

The decision making process for public health measures related to passenger ships: the example of the influenza pandemic of 2009

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ABSTRACT

Background. Public health measures at sea ports have posed a challenge for public health competent authorities, especially in the context of the influenza pandemic of 2009. This paper discusses the response of authorities to notifications of infectious diseases on passenger ships and the importance of assessing the risks related to cases of influenza. It further provides options for health measures and considerations for decision making during a pandemic such as the influenza pandemic of 2009.

Discussion. Prevention and control of influenza have included action taken by both competent port authorities and ships' crews. Assessing the public health risk of each event reported from ships to competent authorities at ports is important before advice is given on implementation of control measures. Public health risk assessment involves appraisal of threats to passengers and crew on board the ship as well as to the population in the community.

Summary. Any public health measures taken should be necessary and proportional to the threat. Measures at ports cannot alone be effective in the prevention of the spread of a disease to the community since other means of transport play a major role. Measures taken on board ships can be effective in containing the disease. Consistent policy based on common protocols and carried out by competent authorities at local, national, European, or international levels are essential.

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Key words: borders, port, passenger ship, international health regulations, health measures, isolation, pandemic, influenza

INTRODUCTION

The implementation of public health measures at sea ports has posed a challenge for public health authorities in Europe, especially during the influenza pandemic of 2009. During 2008, the cruise industry carried an estimated 13.05 million passengers on cruises around the world [1]. In 2007, there were about 410 million cruise and ferry passenger visits to European Union ports [2]. Before arriving at ports, ships on international voyages are required to declare infectious diseases on board, according to the International Health Regulations of 2005 [3]. This paper discusses the response of competent authorities to such notifications and the importance of assessing the risks related to cases of influenza aboard passenger ships. Furthermore, it presents options for health measures and considerations for decision-making during pandemics such as the influenza pandemic of 2009. There is good guidance available to ships' companies, medical officers and masters [4–7]. However, little has been published that examines the role of competent authorities at ports that are responsible for the implementation and application of public health measures on ships.

DISCUSSION

RISKS RELATED TO CASES OF INFLUENZA

It is important to assess the actual public health risk posed by cases of an infectious disease on board passenger ships. Any decision on public health interventions by competent authorities should be appropriate to the risks posed by the infectious agent and the event. Risk assessment procedures should be based on scientific evidence related to the hazard, the impact of the hazard, and the likelihood of occurrence. Important factors that can be used for risk assessment include the characteristics of the infectious agent such as pathogenicity and virulence (hospitalization rate, case fatality rate, etc.), modes of transmission, immunity of the travelling population, and risk groups. Incidence of the disease and geographical distribution, based on information provided by local, national, European, or international organizations and agencies such as ECDC and WHO, can be also taken into consideration in the risk assessment process. Continuous monitoring of the pandemic is important in order to identify changes in disease severity and to implement appropriate health measures. The WHO, CDC, and the European Centre

for Disease Prevention and Control regularly provided pandemic risk assessments for Europe [8].

RISKS FOR PASSENGERS AND CREW ON BOARD

In the event of an influenza-like illness on board a passenger ship, the main threat is related to the passengers and crew who are at higher risk of developing complications from influenza and in whom the disease might be life threatening.

Outbreaks of seasonal influenza have occurred aboard passenger ships in recent years [9–11] with attack rates of up to 37% [12]. If a large number of crewmembers fall ill and are unable to perform their duties, the safety of sailing might be affected. In addition, ill passengers will have their holidays spoiled. Risks related to ferries may differ from those of cruise ships. Medical consultation with a physician on ferries may not be possible. Ferry voyages are shorter and may include frequent stops to ports where medical consultation ashore can be arranged. Furthermore, they do not usually involve activities, such as games and excursions, thus giving less opportunity for interaction among travellers.

Passenger ships can provide a setting for the spread of disease from person to person or indirect transmission (e.g. contaminated surfaces). During a cruise or ferry voyage, passengers and crewmembers spend much of their time indoors. Passengers and crew may be from several nations and can intermingle for extended periods of time in semi-enclosed areas. Shipboard activities and events such as dining, games, and movies increase the likelihood of contact between passengers, and sometimes with crew as well. The virus is easily spread from person to person by inhalation of the air that contains droplets from infected people who cough or sneeze, or by transferring the virus directly by hand or from surfaces contaminated by droplets [6]. Vaccine status may be different among passengers compared with crew. Vaccine practices may be different in cruise lines and ferry companies.

RISKS AT PORTS FOR THE COMMUNITY

Transnational transmission of a disease is a perceived risk, but nowadays other means of transport such as aeroplanes play a major role in the rapid international spread of diseases. The propagation of infectious agents to non-affected countries through ships took place in past centuries. After the discovery of the New World in 1492, Old World diseases such as smallpox, measles, influenza, and typhus annihilated most of the American native populations

[13]. When Christopher Columbus and his men embarked on the second Colombian expedition in 1493, the crew suffered from fever, respiratory symptoms, and malaise. It is generally accepted that the disease was influenza [14].

PUBLIC HEALTH MEASURES

The competent authorities' task is to perform a risk assessment in case of a threat of infectious disease, to advise, implement, or supervise the response measures to be taken, and to ensure that all appropriate measures are in place to protect public health on board and to minimise the spread of a communicable disease from the ship to the community. Health measures implemented by competent authorities, or under their supervision, must be in accordance with national and international law and appropriate to the risk that the disease poses, without causing unnecessary interference to international movement of peoples and goods. Consequently, public health measures should not disrupt the ship's itinerary, disembarkation, or travellers' ability to enjoy the voyage and destination, unless such actions are justified and the rationale behind them is provided.

According to Article 28 of the IHR 2005, competent authorities "may subject the granting of free pratique¹ to inspection" [3]. Consequently, in response to an event of infectious disease, personnel of competent authorities have the right to board the ship to conduct an inspection and determine whether public health measures are required. After application of the required health measures, permission to disembark, embark, or load stores can be given.

MEASURES ON SHIPS

In general, competent authorities, in responding to cases of influenza-like illness, should ensure, after conducting an inspection, that all necessary measures have been taken on board by the designated crew to contain the disease. Detailed guidance for such measures, including surveillance, isolation of ill persons, hygiene measures such as hand washing, cough/sneeze etiquette and hygienic waste disposal, training, advising, cleaning, and disinfection, has been previously published [4–7]. Moreover, competent authorities may be asked to receive clinical specimens from ships and send them to the laboratory for analysis.

MEASURES AT PORTS

Authorities at ports may supervise or make arrangements for the disembarkation of ill persons in such a manner as to minimise the spread of the virus from person to person. They may arrange trans-

port of persons with severe illness to a health care facility and notify cases to the national authorities.

According to International Health Regulations (Annex I), competent authorities at ports are responsible for providing, if necessary, medical examination and care for affected travellers. In addition, appropriate space, separated from other travellers, must be designated to interview suspected or affected persons. Competent authorities may also assess and, if required, quarantine suspected cases amongst travellers. Trained personnel with appropriate personal protection, for the transfer of travellers who may carry infection or contamination, should be available. It should be noted that these capacities should be available in all countries by 2012, according to the IHR timeframe for implementation [3].

In an outbreak situation many persons might be affected, and the competent authorities at ports should have the capacity to deal with a large number of ill people who might need treatment, medical assessment, or hospitalization after disembarking. Response plans should be in place involving all local competent parties with defined roles and responsibilities, as required in Annex I of the International Health Regulations. If the competent authority is not able to carry out the required control measures then the next known port should be informed [3].

Other measures may also be taken according to the findings of the risk assessment performed. A change in the disease severity may require additional or more rigorous measures.

EXPERIENCE DURING THE INFLUENZA PANDEMIC OF 2009

During the initial phase of the pandemic, measures to prevent the introduction of the disease in a country were considered by some countries to delay the spread of the disease. We believe that such measures are of little value since other means of transport play the key role in the transnational transmission of diseases. The effectiveness of measures taken to prevent the transnational transmission of pandemic influenza, such as entry screening using thermal cameras [15], is controversial [16]. Historical data from the 1918 and 1957 pandemics show that screening and quarantining travellers at international borders did not substantially delay virus introduction, except in some island countries, and are likely to be even less effective in the modern era [17]. Control measures against influenza pandemic spread are most effectively implemented within countries, particularly at the community

level, rather than through banning travel at the international level [6].

Within the first months of the influenza pandemic of 2009, proposed public health measures in the community focused on containment of the disease and differed from the mitigation measures that were later proposed and implemented. Although a mitigation policy can be recommended in the community, on board ships the containment of disease is advocated in many studies and guidelines, even for seasonal influenza [4, 10, 18].

During the summer of 2009, incidents of influenza A(H1N1)v virus on board cruise ships gained media attention, with some receiving wide coverage. Various approaches and practices were observed among European countries, some of which differed even within the same country. Some authorities required temperature checks on all passengers going ashore, while others did not accept isolation in cabins, but required disembarkation of ill passengers and crew and admission to hospital. In countries outside Europe, public health measures included treatment and isolation of travellers (crew members and passengers), swab testing of travellers, home quarantine of persons who disembarked, quarantine of suspected cases, medical assessment, and screening [19]. Quarantine of a ship was even discussed and recommended. We believe that there is no justification for implementing quarantine measures for ships under the current epidemiological situation, taking into consideration the characteristics of the virus (pathogenicity, virulence, etc.).

CONSIDERATIONS FOR DECISION-MAKING

Respiratory illnesses (common cold and influenza) are some of the most common infections affecting people [20]. Studies on cruise ships [21] and cargo ships [22] have shown that respiratory tract infections were the most frequently diagnosed illnesses for passengers and crew attending the ship's infirmary. Cases of influenza A(H1N1)v virus infection aboard passenger ships have occurred on ships [19]. Because cases of seasonal influenza often occur on ships and there is widespread transmission of the influenza A(H1N1)v virus in the community, it is likely that passenger ships carrying thousands of people would have at least one person with this influenza [6]. We believe that a risk assessment on board the ship may not be necessary on every ship that has reported cases of influenza-like illness and often it is not feasible. Many European ports receive a huge number of ship visits every year. Popular ports might

receive up to twenty ship visits each day during the summer months. Personnel available in competent authorities might have additional responsibilities to those relating to ships. Some authorities might face problems with lack of personnel or other resources. Assessing the risk of each reported event is necessary, however, before proceeding with the enforcement of public health measures. Criteria that could be considered as relevant by competent authorities when conducting risk assessment on board ships having cases of influenza include: a) severe disease or death on board; b) failure of the ship to fill in an appropriate Maritime Declaration of Health; c) the number of cases presenting with influenza-like illness exceeds that expected (outbreak situation) for the specific itinerary and season; d) any indication or information (e.g. information from the previous port of call) that the ship has not implemented appropriate measures (surveillance, isolation, communication, treatment, etc.); e) the need to follow up outbreak control measures advised at an earlier stage; f) a request for assistance by the ship's master.

SUMMARY

A lack of communication between ports might result in a repetition of risk assessments and conflicting advice, or a failure to follow up the outcome of health measures recommended previously by other competent authorities. Port-to-port communication is necessary in order to share information about the health measures that have been taken, as provided in the IHR [3]. Ships travel from country to country, and a lack of common protocols may lead to contradictory measures and the duplication of investigations.

Consistent policy, harmonization, and standardization of competent authorities' actions based on common protocols at a local, national, European, and international level are important. Using communication tools such as the European Commission Early Warning and Response System or other effective communication systems among competent authorities, in order to perform a proper risk assessment and to follow up the effect of the health measures, can contribute to effectively controlling disease outbreaks. In this way duplication of investigations and unnecessary interventions will be avoided.

Risk assessment based on the current facts about diseases is necessary so that the public health measures implemented at ports are proportional to the threat, and overreactions are avoided.

COMPETING INTERESTS

There is no declared conflict of interest.

AUTHORS' CONTRIBUTION

VAM, CLRB, JK, CH, and GN conceived of the article and prepared the first draft. TP, TR, NB, CVM, CMS, CS, and GR contributed to the production of the first draft and subsequent revisions. All authors read and approved the final manuscript.

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- 1 “free pratique” means permission for a ship to enter a port, embark or disembark, discharge or load cargo or stores; permission for an aircraft, after landing, to embark or disembark, discharge or load cargo or stores; and permission for a ground transport vehicle, upon arrival, to embark or disembark, discharge or load cargo or stores (Article 1, IHR 2005).