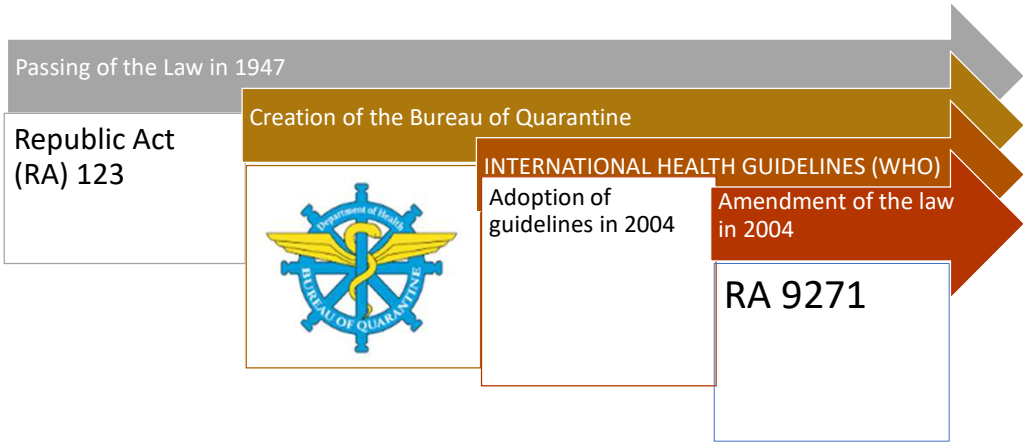
BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Outline of presentation

- Introduction: Brief Overview
  - Bureau of Quarantine at Ports of Entry
    - Authority
    - Role of Government vis-à-vis WHO regulations
- Cruise ship in the Philippines during pandemic
  - Greenlane for seafarers
- Cruise ship in the Philippines post pandemic
  - Data on cruise arrival
  - Philippine Interim Guidelines for Cruise ships
- Role of digital technology in the Post Covid era
  - Country Experience
  - Challenges and Limitations on the use of Digital Technology
- Future Plans

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

QUARANTINE AUTHORITY at the SEAPORT



BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Bureau of Quarantine under the IHR standards

GOAL: Limit spread of health risk to neighboring countries and prevent unwarranted travel and trade restrictions

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

During Pandemic

GREEN LANE CONCEPT

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Cruise Arrivals

Table1: 4-year data monitoring on Cruise Arrivals (pre-and during pandemic)

YEAR	NO. OF CRUISE VESSELS	TOTAL PASSENGERS	TOTAL CREW
2019	56	76,174	46,314
2020	54	0	127,035
2021	25	0	44,273
2022	4	0	154

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

During Pandemic

TH

POST PANDEMIC

Table 2:Comparison of data on Cruise Arrivals by year (pre-, during pandemic and post pandemic)

YEAR	NO. OF CRUISE VESSELS	TOTAL PASSENGERS	TOTAL CREW
2019	56	76,174	46,314
2020	54	0	127,035
2021	25	0	44,273
2022	4	0	154
2023	18	13,815	8,603

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

PRELIMINARY PROCEDURE: POST PANDEMIC

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Post Pandemic: Interim Guidelines for Cruise ships

Ship Physician

- Medical Emergency Contingency and Evacuation Plan
- COVID-19 vaccination status of all passengers and crew onboard
- required documents shall be submitted to the Quarantine Officers during boarding inspection (i.e. Maritime Declaration of Health, vaccination list etc)
- current health status of all passengers and crew onboard

Shipping Agent

- identify a referral hospital for Medical Evacuation in the event that a passenger or crew shall be identified as a confirmed case of Covid

Passengers and Crew

- undergo mustering and thermal screening
- present the generated Quick Response (QR) code to Quarantine Officers for scanning

Post Pandemic

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Post pandemic: **Border Health Control**

Thermal scanning

- Health assessment for febrile passengers

E Travel Scanning

- Health assessment for Red QR code

Health Assessment

- RAT for unvaccinated and symptomatic passengers

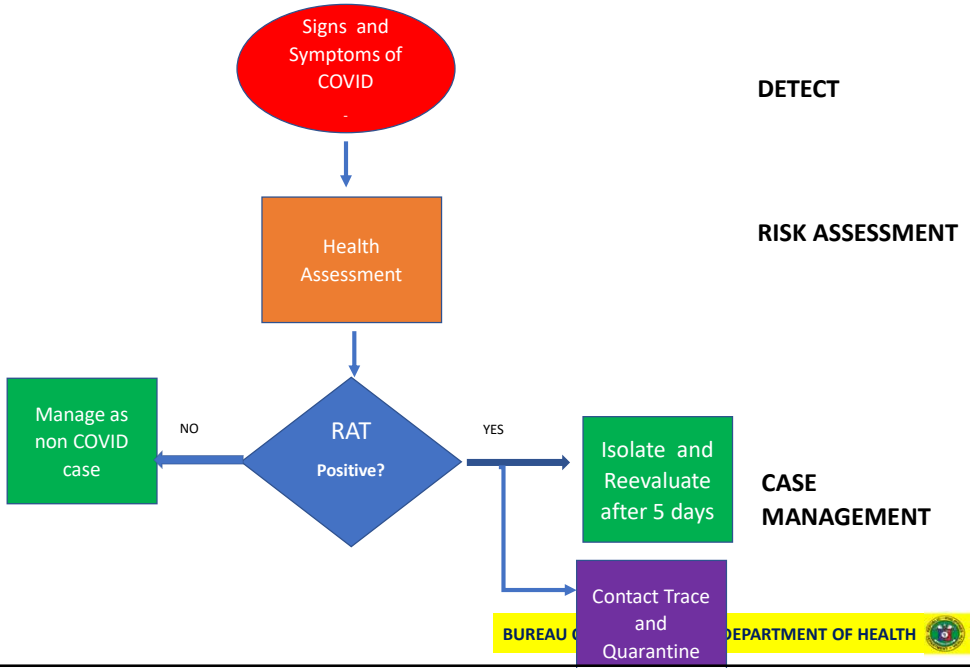
Immigration

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Post Pandemic: Testing

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Process Flow for Symptomatic Passenger



Post Pandemic

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Post Pandemic

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Role of digital technology in Post COVID era: Country Experience

	Digital Technology	Other Conventional Methods
Prevention	ICV (QR code), IEC (AVP)	Tarpaulins
Detection	Thermal scanner Results on line	thermometer RTPCR, RAT
Surveillance	E travel , Timely electronic reporting, data dash board	
Assessment		Face to face Interview of index case
Response		Transfer to Dedicated Hospital, Medical management
Contact tracing		Identification and interview of close contacts
Notification and reporting	Online notification (NOA)	Timely Reporting of incidence
Containment		isolation and Quarantine

Challenges

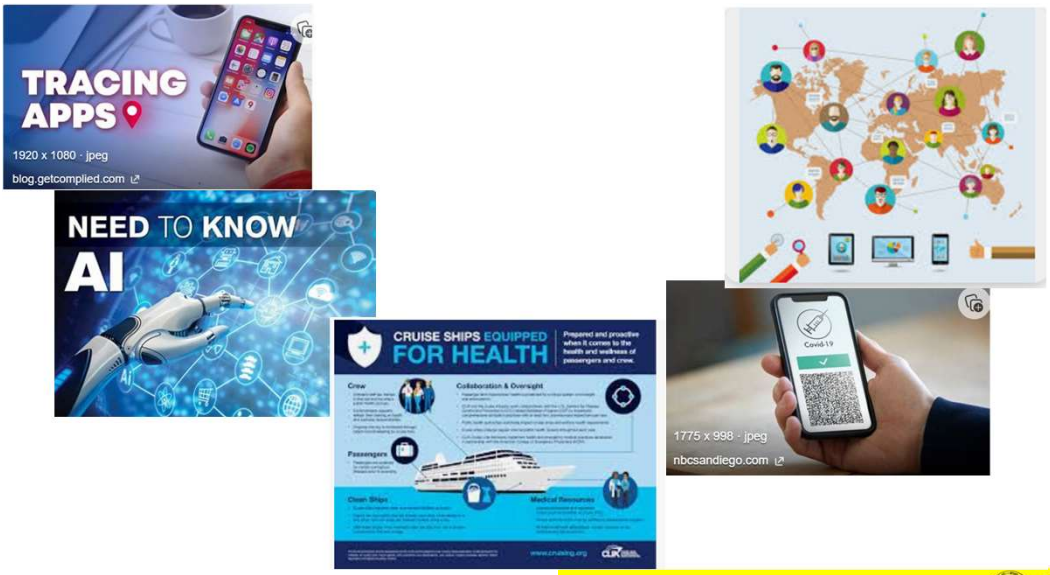
- Misdeclaration
- late/ failed reporting of public health threat in Cruise ships
- Pro-Active referral system for early detection of the suspected case
- timely management to prevent spread
- Passengers acquiring diseases on shore excursions
- Testing for identification of infectious disease pathogen
- Digital technology capacity of countries in surveillance, reporting and response
- Coordination and integration of digital technology into methods of managing infectious disease

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Limitations of digital technology

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Future Plans and Recommendations



BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

"Opportunity is everywhere. The key is to develop the vision to see it."

- ANONYMOUS

BUREAU OF QUARANTINE – DEPARTMENT OF HEALTH

Yung-Ching Lin | Speaker

- Chief Medical Officer
  Office of Preventive Medicine,
  Centers for Disease Control,
  Ministry of Health and Welfare
- Chinese Taipei

Educational Background

- 2016–2021 Master of Laws, National Chengchi University
- 2011–2012 Master of Public Health, Johns Hopkins University
- 2001–2007 Doctor of Medicine, National Taiwan University

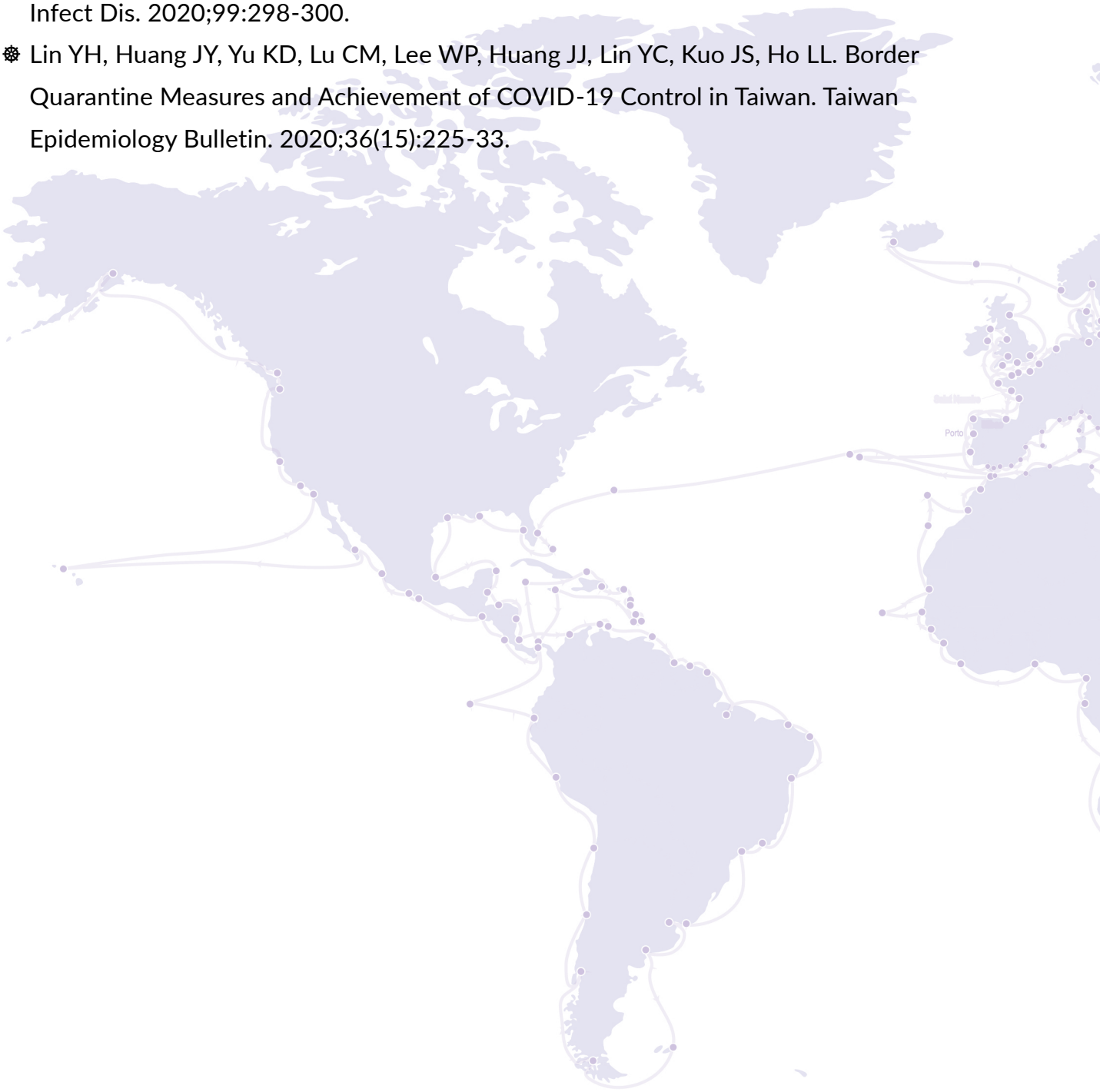
Professional Career

- 2013–present Adjunct attending physician, National Taiwan University Hospital
- 2012–present Medical officer, Centers for Disease Control
- 2007–2011 Resident physician, National Taiwan University Hospital

Publications

- Wu ZH, Yu KD, Lin YH, Yeh YT, Lin YC, Lee WP, Kuo JS, Ho LL, Strategy And Development of Border Quarantine During COVID-19 Pandemic, Taiwan, July 2020 to June 2022. Taiwan Epidemiology Bulletin. 2022;38(19):265-77.
- Lu CM, Huang JJ, Su SW, Lin YC, Lee WP, Ho LL. The Establishment And Implementation of COVID-19 Entry Quarantine System in Taiwan, 2020. Taiwan Epidemiology Bulletin. 2022;38(11):119-26.
- Lin YC. Clarifications of Misconceptions Regarding Vaccine Injury Compensation Program in Taiwan. Taiwan Epidemiology Bulletin. 2020;36(21):340-50.

- Lin YC, Chen MY, Liu MC, Lin YJ, Lin YH, Kuo JS, Wang PS, Shih CL. Quarantine measures for coronavirus disease 2019 on a cruise ship, Taiwan, February 2020. Int J Infect Dis. 2020;99:298-300.
- Lin YH, Huang JY, Yu KD, Lu CM, Lee WP, Huang JJ, Lin YC, Kuo JS, Ho LL. Border Quarantine Measures and Achievement of COVID-19 Control in Taiwan. Taiwan Epidemiology Bulletin. 2020;36(15):225-33.



Responding to COVID-19 Public Health Events on Cruise Ships — Experience from Chinese Taipei

Yung-Ching Lin

In Chinese Taipei, the Centers for Disease Control under the Ministry of Health and Welfare has set up quarantine offices at airports and ports to conduct quarantine for aircraft and ships. According to port quarantine rules, shipmasters should report basic information of the cruise ship and the health status of crew and passengers within 72 to 4 hours before entering the port. Quarantine officers then assess the risk of public health, determine the disposal method, and issue a Quarantine Clearance Permit.

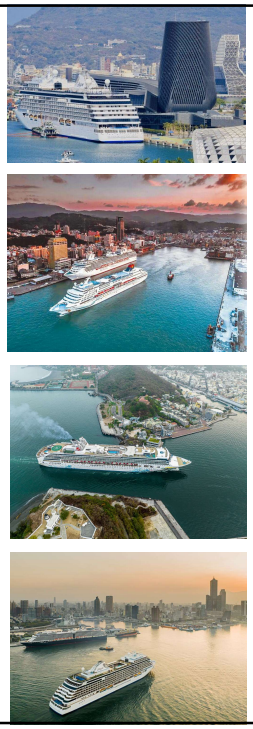
In response to COVID-19, Chinese Taipei activated the Central Epidemic Command Center of COVID-19 Pandemic (CECC) and adopted a three-stage risk management model of containment, preparation, and recovery. As COVID-19 outbreaks on cruises were reported, the CECC put a ban on berthing all international cruise ships in February 2020. Considering the low risks of epidemic situations in the community, the effectiveness of epidemic prevention, and the industrial economy, the CECC approved the operations of domestic cruises in July 2020. Before the cruise started operation, several expert panel meetings were held to discuss the preventive measures on board, and an emergency response drill was conducted. Cruise operators were also required to implement various infection control measures on board. During the resumption of domestic cruises, 91 voyages were operated, and no confirmed cases of COVID-19 were reported. The successful experience of the resumption of domestic cruise ships facilitated the preparations for resuming operations of international cruise ships.

As the pandemic situation improved, the Maritime Port Bureau and Centers for Disease Control of Chinese Taipei referred to the cruise ship's epidemic prevention guidelines of the European Union, the United States, and Australia, consulted experts and scholars, and jointly developed two guidelines for cruise ships. On October 24, 2022, Chinese Taipei lifted the ban on international cruises.

In the post-pandemic era, the cruise tourism industry is recovering rapidly, and all member economies are facing challenges in the risk management and control of cruise infectious diseases, such as harmonizing standards and protocols for cruise ships, improving onboard heating, ventilation and air conditioning (HVAC) systems, arranging quarantine facilities, etc. As the front line of epidemic prevention at the border, preparations cannot be delayed. Learning from the experience of combating the COVID-19 pandemic, sharing experiences among APEC economies, and applying new technologies provide solutions to securing safe cross-border cruise travel.

Responding to COVID-19 Public Health Events on Cruise Ships — Experience from Chinese Taipei

Yung-Ching Lin, MD, MPH, LL.M
Chief Medical Officer
Centers for Disease Control, Ministry of Health and Welfare
Chinese Taipei



1

Outline

- **Border Quarantine System**
- **COVID-19 Risk Management for Cruise**
  - Stage I: Containment
  - Stage II: Preparedness
  - Stage III: Recovery
- **Strengths of Cruise Ship Epidemic Prevention**
- **Challenges in the Post-COVID-19 Era**

2

Border Quarantine System in Chinese Taipei

Ministry of Health and Welfare

Centers for Disease Control

- Taipei Regional Center
- Northern Regional Center
- Central Regional Center
- Southern Regional Center
- Kaohsiung-Pingtung Regional Center
- Eastern Regional Center

- Communicable Disease Control Act
- Regulations Governing Quarantine at Ports

Cruise Ships Quarantine

10 airports

13 ports

Report within 72 to 4 hours prior to entering the port

Any deaths or infected patients on board

No Deaths or infected patients on board

Information collection & risk assessment

Special event

General event

Issue the Quarantine Clearance Permit

Onboard Inspection

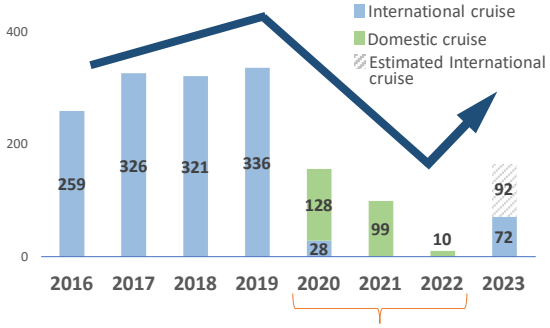
Border Quarantine System
Risk Management
Strengths
Challenges

3

Cruise Ports and Calls in Chinese Taipei

Cruise ports in Chinese Taipei

Cruise calls by year



Berthing of international cruise ships banned during Feb 2020 to Oct 2022

Border Quarantine System
Risk Management
Strengths
Challenges

4

Cruise Ship-Related Outbreaks before COVID-19 Pandemic

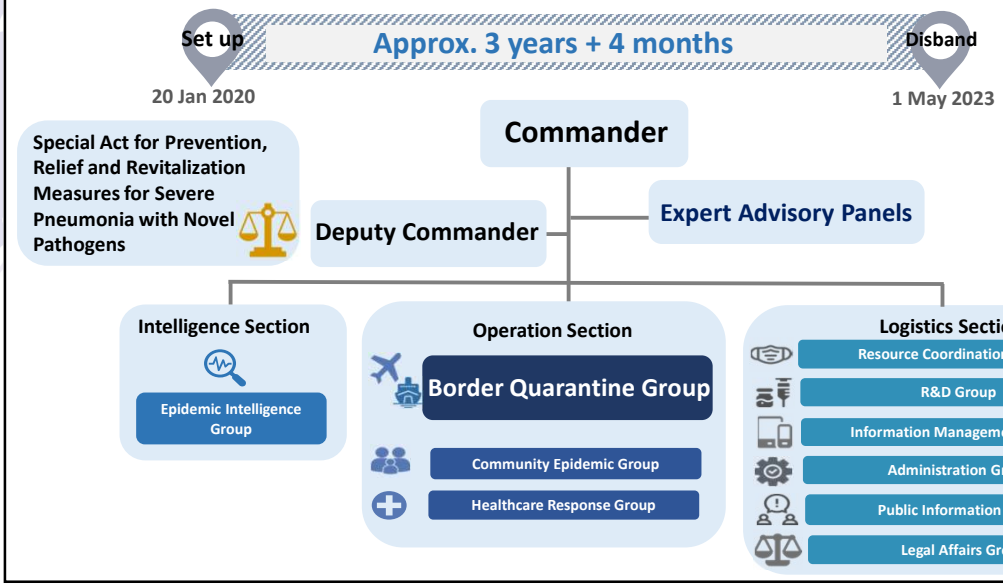
AGE caused by norovirus

- March 2016: 145 acute gastroenteritis (AGE) cases caused by norovirus
  - 129 passengers, 16 crew members
  - Attack rate: 5.17%

Chickenpox

- April – June 2011: 5 chickenpox cases (all crew)
- April – May 2014: 4 chickenpox cases (all crew)

Central Epidemic Command Center of COVID-19 Pandemic



COVID-19 Timeline of Cruise

2 Preparedness (Jul 2020-Sep 2022)

Jul 2020: As the pandemic situation improved, domestic cruises resumed operations

2020 2021 2022 2023

1 Containment (Dec 2019-Jun 2020)

- Dec 2019: COVID-19 outbreak in Wuhan, China
- 20 Jan 2020: CECC was activated
- 4 Feb 2020: Ban on berthing of cruise ships docked in China, Hong Kong or Macau during past 14 days
- **6 Feb 2020: Ban on berthing of all international cruise ships**

3 Recovery (Oct 2022-)

- **24 Oct 2022: Publish the guidelines and lift the ban on international cruises**
- 4 Mar 2023: Loosen COVID-19 control measures on international cruises
- 11 Apr 2023: COVID-19 epidemic prevention measures returned to regular management
- 1 May 2023: CECC was disbanded

Stage I: Containment
Quarantine Measures of Cruise Ship SuperStar Aquarius

8 Feb 2020
SuperStar Aquarius docked at Keelung
1,738 passengers and 776 crew members on board

Establishing an emergency response center at Keelung port

Throat swabs sampling:
- Travel history to China, Hong Kong or Macao
- Fever or any respiratory symptoms during the past 14 days

- **All swabs tested negative for SARS-CoV-2**
- **All passengers/crew disembarked and were required to take 14-day self-health management**

Cleaning and disinfection, passenger CIQS clearance

6 Feb 2020
Conditions of sampling and quarantine measures for SuperStar Aquarius

7 Feb 2020
Operational procedure and arrangements for quarantine measures for SuperStar Aquarius

Medical/quarantine personnel boarded the ship, arranged screening flows, and set up infrared thermal cameras

Fever screening of all passengers and crew members

Lin YC, et al. Int J Infect Dis99, (2020).

Stage I: Containment

Using Big Data Analytics to Prevent the Spread of COVID-19 : Diamond Princess Cruise Ship

31 Jan 2020: Diamond Princess docked at Keelung
>3,000 passengers disembarked

5 Feb 2020
An outbreak of COVID-19 on Diamond Princess reported in Yokohama, Japan

6 Feb 2020
- CECC immediately formed a task force to conduct preliminary investigation
- Contact tracing for those possibly contacted by infected passengers

Passengers: Mobile positioning data
Citizens: Mobile Sensor data

7 Feb 2020
CECC sent an SMS alert notice through the Public Warning System to remind the contacts of the mitigation plan

9 Feb 2020
- CECC sent a notice to all healthcare providers mentioning the event and the guidance
- National Health Insurance Claims data were used to track the health status of all subjects with potential contact

14 Feb 2020
- 20 symptomatic contacts followed the guidance on the alert message and sought medical care
- All symptomatic contacts received COVID-19 testing and all tested negative

Smart contact tracing: a more cost-effective method than the conventional way

Chen CM, et al. Big Data Analytics. JMIR 22, (2020).

Border Quarantine System
Risk Management Stage I
Strengths
Challenges

9

Stage II: Preparedness

Resuming Operation of Domestic Cruise

Background

- **COVID-19 epidemic situation in community stabilized in July 2020**
- **Most confirmed cases were imported**

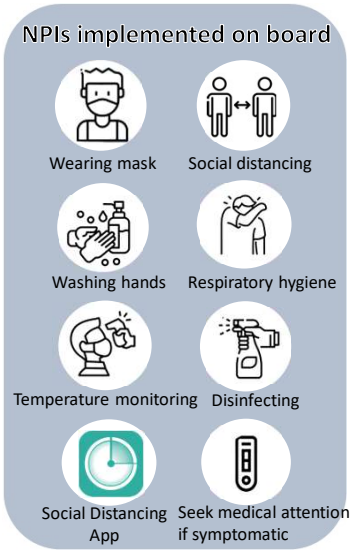
Hallmarks

- **Cruise contingency plans based on scientific evidence and public health experts' opinion**
- **100% external fresh air filtered and supplied to each passenger and crew cabin and public areas**
- **Non-pharmaceutical interventions (NPIs) implemented**
- **91 voyages, creating an output value of ~160 million USD**
- **Zero cases of COVID-19 infection occurred on domestic cruise ships**

Border Quarantine System
Risk Management Stage II
Strengths
Challenges

10

Stage II: Preparedness
Epidemic Preventive Measures in Dec 2021



Crew members

- Fully vaccinated
- Provide a PCR negative result within 72 hrs prior to boarding
- Take PCR tests before and after 14-day quarantine
- Only two crew members share a cabin
- Continual health education and training

Passengers

- Set maximal capacity of passengers to ensure social distancing
- Passengers should
  - ✓be fully vaccinated
  - ✓provide a PCR negative report within 48 hrs prior to boarding
  - ✓daily online reporting of body temperature and health status

Border Quarantine System
Risk Management Stage II
Strengths
Challenges
11

Stage III: Recovery
Developing COVID-19 Guidelines for Resumption of Cruise Ship Operations

Based on reviewed COVID-19 guidelines for cruises, the MPB and CDC of Chinese Taipei jointly developed two guidelines for cruise ships:

(Issued by the CECC on 24 Oct 2022,)

"Operational Guidelines for International Cruise Ships as Home Ports in Chinese Taipei"

"Guidelines for International Cruise Ships Calling at Ports for Inbound Travel"

Border Quarantine System
Risk Management Stage III
Strengths
Challenges
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Stage III: Recovery
COVID-19 Guidelines for International Cruise Ships

"Operational Guidelines for International Cruise Ships as Home Ports in Chinese Taipei"

- Quarantine cabins, medicines and RAT kits
- Crew members:
  - up-to-date COVID-19 vaccination
  - weekly RAT
  - wearing masks outside personal cabins
- COVID-19(-) RAT <2 days before boarding
- Up-to-date COVID-19 vaccination
- Overseas medical insurance
- Wearing mask outside personal cabins

"Operational Guidelines for Travel Agents Organizing Outbound Group Tours"

- Management of confirmed cases/close contacts
- Enhanced control measures in case of sustained chains of transmission on board

Cruise operator | Passenger | Travel agent | Contingency plans

"Guidelines for International Cruise Ships Calling at Ports for Inbound Travel"

- Quarantine cabins, medicines and RAT kits
- Provide emergency contact information during shore excursions
- COVID-19(-) RAT before disembarkation
- Up-to-date COVID-19 vaccination
- Overseas medical insurance

"Operational Guidelines for Travel Agents Organizing Inbound Group Tours"

- Management of confirmed cases/close contacts
- Enhanced control measures in case of sustained chains of transmission on board

13

The Strengths of the COVID-19 Epidemic Prevention Work

Timely border control
Timely ban on international cruises to prevent spread of pathogens from cruise ships to the shore community

Use of digital technology
Using digital technology to facilitate epidemiological investigation on a large number of inbound travelers and cruise passengers

Launching domestic island-hopping itineraries
Balancing cruise industry economy and pandemic prevention and control

Multisectoral partnerships
Collaboration between maritime authority, public health authority, cruise agencies, and experts

14

The Challenges in the Post COVID-19 Era

- Harmonized standards and protocols for cruise ships
- Improving Heating, Ventilation, and Air Conditioning (HVAC) Systems
- Arranging quarantine facilities
- Overseas medical insurance
- Expanding the use of digital technologies

Border Quarantine System
Risk Management Stage III
Strengths
Challenges
15

THANK YOU

Jinuk Park | Speaker

- Deputy Director
  Division of Quarantine Policy,
  Korea Disease Control and Prevention Agency
- Korea

Educational Background

- Bachelor of Chemical and Biological Engineering, Seoul National University

Professional Career

- Made Travel Restriction measure for blocking inflow of “Omicron” as a variant of concern for COVID-19
- Introduction of Quarantine Information Advance Input System, “Q-CODE”
- Agreed on Mutual Recognition of Certificate of Immunization: COVID19 (EU, Vietnam, Philippine, Switzerland)
- Made policy for Hygiene and Sanitation, Quarantine for Ships (Cruise ship, Ferry, Cargo ship, Yacht etc.)
- Made policy for Ship Sanitation Certificate

Cruise Quarantine Changes in the Republic of Korea due to COVID-19 - Focusing on Sustainability

Jinuk Park

In December 2019, Unknown Pneumonia was discovered in Wuhan, China. It was caused by virus named COVID-19. COVID-19 has made the world fearful of an epidemic. WHO declared COVID-19 situation as the pandemic in 2020. March 11th after several months.

Different from the first expectation, COVID-19 variants that is from alpha to Omicron continuously occurred. As the result, COVID-19 has brought tremendous changes to our society. Experiencing COVID-19 pandemic lasting for 3 or 4 years gives us lesson such as recognizing building continuous preparedness system to the disease, especially the infectious disease as important.

COVID-19 pandemic gives many implication to Cruise ship industry. The nightmare started with the case that COVID-19 outbreak occurred in Cruise named diamond princess in February 2020. Related to this case, Korean Government take measure about entry restriction of cruise. This measures last for 2 years and 8 months and lift restriction in October 2023. Despite lifting restriction, Cruise could restart in March 2023 after 5 months.

We could gain lessons about sustainable development for cruise and cruise quarantine from COVID-19 pandemic. In the situation whenever new infectious disease occur, Precautionary approach is important for blocking the influx of infectious disease and lasting cruise industry sustainable. We could focus on managing environment in which disease can occur. With this effort, we, the government could cooperate in the field of quarantine through sharing the information before the disease diffuses. Through these approach, we could gain the objective for preventing infectious diseases and sustainable development for cruise industry.

질병관리청

Asia-Pacific Economic Cooperation Conference

Cruise Quarantine Changes

in the Republic of Korea due to COVID-19

- Focusing on Sustainability

2023. 8. 24.

Korea Disease Control Agency

Division of Quarantine Policy

질병관리청

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질병관리청

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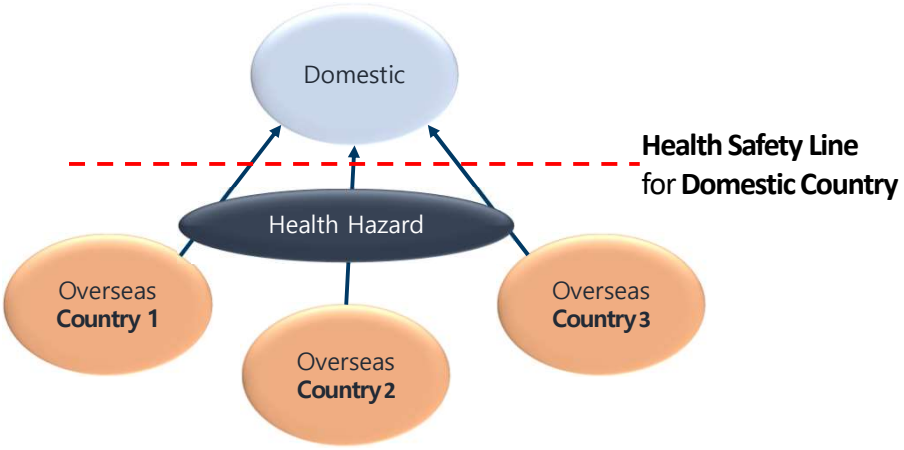
Cruise Quarantine Introduction

2

질병관리청 KDCA

Purpose for Quarantine



What is Quarantine

Health Safety line for Domestic Country

Health Safety Standard → Health Hazard Inspection → Health Hazard Removal

Quarantine is Building Health Safety line
for Domestic Country

What is Health Hazards for Quarantine

Building Health Safety line is Blocking Health Hazards

Health Hazards

Biological	Chemical	Electrical	Physical	Environmental
Virus & Germ	Chemical Material	Overhead Power Radiation	Danger for slip, fall	Air/Water Quality

1. Cruise Quarantine Introduction

질병관리청 KDCA

Target for Quarantine

① Immigrants from Infectious Disease Outbreak Area
② Vehicle, Cargo

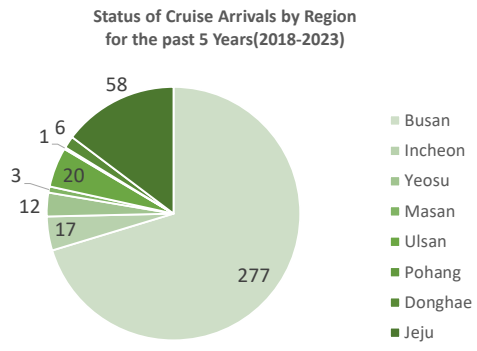
Inspection

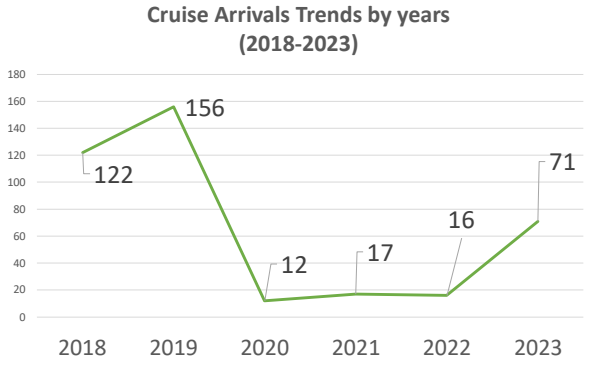
Removal for Health Hazards

1. Cruise Quarantine Introduction

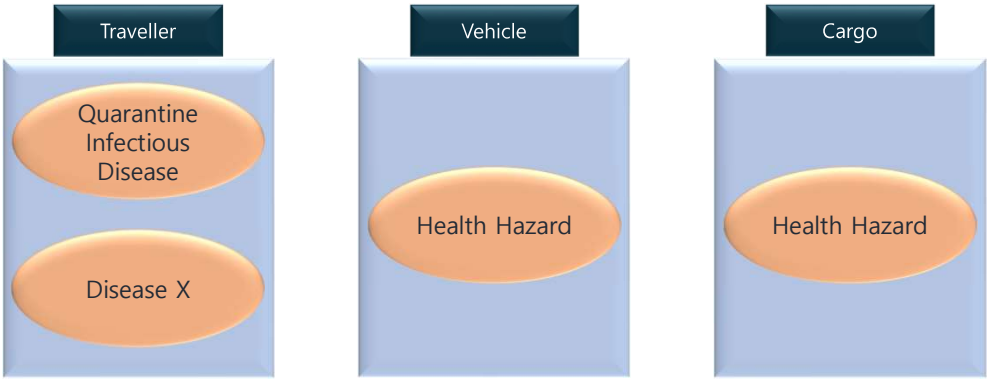
질병관리청 KDCA

Cruise Entry Status in Korea





Cruise Quarantine



질병관리청

2

Cruise Quarantine before COVID-19

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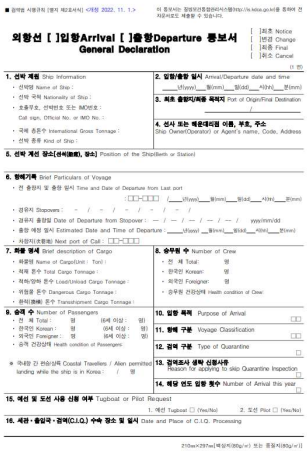
2. Cruise Quarantine before COVID-19

질병관리청 KDCA

Cruise Quarantine - Notifying



외항선 [ ]입항Arrival [ ]출항Departure 종보서
General Declaration

Notifying to Quarantine station

- Arrival **Date/Time**
- Brief Particulars of Voyage
- Port of Origin/ Final Destination
- Number and Status of Crew/Passengers
- Ship Information
- Brief dscription of Cargo

ETC

2. Cruise Quarantine before COVID-19

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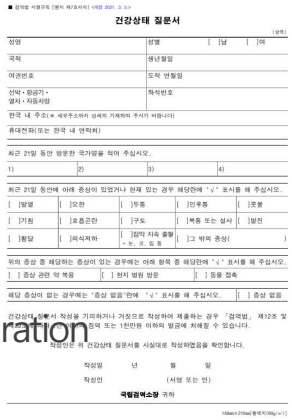
Cruise Quarantine – Traveler Quarantine

1. Check Temperature

Number and Status of Crew/Passengers

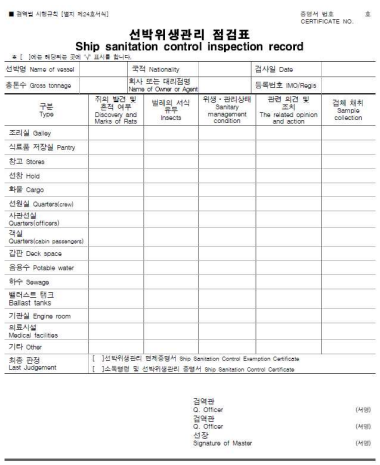
Symptom Check



건강상태 질문서

2. Health Declaration Form

Cruise Quarantine – Vehicle Quarantine

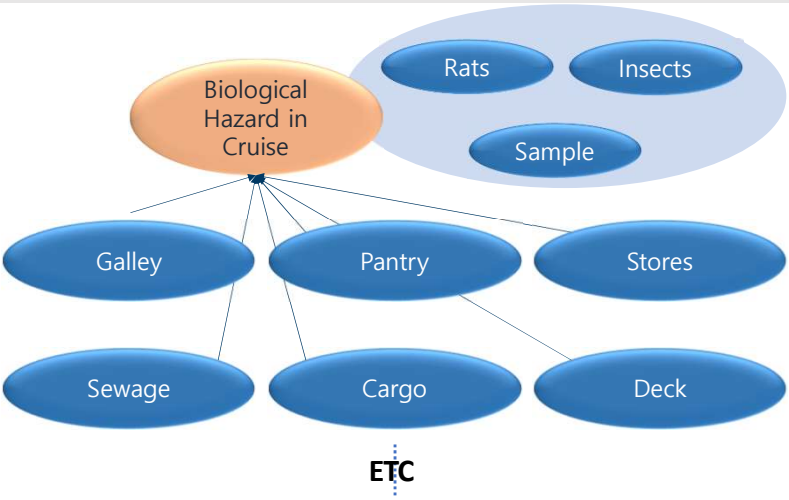


선박위생관리 점검표
Ship sanitation control inspection record

선박명 Name of vessel		국적 Nationality		검사일 Date	
총톤수 Gross tonnage		회사 또는 대리점명 Name of Owner or Agent		등록번호 IMO/Regis	

구분 Type	쥐의 발견 및 흔적 여부 Discovery and Marks of Rats	발견된 서식 유무 Insects	위생·관리상태 Sanitary management condition	관련 의견 및 조치 The related opinion and action	검체 채취 Sample collection
조리실 Galley					
식료품 저장실 Pantry					
창고 Stores					
선창 Hold					
화물 Cargo					
선원실 Quarters(crew)					
사관선실 Quarters(officers)					
객실 Quarters(cabin passengers)					
갑판 Deck space					
음용수 Potable water					
하수 Sewage					
밸러스트 탱크 Ballast tanks					
기관실 Engine room					
의료시설 Medical facilities					
기타 Other					
최종 판정 Last Judgement	[ ] 선박위생관리 면제증명서 Ship Sanitation Control Exemption Certificate [ ] 소독명령 및 선박위생관리 증명서 Ship Sanitation Control Certificate				

검역관 O. Officer (서명)
검역관 O. Officer (서명)
선장 Signature of Master (서명)



질병관리청

3

Cruise Quarantine during COVID-19

13

3. Cruise Quarantine during COVID-19

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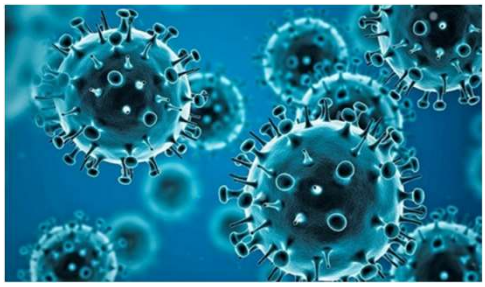
COVID-19 Pandemic Declaraition - WHO(2020.3.)



COVID-19

- 2019.12. Discover COVID-19 in Wuhan
- 2020.2. The first COVID-19 confirmed case in Korea
- 2020.3.11. COVID-19 Pandemic Declaration (WHO)

Reference: COVID-19 image from WHO

3. Cruise Quarantine during COVID-19

질병관리청 KDCA

COVID-19 Outbreak in Cruise

- 2020.2. 3,711 Passengers, 705 Confirmed cases
- 2020.6. About 2,800 Passengers, More than 660 Confirmed cases
- 2022.11. 4,600 Passengers, 800 Confirmed cases

Cruise Quarantine - Entry Restriction and Lift Restriction

◆ **(Entry Restriction, '20.2.)**

- **Restricting Cruise for tourism**
- **Restricting Disembarkation from Cruise**

Fatality Rate decrease
Epidemic Condition improves

◆ **(Lift Restriction, '22.10.)**

- **Permitting Embarkation and Cruise for tourism Entering**

Cruise Quarantine - After reopening

Lifting Restriction (22.10.) → 5 month → Cruise Comeback (23.3.)

Cruise Quarantine Preparation

- **Preparing for Quarantine facility(Table) and officer**
- **Preparing moving line when the suspected cases occur**
- **Preparing simple process for quarantine**

3. Cruise Quarantine during COVID-19

질병관리청 KDCA

Lifting of Desgination
COVID-19 Quarantine Inspection Required Area (7.15.)

KDCA

보다나은 정보 1339

Quarantine Inspection Required Areas

January. 6. 2021

when entering the Repubic of Korea after either staying in or passing through a "Quarantine Inspection Required Areas" you must submit a "Health Questionnaire」to quarantine officials. Failure to do so may incur a fine of up to KRW 10million in accordance with Articles 12 and 39 of the Quarantine Act.

division		nation	Cholera (13)	Plague (1)	Yellow Fever (42)	Avian Influenza (1)	MERS (11)	Polio-myelitis (9)	Ebola virus disease (1)	COVID-19
Asia · Middle	1	Pakistan						●		
	2	China (2 provinces)				●				
	3	Afghanistan						●		
	4	Saudi Arabia					●			
	5	United Arab Emirates					●			
	6	Oman					●			
	7	Bangladesh	●							
	8	Yemen	●				●			

About 3 Years

Fatality Rate decrease
Epidemic Condition improves

KDCA

보다나은 정보 1339

Quarantine Inspection Required Areas

July 15, 2023

When entering the Republic of Korea after either staying in or passing through a "Quarantine Inspection Required Areas" you must submit a "Health Questionnaire」to quarantine officials. Failure to do so may incur a fine of up to KRW 10million in accordance with Articles 12 and 39 of the Quarantine Act.

구분		국가	Cholera (26)	Polio-myelitis (20)	Yellow fever (42)	Plague (3)	MERS (13)	Avian Influenza (2)	Ebola virus disease (2)
22 countries in Asia and Middle East	1	Nepal	●						
	2	Lebanon	●				●		
	3	Bahrain					●		
	4	Bangladesh	●						
	5	Saudi Arabia					●		
	6	Syria	●				●		
	7	Arab Emirates					●		
	8	Afghanistan	●	●					
	9	Yemen	●	●			●		
	10	Oman					●		
	11	Jordan					●		
	12	Iraq	●				●		
	13	Iran					●		

질병관리청

4

Future for Cruise Quarantine
- Focusing on Sustainability

19

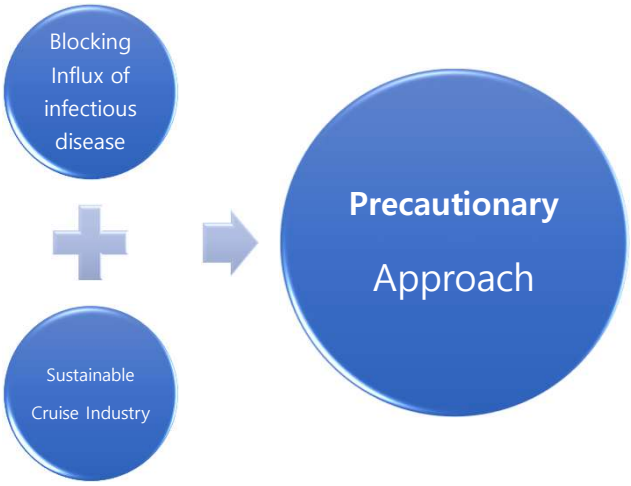
Implication – Precautionary Approach

◆ **(Background)**

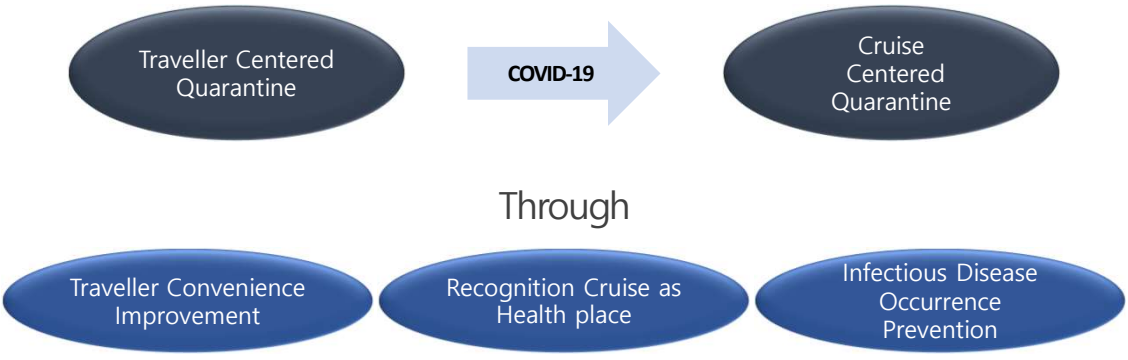
During about 3 years,
Entry Restriction for blocking COVID-19 carves a scar in cruise industry

→ Recognizing Cruise as Risky

→ Need to Precautionary Approach



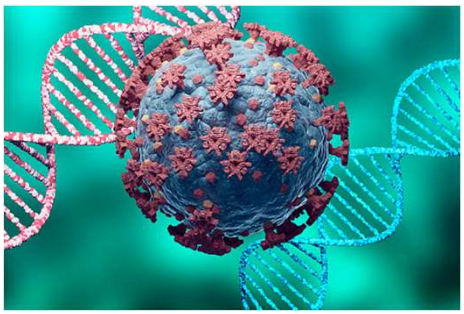
Implication – Precautionary Approach for health hazard



4. Future for Cruise Quarantine – Focusing on Sustainability

질병관리청 KDCA

Implication – Precautionary Approach to Disease X



Disease X

Symptomatic Centered Quarantine

+

Quarantine Cooperation

Korea Disease Control and Prevention Agency · 질병관리청

Thank you

Kyoko Umeda | Speaker

- Manager
  Quarantine and Sanitation Control Division,
  Yokohama Quarantine Station,
  Ministry of Health, Labour and Welfare
- Japan

Educational Background

- 2002 MD, Shinshu University, Japan

Professional Career

- 2020- Current Position
- 2016- Medical Officer, Quarantine and Sanitation Control Division, Yokohama Quarantine Station, Japan
- 2002- Urology clinician

Quarantine experience of DIAMOND PRINCESS in Japan, 2020

Kyoko Umeda

The outbreak of COVID-19 on the DIAMOND PRINCESS cruise ship that entered the port of Yokohama, Japan, in February 2020 was the most difficult incident that the Yokohama quarantine station quarantined, and which required enormous challenges not only to the Yokohama quarantine station but to the whole Japan authorities.

DIAMOND PRINCESS departed from the port of Yokohama on 20 January for a 16-day round trip billed as a tour of Southeast Asia during the Lunar New Year period. She was on her way back to Yokohama, when the Japanese government received the notification from Hong Kong government that a passenger who disembarked in Hong Kong on 25 January tested positive for COVID-19 on 2 February. The Japanese government decided to cancel the initial quarantine in Naha (Okinawa, Japan) and decided to re-quarantine the ship when she entered the port of Yokohama with 2,666 passengers and 1,045 crew on board. Officers of Yokohama quarantine station boarded the ship for quarantine at the anchorage on 3 February around 20:00.

On 4 February, the first PCR test result report revealed positive testing in 10 of 31 samples. It was the beginning of the large cluster with a total of 712 confirmed cases. Since the case was the first outbreak of COVID-19 in Japan, and also the first outbreak on the cruise ship in Japan, Ministry of Health, Labour and Welfare took command from the early stages.

As there were not enough facilities at the time to take on 3,711 people for quarantine, the Japanese government decided to quarantine the passengers and crew members on board. On the other hand, it was the beginning of the great challenges to sustain the lives of as many as 4,000 people on board while fighting to control an infectious disease that was still many parts unknown. We faced many challenges as medical requirements, shortage of medicines, language and culture diversity, sewage and waste disposal problems, and communication issues. Until the quarantine of DIAMOND PRINCESS completed in March,

countless national, local, and private organizations worked together to handle the incident.

To Ensure the Safety and Security of Cruises during the COVID-19 pandemic, Japan International Cruise Committee issued guidelines for the operators of cruise ships in November 2022, under which operators are required to comply with them. International cruises in Japan have resumed operation since December 2022, but it cannot be said that all the issues associated with international cruise operations have been solved, and various issues remain.

Session II:
Cruise Cooperation Dialogue Platform: Experiences of Responding to Public Health Events on Cruise Ships

Quarantine experience of *DIAMOND PRINCESS* in Japan, 2020

Kyoko UMEDA M.D.
Manager,
Quarantine and Sanitation Control Division,
Yokohama Quarantine Station,
Ministry of Health, Labour and Welfare,
Japan

1

COI Disclosure

The authors have no conflicts of interest directly relevant to the content of this article.

2

Quarantine system and organization in Japan

World Health Organization

IHR(2005)

National IHR Focal Point

厚生労働省 Ministry of Health, Labour and Welfare

Quarantine Act

Act on the Prevention of Infectious Diseases and Medical Care for Patients with Infectious Diseases

Quarantine Station

Point of Entry

Local Government

Public Health Center

Local community level

The purpose of Quarantine Act

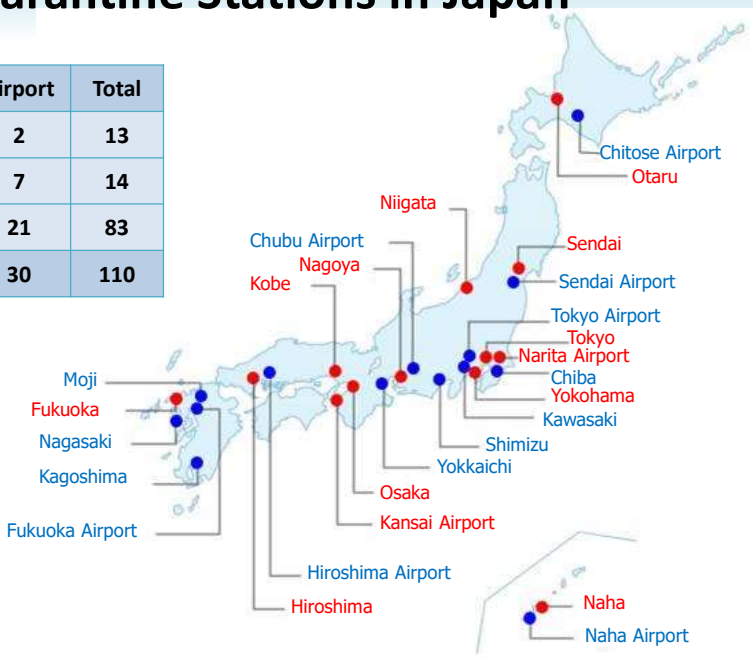
- To prevent pathogens of infectious diseases that are not endemic in Japan from entering the country via vessels or aircrafts.
- To take other necessary measures concerning vessels or aircrafts to prevent infectious diseases that have a serious effect on public health.

3

Quarantine Stations in Japan

	Port	Airport	Total
Central station	11	2	13
Branch office	7	7	14
Sub-branch office	62	21	83
Total	80	30	110

Yokohama Quarantine Station



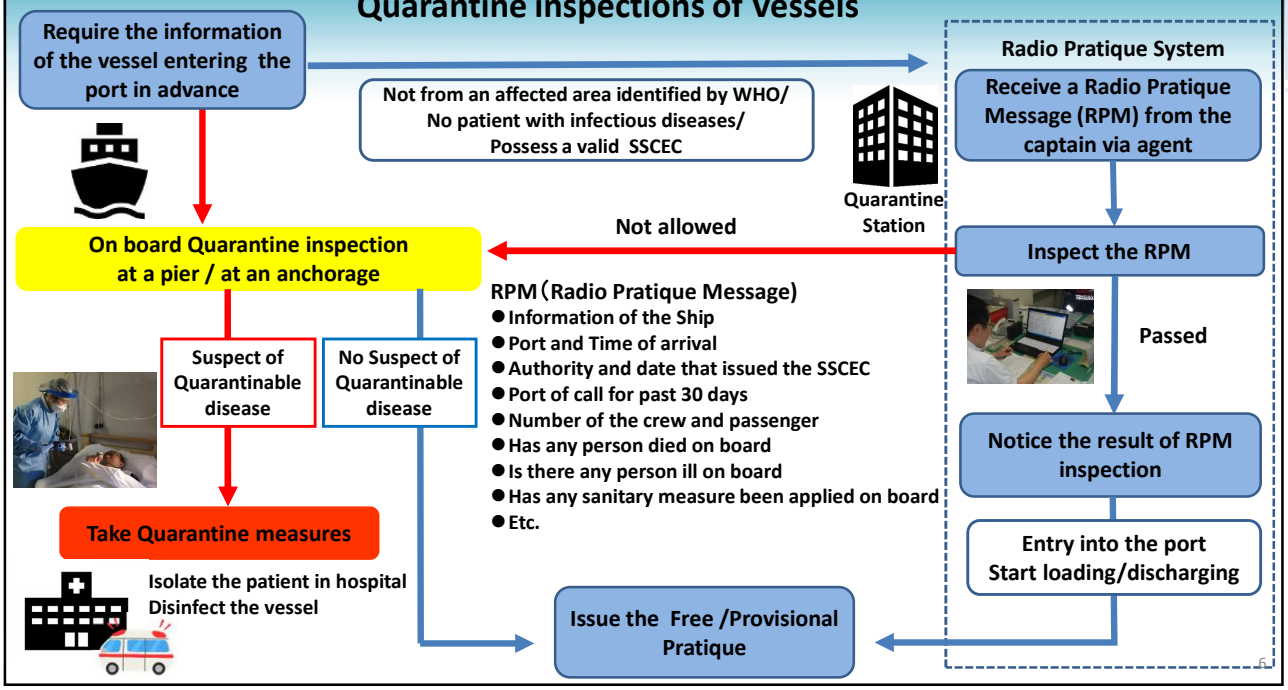
4

Infectious Diseases based under the Quarantine Act

Quarantine Act Article 2	Quarantinable Infectious Diseases	Measures
Item 1	Ebola hemorrhagic fever	・Inquiry ・Medical Examination ・Isolation ・Detention ・Disinfection
	Crimean-Congo hemorrhagic fever	
	Plague	
	Marburg disease	
	Lassa fever	
	South American hemorrhagic fever	
	Smallpox	
Item 2	Novel influenza（Pandemic influenza）	
Item 3	Avian influenza（A/H5N1）	・Inquiry ・Medical Examination ・Disinfection
	Avian influenza（A/H7N9）	
	Middle East Respiratory Syndrome（MERS）	
	Malaria	
	Dengue fever	
	Chikungunya fever	
	Zika virus disease	

5

Quarantine inspections of Vessels



6

Quarantine inspection of Cruise ships

Special measures

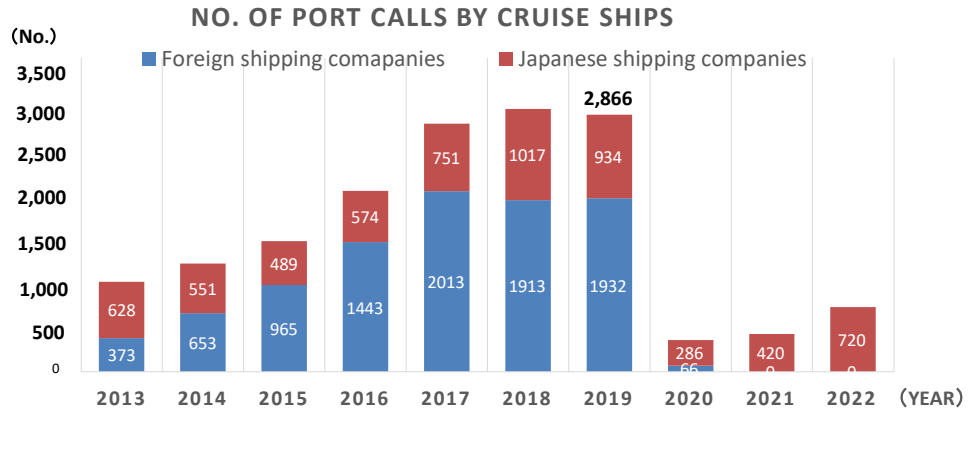
- Quarantine inspection of cruise ships entering Japan ports within 10days from countries in which Avian influenza A(H5N1/H7N9) is endemic must be done on-board.
- Quarantine inspection of cruise ships entering Japan ports within 14days from countries in which MERS is endemic must be done on-board.

Checking passengers' body temperature using thermography

7

Tendency of cruise ships in Japan

- More than 2 million cruise passengers visited Japan each year since 2017.
- The number of cruise ships calls to Japan ports increased to 2,866 in 2019.



8

TRAINING

9

Quarantine experience of a cruise ship *DIAMOND PRINCESS* On 3 February 2020 to 25 March 2020

Timeline①	
20 January	A cruise ship *DIAMOND PRINCESS* (British-registered) departed from the port of Yokohama for a 16-days round-trip billed as a tour of Southeast Asia during the Lunar New Year period.
1 February	*DIAMOND PRINCESS* called at port of Naha, Okinawa(Japan) and went through quarantine.
2 February	*DIAMOND PRINCESS* was on her way back to Yokohama when Japanese government received the notification from the Hong Kong government that a passenger who disembarked in Hong Kong on 25 January tested positive for COVID-19.
3 February	Japanese government decided to re-quarantine the ship when she enter the port of Yokohama with 2,666 passengers and 1,045 crew on board. Officers of Yokohama quarantine station boarded the ship for quarantine at the anchorage in the evening.

10

Timeline②	
4 February	Tests revealed COVID-19 infections in 10 out of 31 people tested on 3 February.
5 February	Quarantine measures were applied to request all passengers to stay in their own cabins. Evacuation of the confirmed cases to the infectious disease designated hospitals started.
7 February	Medical Teams of Japan Self-Defense Force started their mission on board (taking samples, monitoring health, maintaining daily services for the passengers).
8 February	DMAT(Disaster Medical Assistance Team) and DPAT(Disaster Psychiatric Assistance Team) started their mission on board to provide medical care for passengers and crews.
15 February	Japanese government declared the conditions for passengers to complete the quarantine on *DIAMOND PRINCESS.* ➢ Completion of 14 days quarantine in their own cabin ➢ Confirmation of negative result of the PCR test on board ➢ Undergoing the health check by physicians at disembarkation

11

Timeline③	
14-17 February	Considering the onboard environment, passenger's age, underlying diseases, etc., among the high-risk passengers, 55 applicants who had tested negative moved to government quarantine facilities.
19-22 February	970 passengers who had completed the 14 days quarantine on board disembarked and returned home, whereas 89 passengers whose companions had tested positive were transported to government quarantine facilities.
27 February-1 March	240 crew members who had tested negative were transported to government quarantine facilities for another 14 days of quarantine.
※17 February-1 March	1575 passengers and crew members evacuated to their home countries on government-chartered planes of each country.
25 March	After confirming the completion of disinfection procedure of *DIAMOND PRINCESS*, the quarantine which had lasted about two months finished.

12

Number of confirmed cases on *DIANMOND PRINCESS*

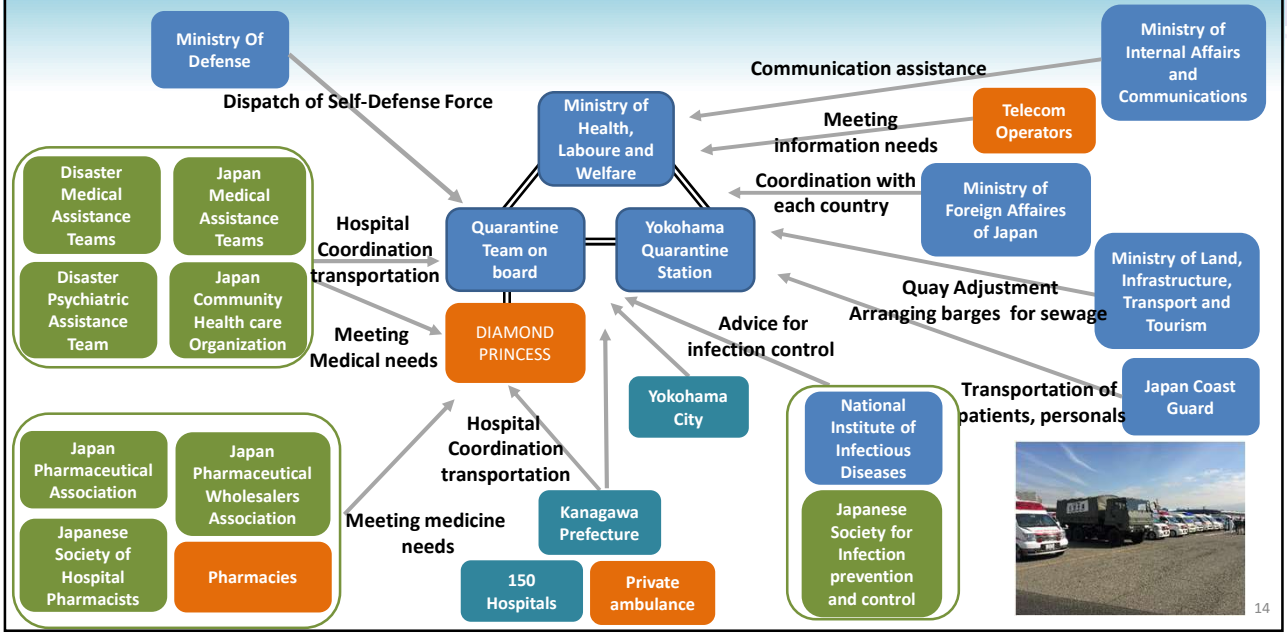
Tested	Confirmed	Total deaths
3,711	712 (Including 331 asymptomatic cases)	13

Challenges

- Having no previous examples or precedent
- No facilities that can accommodate thousands of people at once
- According to the characteristics of cruise ships
  - Elderly passengers with underlying diseases →medical needs, shortage of medicine
  - Multinational and multilingual issues
  - Unstable transmission status
  - Sewage issues
- Mental health disorders caused mainly by loneliness and anxiety due to isolation
- Education on infection prevention and infection control measures for personnel engaged

13

Organizations cooperated with Yokohama Quarantine Station



14

Initiatives to Ensure the Safety and Security of Cruises during the COVID-19 pandemic

Japan Oceangoing Passenger Ship Association

Formulation of Guidelines for measures to Prevent COVID-19 for oceangoing cruise ship operators

Japan International Cruise Committee

Formulation of Guidelines for COVID-19 prevention measures for Foreign crise ship operators

Japanese cruise operating company

Formulation of an infectious disease control manual

Implementation of measures against infectious disease

Foreign cruise operating company

Development of a response plan for COVID-19 related to sanitation on board

Implementation of measures against infectious disease

certify — **Class NK** — certify

- Certified according to biosafety management system standards
- Confirmed that each company's infectious disease control measures conform to the guidelines and function as a system

15

Guidelines for COVID-19 prevention measures for Foreign crise ship operators

➢ **Vaccination Policy**

- 95-100% of passengers above 18, are required to be fully vaccinated with a primary series of 2 doses of vaccine.
- All crew members must have completed 3 doses of the vaccine.

➢ **Testing Policy**

- All passengers aged 5 and over must have a documentation that proves negative result from a PCR test, or a qualitative antigen test conducted within 3 days prior to embarkation.

➢ **Anti-COVID19 process in practice**

- Disinfection, Social distancing guidelines, Mask wearing guidelines

➢ **Sanitation Policy**

➢ **Drill and Training**

➢ **Measures for response and management of COVID-19 case**

- When a suspect case is identified, an antigen qualitative test or PCR test should be preformed.
- If the result of the test is confirmed positive, isolation treatment should be stared.
- Check the health conditions of all passengers and crew members and report to the quarantine station.

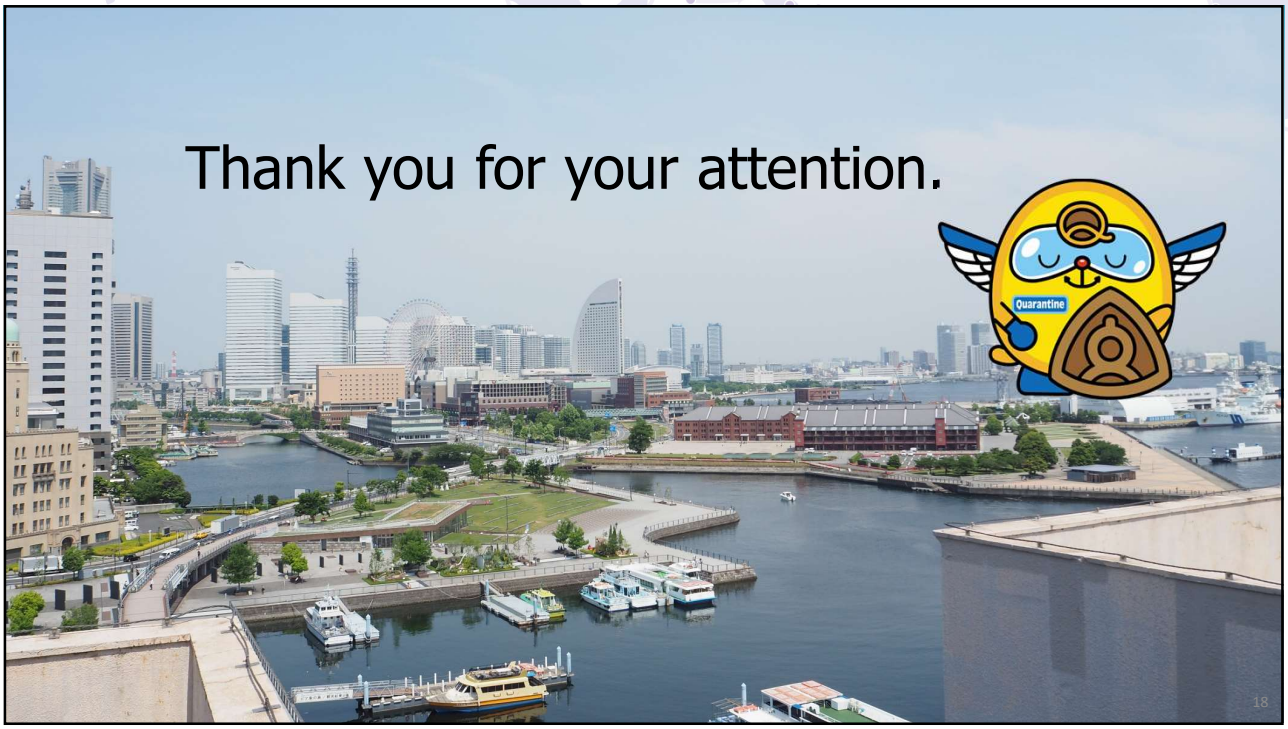
➢ **Alert levels and response**

16

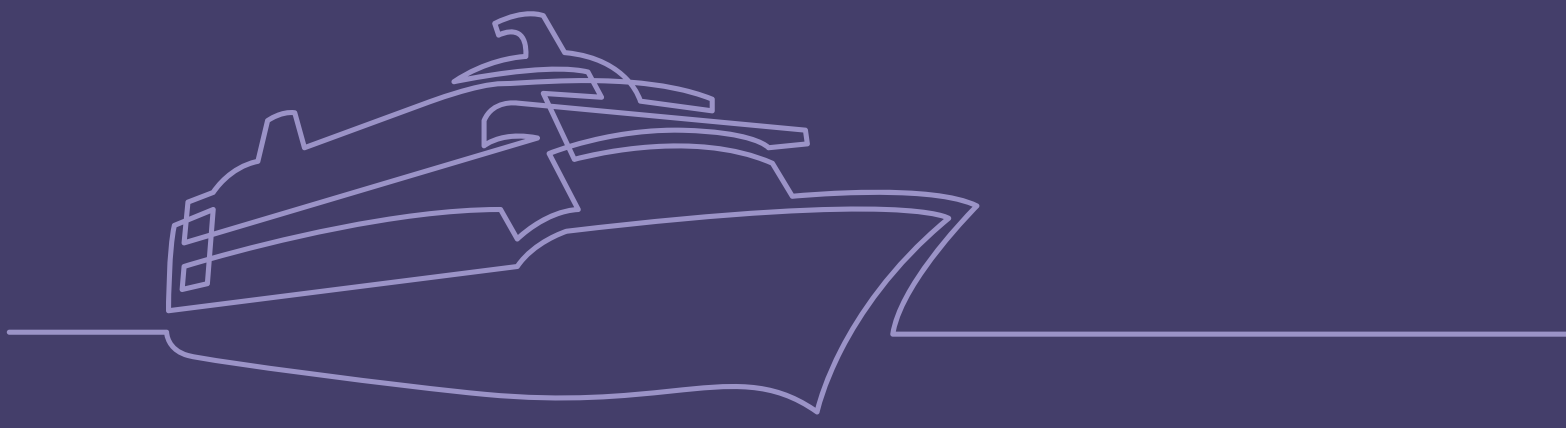
How do we ensure safe and secure international cruises?

- **Review of infectious disease control measures on cruise ships**
  - Formulation of criteria for canceling cruises in the early stages of an infectious disease outbreak
  - Establish an onboard system to grasp the status of infectious diseases on board in normal times and detect abnormalities at an early stage
  - Review of guidelines to prevent the spread of infection on board ships
  - Develop stricter international standards
- **Strengthening the system of quarantine stations**
  - Authority to request suspension of cruise ship operations
  - Consolidation and maintenance of cruise ship quarantine ports
  - Strengthening cooperation with local governments

17



Session III
Strengthening Prevention and Control on Cruise Ships: Application of Digital Technology



Jang-Hwa Leu | Moderator

- Director General
  Administration for Digital Industries,
  Ministry of Digital Affairs
- Chinese Taipei

Educational Background

- National Taipei University EMBA
- National Taiwan University M.S. Electronic Engineering
- National Taiwan University B.S. Physics

Professional Career

- Director General, Industrial Development Bureau, MOEA
- Deputy Director General, Industrial Development Bureau, MOEA
- Secretary General, Industrial Development Bureau, MOEA
- Director, IT Industries Division, Industrial Development Bureau, MOEA
- Senior Technical Specialist, Department of Industrial Technology, MOEA
- Section Chief, Department of Industrial Technology, MOEA
- Senior Engineer, Department of Industrial Technology, MOEA
- Inspector, Department of Aviation and Navigation, MOTC
- Executive Officer, Department of Aviation and Navigation, MOTC
- Associate Engineer, Civil Aeronautics Administration, MOTC
- Assistant Engineer, Civil Aeronautics Administration, MOTC

Ethan Tu | Speaker

- Founder
  Taiwan AI Labs
- Chinese Taipei

Educational Background

Ethan Tu holds a bachelor's degree and master's degree in computer science from National Taiwan University (NTU)

Professional Career

- Principal Developments Manager of Microsoft AI & Research Group
- Senior Program Lead of National Human Genome Research Institute (NHGRI), National Institutes of Health (NIH), United States
- Founder of PTT

Development of Artificial Intelligence Applications to Tackle COVID-19 Pandemic by Taiwan AI Labs

Ethan Tu

During COVID-19 pandemic, Taiwan AI Labs had collaborated with Centers for Disease Control (CDC). By working closely with medical centers a federated medical alliance set up a federated learning platform. To achieve responsible AI, Taiwan AI Labs delivered the following AI solutions with right-respecting data governance and trustworthy methodologies,

1. The Social Distancing App, which utilizes a Bluetooth-based federated contact tracing platform, received recognition from government and was deployed on a national scale during the COVID-19 pandemic. There were over 12 million downloads during the pandemic.
2. AI-assisted chest X-ray image screening, to quickly identify COVID-19 patients (AI SARS-CoV2 classifier), a AI SARS-CoV2 virus transmission tracing system and in-silico identification of potential therapeutic agents for COVID-19 (DockCoV2).
3. Infodemic cyber security systems provide cognitive security tools to identify and alert COVID and Vaccine related misinformation.
4. DockCov2.org, a federated drug discovery tool for treatment discovery using computational Protein-ligand docking Simulations.

For more information on Taiwan AI Labs' COVID-19 related solutions, please visit our website at https://covirus.cc.

I-Ming Parng | Speaker

- Director General
  Department of Information Management,
  Department of Disease Control,
  Ministry of Health and Welfare
- Chinese Taipei

Educational Background

- MPH, Public Health, National Taiwan University

Professional Career

- Director of Medical Affairs Division, NHIA
- Director of Southern Division, NHIA

Experience in Promoting Digital COVID-19 Certification

I-Ming Parng
Ministry of Health and Welfare
24 Aug. 2023

Issue Process

Original Design: 7 Days

Acture: Instant

Verify(GDPR comply)

2

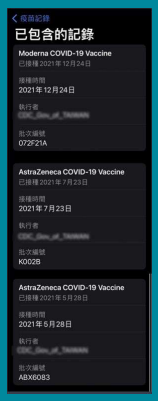
Inspiration for Covid-19

Global Standard

- EUDCC
- Smart Health Card

Commercial Giant for Digital

- Apple: Wallet, Health
- Google



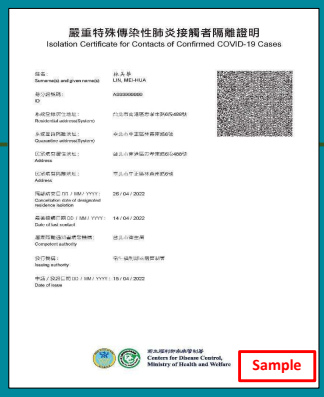
3

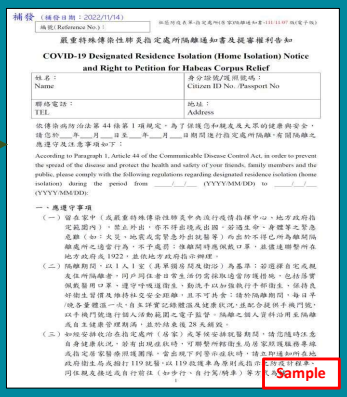
One Touch to your mobile phone

- Apple Inc. offer APIs to add into Wallet and Health
- Google offer API to allow the Certificate to install to the Android and show the icon

4

Digital Certificate Extension





Designated Residence Isolation Notice

Home Isolation Notice

Isolation Treatment Notice/Relief Notice

5

Daily report for digital certificates

數位新冠病毒健康證明平台

統計截止時間：2022/07/26 11:30AM

	登入人數	登入人次	當日申請人數	當日申請人次	累計申請人數	累計申請人次
疫苗(DVCV) EU-DCC	6,281,626	15,709,244	16,508	21,514	3,668,689	6,890,267
疫苗(DVCV) SHC			9,028	10,026	121,097	141,078
檢驗(DVCT)			4,013	6,472	1,039,310	2,198,168
快篩 (DVCTQ)			15,756	20,888	986,352	1,748,804
接觸者居隔 (DVCC)			1,863	2,801	208,652	408,002
確診者指隔 (DVCR)			2,033	2,530	202,572	307,108

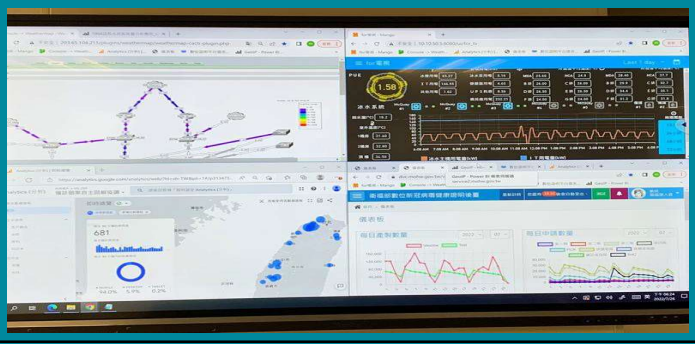
疫苗數位證明成功申請數量

	第一劑	第二劑	第三劑	第四劑	總計
當日	748	2,166	16,963	1,637	21,514
累計	202,806	1,760,443	4,883,805	43,213	6,890,267

註：統計起始時間：2021/12/28 08:00AM

Dashboard for network

Quick view from GA



Dashboard for computer facilities

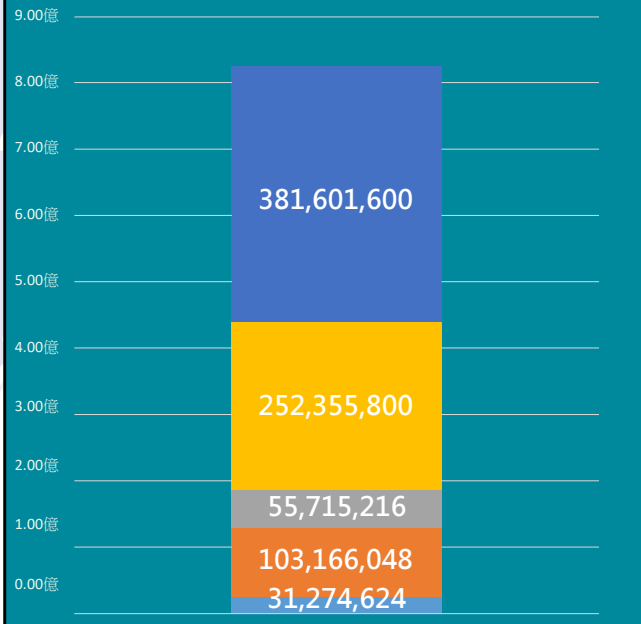
Dashboard for digital certificates

6

Down Size for GCP

Cost down : Save 20000 USD for each Month

7



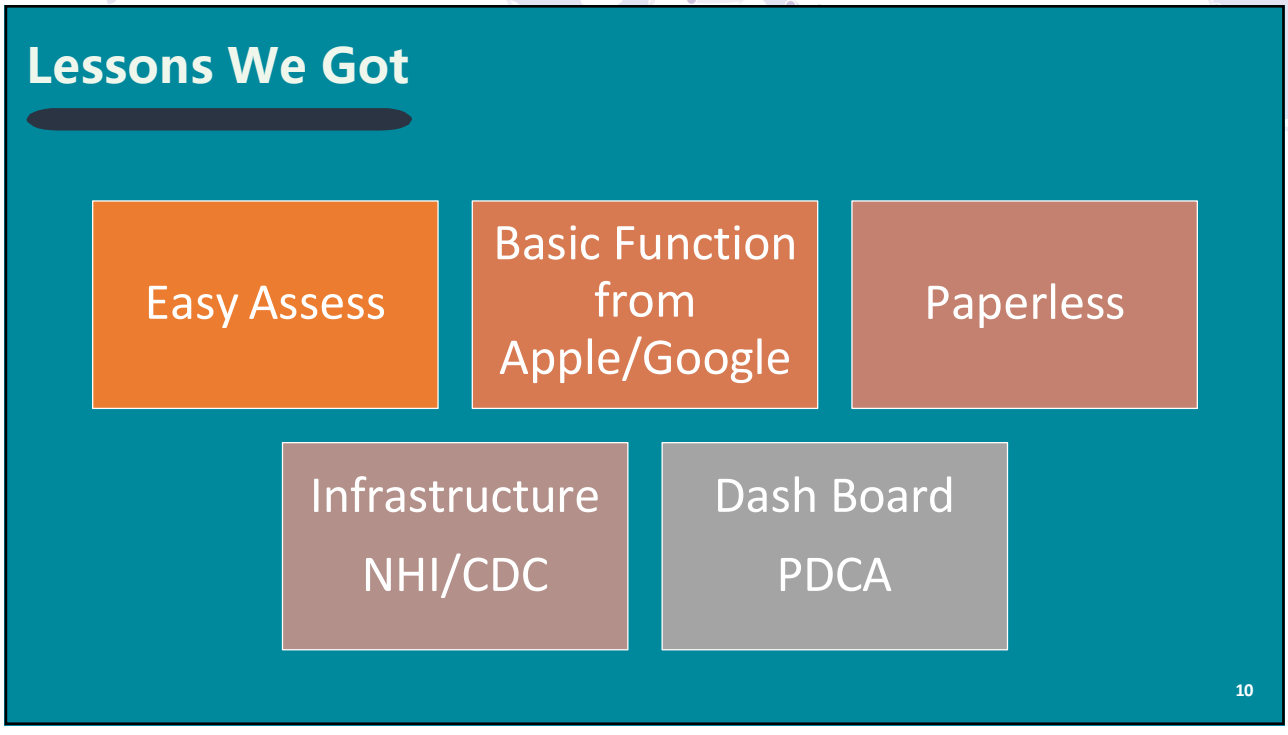
How much we save from paperless

824 Millions NTD

Paperless
154 Towles 101

8


How much we save from worker
105,148
81,444
save
0.75 millions
person days
159,001
268,662
145,092
入境檢疫隔離通知書
確診者隔離通知書
接觸者隔離通知書
快篩陽性證明
PCR陽性證明
equal
1000
worker
For 3years
9


Lessons We Got
Easy Assess
Basic Function from Apple/Google
Paperless
Infrastructure NHI/CDC
Dash Board PDCA
10

THANK YOU

12

Pierfrancesco Lepore | Speaker

- Vice President Medical Services
  Medical Department,
  MSC CRUISE MANAGEMENT (UK) Ltd
- United Kingdom

Educational Background

- Medical Dr-Specialized in Hygiene and Preventative Medicine – Specialized in Neurology

Professional Career

- 1993-2012 Italian National Public Hospitals as Neurologist, Chief Medical Officer -Director of Acquired Hospital Infections

Publications

- Covid prevention on board, Panrotas BR 21.7.2021
- The ship's water Safety Plan, Shipsan newsletter 2014
- An Outbreak of Meningitis, Medicine Maritime FR 2014

Digital Applications to prevent communicable disease on board cruise vessel–Field experiences with focus on HVAC system

Pierfrancesco Lepore

MSC cruises, as every single cruise operator, was hit hard by the COVID Pandemic at the start of 2020, leading to a global shutdown of cruise operations by March. We had to tackle a number of challenges directly related to this, such as putting our ships in hot lay-up and safely repatriating most of our crew in a closed-border environment and with few accommodation options ashore.

Our Top management had a clear vision about the so-called 'New Normal' and we started to work around the clock on a new approach to be able to operate safely in the pandemic environment. We tasked our Business and Technology Innovation Team with following the medical supplier industry innovation and certification pathways in terms of testing. Our technical office was in charge of managing the fleet and renewing certifications to be ready for sailing. The Medical Department, which I lead, was asked to re-design the on board medical centres, to implement isolation areas on board, to enhance the equipment, and to increase the medical personnel onboard following the latest CLIA guidelines.

In the meantime, we appointed a team of authoritative experts, called the BLUE RIBBON PANEL, some of whom are attending this congress as presenters, that should help us to implement a multi-layered, evidence based, systemic and holistic COVID Protocol, with the aim to restart the cruises operation in compliance with the regulatory framework of the time.

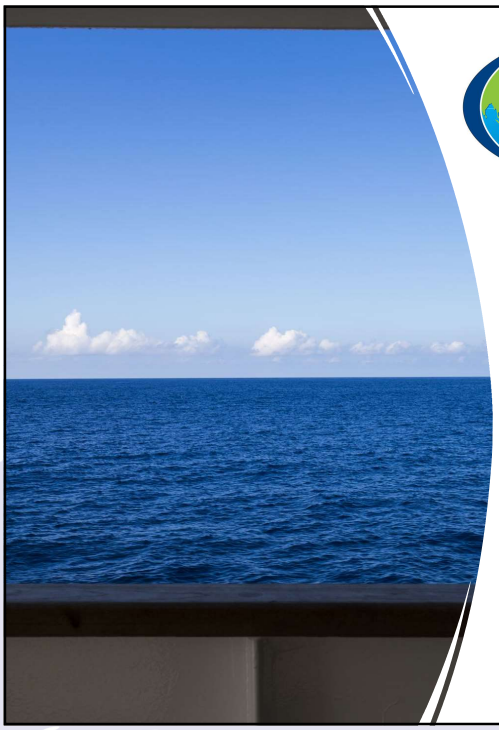
Some game-changing tools that contributed to this were the availability of vaccines as well as technologies that allowed us to test, report, track and trace and consequently, notify Health Authorities of positive cases and close contacts among guest and crew members, building a capacity to isolate cases on board or at hotels ashore was also important to alleviate pressure on the ship's environment.

This was possible only with a massive use of digital technology that represented for us e crucial tool to achieve the business continuity together with very high standards of Health and Safety, as required by the situation.

We have to highlight other two key factors that helped our industry tell a story of success: part of the academic community, international, national and local institutions.

We realized that it would be possible to build synergies with them during the pandemic. All actors involved need to ally with each other and generate a win-win logic that puts prejudice aside. This is key to develop constant Public Health awareness and appropriateness. These synergies can become a high quality model to export in other public and private sectors.

This presentation shows all the digital equipment we used during the pandemic focusing on a pilot experience of application of new technology to HVAC system.



Managing Infectious Diseases on Cross-Border

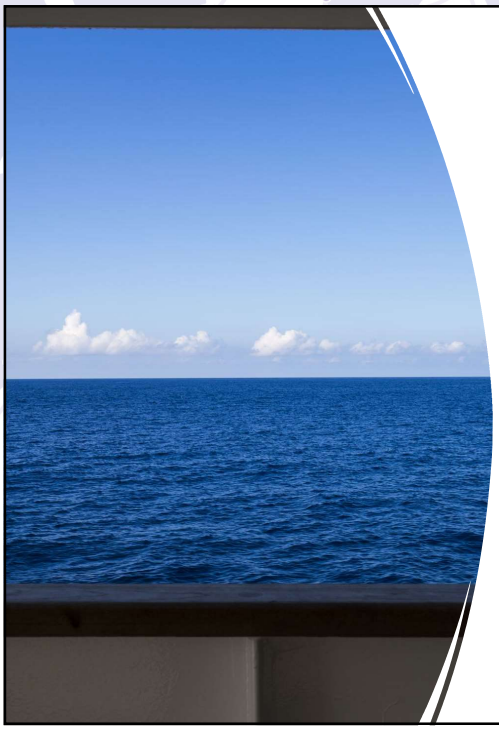
Cruise Ships in the Post-COVID-19 Era: Application of Digital Technology

24-25 August 2023 - Chinese Taipei

Digital Applications to prevent communicable disease on board cruise vessel

Field experiences with focus on HVAC system

Dr. Pierfrancesco Lepore
MSC CRUISES MANAGEMENT LTD UK



Digital technology and COVID pandemic

MSC restart during COVID

COVID test solution scouting activities to support the restart of MSC Fleet

6+ TESTING METHODOLOGIES

340+ TESTING SOLUTIONS

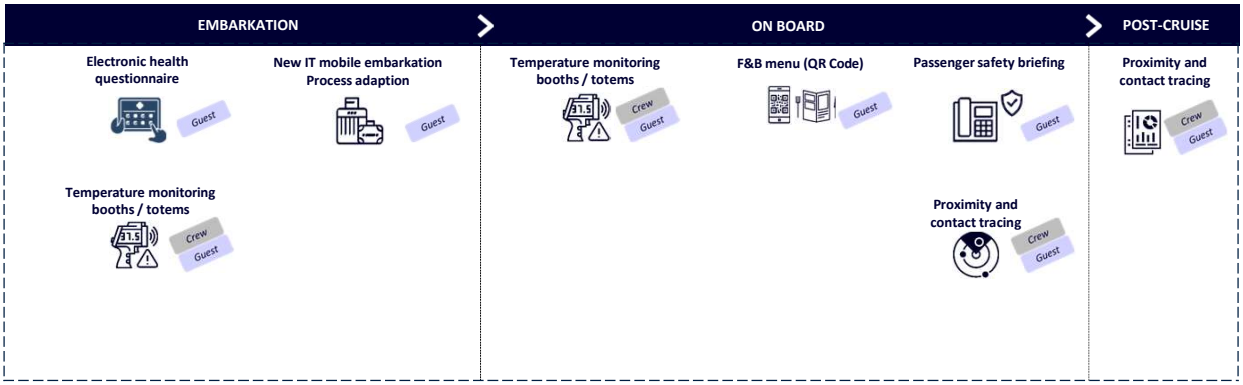
200+ COMPANIES FROM 15 COUNTRIES

5 TESTING SOLUTION ADOPTED FOR H&S MSC PROTOCOL

Antibody Testing	24
Antigen Testing	74
Breath Analyzers	20
Lab Setting PCR Testing	126
Point of Care PCR Testing	42
LAMP Testing	24
Others	38
Total scouted solutions	348

Country	
USA	133
Europe	112
Chinese Taipei	**26**
United Kingdom	23
South Korea - Japan	21
Singapore	11
Israel	6
Australia - New Zealand	6
Canada	4
Indonesia - India	4
Brazil - Peru	2
Total scouted solutions	348

NNRP Tech solutions adopted along the Customer Journey



MSC

The solutions above are the only ones included into the NNRP budget approved, submitted by CBI to the CEO.

Legend:
Guest — Use case involving Guest journey
Crew — Use case involving also crew journey

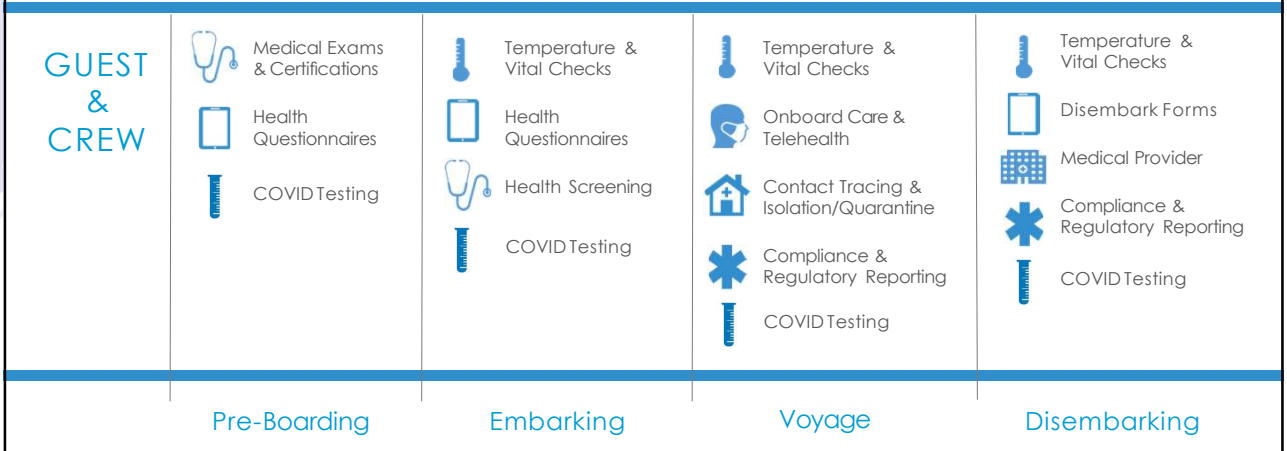
NNRP Tech solutions – Status Update as of 14/08

USE CASE	HIGH LEVEL DESCRIPTON	STATUS	HIGHLIGHTS
Booking info – T&C & check-in data and timeslot update	• Update of T&Cs by adding a **Covid-19 policies addendum** section • Insert as **mandatory email & phone number of the guest** plus Country of residence, City, Zip code, address • Insert the dynamic label of **arrival timeslot into the embarkation form** (confirmed on B2B, B2C and MSC for ME) • Insert into the **e-ticket the Health Questionnaire** and **Passenger Locator Form**	**DONE**	• Timeslot shown on e-ticket will get aware guests of their assigned embarkation time and ship departure time.
New IT mobile embarkation process adoption	• Implement the new IT embarkation process by **leveraging on Tablets** • Checks at the gangway will be based on the **embarkation form barcode scanning** only (process will be based on paper embarkation form)	**DONE**	• Test performed onsite at GOA Terminal simulating the whole flow. New version of mobile check-in app *including last fix* will be released by Saturday 15/08
Passenger safety drill	• New process carried out via Public Announcement system and in-cabin TV safety video with a **Guest's acknowledgment via phone** required and **tracked into MEMP**	**DONE**	
Health Questionnaire	• At terminal entrance (step 1) the **printed questionnaire (and Passenger Locator Form)** will be **filled in and signed by guests** and shown to the terminal crew agents who will collect it • Onboard (step 2), the **documents collected** will be **scanned via the OCR machines** placed at Medical Center, **and digitally stored** into the central repository/ system	**DONE**	• Development to integrate the Health Questionnaire form pdf link into Seacare has not been approved yet
Guest & Crew body temperature check	• Deploying a system to support crew to **daily measure guest body temperature** scanning through a **contactless thermometer**, and directly **store the data on Seacare system** • Deploying a **self-service body temperature scanning** system for daily collecting the crew body temperature through a **contactless Totem** system and directly **store the data on Seacare system**	**DONE**	
F&B menu (QR Code)	• **QR Code** available **on the table of F&B venues** and in the **guests cabin** • When QR code is scanned, the **Guest is redirected to the pdf** of the menu/F&B packages (the guests will have the possibility to see the content with his preferred language)	**ON GOING**	• On board Stress tests and UAT on going by IT & F&B • Tables set-up with printed QR codes and plexiglass holders on going
Proximity and contact tracing	• **For Guests: disposable wearables** in white and red colours, delivered in cabins with Cruise Card within the MSC Welcome Kit • **For Crew members: rechargeable wearables**, to be returned at the end of contract	**ON GOING**	• Contact Tracing Service test almost completed • Crew bracelets delivered on Friday 14 Aug 2020 (material to be processed) • Training session to be completed due to operations interruption
MSC for Me – GR updates	• **Digital contents update** to inform Guests regarding all new COVID-19 protocol measures.	**ON GOING**	• Contents sharing and uploading in progress • MM Manager disembarked

Note: the above report status is based on the direct activity done by CBI for MSC for Me channels and available feedbacks collected on the field from others departments directly involved and owners of the identified solutions.

Guest & Crew Journey

SEACARE



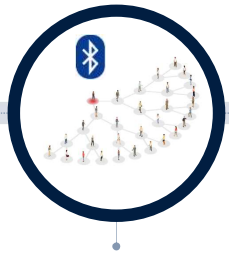
Enhanced and Connected Medical Monitoring

Daily Temperature Checks

- Health monitoring booths for daily temperature screenings for guests and crew using infrared skin temperature sensor and with direct data transfer to Seacare (onboard medical system) for data storage

Covid-19 Testing Machines

- Point of care PCR , immunofluorescence swab tests and serological test to be used for identification of covid-19 infection of suspected cases



Proximity & Contact Tracing

- Monitoring of Guests' movements and contacts
- Leverage on CCTV footage, dining table assignment, purchases

Health System

- System to manage on board cases
- Allows shore side medical team to track patient progress and review status
- Free medical consultation and assessment for Guests who have any fever or symptoms of COVID-19

MSC

7

MSC Cruises: Universal COVID 19 screening

ANTIGEN (onboard)

All guests will be tested at terminal with Antigen Fluorescent immunoassay system for the qualitative detection (and quantitative analysis) of specific nucleoprotein antigens to SARS-CoV-2 present in human nasopharynx. The test is for in vitro professional diagnostic use and intended as an aid to early diagnosis of SARS-CoV-2 infection in patient with clinical symptoms with SARS-Cov-2 infections

RT-PCR molecular (onboard)

The solution provides an automated SARS-CoV-2 RT-PCR test for the qualitative detection of COVID-19 in approximately 45 minutes with less than a minute to prepare the sample.

Shore side support

Laboratories for SARS-CoV-2 RT-PCR tests according to the needs and authorities indications with release of the results within 2/4 hours from the execution of the sampling

Private medical facility available to manage positive mild cases (hospitality and preventive isolation)

Medical and paramedic staff to take swab and have a "professional" primary screening at terminal

MSC

8

Medical Capabilities

Medical Staff

- Increase in staffing according to ship size and capacity.
- Independent new role on board: Health Protocol Compliance Officer

Equipment

- Medical center is equipped to handle medical emergencies and outbreaks
- Dedicated shore side medical assistance

Isolation / Quarantine / Case Management

- Dedicated area of cabins
- Three different isolation / quarantine zones according to cases and close contacts
- Easy and sterile access from Medical Centre
- AC isolated from the other groups of cabins
- Ongoing ship board risk assessment and enhanced management measures have been established in the context of detected cases of COVID-19 and evidence of community transmission to further prevent vessel bourne exposure
- Shoreside command and control system has been established to facilitate emergency disembark of COVID-19 cases and contacts, provide containment with care and prevent interaction with the public
- Specialized medical service to evacuate COVID-19 patients

HVAC

- Public areas: 100% fresh air without recirculation
- Total fresh air system in cabin
- Hospital Areas: Total fresh air under negative pressure against the surrounding space. High efficiency filtration and frequent changing applied

MSC

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Managing COVID-19 cases on board

If the medical officer determines that there is a possible case of COVID-19 on board:

- Guest is isolated in a dedicated single cabin
- Medical assessment with laboratory testing
- Use the Passenger/Crew Locator Forms (PLFs)
- Contact are restricted to only those necessary and with appropriate PPE
- Increase surveillance and be ready to activate contingency plan

Management of contacts

- Close contacts isolated in a dedicated single cabin (children with one of the parents)
- Medical assessment with laboratory testing
- Use the Passenger/Crew Locator Forms (PLFs)

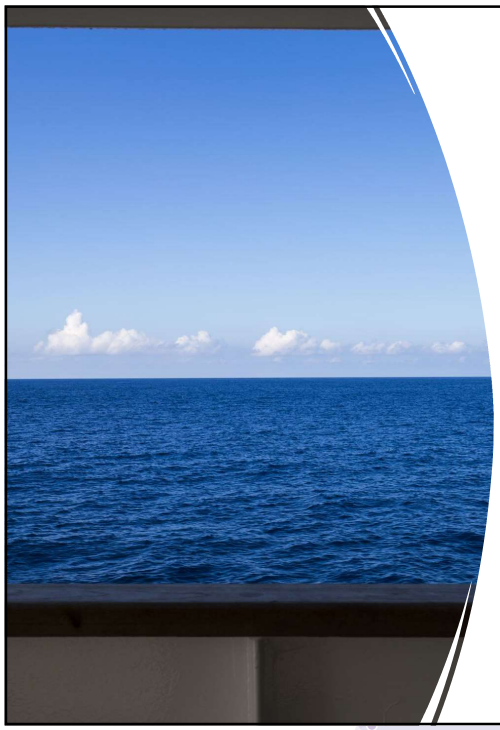
Disembarkation

Conduct risk assessment of the event in cooperation of the port health authority decide if :

- The guest need to be disembarked and moved to local shore side facility for quarantine or can stay onboard until arrival at the final destination

Reporting

- Immediately inform the competent authority at the next port of call about any possible case of COVID-19
- Provide all relevant public health information requested by the competent authority at the port



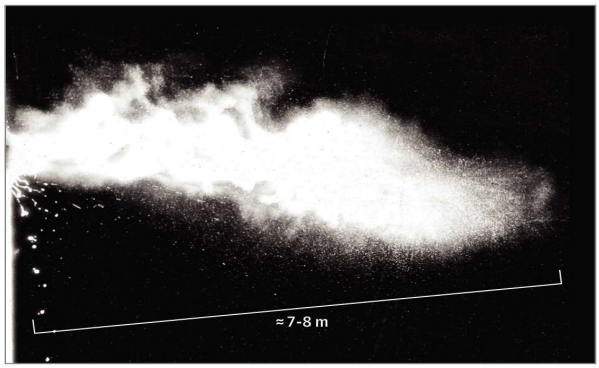
FOCUS ON HVAC

MSC restart during COVID

JAMA Network

From: **Turbulent Gas Clouds and Respiratory Pathogen Emissions: Potential Implications for Reducing Transmission of COVID-19**

JAMA. 2020;323(18):1837-1838. doi:10.1001/jama.2020.4756



HEATING, VENTILATION AND AIR CONDITIONING SYSTEM IN THE CONTEXT OF COVID 19 – ECDC GUIDANCE JUNE 2020

COVID-19 is thought to be primarily transmitted via large respiratory droplets, however, an increasing number of outbreak reports implicate **the role of aerosols in COVID-19 outbreaks**. Aerosols consist of small droplets and droplet nuclei which remain in the air for longer than large droplets. **Studies indicate that SARS-CoV-2 particles can remain infectious** on various materials, as well as **in aerosols in indoor environments**, with the duration of infectivity depending on temperature and humidity. So far, transmission through fomites has not been documented, but it is considered possible.

ASHRAE EPIDEMIC TASK FORCE – Oct 19, 2021
Core recommendation for reducing airborne infectious aerosol exposure

1. Public Health Guidance

Follow all current regulatory and statutory requirements and recommendations, including vaccination, wearing of masks and other personal protective equipment, social distancing, administrative measures, circulation of occupants, hygiene, and sanitation.

ASHRAE EPIDEMIC TASK FORCE – Oct 19, 2021
Core recommendation for reducing airborne infectious aerosol exposure

2. Ventilation, Filtration, Air Cleaning

2.1 Provide and maintain at least required minimum outdoor airflow rates for ventilation as specified by applicable codes and standards.

2.2 Use combinations of filters and air cleaners that achieve MERV 13 or better levels of performance for air recirculated by HVAC systems.

2.3 Only use air cleaners for which evidence of effectiveness and safety is clear.

2.4 Select control options, including standalone filters and air cleaners, that provide desired exposure reduction while minimizing associated energy penalties.

ASHRAE EPIDEMIC TASK FORCE – Oct 19, 2021
Core recommendation for reducing airborne infectious aerosol exposure

3. Air Distribution - Where directional airflow is not specifically required, or not recommended as the result of a risk assessment, promote mixing of space air without causing strong air currents that increase direct transmission from person to person

ASHRAE EPIDEMIC TASK FORCE – Oct 19, 2021

Core recommendation for reducing airborne infectious aerosol exposure

4. HVAC System Operation

4.1 Maintain temperature and humidity design set points.

4.2 Maintain equivalent clean air supply required for design occupancy whenever anyone is present in the space served by a system.

4.3 When necessary to flush spaces between occupied periods, operate systems for a time required to achieve three air changes of equivalent clean air supply.

4.4 Limit re-entry of contaminated air that may re-enter the building from energy recovery devices, outdoor air, and other sources to acceptable levels.

DOES ASHRAE'S GUIDANCE AGREE WITH GUIDANCE FROM WHO AND USA-CDC?

WHO (April 30, 2021) : Coronavirus disease (COVID-19) How is it transmitted?

We know that the disease is caused by the SARS-CoV-2 virus, which spreads between people in several different ways from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. These particles range from larger respiratory droplets to smaller aerosols.

• Current evidence suggests that the virus spreads mainly between people who are in close contact with each other, typically within 1 metre (short-range). A person can be infected when aerosols or droplets containing the virus are inhaled or come directly into contact with the eyes, nose, or mouth.

• The virus can also spread in poorly ventilated and/or crowded indoor settings, where people tend to spend longer periods of time. This is because aerosols remain suspended in the air or travel farther than 1 metre (long-range).

People may also become infected by touching surfaces that have been contaminated by the virus when touching their eyes, nose or mouth without cleaning their hands.

DOES ASHRAE'S GUIDANCE AGREE WITH GUIDANCE FROM WHO AND USA-CDC?

USA-CDC (May 7, 2021) : Scientific Brief - SARS-CoV-2 Transmission

Infectious exposures to respiratory fluids carrying SARS-CoV-2 occur in three principal ways (not mutually exclusive):

1. **Inhalation** of air carrying very small fine droplets and aerosol particles that contain infectious virus. Risk of transmission is greatest within three to six feet of an infectious source where the concentration of these very fine droplets and particles is greatest.
2. **Deposition** of virus carried in exhaled droplets and particles onto exposed mucous membranes (i.e., "splashes and sprays", such as being coughed on). Risk of transmission is likewise greatest close to an infectious source where the concentration of these exhaled droplets and particles is greatest.
3. **Touching** mucous membranes with hands soiled by exhaled respiratory fluids containing virus or from touching inanimate surfaces contaminated with virus.

DOES ASHRAE'S GUIDANCE AGREE WITH GUIDANCE FROM WHO AND USA-CDC?

Airborne transmission of SARS-CoV-2 is significant and should be controlled. Changes to building operations, including the operation of heating, ventilating, and air-conditioning systems, can reduce airborne exposures.

Ventilation and filtration provided by heating, ventilating, and air-conditioning systems can reduce the airborne concentration of SARS-CoV-2 and thus the risk of transmission through the air. Unconditioned spaces can cause thermal stress to people that may be directly life threatening and that may also lower resistance to infection. In general, disabling of heating, ventilating, and air-conditioning systems is not a recommended measure to reduce the transmission of the virus.

WHO and USA-CDC agree that indoor airborne transmission is possible, especially in poorly ventilated spaces, so ASHRAE's guidance focused on reducing airborne exposure is consistent with the current position of these major public health organizations.

MSC HVAC FIRST PHASE IMPLEMENTATION

1. Public areas: 100% fresh air without recirculation

2. Total fresh air system in cabin

3. Hospital Areas and Isolation cabin dedicated quarters: Total fresh air under negative pressure against the surrounding space. High efficiency filtration (MERV 10) and frequent changing applied. Toilet aspiration modified. Under door gaps filled

MSC HVAC PILOT ENHANCEMENTS

IMPLEMENTABLE IN CRUISE SHIP'S ENVIRONMENT:

OZONE AIR PURIFIER - IONIZER AIR PURIFIER - UVGI

NOT IMPLEMENTABLE IN CRUISE SHIP'S ENVIRONMENT:

HYDROGEN PEROXIDE – VAPOR – ACTIVATED CHLORINE

MSC HVAC PILOT ENHANCEMENTS - OZONE

FIRE RISK HAZARD

HIGH TOXICITY FOR OPERATOR

TOXIC FOR MARINE ENVIRONMENT (WITH LONG TERM EFFECTS)

TIME CONSUMING

POSSIBLE SURFACE DAMAGING

MSC HVAC PILOT ENHANCEMENTS – IONIZING TOOLS

NON 100 % EFFECTIVE AGAINST SARS COV2

AIR FLOW MUST NOT BE DIRECTED ON PEOPLE FOR HEALTH HAZARD

POSSIBLE CREATION OF OZONE AS BYPRODUCT

MSC HVAC PILOT ENHANCEMENTS – UVGI

The effectiveness of UVC to kill bacteria, virus other microorganism is clear since ’70s (anti TB is the most frequent application)

IN A CRUISE SHIP is unthinkable to supply the surface disinfection with multiple Upper Room devices.

We implemented a UVGI device within the HVAC inlets and in other critical points of the system of one vessel in construction, modifying also the speed of the airflow allowing the action of the lamp for at least 6 seconds under the device.

The UVC produced was of wave length of 254 nm*

*Nowadays are already available devices with technology that doesn’t hurt the humans at wavelenght of 222 nm

MSC HVAC PILOT ENHANCEMENTS – UVGI - OUTCOME

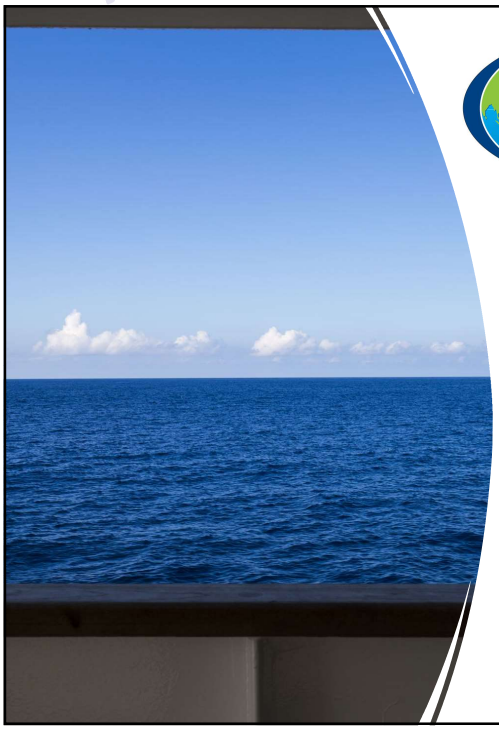
Unfortunately **our air sampling did not show a real plus** compared to a twin ship in operation not equipped with these devices. There was a generic decrease in eterothropic plate count for bacteria, at lower level of normal range but not statistically significant, and there was no presence of SARS CoV2 in both ship tested with PCR method. The ships were tested with comparable presence of people on board and in operation condition. Moreover **the hazard for the operators** and the **more complex maintainance operation** plus **a cost/effectiveness** analysis led the company to not adopt the sistem on other vessels, **preferring the high filtration with MERV 13 and HEPA** were is technically possible as preventative measure to be used Fleetwide.

Going digital: how technology use may influence human brains and behavior

Margret R. Hoehe, MD, PhD - Department of Computational Molecular Biology, Max Planck Institute for Molecular Genetics, Berlin, Germany;
Florence Thibaut, MD, PhD - University of Paris; INSERM U1266, Institute of Psychiatry and Neuroscience, Paris, France;

"Now, more than ever, during and post coronavirus times, it is important that technology is taken advantage of to improve communication and enhance personal, professional, and societal relationships, guaranteeing equal opportunities for access and development for all."

Dialogues Clin Neurosci. 2020 Jun; 22(2): 93–97.
doi: 10.31887/DCNS.2020.22.2/mhoehe



Managing Infectious Diseases on Cross-Border

Cruise Ships in the Post-COVID-19 Era: Application of Digital Technology

24-25 August 2023 - Chinese Taipei

THANK YOU ALL!

Dr. Pierfrancesco Lepore
MSC CRUISES MANAGEMENT LTD UK

Jenny Lim | Speaker

- Regional Vice President
  Fleet Hotel Operation,
  Norwegian Cruise Line
- Malaysia

Jenny Lim joined Norwegian Cruise Line as a Guest Service Manager in 2001. In her 20 years of service with the Company, she's held a number of roles onboard, including Food & Beverage Director, Assistant Hotel Director and Hotel Director before she was promoted into her current role as Regional Vice President of Fleet Hotel Operations.

Jenny is currently responsible for ships located on the West Coast of the United States, including Hawaii, as well as Australia, New Zealand and Asia regions.

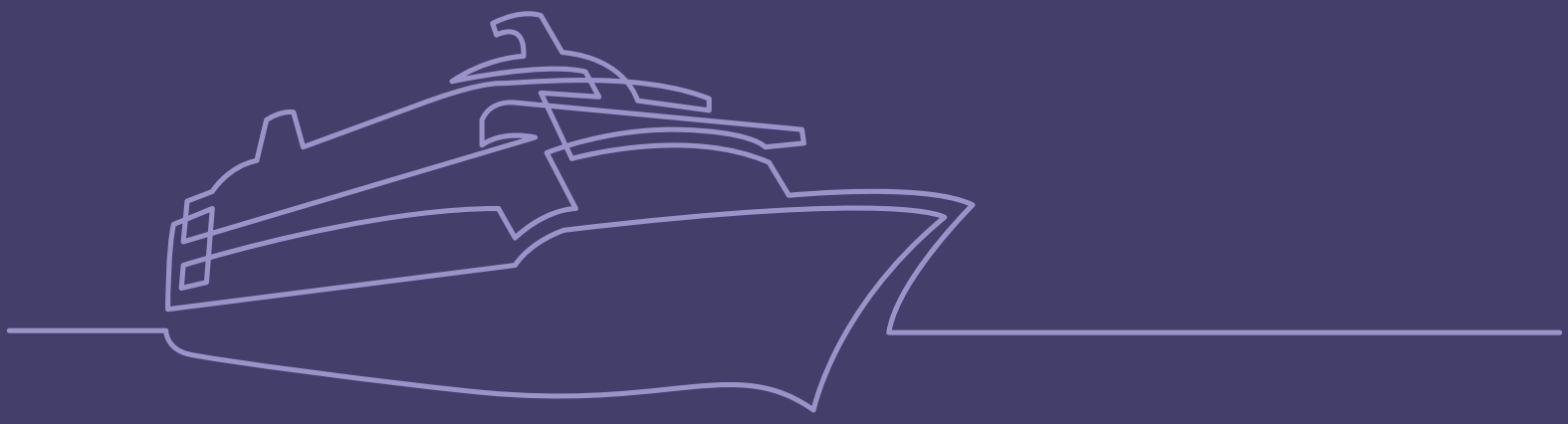
Jenny played a key role in the Norwegian Joy's re-deployment to the Chinese market. Prior to Norwegian Joy, Jenny also served on the opening teams of Norwegian Pearl, Norwegian Gem and the re-flagging of Norwegian Sky.

Jenny's passion and dedication to her team shines in everything she does and she enjoys building strong, cohesive relationships with her management teams and crew. She commits herself to always serving as a role model, as she believes actions speak louder than words. She enjoys mentoring others and shares; "I'm fulfilled by lending a helping hand and instilling confidence in others to believe in themselves and follow their own path, cultivated by the values and qualities within themselves."

Jenny graduated at Sepang Institute of Technology College in Malaysia in Business Administration and hails from Kuala Lumpur, Malaysia

Porto

Session IV
Site Visit to the Port of Keelung

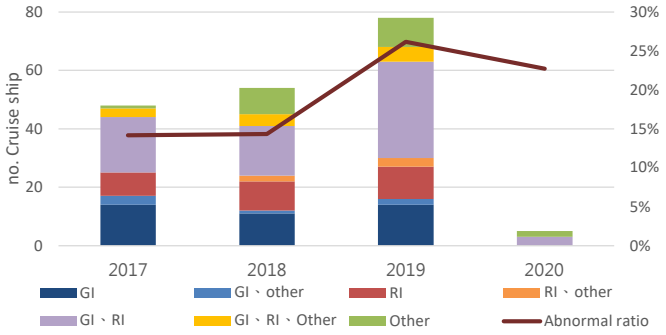



Practical Experience in Cruise Quarantine and Inspection of Ships at the Port of Keelung
Taipei Regional Center, Centers for Disease Control, Ministry of Health and Welfare
2023.08.25

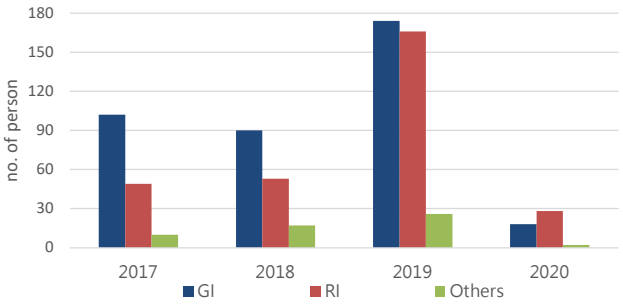

Disposal process for cruise ship outbreak events
Preparedness
Evaluation of Notified information
Assessment of public health risks
Cross-section communication
Response
QUARANTINE
Case Disposition and Report
IHR

Health abnormalities notification (2017-2020)

Classification of health abnormalities



Notified no. of ill persons



※55 health abnormalities were others including 11 chickenpox (8 cases in 2019) and 44 non-communicable diseases

COVID-19 cruise quarantine policy

2020.1.24 — Requirement of health declaration from passengers (China, Hong Kong and Macau)

2020.2.6 — **Banned the docking of international cruise ships**

2020.6.29 — Resume shipping Island-hopping itineraries

2022.10.24 — **Lift ban on international cruises**

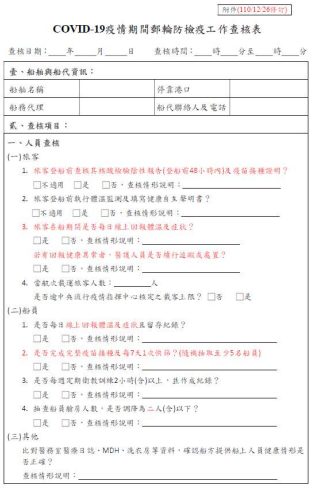
2023.3.4 — loosen COVID-19 control measures on international cruises

Emergency response drill during COVID-19 pandemic






Cruise ship inspection during COVID-19 pandemic



附件(110/12/26修訂)

COVID-19疫情期間郵輪防檢疫工作查核表

查核日期：___年___月___日　查核時間：___時___分至___時___分

壹、船舶與船代資訊：			
船舶名稱		停靠港口	
船務代理		船代聯絡人及電話	

貳、查核項目：

一、人員查核

(一)旅客

1. 旅客登船前查核其相關檢驗陰性報告(登船前48小時內)及疫苗施種證明？
□不適用　□是　□否，查核情形說明：_____
2. 旅客登船前執行體溫監測及填寫健康自主聲明書？
□不適用　□是　□否，查核情形說明：_____
3. 旅客在船期間是否每日確認體溫及症狀？
□是　□否，查核情形說明：_____
游客回報健康異常者，醫護人員是否確行追蹤及處置？
□是　□否，查核情形說明：_____
4. 當航次載運旅客人數：_____人
是否違中央流行疫情指揮中心核定之載客上限？□否　□是

(二)船員

1. 是否每日確上回報體溫及症狀及留存紀錄？
□是　□否，查核情形說明：_____
2. 是否完成完整疫苗接種及每7天1次快篩？(隨機抽取至少5名船員)
□是　□否，查核情形說明：_____
3. 是否每週定期衛教訓練2小時(含)以上，並作成紀錄？
□是　□否，查核情形說明：_____
4. 抽查船員餐廳人數，是否調降為二人(含)以下？
□是　□否，查核情形說明：_____

(三)其他

此郵輪靠泊醫療日誌、MDH、洗衣等等資料，確認船方提供船上人員健康情形是否正確？
查核情形說明：_____

二、環境查核

(一)軟硬體部分

1. 船舶口、公共區域設置清毒洗手液？
□是　□否，查核情形說明：_____
2. 提供開航前衛教宣導影音於船房播放衛教宣導影片？
□是　□否，查核情形說明：_____
3. 船上是否配備普查 COVID-19快篩試劑及2套 PCR 儀器？
□是　□否，查核情形說明：_____
4. 依據船上物資進出及人口數估算，PPE(個人防護裝備)使用是否合理？
□是　□否，查核情形說明：_____

(二)人流管控及接觸者追蹤部分

1. 船上人員是否保持社交距離？如未保持社交距離，是否落實戴口罩？
查核情形說明：_____
2. 船上主要公共場域，是否派員引導及人流管制？如剖院、賭場、餐廳等
查核情形說明：_____
3. 隨機抽選1名旅客，請船方以 TRACEY 人流管理監視器提供接觸者資料
□無法提供　□可提供：耗時____分鐘　□其他說明：_____

(三)環境部分：清消落實情形(如:客房通過人工擦拭每天3次，公共區域每2小時1次)？
□無查獲　□查獲未落實情形，描述：_____

三、**緊急應變**：船員是否熟知緊急應變流程，並其能做出適切應變
隨機抽取安屋不同部門之2名船員詢問下述問題(亦可變化題目或施作詢問)：
1. 艙務旅客過程中，如發現旅客不斷嘔吐，會如何處置及通報？
查核情形說明：_____
2. 如船方宣布啟動應變流程，應負有的事項？
查核情形說明：_____

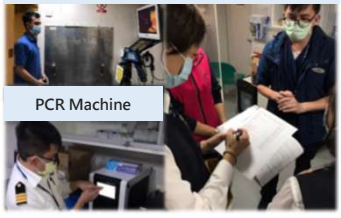
參、查核結果綜合評估：

查核單位	受查核單位
承管署：_____	船方代表：_____
衛生局：_____	船代代表：_____

Warning signal & Disinfection record

Health Promotion Video

Temp. Monitor　Stockpile of PPE

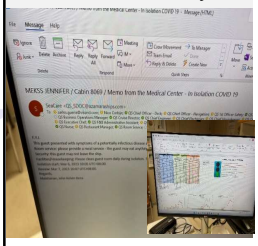


PCR Machine

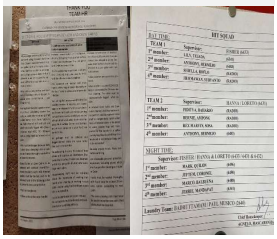
Medical Log Review

Cruise ship preparedness of Post-COVID-19 pandemic

Case Information Delivery

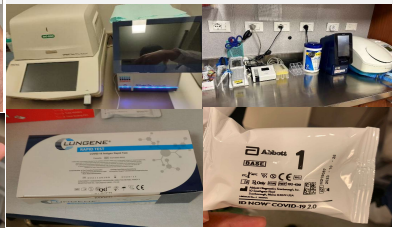


Response guide & team



Stockpile of Drugs and PPE

Testing Instruments and Reagents



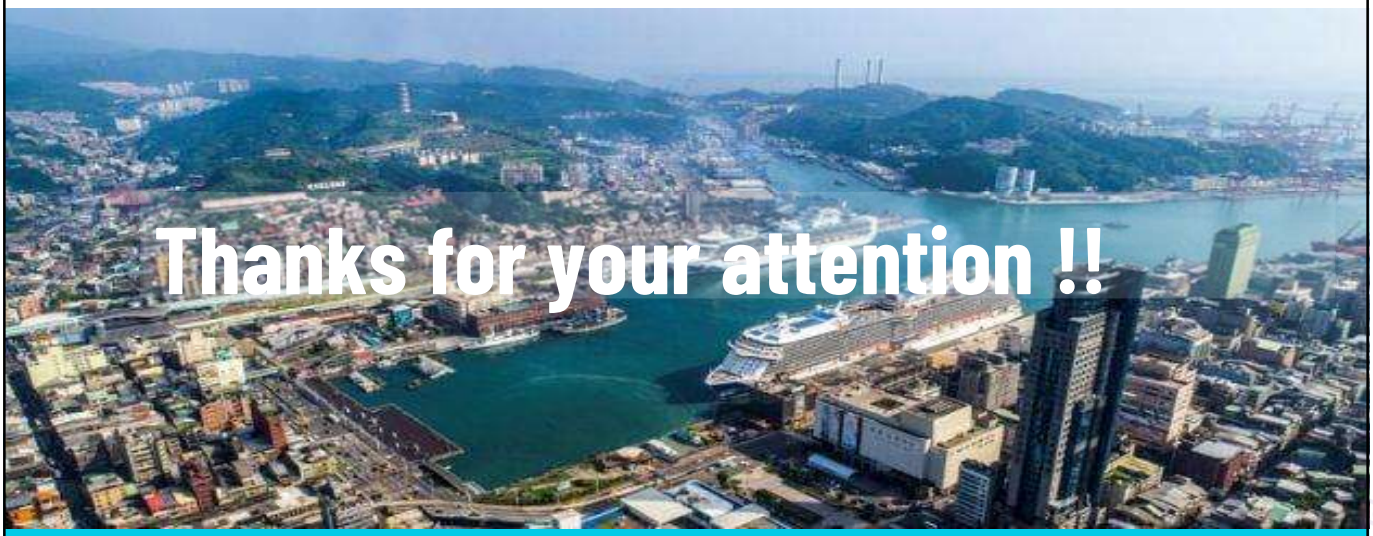
Laundry Space

Environmental Cleaning & Disinfection

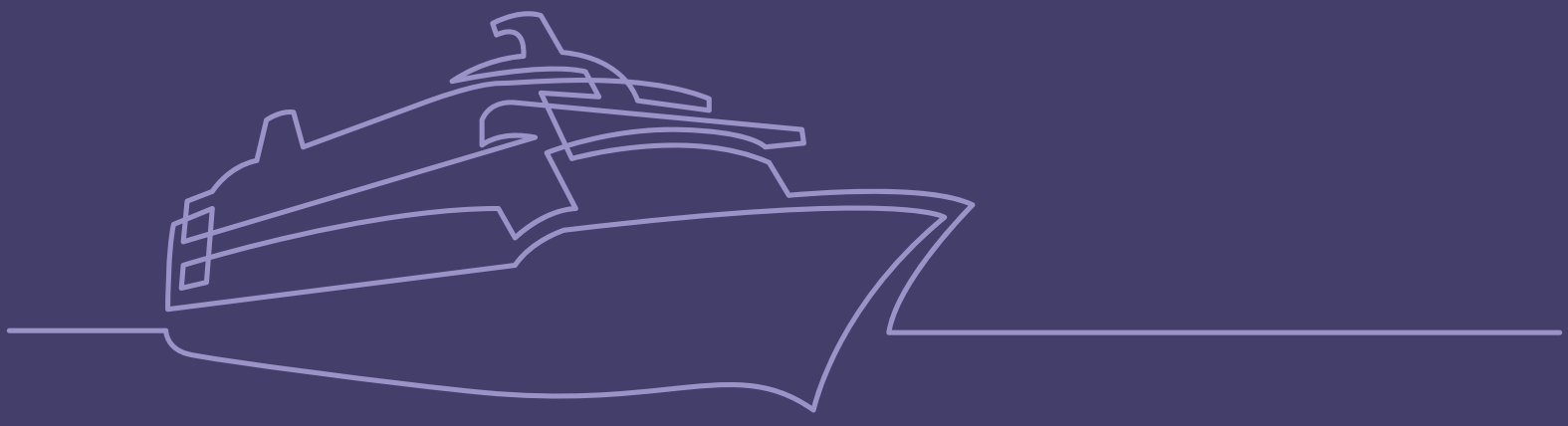
Ventilation Systems

Conclusion

- Elevate knowledge and management of health control measures on ships and ports
- Strengthen control measures for respiratory infectious disease
  - Vaccination requirement
  - Incentive to respiratory hygiene and cough etiquette
  - Improvement of ventilation system and disinfection equipment
  - Upgrade infectious disease detection capacity
  - Quarantine imperative for sick person


Thanks for your attention !!

List of Participants



Porto