

## FIELD REPORT

**Screening of COVID-19 suspect cases in a Cargo Ship: A rare field experience**Senthilnathan Subramaniam<sup>1</sup>, Praveen Madala<sup>2</sup>

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**Abstract**

**Background:** World Health Organization (WHO), China Country Office informed cases of pneumonia of unknown aetiology detected in Wuhan City, Hubei Province of China. On 7th January 2020, Chinese authorities identified a new strain of Coronavirus as the causative agent for the disease. By 1st April 2020, the disease since its first detection in China has spread to over 200 countries/territories leading to a total of 823626 confirmed cases and 40598 deaths. WHO declared the novel Coronavirus outbreak as a Pandemic on 11 March 2020 and named the 2019 novel Coronavirus as COVID-19. As the screening of these suspects in ships is a challenging and novel one, the present study was aimed at identifying the proper and systematic way of screening of these suspects. Screening if done systematically aids in early diagnosis of the COVID-19 suspects and if coupled with pre-arrival preparedness through e-mail follow up helps in proper planning. Proper risk communication can help in alleviating the fears of the stakeholders and public. **Aims & Objectives:** The primary objective of this study was to screen the COVID-19 suspect cases systematically in the vessels and the secondary objectives were to identify any gaps in the process of collection, transport and receipt of results of samples of COVID-19 Suspect cases, know the process of risk communication & to share the experience to other seaports for duplication. **Materials & Methods:** Screening was done for all the crew by the Investigators with proper Personal Protective Equipment (PPE) on the Bridge (Navigation Deck) of the vessel mainly for recording the temperature and eliciting other signs & symptoms of COVID -19. It was then followed by sending the samples of the two COVID-19 suspects for testing to the Government approved laboratory in a systematic way. Risk communication was also done to all the stakeholders and media in a well-coordinated manner at the earliest to update them on the facts and to prevent false communication. **Results:** Pre-arrival preparedness through screening of pre-arrival documents and systematic approach adopted for screening of the COVID-19 suspects led to early diagnosis of the suspects. Samples were collected as per protocol and sent for testing to the laboratory and reports of the same were obtained without any much constraints through proper liaison with Tamilnadu State Health team. Risk communication to the stakeholders and media prevented panic among the public and stakeholders. **Conclusions:** Pre-arrival e-mail follow-up and arrangements like coordination meeting with the stakeholders led to proper planning. Systematic screening and proper liaison with State Health team helped in the early diagnosis of the suspects. Proper and early risk communication to the stakeholders and media prevents panic, facilitates good support and prevents communication of maleficious information to the public.

## Keywords

Pre-arrival Preparedness; Screening; Risk Communication

On 31st December 2019, the World Health Organization (WHO) China Country Office was informed of cases of pneumonia of unknown aetiology (unknown cause) detected in Wuhan City, Hubei Province of China. On 7th January 2020, Chinese authorities identified a new strain of Coronavirus as the causative agent for the disease. The disease since its first detection in China has now spread to over 200 countries/territories, with reports of local transmission happening in more than 160 of these countries/territories. As per WHO (as of 1st April, 2020), there has been a total of 823626 confirmed cases and 40598 deaths due to COVID-19 worldwide (1).

Infection is spread through droplets of an infected patient generated by coughing and sneezing or through prolonged contact with infected patients (2).

WHO declared the novel Coronavirus outbreak a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (3) & as a Pandemic on 11 March 2020 (4). WHO named the 2019 novel Coronavirus as COVID-19 (5)

It is essential that competent authorities plan, prepare and respond effectively to events within the context of International Health Regulations (IHR) (6). As the disease is novel and experience of screening on ships for COVID-19 suspects is also novel, the present study which involves a systematic way of screening is of utmost importance in diagnosis of the infection while ensuring personal protection of the investigators.

## Aims & Objectives

1. To screen the COVID-19 suspect cases systematically in the vessels.
2. To identify the gaps (if any) during the process of collection, transport and reporting of the results of samples of COVID-19 Suspect cases.
3. To know the process of risk communication to the stakeholders and media.
4. To share the field experience to other seaports for enhancing their knowledge on safe and systematic screening of COVID-19 Suspect cases in vessels.

## Material & Methods

Screening of the vessel depends on whether a ship is healthy or suspect one through scrutiny of pre-arrival documents which were sent by the Master of the vessel through e-mail of which the main document was the **International Health Regulations 2005-2019 novel Coronavirus (nCov) Form** (Figure 1) devised by our organisation. The other documents which were also screened to know the health status of the crew were Medical Log, Maritime Declaration of Health along with its attached schedule

The Ship Master has sent all the pre-arrival documents on 12th February 2020 in which the deciding factor for the ship to be "Suspected" under the COVID-19 ship screening was the Ports of Call list with actual dates of arrivals and departures in which it was found the Ship has called the Ports of China and the ship was coming within 14 days of completion of Incubation Period of the disease.

The Master of the ship has been also advised to follow the pre-arrival preparations for COVID-19 Screening which emphasizes on daily twice recording of the body temperature of the crew till the arrival of the ship, adequate stocking of PPE, hand sanitizers and disinfectants; avoid entry of non-essential visitors coupled with maintenance of respiratory and hand hygiene.

Earlier, the Estimated Time of Arrival (ETA) of the Vessel to the Port of Chennai was 15th February 2020.

On 13th February 2020, the details of the visitors to the ship during the last five Ports of call have been submitted in which it was found that all were local healthy visitors and there were no international visitors.

Reason for delaying the berthing plan: On 15th February 2020, a coordination meeting with the Shipping Agents and Stevedores was conducted at the Port Health Office. In the meeting, it was noted that for the cargo operations aimed to discharge Steel Coils cargo, more number (approximately 160 persons) of stevedores per each shift were required for the four hatches of the ship. And, for an estimated eight shifts to be carried out for two and half days, it was felt that it was highly unsafe to carry out the cargo operations with the possibility of high

risk of contact between ship crew and stevedores. Hence, it was decided to postpone the berthing till the completion of 14 days from the departure time of last Port of call which happened to be evening hours of 18th February 2020 which was calculated based on Universal Time Coordinated (UTC).

An email was also sent to the Master of the vessel regarding the detailed SOP (Table.1) to be followed before the berthing of the vessel in order to reduce the risk of transmission of COVID-19 infection to the visitors and for submitting the undertaking given by all the Stakeholders by evening so that berthing of the vessel can be done.

In the morning hours of 18th February 2020, a second coordination meeting was conducted in Port Health Office with all stakeholders viz., Customs, Immigration, Assistant Traffic Manager of the Port, Shipping Agents, Stevedores, Central Industrial Security Force (CISF) and Surveyors for explaining the detailed SOP and responsibilities of various stakeholders to carry out safe cargo operations.

Later, the vessel was made to berth as the Master complied to all the pre-arrival SOPs including sending the daily twice temperature report of the Crew.

After giving an enough cool down period of 20 minutes for the Crew after gangway arrangement, we boarded the vessel by the gangway at 18:20 hours and reached the Bridge through the stairs outside the accommodation deck to carry out the temperature and medical screening. It was found that two of the Crew members viz., the Third Officer (100.40F) & the Chief Engineer (100.0F) were having fever. Temperature was recorded by using both infrared and mercury thermometers.

These crew were considered as COVID-19 suspects as fever being the most common symptom (07,08) and first atypical symptom (09) to appear in mild illness of Clinical syndromes associated with COVID-19 disease and as they have positive history of travel from a country reporting local transmission of COVID-19 which was China.

Inspection finished at 19:30 Hours. The ship has been given Limited Pratique and was put under strict quarantine till the results are reported.

#### **Action initiated by the PHO Team following Medical Screening: -**

1. These two members who were suspects have been isolated to their Cabins.
2. The captain of the vessel instructed to avoid close contact by other crew members with these

crew and to give them food and water in their cabins only by the crew who is in charge of the hospital by wearing PPE.

3. Gangway was lifted upwards immediately after the disembarkation of Port Health Authorities and no cargo operations were allowed.
4. The ship was also strictly advised not to allow any person to enter the ship.
5. Security personnel have been deployed at the gangway of the ship to ensure the ship is strictly quarantined and the area cordoned off.
6. Communication sent to Public Health - International Health division of Ministry of Health & Family Welfare (MOHFW), Chennai Port Trust Officials, Senior Regional Director for activating the State Health Team.

The next day, i.e., on 19th February 2020 in the early morning hours between 07:15 AM to 08:10 AM, samples have been collected by state health team in coordination with Port Health Officer and sent for COVID-19 testing to Indian Council of Medical Research (ICMR) approved Government laboratory which was King Institute of Preventive Medicine & Research (KIPM), Guindy(10) in cold chain. In order to avoid panic to the public, the sampling was planned early morning.

#### **Methodology of Sample Collection: -**

The Port Health Officer guided the State Health Team and first helped to prepare the ship by briefing the procedure to be done and the same was translated to the crew in Chinese by the Master of the vessel. The accommodation doors were kept open and the mess room was chosen as the place for sample collection being open area and a non-living area and the doors were kept open for good ventilation. The place was disinfected and kept ready. The ship crew were advised to be in the accommodation deck and not come in contact with health team members. The cabins will not be an ideal place as they will be contaminated with the secretions and possibility of spread of infection to the sampling team. The PPE was worn inside the ship on the main deck to avoid panic among the stakeholders. After preparation of the sampling kit, the crew were called one by one and the naso-pharyngeal swab, throat swab and blood samples were taken. After samples were taken labelled and properly packed in cold chain container for further transportation to the laboratory, the PPE was removed and collected in the Bio-hazard bags

and only the N95 and gloves was worn till the team disembarked the ship. After disembarking, the N95 masks and gloves were also disposed in the Bio-hazard bags and given to the Port Trust Hospital for safe disposal.

Press briefing was convened on the same day i.e., on 19th February 2020 around 10 AM by the Chennai Port Trust Officials and Port Health Officer to share the facts about the 2 suspects and that they are safely isolated on vessel without any contact with shore. This ensured the media was given factual information to prevent any panic among public.

The COVID-19 test results of the suspects came at 4:30 pm and were found to be negative.

Later, a second press brief briefing has been convened in the evening hours of 19th February 2020 to declare the test results of the suspects. Later, the Master was advised to strictly follow the SOP and to report on any crew developing fever / signs & symptoms of Coronavirus.

The Port operations were allowed at 5 pm after information to all the Public Health Emergency Contingency Plan (PHECP) team and the stakeholders.

Evidence Report Form (ERF) has been attached to the Original SSCEC for further follow up by the next Port Health Authorities.

The ship was at Port for 2 days which was monitored on daily basis for 2 days and the Port operations were done by stakeholders strictly as per SOP. It was ensured that the crew were also with PPE when working outside on deck and only minimal number of crew were allowed on deck.

The ship completed the port operations and sailed on 21.02.2020, 21:00 hours to Chittagong.

## Results

Pre-arrival screening of the ship's documents helped in proper planning. Stakeholders coordination meeting conducted before the arrival of the ship resulted in proper understanding of the roles and responsibilities of various stakeholders. A well coordinated plan with State Health Team achieved early diagnosis of the COVID-19 suspects without any difficulty in collection, transport or receipt of the test reports. The ship operations which were conducted safely by following SOP decreased the time of cargo operations from an estimated two and half days to two days. Proper and early risk communication which is a part of PHECP helped in disseminating the factual information to all Stakeholders and Media

## Conclusion

Pre-arrival follow up of the vessel by e-mail helps to achieve proper pre-arrival preparedness required for safe and controlled Port operations. Screening if done systematically by email and by adopting proper methodology for the collection & transport of COVID-19 suspects samples to the designated laboratory aids in early diagnosis of the suspects while ensuring the safety of the investigators from being affected. Risk communication to the stakeholders and media helps to allay the associated fears and will help in a huge way to disseminate the factual information and to prevent the maleficious information from being circulated.

## Recommendation

Pre-arrival preparedness and planning which will be achieved through screening of pre-arrival documents helps to save lot of time and to plan for the support of other stakeholders. Pre-arrival coordination meetings can lead to proper guidance on the roles and responsibilities of various stakeholders and prevents duplication of activities. Systematic medical screening of the crew as per the methodology adopted in this study helps the investigators to screen the crew properly while ensuring safety to the investigators. Methodology to be followed for sample collection as described in the study can be adopted for proper and safe collection of the samples. Risk Communication to the stakeholders and media is very important activity that has to be ensured for allaying the associated fears and in preventing the spread of maleficious communication.

## Limitation of the study

Round the clock availability of processing of samples of COVID-19 Suspect cases would have resulted in much more early diagnosis of the suspects and in allaying the fears of the Ship's crew and other stakeholders.

## Relevance of the study

As COVID-19 infection is a novel one and the experience of screening of ships with suspect cases is also novel, this study will be very much useful for the other Port Health Authorities in duplicating the sequence of activities followed in the present study.

## Authors Contribution

SS – Involved in planning the study, execution of the study, screening and final approval of the manuscript



PM – Involved in screening and drafting of manuscript

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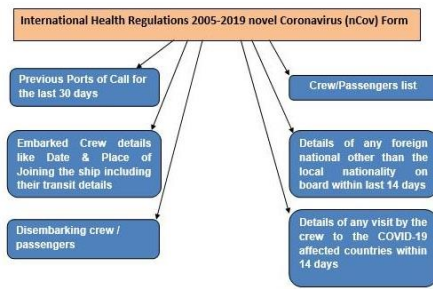
## Tables

TABLE 1 DETAILED SOP BEFORE BERTHING OF THE SHIP

1.	The ship must disinfect the bridge area during Pilot access with 1% bleaching solution/Sodium Hypochlorite <sup>(11)</sup> .
2.	Keep the bridge doors open. Measure the temperature of all the crew on the Navigation deck when the Pilot comes on board. All crew must wear masks during Pilot boarding and Port Health Authorities Inspection. All crew will be examined at the bridge deck.
3.	The Meeting Room, Cargo Office, Chief Officer's Office, Tally room and all the door handles to the accommodation deck from entrance and ship gangway to be used during the port stay to be disinfected with 1% bleaching solution/Sodium Hypochlorite <sup>(11)</sup> , by preparing fresh solution, by spraying and cleaning with fresh clothes. After that, the bleaching solution must be sprayed and left to dry. <b>So, CLEANING ONCE AND THEN SPRAYING ONCE.</b>
4.	All the meetings with the shore visitors shall be restricted to the meeting room. The meeting timings must be all entered by the Shipping Agent. All the Persons who are about to board the ship must be checked for the temperature using Non-contact Infrared Thermometer. If anyone is with high temperature of 99°F or 37.4°C and above, they should not be allowed to go on board. Each shift, the stevedores who are entering the ship has to be checked for temperature. To give the stevedores list with temperature recordings to the Master & Port Health Officer by email shift wise. <b>This is to ensure the Shore persons don't take any infection on board and infect the crew and we get confused of COVID-19.</b>
5.	Each and every person who are about to do the work on board has to get the Port Health Authority permission. Their name and phone number to be recorded. The entry timings and exit timings to be recorded.
6.	The Stevedores & Shipping Agent to have the Office set up on wharf in the nearby warehouse or shore cabin for any preparation of the documents. The master is advised to arrange a table and chair on the deck 3 metres away from gangway for all discussions of the stevedores and agents during port operations. Only for any essential communication they will enter the meeting room for discussion.
7.	Only one person from the Shipping Agency will handle all the communication with the Chief Officer or Master as needed. Only 1 stevedore for the whole period of the operation to be given permission to interact with the ship crew. These persons are to get the Port Health Authority permission and they are the only persons who will be allowed to board and enter the accommodation meeting room.
8.	The stevedores to provide drinking water facilities for stevedores on the deck.
9.	All the stevedores are not allowed to take any water, or use toilet on ship or sleep on the deck. Toilets break to be given and use only the shore facilities. Tally room not to be used.
10.	The master must only have the minimum essential crew to be on deck to assist the stevedores for any emergencies like crane assistance or hatch assistance or electrical assistance or cargo issues and all crew will wear masks when they are in meeting room or on deck. The crew must maintain 6 feet distance from all shore persons. All such inspections to be recorded with timings.
11.	No ISPS Log to be entered by the ship crew. The agent will enter the details of all the visitors to the ship and give the details on daily/shift basis to the ship master by email
12.	All the masks, gloves used by the authorities / stevedores/ surveyors/ Shipping agent to be collected in Bio-Hazard bags and disposed safely to Port Hospital / authorised agency.
13.	The Master/Shipping Agent/Stevedores have to give an undertaking to follow these guidelines strictly before the ship is allowed for berthing and port operations.

**Figures**

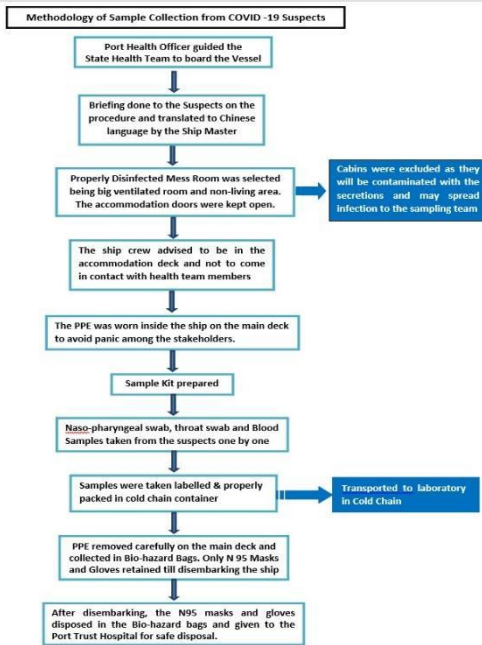
**FIGURE 1 IHR FORM**



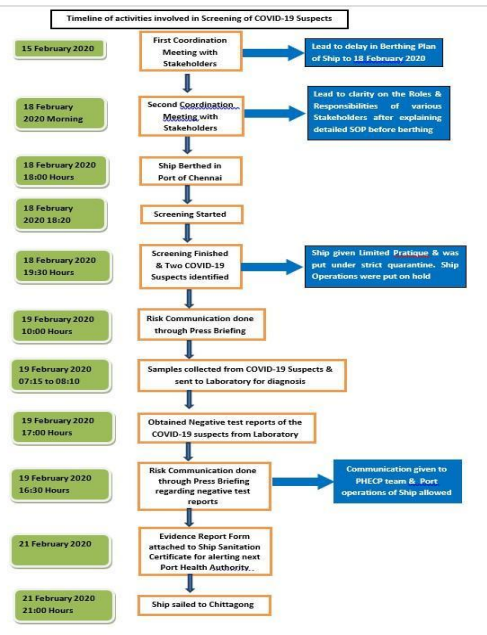
**FIGURE 2 COVID 19 SCREENING**

Documents to be submitted to Competent Authority of Port for COVID-19 Screening			
International Health Regulations 2005-2019 novel Coronavirus (nCov) Form	Medical Log	Maritime Declaration of Health along with its attached schedule	Ship Sanitation Certificate

**FIGURE 3 SAMPLE COLLECTION**



**FIGURE 4 TIMELINE**



**FIGURE 5 PORT HEALTH OFFICER ALONG WITH STATE HEALTH TEAM FOR SAMPLE COLLECTION**

