EU HEALTHY GATEWAYS JOINT ACTION
GRANT AGREEMENT NUMBER: 801493
PREPAREDNESS AND ACTION AT POINTS OF ENTRY
(PORTS, AIRPORTS, GROUND CROSSINGS)

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Interim advice for preparedness and response to cases of 2019-nCoV acute respiratory disease at points of entry in the European Union (EU)/EEA Member States (MS)

Exit and entry screening at points of entry

Version 1

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This interim advice was prepared after a request from the European Commission's Directorate-General for Health and Food Safety (DG SANTE). An ad-hoc working group was established with members from the EU HEALTHY GATEWAYS joint action consortium. Names and affiliations of the working group members are listed at the end of the document.

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Exit screening in China in combination with entry screening in EUMS

What can be achieved and what cannot be achieved

Exit screening measures aim at assessing the presence of symptoms and/or the exposure to 2019-nCoV of travellers departing from affected countries. Travellers identified as exposed to, or infected with 2019-nCoV will not be allowed to travel. *Entry screening* measures aim at assessing the presence of symptoms and/or the exposure to 2019-nCoV of travellers arriving from affected countries. Travellers identified as exposed to or infected with 2019-nCoV will be isolated and treated or quarantined. Entry screening could be more valuable when the robustness of exit screening measures implementation is uncertain, and when the duration of time from departure from an affected area until arrival to a non-affected area is long.

Both exit and entry screening can identify symptomatic travellers and those who honestly declare their exposure. Screening measures will not identify mild symptoms, asymptomatic, incubating travellers or those concealing symptoms (e.g. antipyretics)[1-3]. Those travellers will not be detected and will enter the country. Screening measures are expected to identify seasonal influenza cases that are currently prevalent in Europe and China[4]. False positive and false negative results of temperature measuring devices could affect sensitivity and specificity of screening measures. The scientific evidence published demonstrates that entry screening is ineffective to detect infected incoming travellers[4,5]. Modelling work by the European Centre for Disease Prevention and Control (ECDC) specifically for 2019-nCoV has assessed the effectiveness of entry screening in detecting travellers infected with 2019-nCoV to be low[4]. Approximately 75% of cases from affected Chinese cities would arrive at their destination during the incubation period and remain undetected, even if the efficacy of the screening test to detect symptomatic individuals were 80% for both exit and entry screening.

Concomitant beneficial effects of entry screening

Entry screening, if applied, is considered a supplementary measure to information strategies, epidemiological investigation, contact tracing, quarantine and laboratory support in order to achieve a comprehensive case/outbreak management response. Measures of entry screening have some concomitant beneficial effects: a) obtaining contact information of travellers to be used if needed for contact tracing or public health observation purposes[6,7]; b) educating and informing the traveller passing through the screening points about the public health risks and prevention measures[6]; c) linking the traveller with public health authorities for the duration of the incubation period to facilitate health monitoring and prompt referral for care if they became ill[6]; d) facilitating rapid and appropriate clinical care for ill travellers[6]; e) maintaining confidence that air travel is safe[6], may have helped dissuade ill persons from travelling by air[8]; f) preserving public confidence[2,3,9]; g) relieving political and social pressure and limiting negative economic consequences from travel and trade restrictions[2]; h) help avoiding major economic, social and international impact which even a single imported case may have[10]. The degree of success, beneficial and adverse effects and limitations of entry screening at points of entry for Severe Acute Respiratory Syndrome (SARS), Influenza Pandemic (H1N1) 2009 and Ebola Virus Disease (EVD) are presented in the following table.

Adverse effects of entry screening

Entry screening is highly resource demanding. It has been estimated that Canada invested Can$ 7.55 million on entry / exit screening during SARS outbreak, but no confirmed cases were identified[3]. Australia estimated that during Influenza Pandemic (H1N1) 2009, the cost of staffing airport clinics has been estimated at about US$50,000 per case detected[11]. Entry screening may give to the public a false sense of security[12] and stigmatization of travellers under public health observation[13]. Investing in screening measures reduces the resources from other effective measures[3,10]. The de facto point of entry into the healthcare system for travellers with serious infectious diseases was found to be the in-country, acute care facilities (hospitals, clinics, and physicians' offices) and not the airports[3]. There are also language barriers - flight announcements about screening measures and requests for declaring exposures were not understood by passengers[2].

How entry screening is implemented

Entry screening measures are generally conducted as a two-step process: primary screening and secondary screening [14,15]. Primary screening includes an initial assessment by personnel, who may not necessarily have public health or medical training. Activities include visual observation of travellers for signs of the infectious disease and measurement of travellers' body temperature. It can further include completion of a questionnaire by travellers asking for presence of symptoms and/or exposure to the infectious agent. Travellers who have signs or symptoms of the infectious disease, or have been potentially exposed to the infectious agent, are referred to secondary screening. Secondary screening should be carried out by personnel with public health or medical training. It includes an in-depth interview, a focused medical and laboratory examination and a second temperature measurement[5].

Resources and logistics required

If it is decided to implement entry screening measures, detailed planning is required, with careful execution to ensure consistent application by all staff involved and to all targeted travellers[5]. The timing (starting and stopping of screening measures), the screening methods, the technology and tools, the human resources and training issues should be considered in the preparedness and response plans. Training of staff is an important component and should address recognising the signs and symptoms of the disease, screening procedures and documentation, and appropriate use of Personal Protective Equipment (PPE) and technology for measuring body temperature [6].

Interview space must be available at the facilities of the point of entry as required by the IHR 2005[16]. The most suitable site of primary and secondary screening should be decided: on board the conveyance, at the terminal, or before or after collecting luggage. Further essential resources include capacities for laboratory diagnosis, quarantine, isolation and treatment of suspect, exposed or affected travellers. Entry screening should be part of a broader set of measures and different stakeholders need to cooperate. Both the public and the private sectors, the transport industry, points of entry administrations and actors at all levels, from the local point of entry to the national, EU and international level should be involved [17].

Other issues for consideration about entry screening are the identification of targeted travellers or itineraries at ports, airports and ground-crossings, including lists of returning workers from missions in affected countries (if applicable, obtained from aid recruiting organisations), lists of visas granted to affected countries, disclosure policies, and expert support on legal, communication, health advisory and others issues [13,18]. If entry screening will be decided to be applied in all incoming travellers from affected countries, then the itineraries of direct, indirect and connecting flights should be identified. Particularly challenging is the identification of incoming travellers arriving with connecting flights in the various airports in the country.

Technology to be used should be decided, as well as instructions for use, maintenance and accuracy checking, evidence that is suitable to be used as a diagnostic tool and specificity and sensitivity. Training of staff on the use of equipment is essential[5]. An ECDC technical report reviewed evidence about the accuracy of body temperature measuring devices and concluded that some non-contact infrared thermometers are approved for use as diagnostic tools as happens with the contact thermometers, but thermal scanner cameras have not been evaluated for such purpose[19]. The report continues that non-contact infrared thermometers are more accurate than the thermal scanner cameras.

Practices and resources

Entry and exit screening measures protocol
https://www.who.int/csr/resources/publications/ebola/exit-screening-guidance/en/

Entry and exit screening measures assessment of effectiveness and good practices identified
https://www.mdpi.com/1660-4601/16/23/4638/htm

Entry and exit screening measures interview space at points of entry (see Annex 7 of document)
https://www.who.int/ihr/publications/9789241510165_eng/en/

Training materials about entry and exit screening

On 30-31 January 2019, a training course took place in Luxembourg, organized by DG SANTE and the Consumers, Health, Agriculture and Food Executive Agency (Chafea), with the support of the consortium of University of Thessaly (UTH), Robert Koch Institute (RKI) and the National Institute for Public Health and the Environment (RIVM). The overall aim of the course was to build capacities and to foster cooperation between the public health/medical border authorities from EU MS, EU border control agencies and international organisations. The training course was designed in order to foster exchange of knowledge and practices on entry/exit screening for infectious diseases in humans and health measures at border controls (at air, water and land border crossings), and to contribute to the implementation of Decision 1082/2013/EU and the International Health Regulations 2005 (IHR).

The presentation about **technology for body temperature measurement** can be downloaded at:
https://www.healthygateways.eu/Portals/0/plcdocs/10-Screening_methodology__based_on_the_results_of_bibliographic_review.pdf

The training materials of the training course are available to the EU MS and access can be given by the EU HEALTHY GATEWAYS joint action (contact email: info@healthygateways.eu).

Algorithm for decision making on entry screening

https://www.healthygateways.eu/Portals/0/plcdocs/15-Algorithm_EE_V4.pdf.

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Degree of success, beneficial and adverse effects and limitations of entry screening at points of entry for Severe Acute Respiratory Syndrome (SARS), Influenza Pandemic (H1N1) 2009 (A(H1N1)pdm09) and Ebola Virus Disease (EVD)[5]

Degree of success in identifying ill or exposed travellers	Concomitant effects		Limitations
	Beneficial	**Adverse**	
Influenza A(H1N1)pdm09[11,20] **Sensitivity**: 6.67% (95% CI, 1.40%–18.27%) **Specificity**: 99.10% (95% CI, 99.00%–100.00%) SARS[2,3,10,21] Entry screening measures **did not detect any confirmed** SARS cases in Australia, Canada, and Singapore.	Influenza A(H1N1)pdm09 and EVD · Obtaining contact information of travellers to be used if needed for contact tracing or public health observation purposes[6,7] EVD · Educating and informing the traveller passing through the screening points about the public health risks and prevention measures[6] · Linking the traveller with public health authorities for the duration of the incubation period to facilitate health monitoring and prompt referral for care if they became ill[6] · Facilitating rapid and appropriate clinical care for ill travellers[6] · Maintaining confidence that air travel is safe[6] SARS · May have helped dissuade ill persons from travelling by air[8] · Preserving public confidence[2,3,9], relieving political and social pressure and limiting negative economic consequences from travel and trade restrictions[2] · Help avoiding major economic, social and international impact which even a single imported SARS case may have[10]	EVD · May give to the public a false sense of security[12] · Stigmatization of travellers under public health observation[13] SARS · High cost of screening measures[2,3,21] · Investing in screening measures reduces the resources from other effective measures[3,10] .	Influenza A(H1N1)pdm09 · Screening cannot detect incubating or asymptomatic travellers[1] SARS · False declarations by passengers about exposure and disease signs and symptoms[2] · Antipyretic drugs can be used by travellers to conceal fever[2] · Questionnaires asking about exposure and thermal scanning machines, were nonspecific for SARS[3] · The frequency of SARS among international passengers arriving or departing was low resulting in low positive predictive value[3] · The de facto point of entry into the healthcare system for travellers with serious infectious diseases was found to be the in-country, acute care facilities (hospitals, clinics, and physicians' offices) and not the airports[3] · Language barriers - flight announcements about screening measures and requests for declaring exposures were not understood by passengers[2]

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