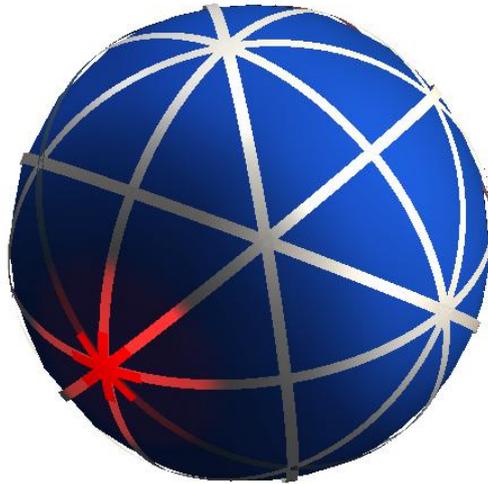# PANDHUB

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                         Incidents in Transport Hubs

D4.3 – Guidance and support tools when performing a multi-country investigation: considerations for responding to serious cross-border threat events in transport hubs

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Summary

This deliverable concerns aspects of multi-country investigations of EU serious cross-border threats that are relevant to transport hubs and transport hub operators.

In the event of a serious cross-border communicable disease outbreak or threat inside Europe, coordination of investigation, risk assessment and scientific support would be led by the European Centre for Disease Prevention and Control (ECDC) by methods ECDC has developed and adopted. Therefore, it was agreed by the PANDHUB Stakeholder Liaison Group and consortium to focus this deliverable on what is specific to transport hubs as an infectious disease event setting; what the impact of the setting might be on cross-border outbreak investigation and what tools and guidance might be of operational use to hubs, for preparedness and response.

Through a series of consultations with transport operators, public health experts and exploration of pertinent literature, this report discusses what is extraordinary, or challenging, about the hub context for a cross-border outbreak investigation. This work also summarises the current state of incident management preparedness for biological threats within the hubs consulted, identifies common themes and presents recommendations, where gaps in guidance or preparedness have been highlighted.

The needs of transport operators for preparedness and contingency planning for serious biological incidents varied, *e.g.,* by hub type (ground transport or airport), presence of onsite first aid and medical care at individual hubs or whether they directly connect with international points of entry. The extent of these individual needs might also reflect the level of operational involvement operators had during the Ebola Virus disease (EVD) outbreak and how well they felt the situation was handled within their hubs.

One of this report's main findings from these consultations was the desire for stronger connections between transport operators and public health practitioners, to support both business continuity and incident response. These connections focus on clarity of the route into Public Health; the provision of public health information either before, and/or during, the acute stage of a serious biological incident; and best practice strategies for communicating risk to staff and stakeholders. Included in this document are tools and guidance suggested by operators and other stakeholders to help address these points.

On a larger scale, this report highlights that there is currently no European-level cross-sector transport preparedness guidance to aid hub operators with development of operational pandemic, or serious biological threat, contingency plans. Additionally, despite the development of communication platforms, such as those for ports (SHIPSAN) and airports (AIRSAN), there is no evidence of a Europe-wide cross-sector transport communications system.

The first recommendation of this report is the development of a European-level preparedness planning framework for transport operators, that not only supports planning, but also formalises response networks ahead-of-time and provides operators with an evidence base for decision-making, helping ensure that the balance of business continuity and protecting health is achieved.

The second recommendation is the development of European-level cross-transport sector communication plans, with best practice risk communication strategies and scenarios, for cross-border threat incidents. This could be developed within the preparedness planning framework. Article 4 of EU Decision 1082/2013 obliges Member States to share preparedness plans. EU 2017/1140 legislation on cross–border threats[1] concerns the exchange of personal data through EWRS between EU Commission, ECDC, Member State Ministries and National Infectious Disease expert institutions for contact tracing. These personal data include travel specifications with conveyance data. The third recommendation is development of a cross-sector transport communications platform, potentially building upon existing platforms, to connect transport operators with each other and with public health.

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[1] COMMISSION RECOMMENDATION (EU) 2017/1140 - on personal data that may be exchanged through the Early Warning and Response System (EWRS) established pursuant to Decision No 1082/2013/EU of the European Parliament and of the Council for the purposes of the coordination of contact tracing measures in relation to serious cross-border threats to health. Published 23rd of June 2017.

Abbreviations

APHP	Assistance Publique Hôspitaux de Paris
COBRA	Cabinet Office Briefing Room A
ECDC	**European Centre for Disease Prevention and Control**
EU	European Union
EVD	Ebola Virus Disease
IHR	International Health Regulations
MERS-CoV	Middle East Respiratory Syndrome coronavirus
NHS	National Health Service
PAGNet	Ports, Airports and Ground Crossing Network
PHE	Public Health England
POE	Point of Entry
RAGIDA	Risk Assessment and Guidelines for Infectious Diseases transmitted on Aircraft
SARS	Severe Acute Respiratory Syndrome
SAMU	**Service d'Aide Médicale Urgente (French Emergency Medicine Organization)**
TfL	Transport for London
VT	Virgin Trains
WHO	World Health Organization

Contents

1. Introduction

The focus of this deliverable is to describe what is specific, and peculiar, to the transport hub as an infectious disease event setting and how this might impact on cross-border outbreak investigation. A hub is essentially a place of mass gathering: large transport hubs can constitute enclosed spaces with a high density of individuals—such as in shops, at passport control and check-in desks—and can act as amplifier for person-to-person transmission of communicable disease, refer to Deliverable 2.2 *Report on Hotspots.* Where hubs are international, there is the potential for disease outbreaks to involve multiple countries (cross-border threats) because of the potential to disperse and propagate communicable disease into other countries relatively quickly and widely. Transport hubs can also be attractive targets for intentional biological release because of the large number of people who pass through them, but also because hubs, particularly rail hubs, can offer unrestricted access; complicating contact- and source- tracing efforts.

Deliverable 2.3 *Disease spread in transport environments* found that although confirmed transmission of influenza has been documented to occur on board aircraft and ships and influenza-like illness (ILI) transmission has been documented for ships and on trains, there is no documented evidence of transmission of influenza, EVD or pneumonic plague in transport hubs for travel by air, land or sea, nor of deliberate release with regards to plague or anthrax in such settings. However, the potential for transmission of influenza at airports has been illustrated in modelling studies: air transport accelerates the importation of both influenza and EVD to new areas whilst hubs with direct international connectivity pose the greatest risk of human-human transmission.

Despite their potential role in disease propagation and transmission, hubs also have a unique role in limiting spread, either through early communication with other hubs, staff and the public, contact with Public Health or through increased awareness and infection control. But this is dependent upon preparedness, knowing what would be required of them as operators; having the communication flows and contact information in place to alert the next actor in the chain, be that health, public health, transport operator or law enforcement/security authority.

The global repercussions of the EVD outbreak in West Africa (2014-2016) were a serious operational challenge for transport operators, as well as for public health organisations. It became clear that, while operators have well-practised and effective incident management

plans for safety and security-related incidents, a focus was required on developing incident management plans for serious biological threats.

As detailed in Deliverable 5.1 *Review of communication flows*, health crisis management information flows and the various actors are already well-defined and organised according to International Health Regulations, from national to European and international levels. However, from a transport hub operational focus, two important conclusions arose from Deliverable 5.1:

i) There is no general cross-sector European-level guidance for the management of infectious disease incidents in transport hubs (although there is guidance informing action when there is a health incident aboard a transport vehicle);

ii) There is no European-level communication network between transport hubs, particularly between the main European train stations, nor a European port network for human health (although some countries might have well-run national communication systems between specific transport operators, *e.g.,* train industry; ports; through national focal points)

For this task, a series of consultations was held with major transport hub operators, Port Health, public health and ECDC experts, to understand the current preparedness for a serious health event with cross-border potential occurring in a transport hub. The findings of those meetings are reported here, with key themes discussed within the wider context of what guidance and tools would be of value, at both national and European level, to help ensure that hubs, stakeholders and public health protection are ready to respond to the next big biological threat – whatever that proves to be.

2. Goal

The main goal of this deliverable is to investigate what is peculiar, or particular, about infectious disease events in transport hubs, and what implications and challenges these might have on investigating an infectious disease outbreak on a multi-country scale.

Additional goals are to understand how serious biological events are managed, by different transport hub sectors and between different countries; identify current gaps in information, communication or incident management processes and to make suggestions or

recommendations for guidance or tools to improve response to health threats, within the extraordinary context of a transport hub.

3. Limitations

The focus of this report is on real-time events occurring in a transport hub but, as with biological events (natural or otherwise), an event in a transport hub might only be identified when infected individuals present to healthcare. For this reason, contact tracing within hubs is considered here, where there is retrospective linkage to travel.

The production of guidance and support tools to perform multi-country investigations has been considered by the PANDHUB Stakeholder Liaison Group and consortium to be outside of the Task 4.3 remit since, in the event of a communicable disease cross-border outbreak or threat inside Europe, coordination of investigation, risk assessment and scientific support would be led by the European Centre for Disease Prevention and Control (ECDC), following the European Union Decision 1082/2013/EU on serious cross-border threats. Additionally, public health officials attached to major hubs know the International Health Regulation focal points and links with the European Early Warning and Response System (EWRS) very well. This deliverable therefore focusses on what is specific to transport hubs as an infectious disease event setting, the impact of the setting on cross-border outbreak investigation and what tools and guidance might be of operational use to hubs, for preparedness and response.

A number of transport operators were approached to be interviewed for this work. Some either did not respond or, if they did, a meeting was not held due to a halt in communication, although consultations held do span airports and ground crossings. The main consultations conducted for this deliverable have, for practicality, been with UK transport operators although discussions with EU transport operators and ECDC experts at stakeholder liaison meetings have ensured that this document is written within a European context and is applicable to a wider European audience.

4. Methods

For this task, consultations were held with public health experts and (UK) transport operators (rail and air) (

Table 1). To ensure that the scope of this deliverable is fit-for-purpose within the project and the findings are representative in a European environment, all work has been presented to members of the PANDHUB Consortium and Stakeholder Liaison Group (Table 2) and feedback gathered for final drafting of this report.

4.1   Consultations with transport operators and public health experts

With reference to incidents which might pose a cross-border (multi-country) threat - such as those scenarios considered in Deliverable 2.1 - occurring in a transport hub, we asked what processes existed and what challenges transport operators faced, in order to:

I.   identify what existing European-level transport hub-to-hub point of entry communication/coordination mechanisms individual transport operators might have in the event of a cross-border threat incident;

II.   understand what existing hub-to-public health communication mechanisms transport operators might have;

III.   understand what the challenges might be in responding to, and communicating, an incident in a hub;

IV.   understand what guidance/proforma tools/administrative arrangements would be useful for transport operators in a cross-border threat situation (that they might not already have) *e.g.,* decision-making/communication tools, public health information or contact details.

The consultations and discussions with experts from international public health bodies included ECDC and Public Health England Port Health, and were conducted to understand public health considerations with respect to incidents occurring in transport hubs.

Table 1. Interviewees and affiliations

Reponsibility	Organisation
Regional Centre Director, Sussex, Surrey & Kent/Programme Director, Operations Centre	Public Health England
Head of Port Health, Heathrow	Public Health England
Environment, Health and Safety Director	Gatwick Airport Ltd
Head of Safety, London Underground	Transport for London
Head of Health and Safety, Surface Transport	Transport for London
Head of Resilience and Security Planning	Transport for London
Public Health Registrar Health and Environment	Transport for London
Consultant in Public Health	Transport for London
Executive Director, Corporate Affairs	Virgin Trains
Senior Expert, EU preparedness group	European Centre for Disease Prevention and Control
Expert Epidemiologist	European Centre for Disease Prevention and Control
Expert – response and epidemic intelligence	European Centre for Disease Prevention and Control

4.2 PANDHUB stakeholder liaison meetings

Work on this task and deliverable was presented to project stakeholders during the 6-monthly plenary meetings, latterly at the plenary in Paris, April 2017. Feedback was asked for from, and questions posed to, attending transport operators and representatives from ECDC, with the aim of clarifying direction of the deliverable and ensuring that the perspective of the work is European.

Table 2 Stakeholder Liaison Group experts

Reponsibility	Organisation
Security Manager	Régie Autonome des Transports (RATP), Paris
Vice president and director of passenger management	Finavia - Finnish airport operator
Head of Influenza and other Respiratory Viruses	European Centre for Disease Prevention and Control

5. Results

5.1 Cross-border threats and European Centre for Disease Prevention and Control's role in cross-border investigation

A serious cross-border health threat is defined under Decision no. 1082/2013/EU of the European Parliament and of the Council (1) as "*a life-threatening or otherwise serious hazard to health of biological, chemical, environmental or unknown origin which risks spreading across the national borders of member states*". This includes novel and emerging threats: sudden and large-scale *e.g.,* influenza, EVD, SARS or MERS-CoV or long-term threats: known or foreseeable *e.g.,* multi-drug resistant tuberculosis, HIV, polio and STIs. The diseases of interest in the PANDHUB project (pneumonic plague, influenza, MERS-CoV, EVD, anthrax) are categorised as novel and emerging threats and therefore outbreaks would necessitate cross-border investigation.

There are a number of cross-border, multi-country outbreaks a year requiring investigation, such as *E. coli (2),* MERS-CoV (3), Legionnaires' disease (4), Multidrug-resistant tuberculosis (5), Salmonella Enteritidis (6) and Botulism (7). Some of these events fall into the category of serious cross-border threats. These are investigated with support from ECDC.

The serious global outbreak of SARS in 2003 and its rapid spread across borders was a motivating force behind the creation of the European Centre for Disease Control in 2005. This EU-wide institution for public health was established to improve coordination of Member States' response, and provide scientific advice on options, to control such outbreaks at the EU level. Legislation to improve preparedness and response across the EU to serious cross-border health threats was formalised by the European Parliament and of the Council of 22 October 2013 through Decision 1082/2013 (1). As an independent technical agency of the EU established by Regulation (EC) No 851/2004, ECDC supports the Health Security Committee by providing co-ordinated investigation, validated data, risk assessments, and scientific guidance. The overall aim of ECDC during a public health event is to minimise the impact of the crisis on EU citizens, by assisting the Member States and the European Commission in their response activities. The operational management of the health events stays under the responsibility of the member states, but European and international bodies

are informed in instances of serious cross-border threats. In the event of a European threat, the European Centre for Disease Prevention and Control (ECDC) would co-ordinate investigation and response, upon request from Member States.

Public health officials attached to major transport hubs know the national, International Health Regulation (IHR) and WHO focal points and the links with the Early Warning Response System (EWRS) very well. This is ECDC's official reporting tool; a secure alert system allowing Member States to send alerts about events with a potential impact on the EU, share information, and coordinate their response. The system has already been successfully used for previous outbreaks of SARS, pandemic influenza A(H1N1) and other communicable diseases.

5.2 Lessons learned from the EVD outbreak, West Africa 2014-2016

It is clear from discussions with transport operators and other stakeholders for this report that a number of operators were concerned that the response to the EVD outbreak had not been managed well in their hubs and had caused confusion. Moreover, senior managers felt that the outbreak highlighted skills gaps within their incident management teams and also underlined the need to have greater information from health protection organisations, both prior to, and during, an event. What is key, perhaps to transport operators and hub or port health authority (refer to section 5.5.4.3) staff alike, is to have more public health information in advance of a serious biological incident; to have contingency planning scenarios and generic planning modelling tools to support operational decisions. Although Port Health functions can differ between Member States, from a Port Health perspective, it is important to determine what operational control measures they would need to have in place on behalf of health protection organisations in a 'big' incident. It was felt that the only two control measures currently available to a hub would be communications and information support, with the potential for screening. Operators and Port Health are keen to have the tools in place to enable them to be more proactive with regards to health events, rather than reactive 'on the fly'. The need for effective communications was also a requirement.

5.3   Challenge of responding to biological threats

There are a number of scenarios in which a serious biological threat could occur in a hub: a controllable situation where information from air traffic control identifies an incident on a plane (you can park the plane somewhere); where there is an identified threat, such as with the EVD outbreak or pandemic influenza (preparedness meetings can be held with public health organisations and rescue services involved), but where there are no preparedness tools or prior warning, *e.g.* a collapsed person with an infectious disease, occurs in a terminal or nearby premises or facilities, or in an underground system, this can be more problematic and less controllable.

There is another scenario where it may not become apparent that a transmission event has occurred until the index case or secondary cases are detected within the health system and are retrospectively linked. If the incident occurred in an international transport hub, potential contacts will have dispersed away from the exposure site and, depending on the incubation period, the delay in detection could be days or weeks. This presents a challenge for contact tracing and source identification. Additional challenges with biological threats are (8):

- difficulty of timely detection and diagnosis
- rapid depletion of human and structural resources
- heightened perception in media, politics and society
- training deficits in first response structures
- no harmonised risk assessment processes
- complexity of intersectoral cooperation
- high potential to achieve a cross-border dimension

5.4 Transport hubs and the challenges of contact tracing for outbreak investigation (retrospective linkage)

5.4.1 General considerations

Transmission of infection in a transport hub is not much different from transmission in any mass gathering; a hub is a place. Major international hubs service large numbers of people in close contact with others, often in confined spaces for varying amounts of time. However, one of the main additional concerns is that an international hub provides the means to disperse infection to other locations and, in particular, other countries very quickly.

Identifying potentially-exposed individuals retrospectively will be a challenge. There will be parts of hubs which have restricted entry, a 'closed' system – providing a potential opportunity to identify travellers, by ticketing or card use - and parts that offer unrestricted access to hub infrastructure – 'open' system meaning that 'unidentified' users could not easily be traced. These elements will differ with transport hub type. Train stations particularly are vulnerable to deliberate attack with lots of rail track and many passengers.

There is guidance on when and how, to initiate contact tracing (9) (10) (11) (12) (13), but for most of the organisms of interest in PANDHUB contact tracing would be initiated, due to their serious nature. The practicalities of contact tracing and identifying those potentially exposed in a transport hub itself are complex and the challenges will vary by transport hub type. From the consultations held for this deliverable, the following sections summarise the challenge of contact tracing from the point of view of transport operators.

5.4.2 Airports

An airport is essentially a 'closed' system; once an individual has passed through security with a boarding pass, they are in the system. Passport details could be used to obtain flight details from the airline but there are then data protection issues; the Police would usually do this. Once someone passes through Security, an airport will be aware of their presence, because they will be flying out or arriving on a flight. The more difficult issue is contact tracing a traveller's friends and family who are part of the huge number of individuals who enter the airport to see a traveler off and yet never have contact with any staff member. At any one time at UK's Gatwick Airport, for example, there can be three to four thousand

people in the open access areas. These individuals include the family and friends of a traveller but also shoppers and London commuters who might pass through the airport rail station. Gatwick Airport has about 43 million travellers a year, with yet another ~43 million people 'seeing people off' or passing through. These individuals might typically spend a few hours in open access areas without having any contact with airport staff. Heathrow Airport had 75.7 million passengers in 2016, 94% of which were international passengers.

5.4.3   Ground transport

In contrast to airports, ground transport hubs are 'open' systems and this makes tracing someone more challenging. The challenge is increased by the fragmentation of the rail industry (as described in Deliverable 5.1). There is also no real way of knowing who is where in a train hub. Virgin Trains would have no way of knowing if someone had travelled on a certain day if they had i) a season ticket ii) an open-ended ticket or iii) booked through a third party provider. Virgin Trains, for example, carries a limited database of passenger contact information (email address) as only ~20% of bookings are made online through their system, other companies offer on-line bookings with Trainline, the largest, having ~80% of the booking market. Annual passenger journeys for 2014/15 were 34.5 million. Wi-Fi access on trains is free to 1st class travellers and at cost to standard class, so there is another, limited, database of passenger contact information. Even with train-company ticketing systems, however, it wouldn't be known for how long, or where, someone has been standing on a concourse (and potentially exposed to an incident).

The Contactless payment system is considered too new at present to track journeys and, although journey-tracking technology exists, there is still work to do before data become accessible. Currently, only the Oyster card system offers the potential to track individual journeys, on the Tube and Docklands Light Railway, by recording which station a passenger started and ended a journey, but not how he or she travelled between the two locations. On buses, Oyster cards are only used at the beginning of a journey so the final destination is unknown. Further, data are recorded only if the card is registered, and there are quite a high proportion of them that are not; only 4.5 million cards, out of the >60 million issued since 2003, are registered with TfL. However, the Police would need to request a court order to access these data and could provide information on the people who were in a station at certain time and place (if the Oyster card were registered), but there would be many legal hurdles that would arise to obtain this and 'track' an individual.

Transport for London suggested that one could get numbers of people moving through systems, but these would turn into guesses for certain areas. It could also take up to a week to obtain data on the numbers of people who travelled in, or through, an area. Photos might be available of the transport system in use. Transport for London was involved with a project looking into use of CCTV images with facial recognition at turnstiles, but it was considered to be a very expensive option. Essentially though, as with other transport hubs, TfL are not interested in tracking people, they are interested in transporting people; although they were involved in a recent pilot study to help give TfL a more accurate understanding of how people move through stations, interchange between services and how crowding develops[2].

From a purely practical point of view, in an incident Virgin Trains might shut things down and publish a message along the lines of "*did you go through Euston today at a certain time? If so, contact x.*" If there were severe disruptions, they would try and communicate to as many people as possible via media/social media/own website/marketing – although this would never reach everybody. Refer to section 5.5.2.

5.5   Key themes highlighted from transport hub operator and expert consultations

5.5.1   Balancing priorities: business continuity and health protection

In the face of a biological threat or pandemic infectious disease, the priority of the transport hub operator is to keep their hub open and keep people travelling. Keeping hubs open is also important for other, social, reasons because there are knock-on effects of transport system disruption, primarily because it can affect passenger behaviour (using cars rather than public transport), but there might also be external pressure upon them from within the health system to close down their services such as from emergency services. Indeed there might be a political decision from government level for that. Essentially the priorities are:

o **Transport hub operators** - run a transport service. Business continuity is important.
o **Infectious disease specialists** - diagnose and manage disease and participate in preventing disease spread

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[2] https://www.theregister.co.uk/2016/11/17/tfl_to_track_tube_users_by_wifi_device_mac_address/

o **Public health professionals** – carry out risk assessment considering a broad range of factors, and guide preventive and control measures

Operators do not want individuals to be afraid of using transport services as this would decrease the number of service users; public health professionals may consider a reduction of person-to-person contacts in confined spaces (such as on public transport or in hubs) to reduce disease transmission. In acute and major infectious disease scenarios, the initially limited, and rapidly changing, information available on the effectiveness of transmission and control measures may lead to rapidly changing control policy advice. These businesses are iconic brands; maintaining reputation and the confidence of the staff and public, are priorities for the business, so strategically, there must be a balance of views in response. Risks associated with an infection spreading in a transport hub must be viewed against the detrimental effect to the operator as a business but also against public health needs.

5.5.2 Capability gaps in incident management plans and training

5.5.2.1 Lack of incident management plans

Transport hub operators deal with all types of incidents in their hubs on a daily basis. Incidents such as use of explosives, derailment, fire, and security breaches, are well-monitored and audited with well-defined procedures for preparedness and response. Safety- and security-related incidents, however, are better planned for than infectious disease events and there is concern amongst the operators consulted that, outside of First Aid, there are skills gaps within incident management teams for responding to health protection incidents or biological threats (natural epidemics e.g. EVD outbreak 2014-2016; intentional release or accidental release). Infectious disease and infection control knowledge and tools were seen as vital by many of the operators for incident management training but also for working with hub partners (such as shops; airlines; Border Force).

5.5.2.2 Lack of preparedness exercises for health protection incidents

The focus of transport hub operator exercises is on crisis training where they are the decision makers, not on pandemics or serious biological threats. This is because they are low probability (yet high impact) incidents, they might be novel, or not addressed fully by any exisiting guidance, but also because the response would be out of their control. They would take the lead from others in these events (e.g. British Transport Police, Home Office; public health). However, they would be interested in being involved in exercises held by others.

With regards to deliberate release organisms, consulted operators and public health staff felt that knowledge and preparedness, such as 'white powder' incidents, have waned since the wake of the 2001 'Amerithrax' US anthrax letters. 'Suspicious' behaviours have been forgotten as different threats to public health and safety have emerged.

5.5.3   Risk communication: maintaining confidence

5.5.3.1   Communication with staff

Maintaining staff confidence during an incident is a key consideration and essential to business continuity; the service relies completely on its staff. Incidents can be managed if staff are kept healthy and 'on board'. This is achieved by keeping staff well-informed; if they do not, operators will lose them. They may not come to work and the challenge of keeping services running becomes much harder. If staff refuse to work, through fear of catching a severe infection, then the systems would fail.

In a serious infectious disease incident, it is essential that staff are provided with reliable public health information in a timely manner, whether this be jointly with public health institutions in Member States or from public health experts embedded in major transport hubs. Communicating risk to employees, however, can be challenging. If staff do not get enough information from their employer they will go to their Trade Unions. There is then a need to satisfy Trade Unions that it is safe for staff to continue working and the operator is doing the right thing. A recent situation concerning the Paris metro highlights this point: amid concerns about chikungunya infection in France, there were alerts about Asian tiger mosquitoes in a metro station. Staff did not want to work and operators needed to explain what the risks were and what staff should do. In the absence of appropriate, timely information, losing staff has financial implications and can arise from even small incidents. Operators are keen to understand what best practice is for communicating with their staff, and what to communicate.

5.5.3.2   Communication with stakeholders

All operators highlighted the importance of sharing good quality information with their staff and other stakeholders. Various mechanisms and methods are currently used.

The UK's Gatwick airport operators, for example, have an Airport Community app for stakeholders: https://itunes.apple.com/gb/app/airport-community/id1032645180?mt=8. This

internal app is active in Gatwick, Edinburgh and Dubai airports. Airport stakeholders (staff, airlines and ground handlers) can register their phone numbers and text messages can be pushed out to them by the incident management team. There is an additional text alerting system set up for leaders of the airport community. Gatwick Visa is website http://www.gatwickvisa.com/ designed to support stakeholders with safety and security.

A number of operators said they would find it useful to have guidance from public health on risk communication; including how to communicate and share public health information on risks and scenarios with relevant stakeholders responsible for running related processes at hubs, including retail establishments.

5.5.3.3   Communications with the public

For transport hub operators, engagement with the public and maintaining public confidence in the network is considered critical. In a serious threat incidence, UK ground transport operators would take advice from the Department of Transport (DfT) regarding communications to the public, rather than make an internal decision. Notice boards could be placed in tube stations advising people about for example, the threat of a 'flu pandemic, including action to be taken, but this would have to be a region- or country-wide message, not transport hub operator-specific.

Virgin Trains' communication mechanisms with passengers, media and stakeholders could theoretically push out messages on behalf of public health, but they would take advice from authorities as to when. If it were a small station, e.g. Coventry Station, VT operate the station. If it were a larger station, such as Birmingham New Street or London Euston, Network Rail would run it. Their four main channels of communications are: i) VT Connect – someone records a message on a phone and sends it to everyone on that network that has a phone. Usually this is a medium used by the Managing Director, with one message a week or month. It is a very effective means of communication and in an incident a message could potentially be recorded and sent to a database of relevant individuals. This is however an emergency tool ii) Yammer social network iii) email system and iv) digital posters sited around the network for instant messaging (also refer to Deliverable 5.2).

5.5.3.4   Communications hub-to-hub

From the consultations with transport hub operators, it was clear that communication with onward hubs in an incident would be limited, beyond that of the next hub in the chain, or perhaps would not occur at all. This might depend on the type and size of hub. In the UK, large hubs may have a port health presence. If an incident occurred at a large UK hub, *e.g.* Kings Cross or Waterloo, the focus would be on managing the incident locally; staff would be occupied with dealing with the incident. Operational staff would report to TfL, who might then escalate the incident to another service, such as fire and ambulance, but they would not communicate with or inform other stations. Processes are clearer, for example, where there is a health incident on a train or plane. If an incident occurred at Heathrow airport for example an infected individual aboard a plane to the United States, the UK national IHR focal point would contact the US IHR focal point and communicate. Then there would be government-to-government level communication. There are no defined mechanisms by which operators (might) contact other hubs, and these might not be consistent processes anyway, depending on the incident and the connections a hub might have to others. However, it depends on the type of event in question and whether it were already contained. Where the transport system is a huge network (such as TfL), there is some integration of transport systems, *e.g.,* Victoria, but these systems all have separate management structures. In terms of hub-to-hub communication, legislation can be required to communicate and talk with counterparts. Emergency plans are shared where systems share an interface *e.g.,* Victoria. In some cases (TfL) it was felt that even if there were a defined communication method, hub staff would not have the training on disease symptoms to identify a situation necessary to report onwards and risk assessment in a potentially serious incident would not likely be delegated to them. There are large numbers of people passing through the networks and operational staff wouldn't 'stop' anyone. TfL couldn't think of any scenario in which operators would phone ahead to other hubs (although possibly if a knife were involved). It was felt (TfL) that UK Border Force would be more likely to make decisions and deal with incidents that had a multi-country element.

5.5.4   Communication with public health and clarity of route into health system

5.5.4.1   General considerations

Having appropriate 24/7 contact number(s) for health protection and access to public health information in the acute stage of an incident was seen as paramount by all operators. It was considered important that health protection organisations also had transport operator contact

details. Some operators felt that (local) communication processes with Public Health were currently not clear. This might cause problems, it was suggested, not just for a major infectious disease issue with possible international implications, but also for smaller infectious disease scenarios and other situations more generally. It was also clear that whilst certain senior operational staff at large ground transport hubs might potentially contact Public Health, staff at smaller hubs (such as coach stations or interchanges) might not know to. For the UK, the National Health Service (NHS) might be the point of contact for smaller hubs, and indeed this is the expected route into the health system. Operators would seek contact with an emergency service, fire and ambulance say, to take over responsibility for an incident, they would then respond with what was requested of them. Virgin Trains wouldn't contact health protection teams directly; British Transport Police are the emergency service most contacted by VT, with the ambulance service next.

5.5.4.2   Incidents on ground transport

At UK's Kings Cross station, for example, if an incident occurred on a train, transport staff would deal with the incident; the train would pull into the next station and an ambulance would be called and the NHS brought in. If it were in another station, the situation would be roughly the same, but a little more complicated; it would depend upon who ran the station: Network Rail or a train company.

In a deliberate release incident it would depend on how Virgin Trains got to know about it. It would be more likely that the British Transport Police would raise the alert, rather than Virgin Trains. Virgin Trains would respond to what they were asked to do by, for example, stopping all services. Network Rail have all the contacts for further action and would contact the authorities leading into COBR *etc.,* who would then take over the handling of the incident.

5.5.4.3   Port Health

There is no European port or traffic hub health network for human health and the provision of the port health function is interpreted differently in different Member States In the UK, the Association of Port Health Authorities comprises of Port Health Authorities at large hubs: Heathrow Airport has a port health presence, but Birmingham Airport, for example, does not. The authorities enforce a wide range of international, European and domestic legislation at ports and aboard vessels carrying passengers and freight. The controls are in place to protect the public, animal and environmental health of the UK and Europe, but they are more

focussed on food-related health. At Frankfurt Airport, port health has a more clinical role in the airport.

In the UK, if there were a health event, the standard role into Health (the National Health Service) is through the ambulance service; if there were a health protection issue, Birmingham airport would contact local Public Health; it would be a big request to expect them to contact a national body, such as Public Health England (PHE). In large airports, such as Gatwick Airport, they know about the local Health Protection Unit in Horsham; at Heathrow Aiport, they know about the North West London Health Protection Team and the Port Health team at Heathrow.

5.5.5   Need for improved access to public health information

In a public health emergency, all transport operators and other stakeholders said that they would value access to public health information and, indeed, stronger communications with public health generally. It was agreed that there was scope for development of public health tools and guidance, around public health information and risk communication support.

6. Discussion

The consultations for this report highlighted common themes expressed by transport hub operators when considering preparedness and response for serious health threats with cross-border potential. The majority of responses reflected the desire to have stronger relationships with health protection bodies, to have access to public health information and to be proactive, but it is clear that the balance of business continuity and health protection is ultimately important.

Whilst transport operators might have individual (pandemic) business continuity plans, there is currently no preparedness guidance at European level to support these. There is clear scope for strengthening preparedness and response at transport hubs, at both local and European level, as highlighted by the response to the EVD outbreak.

6.1   European-level template preparedness plans

Serious cross-border threat incidents can be highly political, *e.g.,* SARS or H5N1, due to the major impact they potentially have on the society, and the political environment for decision-making varies between countries. ECDC was established to ensure that the Member States have a consistent knowledge base for their policies, but ECDC does not have the mandate to make formal policy recommendations, nor a control management role. However, the efficiency of international investigation and coordination of control policies between EU Member States depend to a great extent on the involvement of ECDC and Health Security Committee. High-level preparedness for international incidents needs the incorporation in national and international preparedness plans of components addressing the role of traffic hubs in the transmission of rapidly emerging infectious disease threats and their control.

From project stakeholder liaison group discussions, it was agreed that preparedness tools and guidance are needed for responding to serious health protection incidents in transport hubs. It was also agreed that it would be very valuable to develop template training and planning tools and guidance at a European level. This could be in the form of a general preparedness framework of elements for transport hub operators to consider, covering response and communication networks. It is not known what the next serious biological threat will be (it might be a novel scenario), so transport operators could take and adapt framework plans. Overall, this stresses the fact that communicable disease preparedness plans in the EU Member States, whether disease scenario-specific or part of a general emergency plan, need to involve all government sectors, including the transport sector for ensuring rapid public health action and business continuity.

Structurally, it was suggested, that the plans could illustrate a number of rapidly evolving incidents like a white powder airborne release in a hub, or the measures needed in hubs for a commencing pandemic threat of influenza or Ebola-type disease, with two or three generic adaptable principles of how to handle the incident. Whether to stop the underground in a capital city may ultimately be decided on the political level, but such a decision should be based upon the best available expert assessment of the individual infectious disease risk. However, tools outlining the means and coordination of handling the incidents are needed.

Additional benefits of developing preparedness plans at European level would be the creation of a network of major hubs that can be activated immediately for response. It would

also be beneficial for transport hub operator management to be aware, in advance, of the situations and consequences of actions they might take during an incident.

A European-level network effectively linking hub and transport operators with public health could benefit transport operators to understand what to do in a cross-border threat. For example, to understand what actions to take in France if an incident occurs in Belgium, and what the impact might be. It would also benefit public health professionals: if, for example, The French Emergency Medicine Organisation (APHP) were called for a health incident on a Eurostar train in Paris, the train can be stopped at the next station and a call made ahead made to SAMU so that they are waiting; there is time to prepare. But if the incident were on a Eurostar train in the tunnel on its way to England, APHP wouldn't know whom in the UK to contact. However, rather than creating a new network, it might be more practical and feasible for national institutions to engage transport hubs in more detail in their preparedness plans for biothreats. In these, a few key scenarios could be identified and exercised. With that being said, the type of biothreat to come is mostly unknown, requiring immediate high quality risk assessment expertise for appropriate decision making.

6.2   European-level risk communication plans

6.2.1   Risk communication with staff

Well-practised and rehearsed incident management teams mean that staff are reassured and can provide reassurance, in turn, to the public. To try to mitigate a situation where staff may not come to work in an incident operators should have communication plans ready that are adaptable to any problem. Staff need to know the risk of infection and the level of that risk in a timely manner with the best knowledge available in a frequently rapidly evolving situation. Some operators' business plans give information on using infection control measures such as masks and gloves, but not on how to use them or why. More information is required beyond basic knowledge and principles, for example, on what behaviour is required and why (see Deliverable 4.5 *Protection of people and infrastructure*). Engaging key actors at an early stage can avoid uncertainly and conflict and help keep staff 'on board'.

Risk communication messages for staff and the public were seen as highly valuable by the PANDHUB stakeholder liaison group and transport operators alike. Best practice communication processes and adaptable messages for a few most likely scenarios could be

included as part of the European-level operational framework, for operators to consider and adapt them for their local plans. It would also be valuable to suggest how to adapt these. For airports and international train stations, it would be beneficial to have these pre-translated into different languages. The Paris Metro, for example, already has announcements in English, Chinese, Spanish, Japanese and German.

Guidance might also outline what might be asked of transport operators in a serious health threat incident, in terms of reporting to health services and implementing infection control measures (see Deliverable 4.5 and section 6.5).

6.2.2 Risk communication with stakeholders

Information sharing with stakeholders in an incident is possible given prior planning. Transport hub operators are responsible for other hub stakeholders - the hub community - such as retail and other third-party community individuals, and it is important to work with them in an incident. Tools, such as pre-written emails, that could be sent out to all companies involved in an incident were seen as being of particular value.

6.2.3 Risk communication with the public

It was felt by some operators that risk communication with the public in a serious biological incident was the responsibility of public health agencies or governments, and the focus of operator business continuity plans is communication with staff and stakeholders. However, operators also want to keep people using their services, and are in a position to communicate public health messages in their hubs. Usually, this would be under the direction of their directing authorities, as these are usually not internal operator decisions. Deliverable 5.2 *Improving communication with the public: a scoping review* reviews the literature for current and best practice communication methods with the public and sets out recommendations for future public communication activities for transport hub operators to consider, around social media. Of note, no articles discussed the use of infectious disease communication tools in a transport hub setting, highlighting a significant gap in the research as well as a potential need for the development of these tools and strategies in industry and research communities.

6.3 Creation of an European-level cross-sector transport hub communication system/platform

From discussions with hub and transport operators and other stakeholders for this report there appears to be no cross-transport sector communications system at a European level. There are separate networks for transport operators at European level for ports and airports created through the AIRSAN and SHIPSAN projects (Table 3), but it is not clear what specific information exchange at European level exists for ground transport.

For strengthening response to potential cross-border threats, a Europe-wide cross-sectorial transport communication system might be considered. There are currently no formal mechanisms for transport hub operators to contact other hubs in the acute stage of an incident; communications with other hubs would be between national and international IHR focal points at major points of entry and, once an incident is in the health system, these are well-documented and well-understood. However, to avoid delays from communication through the IHR national focal points and EWRS contacts, compromising the efficiency of control measures in transport hubs in other countries, the hubs need to be effectively linked to public health.

To further address implementation of the requirements of Decision No 1082/2013 EU, DG SANTE released a joint action[3] in February 2017. The aim of the action is to prepare the transport sector for immediate and adequate response to serious cross-border threats to health. It also calls for creation of a network to communicate and notify rapidly in case of cross-border risks to health, including coordination of concerted actions.

The communication platform of the SHIPSAN network is used to report health issues between ports and port to national authority, and this might provide an interesting insight or structure into development of a cross-sector hub-to-hub communication system. A connection between EWRS and transport hubs, might be valuable. In this way, public health agencies would have the detail for the points of entry from one country to communicate to onward countries (or Europol/Interpol if an intentional release). Indeed, if it were an

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[3] JA-04-2017 Joint Action on preparedness and action at points of entry (air, maritime and ground crossing)

intentional release there would need to be a secure way of communicating information between hubs.

Table 3: Existing transport operator networks

AIRSAN network	SHIPSAN network	PAGnet network
Brings together national public health and civil aviation authorities, local public health authorities, airport management and airlines across EU Member States, to facilitate greater mutual understanding of the requirements, practicalities and impact of proposed measures in the management of public health threats in air transport. The communication platform can be used by registered members to exchange information, *e.g.* on exercises or information material. http://www.airsan.eu/Home.aspx	Created to strengthen an integrated strategy and sustainable mechanisms at the European Union level for safeguarding the health of travellers and crew of passenger and cargo ships and preventing the cross-border spread of diseases, improving citizens' health security. The communication platform facilitates ship-to-port, port-to-port and port-to-national authority communication. http://www.shipsan.eu/	Brings together public health officials responsible for port health (ports, airports and ground crossing) and key partners to coordinate public health activities at ports, airports and ground crossings. It is a WHO web-based network for the prevention, detection and control of international spread of disease and its agents through international travel and transport. It includes the organisation of conferences and meetings, access to guidance and tools and community identification. http://www.who.int/ihr/ports_airports/pagnet/en/

6.4   Clarity of contact and route into public health

The most important subject raised by all transport operators was to have 24/7 contact number(s) of health protection – and this should be tested in preparedness exercises with different scenarios. Reciprocally, it is important for health protection to have contact details of operators, to tell them, for example, that health protection now has the incident in hand. Having appropriate contact numbers and access to public health information in the acute stage of an incident was deemed paramount. It is the responsibility of emergency preparedness and response professionals to strengthen those relationships and

communications locally, ahead-of-time and ensure that the contact details are part of any hub and transport operator emergency plans, where there is a health element.

On a European level, up-to-date contact details between transport operators and public health (ECDC) were considered useful. If there were an event in Paris involving a transmissible agent, for example, public health would promptly need information on travel connections to communicate the incident to onward hubs and then report onwards to ECDC.

6.5 Access to public health information and potential guidance and tools

There were differing opinions on what would be useful to have from public health and at what stage of an incident. Some operators considered it more important to have public health tools or guidance in advance, rather than during an event; the reason being that incident management teams can be proactive, trained and practised. It was felt that having a crisis plan sent at the time is sometimes too late; well-practised and -rehearsed incident management teams provide reassurance to staff, stakeholders and the public. Ahead-of-time guidance and tools were seen as vital and would get fed up to the operator control centre and dispatched to incident management teams.

An alternative viewpoint was that the provision of guidance or tools in advance of an incident would likely mean they would not be used; since during an incident they would be busy dealing with it, or they would be taking the lead from others, or the scenario would be novel, not addressed at all or addressed appropriately by the prepared guidance. Moreover, it was felt that no-one would remember to use them and wouldn't have the time to rehearse a scenario. It was suggested that it would be better for health agencies to have the documents existing internally and then send to the transport providers in the event of such an incident. It was made clear by all operators that any tool would need to be based on clear simple principles in lay language of one-or two-pages long, bespoke to each type of transport hub provider that could be fed into existing crisis plans, for each type of incident.

6.5.1 Tools for preparedness

Transport staff awareness to signs and symptoms of potential diseases of interest, and what to do in those instances, might hasten reporting of health events to health services.

Preparedness tools suggested by transport operators centre around infection control and guidance for action (Table 4).

6.5.2 Infection control

It was suggested that it would be useful for operators to have checklists and instructions on: how to prepare for infectious disease cases; what scenarios should be prepared for; and to benchmark current practices vs best practices. More specifically, it was suggested by all operators that it would be very useful to have aide or reference cards with broad guidelines describing what to do, or suspect, if an individual presents with infectious disease symptoms. One operator suggested that this potentially be based on Essential Visual Standard, pictorial with a little narrative, e.g. '*if you see this, then it is likely this*..' and move onto a flow chart. The aide might then say e.g. 'call [#]' or 'visit [website] and follow instructions' (although a limitation with a website or app is that the more clicks involved, the less likely people are to look at it). For further discussion on infection control in transport hubs, refer to Deliverable 4.5.

6.5.3 Guidance for action or decision-making tools

Suggested tools of value were: when to contact public health - possibly summed up in three questions (when to call, and when not); what essential information to report up to public health; guidance for action in a suspicious incident such as a hoax illness, or when faced with suspicious behaviour; what operators should do in an incident involving a CBRN powder/solid/liquid.

6.5.4 Real-time tools in the acute stage of an incident

It was suggested by operators that access to public health information leaflets (potentially time-stamped), Frequently Asked Questions (FAQ) leaflets or provision of a link to public health website, would be valuable in order to provide reassurance to operators, and its staff, that the right course of action was being followed. In this way, public health organisations would provide 'the science' behind operational decisions and actions. It was also suggested that public health agencies could provide this information to transport operators by email or make it available on their website, informing operators as to where it is.

One operator suggested that it could be useful for health protection organisations to develop an app, linked with the (UK) ambulance service, Red Cross or St John Ambulance (a trigger within their existing apps), which allows for a simple, quick symptom check; something that is ideal for the average 'man in the street', to help identify if the person in front of them has EVD or 'had a late night'. It might also help transport operator staff know when to call in a possible case (and possibly avoid unnecessary panic). The operator in question suggested that their Strategic Contact Network could push out the app to internal communications teams. Other operators, however, queried whether realistically anyone would download or use an app, since there is a proliferation of them available.

Table 4: Suggested guidance and tools for transport operators

Guidance or tool	To provide information on
Tools ahead-of-time	
Infection control checklists and instructions	What scenarios should be prepared for
	Best infection control practices
Visual aide/reference cards (infection control)	Broad guidelines on what to look for an infectious disease case
	What to do if infectious disease case suspected
Guidance for action documents	
Flowchart or decision tree	When to contact public health
	Essential information to report to public health
	What to do in a suspicious incident e.g. hoax illness or potential CBRN-related incident
Real-time tools	
Time-stamped public health information leaflets	The 'science' behind operational decisions. Risk communication to reassure staff and stakeholders and the travelling public.
FAQ leaflets	
Pre-written email pro forma	
Provision of real-time link to PH website or app	

6.6   Training exercises

Value was seen in engaging with transports operators' top managers in exercises and discussions about serious biological threat incidents, because they have a role to play; it might also serve to allow a better understanding of the impact an incident might have on their hubs. For instance, it is difficult to measure the impact for the operator of a biological release and validate the decision to stop services or shut stations. With reference to the 2001 'Amerithrax', the economic cost of recovery was huge; reducing recovery costs in an incident might be good motivation for strengthening preparedness plans. As such, it was felt that guidance or exercises should be revisited, particularly for scenarios with anthrax, because it has been used in the recent past, cmpared to other biological agents.

7. Conclusions

The EVD outbreak in West Africa (2014-2016) highlighted gaps and weaknesses in the management of hub responses to a major cross-border threat, and it was a concern raised by many of the transport operators consulted. Incident management for security-related incidents such as fire, bombs and suspicious packages are well-rehearsed and prepared for, but all the operators consulted felt that significant gaps still existed concerning preparedness for pandemic/serious cross-border biological threat. Consequently, there is a real desire amongst transport hub operators to address these; for safety and security of staff and public, and also for resilience and business continuity.

One of the clear findings highlighted by the majority of these consultations, however, was the desire for stronger connections between hub and transport operators and public health to support both business continuity and the contribution of hubs to limit spread of infection. These connections focus around clarity of the route into public health; the provision of public health information either before, and/or during, the acute stage of a serious biological incident; and best practice strategies for communicating risk to staff and stakeholders.

Different transport hub operators have different end-user needs. The level of interest in guidance and tools varied with the type of hub and the nature of its organisation. However, there was a unanimous view that guidance from public health, on the mechanisms and content of risk communication to staff, stakeholders and the public in an incident, would be

very valuable. All guidance for hub operational use would need to be easily understandable, compact and with a hands-on focus.

For a cross-border scenario, the challenges of investigation are related to type of transport hub, its onward connections and where the incident occurred within the hub infrastructure, e.g. in the open access area or area restricted to passengers, in an airport or on a rail concourse. Largely, these challenges are for contact tracing and this is subject to where an individual was within a hub and whether they can be tracked *e.g.,* through passport numbers, ticketing information, WI-FI or travel card (Oyster card) registration.

On a larger scale, operational European-level cross-sector transport preparedness plans are recommended for major transport hubs, to ensure that the cross-border element of a serious biological incident is addressed. The first main recommendation of this report is the development of European-level framework preparedness and contingency plans for hub and transport operators, that are flexible to the incident, formalise networks ahead-of-time and provide operators with an evidence base with which to aid decision-making, ensuring that the balance of business continuity and health protection is achieved. The second main recommendation is the development of European-level communication plans with best practice risk communication strategies and scenarios for transport operators. The third main recommendation is development of a European-level communication network or platform for cross-sector hub and transport operators. Further considerations are refered to in section **Error! Reference source not found.**.

Recently, the European Commission published a Joint Action that speaks to these main recommendations. The Joint Action is on preparedness and action at points of entry (air, maritime and ground crossing) and calls for the development of catalogues of tested best practice and guidelines for MS health authorities to be implemented at operational level through agencies and stakeholders in the field of transport. The catalogues are expected to provide the basis for coordinated cross-sectorial actions to control infectious disease transmission in case of a serious cross-border threat to health affecting or coming from the transport sector.

Elements of other PANDHUB deliverables may help inform responses to cross-border responses to serious infectious disease threats involving transport hubs. This report should be read in conjuction with other deliverables from this project, particularly those listed below in Table 5.

Table 5: PANDHUB deliverables particularly relevant to this report

Deliverable number	Deliverable name
D2.2	Report on Hotspots
D2.3	Disease spread in transport environments
D2.4	Guidelines for threat assessment
D4.4	Disinfection and decontamination guide
D4.5	Protection of people and infrastructure
D5.1	Review of communication flows
D5.2	Communication tools
D5.3	Improvement of communication tools

8. List of considerations

1. Development of a European-level framework for cross-sector transport hub operational preparedness and contingency plans

2. Development of European-level best practice risk communication plans for transport hub operators

3. Development of a European-level communication network or platform for cross-sector transport hub operators

4. Strengthening of relationships between transport hub operators and public health

5. Development of tools and guidance to inform and train transport hub operator incident management teams

6. Consider (more) public health training exercises, including CBRN with transport hub operators for serious biological cross-border threats.

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