Coordination of public health surveillance between points of entry and the national public health surveillance system

*Advising principles*

*2nd edition*
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TABLE OF CONTENTS

ACKNOWLEDGEMENTS .................................................................................................................. 1
LIST OF CONTRIBUTORS .................................................................................................................. 1
2nd VERSION OF THE GUIDE AND IMPLEMENTATION TOOLBOX ....................................................... 1
1st VERSION OF THE GUIDE ............................................................................................................. 2
ACRONYMS ......................................................................................................................................... 3
GLOSSARY ........................................................................................................................................ 3
1. INTRODUCTION ............................................................................................................................. 6
   1.1. Rationale .................................................................................................................................. 6
   1.2. Purpose of the guide .................................................................................................................. 7
   1.3. Target audience ....................................................................................................................... 7
2. IHR PROVISIONS REGARDING PUBLIC HEALTH SURVEILLANCE AT POE ........................................... 7
   2.1. Scope of IHR public health surveillance .................................................................................. 7
   2.2. The national IHR focal point ................................................................................................. 8
   2.3. IHR and public health surveillance at PoE ............................................................................. 9
3. EXISTING DOCUMENTS RELATED TO PUBLIC HEALTH SURVEILLANCE AT POE .................................10
   3.1. Other international regulations .............................................................................................. 10
   3.2. International guidance ........................................................................................................... 11
4. PUBLIC HEALTH SURVEILLANCE COORDINATION BETWEEN POE AND THE NPHSS ....................... 11
   4.1. Public health surveillance at the PoE ....................................................................................... 11
      4.1.1. Objectives ...................................................................................................................... 11
      4.1.2. Specificities of public health surveillance at PoE ............................................................ 11
      4.1.3. Sources of information .................................................................................................. 13
      4.1.4. Health data coordinator ................................................................................................ 14
      4.1.5. Events to be registered at the PoE and reported to the NPHSS ..................................... 14
      4.1.6. Data analysis ............................................................................................................... 18
      4.1.7. Data collection and management system ...................................................................... 18
      4.1.8. Communications between PoE ...................................................................................... 19
   4.2. Events linked to travel retrospectively ..................................................................................... 19
   4.3. Coordination for public health surveillance .......................................................................... 20
      4.3.1. Actors for public health surveillance and information flow ......................................... 20
      4.3.2. Communications between all actors .............................................................................. 21
      4.3.3. Standardization of practice ........................................................................................... 22
      4.3.4. National level coordinator of border public health data ................................................ 22
      4.3.5. Feedback to the PoE and their information providers ..................................................... 23
   4.4. Information for action ............................................................................................................ 23
   4.5. Resources needed .................................................................................................................. 23
      4.5.1. Human resources ............................................................................................................ 23
      4.5.2. Other resources .............................................................................................................. 24
5. STRENGTHENING PUBLIC HEALTH SURVEILLANCE COORDINATION ............................................ 24
REFERENCES ...................................................................................................................................... 25
ANNEXES ......................................................................................................................................... 28
   Annex 1. Literature search strategy .............................................................................................. 28
   Annex 2. International guides related to public health surveillance at PoE ...................................... 29
   Annex 3. Proposed case definitions for diseases and syndromes that may be placed under surveillance at PoE ......31
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Coordination of public health surveillance between PoE and the NPHSS

1st version of the guide

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ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>IHR</td>
<td>International Health Regulations (2005)</td>
</tr>
<tr>
<td>NFP</td>
<td>National IHR Focal Point</td>
</tr>
<tr>
<td>NPHSS</td>
<td>National Public Health Surveillance System</td>
</tr>
<tr>
<td>PHEIC</td>
<td>Public Health Emergency of International Concern</td>
</tr>
<tr>
<td>PoE</td>
<td>Points of Entry</td>
</tr>
<tr>
<td>SARS</td>
<td>Severe Acute Respiratory Syndrome</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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</tbody>
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GLOSSARY

“Affected”: persons, baggage, cargo, containers, conveyances, goods, postal parcels or human remains that are infected or contaminated, or carry sources of infection or contamination, so as to constitute a public health risk (1).

“Aircraft”: an aircraft making an international voyage (1).

“Airport”: any airport where international flights arrive or depart (1).

“Arrival” of a conveyance: in the case of a seagoing vessel, arrival or anchoring in the defined area of a port; in the case of an aircraft, arrival at an airport; in the case of an inland navigation vessel on an international voyage, arrival at a point of entry; in the case of a train or road vehicle, arrival at a point of entry (1).

“Cargo”: goods carried on a conveyance or in a container (1).

“Contact tracing”: identification of persons who may have been exposed to an infectious disease by another infected person (2). It aims to identify new cases and respond to them in a timely way, hence preventing the further spread of the disease (3).

“Contamination”: presence of an infectious or toxic agent or matter on a human or animal body surface, in or on a product prepared for consumption or on other inanimate objects, including conveyances, that may constitute a public health risk (1).

“Competent authority”: authority responsible for the implementation and application of health measures under the International Health Regulations (2005) (1).

“Conveyance”: aircraft, ship, train, road vehicle or other means of transport on an international voyage (1).

“Conveyance operator”: natural or legal person in charge of a conveyance or their agent (1).

“Crew”: persons on board a conveyance who are not passengers (1).

“Departure”: for persons, baggage, cargo, conveyances or goods, the act of leaving a territory (1).

“Designated point of entry”: airports, ports and certain ground crossings designated by States Parties to develop the capacities set forth in Annex 1 of the International Health Regulations (2005). These capacities include: an access to appropriate medical services (with diagnostic facilities); services for the transport of ill persons; trained personnel to inspect ships, aircraft and other conveyances; maintenance of a safe environment; a programme and trained personnel for the control of vectors and reservoirs; a public health emergency contingency plan; capacities for responding to events that may constitute a public health emergency of international concern (1).

“Event”: a manifestation of disease or an occurrence that creates a potential for disease (1).

“Ground crossing”: a point of land entry in a State Party, including one utilized by road vehicles and trains (1).
“Health measure”: procedures applied to prevent the spread of disease or contamination; a health measure does not include law enforcement or security measures (1).

“International Health Regulations (2005)”: international legal instrument entered into force on 15 June 2007 that is binding in 196 countries across the globe (IHR State Parties), including all WHO Member States. The regulations aim to help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide.

“International voyage”: in the case of a conveyance, a voyage between points of entry in the territories of more than one State, or a voyage between points of entry in the territory or territories of the same State if the conveyance has contacts with the territory of any other State on its voyage but only as regards those contacts; in the case of a traveller, a voyage involving entry into the territory of a State other than the territory of the State in which that traveller has commenced the voyage (1).

“Invasive”: the puncture or incision of the skin or insertion of an instrument or foreign material into the body or the examination of a body cavity. For the purposes of this guide, medical examination of the ear, nose and mouth, temperature assessment using an ear, oral or cutaneous thermometer, or thermal imaging; medical inspection; auscultation; external palpation; retinoscopy; external collection of urine, faeces or saliva samples; external measurement of blood pressure; and electrocardiography shall be considered to be non-invasive (1).

“National IHR Focal Point”: the national centre, designated by each State Party, which shall be accessible at all times for communications with WHO IHR Contact Points under the International Health Regulations (2005) (1).

“National Public Health Surveillance System”: a nationwide coordination that enables all public health response levels (i.e. local, intermediate and national) to collect and share public health information to detect, monitor, control and prevent the occurrence and spread of public health events.

“Medical examination”: the preliminary assessment of a person by an authorized health worker or by a person under the direct supervision of the competent authority, to determine the person’s health status and potential public health risk to others, and may include the scrutiny of health documents, and a physical examination when justified by the circumstances of the individual case (1).

“Notification”: the mandatory or advised communication of information by a State Party to WHO as stated in article 6 of the International Health Regulations (2005).

“Point of entry”: a passage for international entry or exit of travellers, baggage, cargo, containers, conveyances, goods and postal parcels as well as agencies and areas providing services to them on entry or exit (1).

“Port”: a seaport or a port on an inland body of water, where ships on an international voyage arrive or depart (1).

“Public health emergency of international concern”: extraordinary event which is determined, as provided in the IHR (i) to constitute a public health risk to other States through the international spread of disease, and (ii) to potentially require a coordinated international response (1).

“Public health risk”: likelihood of an event that may affect adversely the health of human populations, with an emphasis on one which may spread internationally or may present a serious and direct danger (1).

“Reporting”: process by which events and public health risks are brought to the knowledge of the health authorities (3).

“Reservoir”: animal, plant or substance in which an infectious agent normally lives and whose presence may constitute a public health risk (1).

“Ship”: a seagoing or inland navigation vessel on an international voyage (1).

“Public health observation”: the monitoring of the health status of a traveller over time for the purpose of determining the risk of disease transmission (1).
“Public health surveillance”: the systematic on-going collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary (1).

“Traveller”: a natural person undertaking an international voyage (1).

“Vector”: an insect or other animal which normally transports an infectious agent that constitutes a public health risk (1).

“WHO IHR Contact Point”: the unit within WHO which shall be accessible at all times for communications with the National IHR Focal Point (1).
1. **INTRODUCTION**

1.1. **Rationale**

Annex 1 of the International Health Regulations (2005) (hereafter referred to as the IHR) requires State Parties to meet specific minimum core capacity requirements for surveillance and response (1). Public health surveillance has been defined as the systematic ongoing collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary (1). A public health surveillance system serves two main objectives (3):

- To measure disease burden, including monitoring mortality/morbidity trends, in order to effectively guide control programmes and the allocation of resources.
- To early detect public health risks and events of all origins, in order to ensure that they are rapidly investigated and controlled. The organized mechanism to reach this objective is referred to as early warning alert and response (3).

In the context of this document, we have defined the national public health surveillance system (NPHSS) as the nationwide coordination that enables all public health response levels (i.e. local, intermediate and national) to collect and share public health information to detect, monitor, control and prevent the occurrence and spread of public health events.

The efficient collection of pertinent information is critical for early detection of public health risks and events, as is the reporting of information to the competent authorities for taking measures (3). Pertinent information is generated at points of entry (PoE), including ports, airports and ground crossings, and should be reported timely to the NPHSS and beyond, as appropriate. For their part, PoE should promptly receive all pertinent information generated elsewhere that may contribute to their public health surveillance objectives such as to prevent and/or manage the importation and exportation of health hazards or health risks arising at the PoE.

A number of guides (4,5) and meetings of experts have reported a lack of coordination between the NPHSS and authorities at PoE receiving or generating information on health events related to travellers, goods, and conveyances. These meetings include:

- Asia Pacific Strategies for Emerging Diseases (APSED) country consultation (Colombo, Sri Lanka, 14-16 July 2010) (6);
- EpiSouth Plus project meeting (Rome, Italy, July 2011) (7);
- World Health Organization (WHO) 2nd informal consultation meeting for management of public health events on board ships (Lyon, France, April 2012) (8);
- Inter-country meeting on strengthening surveillance and response capacities under the IHR (Beirut, Lebanon, March 2012) (9).
- WHO regional meeting on IHR core capacities at PoE (Kochi, India, June 2013) (10).

WHO organized an expert consultation meeting to develop guidance on coordination between PoE and NPHSS (Lyon, France, July 2012) (11). During this meeting, experts confirmed that existing NPHSS need to formalize and strengthen links among PoE authorities and NPHSS offices at the appropriate levels. They recommended both the purpose and content of this guide.

A first edition of this guide was published in 2014. Since then, the Ebola outbreak in West Africa and other public health emergencies have reinforced the need to have strong coordination between PoE and NPHSS for public health surveillance, and additional resource materials related to public health surveillance at PoE...
have been published. In order to translate the principles set forth in this guide into concrete actions, WHO has developed a toolbox composed of guidance and practical tools to support countries in strengthening their public health surveillance coordination between PoE and the NPHSS.

A second expert consultation meeting took place (Lyon, France, June 2017) to finalize the second version of this guide and its accompanying toolbox (12). In this second edition of the guide: the list of references of interest has been updated, the layout has been changed to clearly separate all advising principles from their practical implementation using the newly developed toolbox, redundancies have been removed and additions have been made to clarify the content.

1.2. Purpose of the guide

This guide aims to support competent authorities in charge of IHR implementation in improving national capacities for the prevention, detection and control of events, by strengthening communications and coordination between PoE and the NPHSS. This guide includes:

- the IHR requirements and principles regarding public health surveillance and PoE;
- a list of published regulations and guidance related to public health surveillance at PoE;
- advising principles for public health surveillance coordination between PoE and the NPHSS;
- a presentation of the toolbox developed to support the practical strengthening of public health surveillance coordination between PoE and the NPHSS.

1.3. Target audience

The target audience for this document includes:

- the authorities at PoE responsible for receiving reports of public health events from designated crew members of conveyances or their operators, and from the NPHSS;
- the authorities at PoE responsible for centralizing public health information and/or conducting public health surveillance activities;
- the authorities at national and intermediate levels responsible for implementing health measures and for providing pertinent public health surveillance information to PoE authorities. These national and intermediate authorities include all levels of the NPHSS and the National IHR Focal Point (NFP);
- all agencies, organizations, and other bodies that contribute to the reporting of information related to potential events involving PoE.

The guidance is directed to all international PoE but can be applied to any airport, port and ground crossing to the extent of the country capabilities.

2. IHR PROVISIONS REGARDING PUBLIC HEALTH SURVEILLANCE AT POE

2.1. Scope of IHR public health surveillance

The purpose of the IHR is to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade (1).

The scope of the IHR has been expanded from specific diseases (cholera, plague and yellow fever) to any “illness or medical condition, irrespective of origin or source, that presents or could present significant harm
to humans” (1). This includes events caused by infectious diseases, zoonosis, chemical and radiological agents, vectors and other sources of diseases.

The IHR no longer provide a list of diseases to be put under surveillance, but define the concept of "public health emergency of international concern" (PHEIC) and provide a "decision instrument" (IHR Annex 2) to determine if an event may constitute a PHEIC, which then requires notification to WHO.

2.2. The national IHR focal point

Under the IHR, each State Party has designated a National IHR Focal Point (NFP), which is accessible at all times for communications with WHO IHR Contact Points. The NFP functions include (IHR article 4.2):

- sending urgent communications concerning the implementation of IHR in the country to WHO IHR Contact Points;
- disseminating information to, and consolidating input from, relevant sectors including those responsible for public health surveillance and reporting, PoE, public health services, clinics and hospitals, and other government departments.

Mandatory notifications by State Parties to WHO through the NFP concern:

- all events that may constitute a PHEIC occurring within their territory in accordance with the decision instrument (IHR article 6.1), including unexpected or unusual events (IHR article 7), within 24 hours of assessment of public health information;
- as far as practicable, any public health risk identified outside their territory that may cause international disease spread, as manifested by exported or imported human cases, vectors carrying infection or contamination, or contaminated goods, within 24 hours of receipt of evidence (IHR article 9.2);
- as far as applicable, and upon request, relevant data concerning sources of infection or contamination at their PoE, including vectors and reservoirs, which could result in international disease spread (IHR article 19);
- the health measures (e.g. entry/exit screening, isolation) implemented in response to events which may constitute a PHEIC (IHR article 6.1);
- additional health measures that significantly interfere with international traffic (e.g. isolation of the affected conveyances) together with their health rationale, within 48 hours of implementation, unless those measures were recommended by the WHO Director General (IHR article 43.5).

For events for which there is insufficient information available to complete the decision instrument, a State Party may nevertheless keep WHO advised through the NFP and consult with WHO on appropriate health measures (IHR article 8).
2.3. IHR and public health surveillance at PoE

According to Annex 1.A of the IHR (1), States Parties shall utilize existing national structures and resources to meet their core capacity requirements for public health surveillance and response including:

- at local level: the capacities to detect events involving disease or death above expected levels for the particular time and place in all areas within the State Party’s territory (including at PoE); and to report all available essential information immediately to the appropriate level of health-care response;
- at national level: to provide, by the most efficient means of communication available, links with airports, ports and ground crossings for the dissemination of information and recommendations received from WHO regarding events in the State Party’s own territory and in the territories of other States Parties.

State Parties designate PoE that shall develop the capacities provided in Annex 1.B of the IHR (IHR article 20.1). These capacities include but are not limited to:

- **At all times:**
  - providing access to appropriate medical services, including diagnostic facilities, to allow the prompt assessment and care of ill travellers;
  - providing access to equipment and personnel for the transport of ill travellers to a medical facility.

- **For responding to events that may constitute a PHEIC:**
  - establishing and maintaining a public health emergency contingency plan;
  - providing appropriate space, separate from other travellers, to interview persons affected or suspected of being so;
  - providing for the assessment, and if necessary, the quarantine of suspect travellers;
  - applying entry or exit controls for arriving and departing travellers.

State Parties shall identify the competent authorities at each designated PoE (IHR article 19). Competent authorities may operate at local, intermediate, or national level depending on the country. The competent authorities at the PoE are responsible for (IHR article 22.1):

- ensuring that baggage, cargo, containers, conveyances, goods, postal parcels and human remains carried through the PoE are free of sources of infection or contamination;
- applying public health measures (e.g. inspections of conveyances, vector control, medical examination of travellers, disinfection, decontamination).

Competent authorities may require:

- The inspection of baggage, cargo, containers, conveyances, goods, postal parcels and human remains (IHR article 23).
- From travellers:
  - their itinerary, destination, health documents required under the IHR;
  - a non-invasive medical examination, and if there is evidence of a public health risk, on a case-by-case basis, the least intrusive and invasive medical examination that would prevent the international spread of disease (IHR article 23);
  - the completion of contact information forms and questionnaires on travellers’ health (IHR article 35).
- The ship’s Maritime Declaration of Health (see section 4.1.3), and from the master of a ship or the ship’s surgeon, any information related to health conditions on board during an international voyage (IHR article 37, IHR Annex 8).
• The Health Part of the Aircraft General Declaration (see section 4.1.3), and from the pilot in command of an aircraft or the pilot’s agent, any information relating to health conditions on board during an international voyage (IHR article 38, IHR Annex 9).

Officers in command of ships or pilots in command of aircraft, or their agents, shall inform the port or airport control as early as possible of any cases of illness indicative of a disease of an infectious nature or evidence of a public health risk on board. This information must be relayed immediately to the competent authority for the port or airport. In urgent circumstances, such information should be communicated directly by the officers or pilots to the relevant port or airport authority (IHR article 28.4). Conveyance operators shall facilitate the provision of relevant public health information requested by the State Party (IHR Annex 4).

If evidence of a public health risk is found on board a conveyance and the competent authority is not able to carry out the control measures required, the affected conveyance may nevertheless be allowed to depart on condition that, at the time of departure, the competent authority informs its counterpart at the next known PoE of the evidence found and of the control measures required. In the case of a ship, this information shall be noted in the Ship Sanitation Control Certificate (IHR article 27.2). The next PoE must also be informed if any travellers have been placed under public health observation but allowed to continue their international voyage (IHR article 30).

States Parties are obliged to collect and handle health information containing personal identifiers in a confidential manner. However, States Parties may disclose and process personal data when it is essential for the purposes of assessing and managing a public health risk, subject to particular conditions (IHR article 45).

3. **EXISTING DOCUMENTS RELATED TO PUBLIC HEALTH SURVEILLANCE AT PoE**

3.1. Other international regulations

Besides the IHR, two other international regulations relate to public health surveillance at PoE:

• The Convention on International Civil Aviation issued by the International Civil Aviation Organization (13), including its Annex 9 (14), Annex 11\(^1\), Annex 14\(^2\), and the Air Traffic Management document (15). These documents:
  o comply with IHR provisions regarding aircraft and airports;
  o detail the documents that can be required by a Contracting State for the entry and departure of an aircraft, the passenger information that can be provided, and the modalities for communicating such information;
  o detail how a suspected communicable disease aboard an aircraft should be reported by the pilot-in-command and the air traffic control;
  o detail the special arrangements for collecting and disseminating in-flight and post-flight reports from aircraft;
  o detail Aerodrome emergency planning and the coordination of actions to be taken in an emergency occurring at an aerodrome or in its vicinity, including public health emergencies;

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Coordination of public health surveillance between PoE and the NPHSS

• include models of the aircraft General Declaration, the Passenger Manifest, and the Public Health Passenger Locator Form (see section 4.1.3).
• The Terrestrial Animal Health Code issued by the World Organisation for Animal Health (16), which defines the requirements of its member countries regarding the surveillance and control of animal diseases.

3.2. International guidance

A list of international guides related to public health surveillance at PoE is presented in Annex 2 of this document.

4. Public health surveillance coordination between PoE and the NPHSS

4.1. Public health surveillance at the PoE

4.1.1. Objectives

Public health surveillance is the systematic on-going collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary. Different objectives of public health surveillance at PoE and of coordination with the NPHSS may be considered, such as:

• the early detection of events for their timely verification and the application of control measures;
• assisting competent authorities at PoE, and at all relevant levels in the health system and other sectors, in implementing preventive measures, investigation, risk assessment, control and follow-up of events;
• alerting other PoE likely to face the same event;
• preventing and managing the importation and exportation of health hazards (including diseases and their agents) into a country and between countries.

The epidemiological situations, as well as the volume and characteristics of the movement of conveyances, cargoes and travellers, vary according to State Party and PoE. State Parties must assess their national situation and the capabilities at their PoE, in order to identify their needs and priorities for public health surveillance.

4.1.2. Specificities of public health surveillance at PoE

PoE are considerably different from community settings and require different approaches for implementing public health surveillance:

• The focus and methods for public surveillance depend on the type of PoE (i.e. ports, airports or ground crossings) and the governance and structural arrangements in effect in the country.
• Useful public health surveillance data may be collected by organizations and ministries other than the Ministry of Health.
• Collecting public health surveillance data may not be viewed as a priority by key actors (e.g. customs and immigration officials, conveyance operators, service providers).
• The lack of health and paramedical personnel in the majority of the conveyances or at PoE, is a challenge for efficient public health surveillance and should be compensated by effective mechanisms for intersectoral communications, coordination, and information-sharing.

• The IHR require surveillance with a multisector “all-hazard approach” including biological, chemical, and radiological hazards. In PoE and conveyances, this relates to the passage of passengers and crews, animals, plants, and goods of diverse origins.

• The approach to public health surveillance at PoE is often focused on detecting and reacting rapidly to individual events, and usually does not include ongoing systematic data collection for analysing and calculating epidemiological indicators.

Travellers usually spend more time on board ships, with more opportunities for interaction, than on aircraft or ground transportation. An aircraft can transfer potential hazards from country to country much faster than other types of conveyance. Ground conveyances remain for a shorter time at ground crossings than aircraft and ships at airports and ports respectively. Moreover, each type of conveyance relates to different types of risks depending on the population and the cargo, the itinerary, and each conveyance’s specific construction and environment.

Specificities at ports:

• Ships provide accommodation for travellers, including passengers and crew members, who may stay on board for a period ranging from few hours to several months. Passenger ships are also able to carry large numbers of people, ranging from hundreds to thousands. A lack of effective public health surveillance activities and control measures can result in rapid and widespread outbreaks (17). Even outbreaks on cargo ships with small crews can jeopardize the safety of sailing if the majority of crew members develop serious illness. The role played by ships in the transnational spread of communicable diseases is documented historically (18).

• Therefore, public health surveillance aboard ships is essential for the timely capture of changes in trends in the numbers and characteristics of cases, and for facilitating the timely implementation of health measures, including contact tracing (19–22).

• Food-borne and water-borne diseases including Legionnaires’ disease, as well as gastrointestinal illness and influenza-like illness should be specifically under surveillance aboard ships (22,23).

• Ships contribute to the dissemination of vectors and reservoirs, their invasion and establishment in new places, and the consequent spread of vector-borne diseases. Cargo ships can carry live animals and diverse goods associated with specific risks, for instance biological hazards, dangerous chemical agents, or vectors.

• Ships can also affect the water in ports by accidentally discharging garbage, sewage and other waste, or with bilge water and ballast water. These may transfer exotic and invasive species to the port water and coastal areas, as well as pollution with a potential impact on sea life and the human populations (e.g. *Vibrio cholerae*).

Specificities at airports:

• Air travel can play a major role in the rapid spread of infectious diseases since it allows millions of travellers and significant volumes of goods to move from country to country within hours.

• Aircraft have also played a role in the dissemination of vectors and vector-borne diseases worldwide; both through passengers and cargo.

• As a result of the high quality of air on board modern commercial aircraft, the risk of air transmission of diseases is likely to be similar to, or less than, other circumstances in which people are together in confined spaces (24).
• Aircraft cannot be unduly delayed from landing. Diverting aircraft from their intended PoE can create risks for the safe operation of that aircraft.

• It is usually impracticable to quarantine travellers on board aircraft so PoE need facilities to handle up to several hundred passengers and crew, some of whom may be cases and close contacts.

Specificities at ground crossings:

• Ground conveyances such as cars, trucks, buses and trains transport travellers, goods, plants and animals. The confined environment of ground transportation, where passengers or animals often remain confined for long hours, can facilitate disease transmission as well as the dissemination of infected vectors and reservoirs.

• Zoonosis surveillance and food safety surveillance (including local food vending stores) are important at ground crossings and should include the veterinary services.

• Specific challenges in applying control measures at ground crossings include:
  o the difficulties of screening large numbers of goods and persons, especially for countries with many hard-to-control ground crossings;
  o the fact that passengers may remain in the conveyance during the border crossing (unless directed to secondary inspection);
  o the lack of accessibility to health services;
  o the lack of facilities or services such as the disposal of special waste and hazardous materials;
  o the lack of human resources competent to address public health events;
  o the lack of formal documents available for each traveller.

4.1.3. Sources of information

When identifying sources of information for public health surveillance, the following main sources common to most PoE can be considered:

• officers in command of ships or pilots in command of aircraft, or their agents, who shall make known any case of illness indicative of a disease of an infectious nature or evidence of a public health risk on board as early as possible (see section 2.3);

• PoE actors, such as veterinary services, agricultural services, customs, immigration authorities, transport authorities, conveyance operators, facility operators (at ports/airports/ground crossings), organizations and/or ministries responsible for shipments of hazardous substances, radioactive sources and human remains;

• PoE health care services (or the nearest health care services), which treat travellers and workers, mainly for acute health events;

• the general public and travellers directly affected by, or who have witnessed, any health event;

• immigration cards which may include passenger itineraries and contact details (24), the cargo manifests, the CITES declarations, and other declarations related to the transport of hazardous substances, radioactive sources and human remains;

• travellers’ public health declaration forms (25), which may be requested by States Parties from arriving and departing travellers;

• the NFP;

• the NPHSS;

• the competent authority at the previous PoE in an international voyage (see section 4.1.7.);

• informal sources of information, such as media reports or rumours.

Specific sources of information available at ports:

• Maritime Declaration of Health: before any ship on an international voyage arrives at its first port of call in the territory of a State Party, the master of that ship shall ascertain the state of health on board, and,
Coordination of public health surveillance between PoE and the NPHSS

on arrival or in advance, will complete and deliver a maritime declaration of health to the competent authority (IHR article 37, IHR Annex 8), except when the State Party does not require it.

- **Ship Sanitation Certificates**: ships should be inspected regularly to certify that they are free of infection and contamination, including vectors and reservoirs (IHR article 39). If the competent authority identifies a public health risk during a ship's inspection, the inspection findings and the control measures taken are recorded in the Ship Sanitation Certificates (IHR article 27 and Annex 3).

- **Ship's illness medical log**: for each voyage, a standardized illness medical log recording all illnesses should be maintained daily by a designated crew member. It should include all cases of communicable diseases, syndromes (e.g. febrile rash, influenza-like illness, acute gastroenteritis), or other such events that occurred during the voyage.

- **Other sources of data**—e.g., stevedores, port workers' unions, port and flag state control systems, maritime and port authorities.

Specific sources of information available at airports:

- **Health part of the Aircraft General Declaration**: the pilot in command of an aircraft or the pilot's agent, in flight or upon landing at the first airport in the territory of the State Party, shall complete the Health Part of the Aircraft General Declaration and deliver it to the competent authority (IHR article 38, IHR Annex 9), except when the State Party does not require it.

- **Passenger Manifest** (i.e. passenger name list): in case of an event aboard an aircraft, State Parties can require the aircraft conveyer to present the passenger manifest, which should provide the names of all the passengers aboard the aircraft (14).

- **Public health passenger locator form**: passengers and crew may be asked to complete this when a public health risk has been identified and States Parties request information for contact tracing (14).

- **Other sources of data**: the air traffic control (responsible for passing on information from inflight communications with aircraft), the airline companies' representatives, ground handlers.

Specific sources of information available at ground crossings:

- The IHR do not stipulate health documents at ground crossings for conveyances or travellers on foot, but systematic health checks of travellers at ground crossings are sometimes conducted as part of health checks on immigrants.

- **Other sources of public health surveillance data** include the drivers of the conveyances, the conveyance operators, or migrant detention centres and border guards. Operational procedures and railway association guidelines could also be considered.

- Whereas cruise ships and aircraft usually have medical staff or trained non-medical staff able to detect events on board and inform the ports or airports, ground conveyances generally lack this type of staff training and involvement.

### 4.1.4. Health Data Coordinator

A focal person or team should be designated with the role of coordinating public health surveillance at each PoE, centralizing and registering all the relevant health information, and ensuring a unique channel of data exchanges with the NPHSS and other actors. In principle, this role may be assigned to the PoE competent authority. However, depending on the actors and resources available, the coordinator can be from the Ministry of Health or another agency.

### 4.1.5. Events to be registered at the PoE and reported to the NPHSS

The various multisectoral actors operating at PoE collect information related to their respective duties and objectives. Some of this information is of interest to human public health, while some is of lesser or no interest since it relates to hazards that are not known to adversely affect human health. The key guiding concept is the public health risk. Under the IHR, public health surveillance activities must cover any type of
event with the potential to become a PHEIC (see section 2.1). Beyond IHR requirements, countries may have to identify other public health risks of interest to them at national level, as well as to individual PoE.

To facilitate the collection and registration process, PoE could register all events defined by the IHR definition of an event as “a manifestation of disease or an occurrence that creates a potential for disease”. Each event should lead to one entry in a paper registry and/or electronic database. However, the amount of data to be collected and registered need to be balanced against the cost and labour this data collection entails.

Events to be registered may be identified by non-medically trained personnel (conveyance operators and their crews, PoE actors), the general public and travellers, media reports or rumours. The following signs and symptoms can be used to suspect a case of disease of an infectious nature (criteria from the Maritime declaration of health and the Health part of the Aircraft General Declaration):

- a fever for several days (temperature 38°C/100°F or greater);
- a fever (temperature 38°C/100°F or greater) associated with one or more of the following signs or symptoms: appearing obviously unwell, persistent coughing, impaired breathing without previous injury, confusion of recent onset, decreased consciousness⁴, glandular swelling⁵, jaundice⁶;
- with or without fever: any acute skin rash or eruption⁷, severe vomiting (other than motion sickness), severe diarrhoea, recurrent convulsions.

Events may also be identified and further documented through documents used at PoE. Table 1 presents some of these documents.

### Table 1. Information available in documents used at PoE

<table>
<thead>
<tr>
<th>Documents that may be available</th>
<th>Type of information collected in the document</th>
<th>Data available in the document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maritime declaration of health</td>
<td>Death. Case of disease suspected of being of an infectious nature. Number of ill passengers greater than expected. Any condition on board which may have led to infection or the spread of disease. Sanitary measure applied on board. Sick animal or pet on board.</td>
<td>For each case: name, age, sex, nationality, port and date joined. Nature of illness, date of onset of symptoms. Whether or not the case has been reported to a port health officer. Disposal of the case, (1) whether the person recovered, is still ill or has died; and (2) whether the person is still on board, was evacuated (including the name of the port or airport), or was buried at sea. Drugs, medicines or other treatment given to the patient. Comments.</td>
</tr>
</tbody>
</table>

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³ Gasping for air; unable to catch his or her breath; breathing too fast and struggle to get enough air (22).
⁴ Condition of an ill person when he or she is not fully aware of what is going on around himself or herself, may appear confused, or may be unusually difficult to awaken. An ill person with decreased consciousness may not know the date or their name (22).
⁵ Enlargements of glands located in the head, neck, or groin (22).
⁶ Yellowish discoloration of skin, eyes and/or other bodily tissues or fluids (22).
⁷ Areas on the skin with multiple red bumps; red, flat spots; or blister-like bumps filled with fluid or pus that are intact or partly crusted over. Rashes may be discrete, may run together and may include one or more areas of the body (22).
<table>
<thead>
<tr>
<th><strong>Ship sanitation certificates</strong></th>
<th>Evidence of public health risks on board, including: infection or contamination, vectors in all stages of growth; animal reservoirs for vectors; rodents or other species that could carry human disease; microbiological, chemical and other risks to human health; signs of inadequate sanitary measures. Control measures prescribed or applied on board.</th>
<th>Evidence found, sample results, control measures or corrective actions prescribed/applied.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ship’s illness medical log</strong></td>
<td>All cases of treatment of sick persons on board, including communicable diseases, syndromes, or other events that occurred during the voyage</td>
<td>Name of the ship, the voyage dates and the voyage identification code, all cases of communicable diseases or events or syndromes. For each passenger or crew member: the first date of a clinic visit or report of illness to a crew member; the person’s name, age and gender; their designation as a passenger or crew member; the crew member’s position or job on the ship, if applicable; their cabin number; the date and time of illness onset; the symptoms of the illness; the use of medication; the presence of underlying medical conditions or medication side-effects or other comments, laboratory results if available.</td>
</tr>
<tr>
<td><strong>Health part of the Aircraft General Declaration</strong></td>
<td>Persons on board with illnesses other than air-sickness or the effects of accidents, who may be suffering from a communicable disease; as well as any cases of illness disembarked during a previous stop. Details of each disinsection or sanitary treatment.</td>
<td>Name and seat number or function of affected person on board (plus additional information depending on airlines, such as the phone number), status of aircraft disinsection.</td>
</tr>
<tr>
<td><strong>Passenger manifest</strong></td>
<td>List of passengers on board a conveyance.</td>
<td>Conveyance no., date, point of embarkation, point of disembarkation, surname and initials of all passengers.</td>
</tr>
<tr>
<td><strong>Public health passenger locator form (only for aviation)</strong></td>
<td>Seat numbers of passengers on board a conveyance during the flight and their contact details.</td>
<td>Flight information including seat number, personal information, phone numbers, permanent and temporary addresses, emergency contact information, travel companions.</td>
</tr>
<tr>
<td><strong>Traveller’s public health declaration form</strong></td>
<td>Symptoms or other information that may suggest a risk of a disease of an infectious nature.</td>
<td>Traveller information. Public health information: signs and symptoms compatible with a communicable disease, risk factors depending on the context. Can also include information on goods transported such as radioactive or hazardous substances.</td>
</tr>
<tr>
<td><strong>International certificate of vaccination</strong></td>
<td>Individual vaccinations for international travel.</td>
<td>Type of vaccine, date of administration.</td>
</tr>
<tr>
<td><strong>Arrival and/or Departure Cards</strong></td>
<td>Passenger details.</td>
<td>May include itinerary, contact information.</td>
</tr>
</tbody>
</table>

Suspect cases of an infectious disease should be further assessed in a proper medical care facility, either at the PoE (if such facilities with appropriate equipment and properly trained medical personnel are available) or outside the PoE. Assessment of suspect cases may lead trained medical personnel at the PoE to suspect or confirm specific diseases or syndromes that could present a public health risk. Proposed case definitions for such diseases and syndromes are presented in Annex 3 of this document.
To make the system sustainable, only data used for public health purposes should be collected (26). The following minimum information should be registered for each event (i.e. case of illness or death indicative of a disease of an infectious nature, or evidence of a public health risk):

- **detection date**;
- **location of the event**: e.g. aboard a conveyance (specify reference of the conveyance and location of the traveller on board), at the PoE, other;
- **description of the case**: age, sex, clinical description/symptoms, dates of onset of symptoms, country of origin, origin and final destination of traveller. Provide background information on the case if appropriate (e.g. vaccination history, specific underlying medical condition, reported contact with a person sick with a communicable disease);
- **current status of the case**, e.g. alive/dead;
- **contact information** of the case;
- **laboratory results** (if available);
- **description of a public health risk**: type of suspected event, source of contamination if applicable, date of occurrence;
- **current status of a public health risk**: e.g. ongoing, controlled;
- **management of the case/public health risk**: health measures implemented or intended (e.g. medical care and/or prophylaxis, treatment administered), referral of the case (specify where and when) or permission to pursue travel, health measure implemented or intended for a public health risk (specify what, where, when);
- **comments**.

It is up to each country to decide which events should be registered and reported to the NPHSS. Timely detection and report of a potential public health risk is critical to the management of a public health event (25). As PoE might not have the capacities to decide if an event is relevant or not, a good rule is that all events registered at the PoE should be reported to the NPHSS. PoE should report symptoms and descriptions of all events/cases and be able to request support from the NPHSS. Confirmation of the aetiology should not delay the reporting of a suspected event.

When an event is reported, the following information should be included:

- **source, date and time of the report** (by whom and when the event was first reported);
- **contact details of the information source** (name, office number, mobile number);
- **description of the event** (what happened, the type of suspected event, the source of contamination, if applicable);
- **location of the event** (e.g. aboard a conveyance, at the PoE, other);
- **start date** (date of onset of symptoms in the first case, or date of occurrence of another type of event);
- **number of cases** (the number of people affected), if applicable and feasible: the attack rate (the number of cases/the population at risk);
- **description of cases** (age, sex, clinical description/symptoms, dates of onset of symptoms, number of cases confirmed, origin and final destination of travellers). Provide background information on the cases if appropriate (e.g. history of vaccination, specific underlying medical condition), and laboratory results if available;
- **number of deaths** (how many deaths occurred among the cases);
- **factors that may affect the spread of the event** (e.g. mass gathering, evidence of infection or contamination identified during an inspection, specific population);
Coordination of public health surveillance between PoE and the NPHSS

- **health measures implemented or intended** (what health measures, who implemented or intends to implement them, and when);
- **status of the event** (whether ongoing or controlled);
- **is assistance needed?** (If so, specify what is needed);
- **any other relevant information concerning the event.**

### 4.1.6. **Data analysis**

The data collected must be analysed and interpreted. This may be carried out at local, intermediate, or national level depending on each country’s specific arrangements and capacities. Procedures should be established for monitoring both the volume of conveyance movement and the number of travellers through the PoE. This information will be used to define the denominators for analysing public health surveillance data (e.g. the number of travellers per time period, the passenger-days of travel, the number of incoming and outgoing conveyances per time period, the number of passengers per conveyance). The following are examples of indicators that could be calculated and monitored:

- number of events identified in the entire country’s PoE per number of incoming and/or outgoing travellers during a specific time period;
- number of events per number of incoming and/or outgoing travellers per type of PoE (i.e. port, airport, ground crossings) during a specific time period;
- number of events per passenger-day on board a conveyance;
- number of events per total number of incoming and/or outgoing conveyances at a PoE during a specific time period.

Seasonality and secular trends can be also analysed. For common diseases like gastrointestinal and influenza-like illnesses, the expected rate per time period or per itinerary could also be calculated (number of cases per number of passengers during a specific period or per itinerary). This could be of help for the early detection of outbreaks (i.e. if the monitoring of these indicators identifies an increase in the number of cases beyond predefined thresholds (3), e.g. 2% of gastrointestinal illness among a ship’s passengers (20,22,23)).

### 4.1.7. **Data collection and management system**

A data collection and management system should be developed to ensure the efficient collection, storage, management, and analysis of health data related to events at PoE. The complexity of the system depends on the resources and capacities available within each country.

A paper-based system does not require specialized technical knowledge to operate the system. However, data collected on paper may have to be further transcribed and/or entered into a database to facilitate data analysis and interpretation. Paper-based systems can also present challenges to monitoring data quality since they also lack the necessary data validation and completeness checks.

While an electronic-based system may require some technical knowledge from the users, it presents a number of advantages. It can provide a more efficient method to store, manage and improve information flow of data. It allows the inclusion of quality control measures to ensure data quality, and greater timeliness in data access and data transmission.

Further consideration should be given by countries to secure data storage, data access and data sharing to ensure patient confidentiality.
4.1.8. Communications between PoE

With regards to an international voyage, the competent authority at the previous PoE must inform his/her counterpart at the next known PoE if a traveller was placed under public health observation but allowed to continue his/her international voyage, or if a public health risk was found on board a conveyance and the required control measures were not performed before departure (IHR article 27.2).

International PoE can communicate directly between each other, or through the NFP, according to national requirements and guidelines. The rules for PoE-to-PoE communication, inside a country and between countries, should be clarified. Direct communications between PoE for operational purposes (in particular in federal countries or between countries) may be facilitated by establishing general administrative arrangements in advance. These may save time and effort by avoiding excessive case-by-case formal authorization procedures. Such arrangements must include all ministries and agencies that play a role in public health-related international communications.

4.2. Events linked to travel retrospectively

Some events among travellers, such as early stage communicable diseases, may be diagnosed after disembarkation.

When there are suspect or confirmed cases of a communicable disease on board, fellow travellers should be advised to contact their healthcare provider should they become ill during a specified period following the travel. They should refer to their recent travel history during their health assessment with their healthcare provider so that the NPHSS can be informed as required (27).

Likewise, in all health facilities, the clinical evaluation of cases of communicable diseases of public health concern should contain a detailed history of recent travels (i.e. within the past three months) including means of travel, destination(s) and duration of travel (24). Information about travel-related cases should be reported to the NPHSS. In such situations, investigation takes place retrospectively and public health measures may need to be applied after the travellers have disembarked and left the PoE. These events must be communicated to PoE health authorities.

In order to identify such travel-related events, NPHSS staff should be advised to collect travel information and include it in their reports. This will make it possible to:

- link the case with travel and consequently inform the competent authority at the PoE, who may then implement the necessary health measures (e.g. in the event of a Legionella case linked to travel in a ship);
- inform, as needed, the counterpart authorities in other countries involved (24);
- identify all the travel-related cases and analyse the public health surveillance data based on that parameter (28).

The following diseases may be considered for the systematic recording of travel information: anthrax, diphtheria, viral haemorrhagic fevers (e.g. Ebola, Lassa, Marburg, Yellow fever), pulmonary tuberculosis, meningococcal disease, measles, SARS, MERS-CoV, human influenza caused by a new subtype, pneumonic plague and Legionnaires’ disease.
4.3. Coordination for public health surveillance

4.3.1. ACTORS FOR PUBLIC HEALTH SURVEILLANCE AND INFORMATION FLOW

Events at PoE cannot be detected solely at the PoE location. Data collection is often a complex process involving different actors at all levels within the country and also external to the country. Actors in public health surveillance at PoE are not limited to the public health sector but also belong to other sectors and disciplines (11). Strong intersectoral operational links and active information sharing should therefore be established. The involvement of chemical, food safety, radiological, and animal health experts may be required, depending on the event (5).

The various actors can be involved in routine surveillance as well as during an emergency (including emergency responses). Many of the same actors perform in both routine surveillance and in emergencies with some changes in roles. Possible roles and responsibilities of actors for PoE public health surveillance are: data provision, data collection and analysis, event detection, data reporting, data dissemination, risk assessment, implementation of control measures and provision of advance notice of such implementation, monitoring and evaluation, training, development and dissemination of guidelines and standard operating procedures, and coordination of the response. Roles and responsibilities of each actor for PoE public health surveillance must be clearly defined and agreed between all actors.

The routes and the rules of communication between actors should also be agreed upon and formalized. Figure 1 presents an example of actors for public health surveillance at PoE and their information flow.
Public health surveillance contact points for the PoE can be at different levels of the NPHSS depending on the situation.

* International centres and networks for surveillance exist only in some regions of the world; † According to national rules and arrangements.

### 4.3.2. Communications between all actors

Actors involved in event detection and response must be identified with their contact details, and their roles and responsibilities must be clearly stated. Depending on the event, different actors from both the private and public sectors would be involved at local, intermediate, national and international levels (example in Figure 1).
Public health surveillance contact points should be identified at each PoE, for each level of the NPHSS, and at the IHRS national focal point, together with the other actors involved (including the conveyance operators and other service providers). A contact list (on paper and/or in electronic format) should be maintained and made available with updated contact details: names, phone and fax numbers, and the email address of the contact points (3,27,29,30). All the public health surveillance actors should be provided with the contact details that relate to their specific responsibilities, in accordance with the agreed routes and rules of communication. Contact information sorted by the type of risk can be useful.

A variety of means is available for communicating information. These include written reports, telephone, fax, radio, and electronic data transmission (e.g. email, web-based communication tools). For events needing immediate reporting the quickest and most reliable option should be selected, but whatever the means used, the actors’ contact details and the information to be communicated must be predefined and agreed upon by all parties. Information-sharing records should always be kept, and data confidentiality needs to be ensured.

4.3.3. Standardization of practice

Data about events collected from the different sources should be registered and consolidated at both PoE and national level. Case definitions must be standardized countrywide (see proposed case definitions in Annex 3).

Standard operating procedures (SOPs) should specify, for each actor, the tasks and modalities required for data detection, triage, registration, verification, analysis, risk assessment, communication, and response. These SOPs should include:

- a list of events to be reported and their case definitions;
- a mapping of data sources and a diagram depicting the information flow;
- a national contact list with updated contact information for each actor (see section 4.3.2);
- each actor’s specific responsibilities;
- the procedures, legal framework, and templates for:
  - receiving, collecting, and assessing reports from arriving conveyances,
  - requesting additional public health information from the conveyance operators,
  - both routine and emergency reporting of information,
  - feedback of information,
  - implementing public health measures and contact tracing.

These SOPs should be adapted for each PoE to ensure that:

- all sources of public health surveillance data effectively transmit their information to the health data coordinator, and,
- in the opposite direction, that all pertinent data generated elsewhere is transmitted in a timely manner to the relevant persons at the PoE level.

SOPs to be used during emergencies must be developed and should be part of the PoE public health emergency contingency plan. Where required, memorandums of understanding could be signed, or other agreements put in place between all the different actors and sectors involved in public health surveillance related to PoE.

4.3.4. National level coordinator of border public health data

At a national level, there should be an authority responsible for coordinating border health activity, including public health surveillance and response, according to the country context. This coordinator/coordinating
authority should liaise with the NFP and be responsible for developing SOPs, identifying needs in terms of material and human resources, and establishing training and contingency plans for public health surveillance at PoE.

Depending on the characteristics of the borders and the resources available, a country may allocate this function to an officer assuming other public health surveillance roles. Alternatively, a country may establish a dedicated Central Coordination Unit, which must then ensure close ties with other public health surveillance units. In countries with numerous PoE and extensive borders and/or coastlines, additional intermediate level coordination may be justified.

4.3.5. Feedback to the PoE and their information providers

Feedback to the information providers is essential for building and strengthening the relationship between the various levels and mobilizing partners. Actors involved in detection, risk assessment and response must be informed routinely about the follow-up and evolution of the events they have communicated, for instance by receiving acknowledgments for the information they have sent, receiving information updates (e.g. laboratory results, actions undertaken, any developments in the spread of the event), and being informed about the closure of the event. This could be done through weekly newsletters, quarterly bulletins, and/or direct communication (3).

In addition, the IHR require the State Party to provide, by the most efficient means of communication available, links with airports, ports, ground crossings for the dissemination of information and recommendations received from WHO concerning events in the State Party’s own territory as well as in the territories of other States Parties (IHR Annex 1).

4.4. Information for action

Public health surveillance information collected at the national and international level may trigger response activities at the PoE and in the country. Case studies and guidance are available for several topics related to response at both PoE and national levels:

- development and implementation of a public health emergency plan (4,31);
- performance of risk assessment for the collection and analyses of information about the hazards, exposures and context in which an event is occurring, to evaluate its risk to human health (32,33);
- implementation of control measures to manage a public health event on board a conveyance or at a PoE (22,34);
- implementation of contact tracing to identify persons who may have been exposed to an infectious disease by another infected person (2,3,14,22,24,34–42).

The main guides are listed in Annex 2 of this document.

4.5. Resources needed

4.5.1. Human resources

Trained personnel are crucial for effective public health surveillance coordination and a timely response to a public health event at the PoE. Training should be provided to all actors involved in public health surveillance, including conveyance operators, customs and other personnel who have contact with travellers, goods and conveyances or who work at PoE. Training should enable non-health personnel to recognize key symptoms and signs indicative of disease of an infectious nature among travellers (see section
4.1.4). Human resources development should follow the overall principle of sustainability. Initial training could be complemented by regular “refresher” training courses (3). Regular meetings among the various actors involved will also contribute to harmonizing practices and improving the system.

### 4.5.2. Other resources

PoE should have an efficient and reasonable record-keeping system (see section 4.1.5) for the traceability of events, documentation on the inspection of conveyances and the application of public health measures, and for monitoring the volume of conveyances and travellers' movements.

Appropriate communications tools are needed between all actors (see section 4.3.2).

The resources required for health assessment, immediate risk assessment and for implementing preliminary control measures, must be available at all times.

### 5. Strengthening public health surveillance coordination

To support countries in implementing the content of this guide and strengthen its public health surveillance coordination between PoE and the NPHSS, WHO has developed and made available a toolbox that includes guidance and tools for assessing existing practices and for developing a tailored action plan and SOPs.

REFERENCEs


7. The Episouthe plus project. 1st work package 7 steering team meeting. Roma: Episouthe; 2011


37. Risk assessment guidelines for infectious diseases transmitted on aircraft. ECDC; 2009.  


42. Responding to new influenza A(H1N1): options for interventions at international points of entry. World Health Organization Regional Office for the Western Pacific; 2009.
ANNEXES

ANNEX 1. LITERATURE SEARCH STRATEGY

The search strategy aimed to identify published papers and guidance related to public health surveillance of events related to points of entry. The following databases were searched:

- Medline using PubMed:
  - Search strategy:
  - Published after 01/01/2005
  - Search performed on 06/02/2017.
  - 1138 results screened.

- WHO IRIS repository:
  - Search strategy: “surveillance” AND “points of entry”
  - Search performed on 07/02/2017
  - The results were screened.

- The web was searched using Google search engine:
  - Search and screening strategy: the 100 first results of each request were screened:
    - Health surveillance” point of entry” OR "points of entry" OR airport OR port OR ground crossing OR aircraft OR ship OR bus OR train filetype:pdf
    - Cross border health surveillance filetype:pdf
  - Search performed on 27/08/2014 and 07/02/17
## Annex 2. International guides related to public health surveillance at PoE

<table>
<thead>
<tr>
<th>PoE Type</th>
<th>Reference</th>
<th>Surveillance-related content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Source</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>Airports</td>
<td>Guidelines for states concerning the management of communicable disease posing a serious public health risk. International Civil Aviation Organization; 2009. <a href="http://www.icao.int/safety/aviation-medicine/guidelines/AvInfluenza_guidelines.pdf">link</a></td>
<td>Guidance for the surveillance and reporting of events on board an aircraft or at an airport.</td>
</tr>
<tr>
<td>Ground crossings</td>
<td>Contact tracing risk assessment profile (CT-RAP) for public ground transport. Robert Koch Institute; 2011. <a href="http://www.rki.de/EN/Content/Prevention/React/Work/wp7/WP_7_tool1.pdf?__blob=publicationFile">link</a></td>
<td>Risk assessment guidance for selected diseases on board ground conveyances to decide whether or not contact tracing is of interest.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disease/syndrome</th>
<th>Case definition</th>
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<tbody>
<tr>
<td>Acute haemorrhagic fever syndrome*</td>
<td><strong>Suspected case:</strong> acute onset of fever of less than 3 weeks duration in a severely ill patient. AND any of 2 of the following: haemorrhagic or purpuric rash; epistaxis (nose bleed); hematemesis (blood in vomit); haemoptysis (blood in sputum); blood in stool: other haemorrhagic symptoms, AND no known predisposing factors for haemorrhagic manifestations. <strong>Confirmed case:</strong> a suspected case with laboratory confirmation or epidemiologic link to confirmed cases or outbreak.</td>
</tr>
<tr>
<td>Cholera*</td>
<td><strong>Suspected case:</strong> In a patient aged 5 years or more: severe dehydration or death from acute watery diarrhoea. In the event of a cholera epidemic: any person aged 5 years or more with acute watery diarrhoea, with or without vomiting. <strong>Confirmed case:</strong> a suspected case in which Vibrio Cholerae O1 or O139 has been isolated in the stool.</td>
</tr>
<tr>
<td>Dengue fever*</td>
<td><strong>Suspected case:</strong> any person with acute febrile illness of 2-7 days duration, AND 2 or more of the following: headache, retro-orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations, leucopenia. <strong>Confirmed case:</strong> a suspected case with laboratory confirmation.</td>
</tr>
<tr>
<td>Gastrointestinal illness†</td>
<td>Acute diarrhoea (three or more episodes of loose stools in a 24 hours period), OR Vomiting AND at least one of the following symptoms: one or more episodes of loose stools in a 24 hour period, abdominal cramps, headache, muscle aches, fever ≥38°C.</td>
</tr>
<tr>
<td>Human influenza caused by new subtypes‡</td>
<td>Laboratory-confirmed case of a recent human infection caused by an influenza A virus which has: a) demonstrated the capacity to infect a human, b) is not a variant or mutated form of those (i.e. A/H1 or A/H3) circulating widely in the human population.</td>
</tr>
<tr>
<td>Influenza-like illness*</td>
<td>A person with sudden onset of fever of ≥38°C and cough or sore throat in the absence of other diagnoses.</td>
</tr>
<tr>
<td>Legionnaires' disease†</td>
<td>Pneumonia (Legionnaires' disease) or self-limiting influenza-like illness (Pontiac fever). AND laboratory confirmation or probable diagnosis of legionellosis or environmental exposure to a shared source of Legionella contamination.</td>
</tr>
<tr>
<td>Measles §</td>
<td><strong>Possible case:</strong> any person with fever and maculo-papular rash, AND at least one of the following three symptoms: cough, conjunctivitis, coryza. <strong>Probable case:</strong> any possible case with an epidemiological link to human-to-human transmission. <strong>Confirmed case:</strong> any possible or probable case not recently vaccinated and meeting the laboratory criteria for measles.</td>
</tr>
<tr>
<td>Meningococcal disease §</td>
<td><strong>Possible case:</strong> any person with at least one of the following five clinical criteria: fever, meningeal signs, petechial signs, septic rash, septic arthritis. <strong>Probable case:</strong> any possible case with an epidemiological link to human-to-human transmission. <strong>Confirmed case:</strong> laboratory-confirmed invasive meningococcal disease.</td>
</tr>
<tr>
<td>Pneumonic plague*</td>
<td><strong>Suspected case:</strong> any person with a sudden onset of fever, chills, headache, severe malaise, prostration and very painful swelling of lymph nodes, or cough with blood-stained sputum, chest pain, and difficulty in breathing. <strong>Confirmed case:</strong> suspected case confirmed by isolation of <em>Yersinia pestis</em>, or epidemiologic link to confirmed cases or outbreak.</td>
</tr>
<tr>
<td>Poliomyelitis due to wild type poliovirus ‡</td>
<td><strong>Suspected case:</strong> a child under 15 years of age presenting with acute flaccid paralysis, or any person at any age with paralytic illness if poliomyelitis is suspected. <strong>Confirmed case:</strong> suspected case with isolation of wild poliovirus in stool specimens collected from the suspected case or from a close contact of the suspected case.</td>
</tr>
<tr>
<td>Disease/syndrome</td>
<td>Case definition</td>
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| Rabies*                          | **Suspected case:** a person with one or more of the following: headache, neck pain, nausea, fever, fear of water, anxiety, agitation, abnormal tingling sensations or pain at wound site, when contact with a rabid animal is suspected.  
**Confirmed case:** a suspected case with laboratory confirmation.                                                                                                                                                                                                                                                                                                                                                               |
| Rift Valley fever*               | **Suspected case:**  
*Early disease:* acute febrile illness (axillary temperature >37.5 °C or oral temperature >38.0°C) of more than 48 hours duration that does not respond to antibiotic or antimalarial therapy,  
AND direct contact with sick or dead animal or its products,  
AND/OR recent travel (in the previous week) to, or living in an area where the virus activity is suspected/confirmed  
AND/OR abrupt onset of any one or more of the following: exhaustion, backache, muscle pains, headache (often severe), discomfort when exposed to light, and nausea/vomiting,  
AND/OR nausea/vomiting, diarrhoea or abdominal pain with one or more of the following: severe pallor (or Hb < 8 gm/dL), low platelets (thrombocytopenia) as evidenced by the presence of petechiae (or platelet count < 100x10^9 / L), evidence of kidney failure (oedema, reduced urine output or creatinine > 150 mol/L),  
AND/OR evidence of bleeding, AND/OR clinical jaundice (3-fold increase above normal of transaminases).  
**Late stages of diseases or complications (2-3 weeks after onset):** patients who have experienced a flu-like illness in the preceding month, with clinical criteria and who additionally develop the following: central nervous system manifestations which resemble meningo-encephalitis AND/OR unexplained visual loss.  
**Confirmed case:** a laboratory-confirmed suspected case                                                                                                                                                                                                                                                                                                                                                                                                 |
| Severe acute respiratory syndrome (SARS)‡ | **Clinical case definition:** a history of fever  
AND one or more symptoms of lower respiratory tract illness (cough, difficulty breathing, shortness of breath),  
AND radiographic evidence of lung infiltrates consistent with pneumonia or acute respiratory distress syndrome, or autopsy findings consistent with pneumonia or acute respiratory distress syndrome without an identifiable cause.  
**Confirmed case:** individual with laboratory confirmation of infection with SARS coronavirus, who either fulfils the clinical case definition of SARS or who has worked with live SARS coronavirus or clinical specimens infected with SARS coronavirus.                                                                                                                                                                                                                         |
| Signs and symptoms of potential infectious diseases that require further evaluation** | Fever (temperature 38°C or more) associated with certain signs or symptoms as appearing obviously unwell, with persistent coughing, impaired breathing, persistent diarrhoea, persistent vomiting, skin rash, bruising or bleeding without previous injury, confusion of recent onset. With or without fever: any acute skin rash or eruption, severe vomiting (other than motion sickness), severe diarrhoea, recurrent convulsions.                                                                                                                                                                                                                      |
| Smallpox‡                        | Acute onset of fever (> = 38.3 °C), malaise, and severe prostration with headache and backache occurring 2 to 4 days before rash onset,  
AND development of a maculopapular rash starting on the face and forearms, then spreading to the trunk and legs, and evolving within 48 hours to deep-stated, firm/hard and round well-circumscribed vesicles and later pustules, which may become umbilicated or confluent,  
AND lesions that appear in the same stage of development on any given part of the body,  
AND no alternative diagnosis explaining the illness,  
AND laboratory confirmation.                                                                                                                                                                                                                                                                                                                                                                                                 |

* ‡ **Note:** These diseases are listed here for information purposes only and do not necessarily represent all diseases or conditions that may be monitored for surveillance purposes.
<table>
<thead>
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<th>Disease/syndrome</th>
<th>Case definition</th>
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<td><strong>Tuberculosis</strong></td>
<td><strong>Suspected case:</strong> any person with a cough lasting 3 weeks or more.</td>
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<td></td>
<td><strong>Confirmed case:</strong></td>
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<td><em>Smear-positive pulmonary tuberculosis:</em> a suspected patient with at least 2 sputum specimens positive for acid-fast bacilli, OR one sputum specimen positive for acid-fast bacilli by microscopy and radiographic abnormalities consistent with active pulmonary tuberculosis as determined by the treating medical officer, OR one positive sputum smear by microscopy and one sputum specimen positive on culture for acid-fast bacilli.</td>
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<td></td>
<td><em>Smear negative pulmonary tuberculosis:</em> a patient who fulfils all the following criteria: two sets taken at least 2 weeks apart of at least two sputum specimens negative for acid-fast bacilli on microscopy, radiographic abnormalities consistent with pulmonary tuberculosis and a lack of clinical response despite one week of a broad-spectrum antibiotic, a decision by a physician to treat with a full course of anti-tuberculosis chemotherapy, OR a patient who fulfils all the following criteria: severely ill, at least two sputum specimens negative for acid-fast bacilli by microscopy, radiographic abnormalities consistent with extensive pulmonary tuberculosis (interstitial and miliary), a decision by a physician to treat with a full course of anti-tuberculosis chemotherapy, OR a patient whose initial sputum smears were negative, who had sputum sent for culture initially, and whose subsequent sputum culture result is positive.</td>
</tr>
<tr>
<td>Viral Haemorrhagic</td>
<td><strong>Probable case:</strong> symptoms compatible with Ebola fever (sudden onset of fever, intense weakness, muscle pain, headache, sore throat, vomiting, diarrhea, rash, impaired kidney and liver functions, internal and external bleeding), AND within 21 days of symptom onset: risk exposure in sub-Saharan Africa (medical treatment, contact with body fluids of ill persons, contact with primates or bats in areas with suspected or known Ebola activity) or contact with a case of Ebola fever.</td>
</tr>
<tr>
<td>fever: Ebola §</td>
<td><strong>Confirmed case:</strong> a suspected case that is laboratory confirmed.</td>
</tr>
<tr>
<td>Viral Haemorrhagic</td>
<td><strong>Probable case:</strong> clinical symptoms compatible with Lassa (malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhoea, myalgia, chest pain, hearing loss), AND within 21 days of symptom onset: risk exposure to rats or their droppings in rural areas of West Africa or contact with a case of Lassa fever.</td>
</tr>
<tr>
<td>fever: Lassa §</td>
<td><strong>Confirmed case:</strong> a suspected case that is laboratory confirmed.</td>
</tr>
<tr>
<td>Viral Haemorrhagic</td>
<td><strong>Probable case:</strong> symptoms compatible with Marburg (abrupt onset, severe headache, severe malaise, muscle aches and pains, high fever, severe watery diarrhoea, abdominal pain and cramping, nausea, vomiting), AND within 21 days of symptom onset: risk exposures in sub-Saharan Africa (medical treatment, contact with body fluids of ill persons, contacts with primates or bats; all of the above in areas with suspected or known Marburg activity) or contact with a case of Marburg haemorrhagic fever.</td>
</tr>
<tr>
<td>fever: Marburg §</td>
<td><strong>Confirmed case:</strong> a suspected case that is laboratory confirmed.</td>
</tr>
<tr>
<td>West Nile fever*</td>
<td><strong>Suspected case:</strong> a hospitalized case of encephalitis due to unknown cause.</td>
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<tr>
<td></td>
<td><strong>Confirmed case:</strong> laboratory confirmation of a suspected case.</td>
</tr>
<tr>
<td>Yellow fever*</td>
<td><strong>Suspected case:</strong> any person with acute onset of fever, with jaundice appearing within 14 days of onset of the first symptoms.</td>
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<tr>
<td></td>
<td><strong>Probable case:</strong> a suspected case with an epidemiological link to a confirmed case or outbreak or a positive post-mortem liver histopathology.</td>
</tr>
<tr>
<td></td>
<td><strong>Confirmed case:</strong> a laboratory confirmed suspected case.</td>
</tr>
</tbody>
</table>