



**TECHNICAL** REPORT

# Ebola emergency preparedness in EU Member States

Conclusions from peer-review visits to  
Belgium, Portugal and Romania

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This report of the European Centre for Disease Prevention and Control (ECDC) was coordinated by Svetla Tsoлова. It is based on information collected during three country visits of an ECDC assessment team of ECDC and EU Member State experts.

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## Abbreviations

ECDC	European Centre for Disease Prevention and Control
GP	General practitioner
IHR	International Health Regulations
MoH	Ministry of Health
PPE	Personal protective equipment
SMURD	Romanian emergency rescue service: 'serviciul mobil de urgență, reanimare și descarcerare'
SOP	Standard operating procedure
WHO	World Health Organization

## Introduction and background

This technical report is a broad-brush picture of what we consider to be the main strengths and vulnerabilities of Ebola emergency preparedness in three EU Member States. It contains a brief background, a description of objectives and an explanation of the methodological approach. Findings are organised in the following sub-sections: preparedness planning, organisational structures, recourses and capacities, intersectoral and cross-border collaboration, and country-specific findings.

European Union Member States have been faced with challenges to prepare and respond to serious cross-border health threats caused by an epidemic (Ebola, a highly contagious viral haemorrhagic fever) that started in West Africa in 2014. This has been the largest ever documented epidemic caused by Ebola virus, both in terms of numbers of affected people and geographical spread. On the whole, the risk of importing unrecognised cases of Ebola virus disease into EU countries remained low, however a single case would make substantial demands on the receiving tertiary hospital. Moreover, the magnitude of the risk for a community relates to the ability of public health and healthcare systems to recognise the case early and effectively manage all patient contacts.

EU Member States have strengthened their healthcare systems to deal with public health crisis situations. Key stakeholders from other sectors (e.g. transport, international affairs, civil protection, internal affairs, and the military) have also been engaged in the discussions, and intersectoral collaboration has been enforced. Moreover, a number of EU Member States have participated extensively in the international effort to contain the epidemic in Africa by providing expertise, logistical and financial support. This process has been ongoing in the context of a new EU legal framework, set by Decision No 1082/2013/EU of the European Parliament and of the Council of 22 October 2013 on serious cross-border threats to health.

ECDC teams visited three Member States upon invitation. The visits were performed in the format of peer-review discussions with national authorities and focussed on preparedness activities, capacity strengthening, and lessons learned in response to the Ebola health threat. Senior preparedness experts from other EU Member States participated as teams members. The peer-review visits took place in Belgium, Romania and Portugal in March 2015.

This summary report gives an overview of the applied methodology and a series of cross-cutting findings that may also be of relevance to other EU Member States. Different approaches implemented by individual countries are also briefly described. In addition, several country-specific conclusions are presented briefly. Finally, some steps forward are suggested that could assist in strengthening both Ebola preparedness and generic preparedness against health threats in the EU.

## Objectives and methodology

The principal objectives of the visits were to support national public health leaders in reviewing their health emergency systems in order to identify strengths and vulnerabilities in the context of preparedness for cases of imported Ebola infection and (if applicable) the management of such cases.

The following outcomes were discussed and analysed during and after the visits:

- Identification of practices and lessons learned with regard to imported infections of highly contagious infectious diseases, such as viral haemorrhagic fever, e.g. Ebola.
- Identification of activities to strengthen the preparedness for health threats due to viral haemorrhagic fevers, e.g. Ebola.
- Assessment of system strengths, system vulnerabilities and risks
- Sharing of experiences between EU Member States
- identification of areas for potential further support from ECDC
- input to EU debate on lessons learned from Ebola outbreak in West Africa and actions to strengthen preparedness in the EU Member States.

The teams were led by senior experts from ECDC. Each of the review teams included senior public health professionals who also serve as ECDC Competent Bodies in Member States other than the ones visited. The Member State experts were selected from ECDC's network of National Focal Points for Preparedness and Response and had knowledge of their countries' Ebola preparedness arrangements. Four of the experts were from Member States that have managed imported Ebola cases.

The ECDC teams comprised experts from the United Kingdom, Netherlands, Spain, Germany, Norway and Bulgaria. Visits lasted three or three and a half working days and were each based on a programme agreed between the team and the country. Visits took place as follows: Belgium: 16–19 March 2015, Romania: 19–21 March 2015, and Portugal: 30 March–1 April 2015.

ECDC's Country Preparedness Support Section has developed a protocol to review emergency preparedness based on the patient pathway. Five critical areas of the case management pathway for actual or suspected Ebola cases were included for review (see Annex, Figure 1):

- point of entry
- community (primary respondents: emergency departments, primary care, public health)
- inland transportation (ambulance services)
- treatment in designated hospital
- medical evacuation

Moreover, aspects of surveillance, communication and laboratory analysis were discussed and reviewed.

A document review was conducted before the country visits, based on materials provided by ECDC's National Focal Point for Preparedness in Belgium, Romania and Portugal. The documents included policies related to Ebola preparedness and response planning as well as standard operating procedures and guidelines.

Discussion points from the protocol were reviewed and agreed upon with the Member States experts. Critical issues in emergency preparedness capacities and capabilities as well as lessons learned from Ebola as a health threat were explored through semi-structured interviews based on a short questionnaire and site visits to assess key facilities and hold discussions with main stakeholders.

The ECDC/EU Member State teams met specialists in public health emergency planning, from health facilities and public health authorities, as well as experts from the non-health sector, for example:

- Health sector: national focal point for preparedness and response; coordinator for public health emergencies (ministry of health/interior); representatives from the ambulance services; infectious disease physicians and nurses working in hospitals designated for Ebola treatment; infectious disease physicians working in non-designated community hospitals; laboratory specialists (senior microbiologist, national reference laboratory for viral haemorrhagic fevers); representatives of professional associations for physicians and nurses.
- Non-health sector: transport (including ministry, national airlines/airports, and sea ports); civil protection (including organisations for national contingency planning); foreign affairs; defence; interior (including crisis management structures).

# Findings on preparedness capacity for the Ebola health threat in three EU Member States

This section provides a brief synthesis and summary of the main findings from the three countries. Public health and healthcare systems vary considerably between the countries, which led to the adoption of different approaches that fit the historical and situational circumstances. Nevertheless, we observed several similarities in the way the three countries addressed the Ebola health threat: professionals were highly motivated, efforts were made to ensure the transparency of actions and information, and collaboration with key stakeholders was intensified.

The points presented here are grouped into four themes: preparedness planning, organisational structures, resources and capacities, and intersectoral and cross-border collaboration.

## Preparedness planning

- Key stakeholders perceive the level of preparedness planning to be adequate to cope with a single Ebola case.
- Preparedness planning was built upon past incident/experience. Countries used the knowledge and experience on health threats accumulated over the last 10 years on respiratory diseases: SARS, the A(H1N1) pandemic, MERS-CoV, and avian influenza. Some countries added, or were planning to add, response measures to Marburg disease in their preparedness plans.
- Extensive work was done on guidance and protocols (standard operating procedures) for Ebola by developing specific new materials.

## Organisational structures

- Public health structures were supported by crisis management systems such as civil protection or rescue and emergency services.
- Specific structures or functions were established or designated to coordinate Ebola preparedness and response (e.g. Ebola coordinator).

## Resources and capacities

- All three countries have a pool of highly motivated experts.
- Public health authorities invested in providing extensive instructions on how to apply procedures and guidelines. Some of the countries also invested in training for first-line healthcare workers. Some health authorities were supported by rescue and civil protection services which provided knowledge and experience in crisis management, and/or by non-governmental organisations with field experience.
- Simulation exercises were recognised as an important element of the planning process for preparedness and as a means of strengthening knowledge and building capacity. Some countries held table-top and field exercises.
- Ambulance services have a critical function as first responders, and efforts were made to strengthen this service.
- Hospital emergency departments in designated health facilities were extensively reviewed by the authorities.
- Countries have come to recognise the importance of sustainable hospital capacity which is also considered as a major resource issue. There have been significant efforts to support designated health facilities (e.g. physical infrastructure, contingency plans, involvement of other actors such as the military).
- Technical improvements that promote efficiency and save time were introduced, e.g. a central information entry point (designated web page) or a surveillance system linking different sectors (health, port control, etc.).
- Health communication messages delivered by a trusted authority were recognised as a critical component of the response. Efforts have been made to provide consistent and timely information to professionals and society as a whole.

- Evaluation of preparedness and response to public health emergencies is an essential element of preparedness planning. Some countries performed mid-term evaluations and introduced changes into their protocols and guidance documents.

## Intersectoral and cross-border collaboration

- Preparedness plans for non-health sectors such as civil protection and border control have been developed.
- Investments were made in the aviation, border control, ambulance services, and civil protection sectors in order to ensure rapid response and safeguard the functionality of mechanisms needed to ensure population protection and infectious disease control (e.g. decontamination). Protocols are constantly updated and revised.
- Collaboration between countries plays an important role in maintaining high levels of preparedness. In particular, collaboration between laboratories was intensified (exchange of information and samples).
- Countries discussed and agreed on a system for medical evacuation (either by enhancing their own capacity or by enrolling into EU mechanisms).

## Conclusions

The review of findings by the visit teams identified a large degree of similarity in the challenges which the countries faced in preparing for possible Ebola cases.

### Common good practices

- Simulation exercises were recognised as a good tool for learning.
- The value of incident (case) reviews as a learning tool to strengthen preparedness was discussed. Incident reviews also help to revise actions taken and improve the timeliness of response (applied in all countries at a different scale and scope).
- While preparing for Ebola response measures, cross-sectoral coordination was improved, given the need for cooperation between health, transport, border services, etc.
- 'One-stop shop' for information on Ebola was provided to citizens, for example through telephone hotlines or websites.
- Lessons learned from past events were used to enhance the Ebola response. Experiences from SARS, avian influenza, MERS CoV and A(H1N1) fed directly into the Ebola preparedness planning.
- Efficient structures to coordinate preparedness and response measures in the context of the Ebola health threat were established.

### Common challenges

- Resourcing: a number of caveats were noted with regard to sufficient availability of staff and resources. Staff issues with regard to business continuity, in particular the number of trained staff that need to be mobilised to care for a single Ebola patient over a sustained period of time, and the establishments of procedures to manage the impact of this staff mobilisation so other hospital services are not compromised. Need to plan the continuity of operations in situations with more than one Ebola case.
- Personal protective equipment (PPE): challenges in obtaining and deploying Ebola-appropriate PPE in quantities needed to manage a confirmed case for several weeks; challenges in ensuring the timely training of a sufficient number of healthcare workers on how to use Ebola-appropriate PPE (challenge successfully resolved in some, but not all countries); challenges with excessive layering of PPE, which makes it difficult for healthcare workers to do their job.
- Transparency of processes: ensuring sufficient consultations with key stakeholders in a time of crisis in order to develop or adapt the necessary guidelines and standard operating procedures.
- Case definition: Some countries relied on relatively specific case definitions for identifying persons who require investigation for possible infection with Ebola virus, without specific algorithms for the investigation of persons considered to be at a lower probability of infection.

- Capacities:
  - Recognised need for more exercises and training
  - Emergency departments in non-designated hospitals may need further assistance in preparedness planning.
- Evaluation, legacy and application of lessons learned: a comprehensive evaluation plan should be considered so that lessons learned can be used to improve protocols and guidance. Need to ensure that practices and experiences from Ebola are captured and sustained to improve preparedness for future threats.
- Interoperability of plans between sectors: More attention could be paid to ensure the interoperability of the various sectoral plans with the preparedness plans from the health sector.

# Country-specific findings

## Belgium

### Main findings

- Organisational structure and collaboration: robust and concise arrangements for Ebola response governance and organisation, with well-recognised leadership. Intensive and effective collaboration between key stakeholders, including clear coordination and collaboration with key organisations outside the health sector.
- Guidelines and procedures: guidelines and standard operating procedures (SOPs) adapted or developed after extensive collaborative efforts, including participation of professional experts, scientific and non-governmental organisations.
- Communication and capacity building: transparent communication with professionals and the public on the Ebola health threat, including one common multilingual website. Simulation exercises and numerous trainings for staff were organised, for the health sector and in collaboration with key stakeholders from non-health sectors.
- Points of entry: entry checks for all passengers arriving on direct flights between Belgium and affected countries. Good organisation of the passengers flow at the international airport. Intensive collaboration between airport administration, airlines and federal health authorities. This allowed authorities to build confidence in the public about the implementation of safety measures, while at the same time maintaining regular flight schedules. The country contributed to efforts of the international community to control and maintain the outbreak by continuing direct flights to affected African countries so that health professionals could be deployed there.
- Community/primary respondents: general practitioners (GPs) were consulted at the end of the development process for guidelines and SOPs. Health inspectors had an important role as intermediate level between primary care and hospital care, particularly with regard to the decision-making process on case recognition and referrals.
- Inland transport: criteria distinguishing 'dry' from 'wet' cases were applied to determine the transportation mode (dry case: mild disease, manifestation without dispersion of liquids; wet case: severe manifestation of disease, including bleeding and/or vomiting). Protocols were developed for transportation modes and the use of different types of personal protective equipment (PPE).
- Hospitals designated as Ebola treatment centres: three hospitals in three different areas of the country were designated for Ebola care. Structures were modified to meet requirements for isolation and protection of staff when receiving and treating highly infectious patients.

### Main strengths in preparedness planning, organisation and function

- Clear criteria for deciding on a case (symptoms compatible with disease, e.g. fever; evidence of exposure; assessment of risk behaviour).
- Guidelines and flowcharts on algorithms were developed, regularly updated, and disseminated to different levels of the healthcare system.
- Medical staff was informed, trained and provided with advice on how to detect, protect and control the spread of highly contagious viral haemorrhagic fevers such as Ebola. Public and professional communication measures were substantial, with a strong commitment to establish a multilingual 'one-stop shop' website for reference.
- Organisational structures were enforced and specific structures were established to improve the coordination with counterparts. The appointment of an Ebola coordinator and deputy coordinator was a great step forward and improved coordination at clinical and political levels.
- Collaboration between authorities was enhanced in the context of Ebola. Regular reports produced by the Ebola coordinator were discussed and disseminated to relevant stakeholders. The risk management and risk assessment groups collaborate efficiently.
- Direct flights to affected countries were not interrupted, which helped the international community of health professionals to continue their efforts to contain the outbreak in West Africa.
- Designated healthcare facilities were in frequent contact with public health authorities, which improved certain organisational aspects and capacities. There was an exchange between healthcare facilities and public health authorities on adopted practices.
- Laboratory capacity was sufficient; diagnoses were timely.

### Challenges and lessons learned

- Availability of staff was discussed both for the public health area as well as for primary, secondary and tertiary care. Also debated was the sustainability of functions at different levels of the healthcare system if more than one case of Ebola would have to be treated. Shortage of staff and work overload can cause significant pressure when trying to sustain other (routine) activities.

- Lack of resources was responsible for not organising more simulation exercises.
- There is no standardisation of PPE because hospitals initiated procurement of PPE at different times. This may be an issue if the country wants to build a common stockpile.
- Some guidelines/protocols were still in development or in the finalisation stage. Professionals dealing with risk groups need to be more involved in technical discussions and testing guidelines (e.g. carers for asylum seekers). Risk assessments for targeted populations should be supported by more analyses of specific data.
- A detailed analysis of suspected cases should be performed to reveal weak points so that the system can be improved further. It is particularly important to assess the level of burden placed on the system and how this was addressed.

#### Main measures proposed by ECDC

- Preparation of clear plans for system sustainability and resource supply.
- Comprehensive analysis of algorithms of case management based on the experience with suspected cases.
- Initiatives for more simulation exercises with counterparts from all levels of the health system (including GPs) and non-health sector stakeholders. GPs preparedness and their involvement in simulation exercises may need to be further discussed and assessed.
- Review and evaluation of entry screening: lessons learned could be performed in collaboration with countries who applied similar policies. Sharing best practices between airport and airline authorities, and marine and railway authorities, may support the learning process.
- Evaluation of system performance and incorporation of legacy and lessons learned into generic preparedness planning.

## Romania

#### Main findings

- Romania initiated and established a wide range of measures in a short time. The peer-review team concluded that the country is well on its way to being fully prepared to detect, transport and care for an imported Ebola case, while at the same time ensuring adequate staff protection. However, more work needs to be done in order to be fully prepared.
- Areas identified for further improvement mainly concern procurement of PPE, transportation equipment, training in proper use of PPE, developing and disseminating more detailed national guidelines, and simulation exercises.
- In order to fully capitalise on the investment made, it is important to ensure that the advances made in preparedness will also be applied to future health threats, e.g. MERS-CoV, SARS, highly pathogenic influenza strains, polio, and MDR/XDR tuberculosis.

#### Main strengths in preparedness planning, organisation and functions

- Clear organisational structure: robust and concise arrangements for Ebola response governance and organisation, with well recognised leadership. There has been a strong national Ebola committee in place since October 2014, with a cross-sectoral approach which involves all relevant actors. Governmental decisions covering the main aspects of Ebola preparedness are efficiently distributed and well known.
- Technical and scientific competency in the National Institute for Public Health and in the Matei Bals Infectious Disease Hospital is high. Both institutions serve as national resource centres for advice and adapt international scientific guidelines to the Romanian context. Matei Bals infectious disease hospital has developed SOPs and trained staff in the use of advanced isolation equipment, e.g. negative pressure chambers.
- A designated treatment facility in a field military hospital was identified as a single treatment unit for an Ebola case. The hospital can host assigned staff in a secluded compound.
- There is a parallel reporting system in place to detect a potential Ebola case, both through regular surveillance reporting within the public healthcare system and through the 112 emergency number.
- There is a highly proficient rescue service in place with five dedicated SMURD ambulances, complete with isolation units. Helicopters and airplanes for domestic and international patient transport are also available. The Romanian emergency medicine system is highly efficient and seamlessly integrated into the rescue services, thus ensuring high-quality patient management, infection control and staff protection. Staff in the emergency rooms was well aware of Ebola and has efficient routines in place for triage and isolation.
- It seems that GPs are aware of Ebola symptoms, reporting routines, and personal protection with 'light PPE' and distancing (assessment based on limited access to information).
- The border control is well integrated into the district public healthcare system; cooperation with the police, customs, and rescue services is good.
- Because of the lack of PPE, some avian influenza PPEs are getting reused.

### Challenges and lessons learned

- The identification of a number of ‘suspected cases’ (none infected with Ebola virus disease) has demonstrated the sensitivity of Romania’s alert system and also enabled Romania to exercise parts of its Ebola preparedness plan.
- Procuring large quantities of the splash-proof PPE for the treatment and care of symptomatic Ebola case has proved to be challenging. The low quantity of Ebola-specific PPE available severely limits the number of healthcare staff who can be trained in the safe ‘donning’ and ‘doffing’ of PPE.
- The number of healthcare staff trained in how to safely ‘don’ and ‘doff’ Ebola-specific PPE is relatively low; guidance available in health facilities is not always consistent or detailed enough.
- Romania has experienced a ‘brain drain’ of healthcare workers in recent years, which means that the number of trained staff available across the healthcare system is not always optimal. Given the large number of skilled staff needed to care for a symptomatic Ebola case, having to manage such a case for several weeks would put significant pressure on the Romanian healthcare system.
- Romania’s preparedness efforts against earlier health threats – notably avian influenza in 2005–2006 and the 2009 influenza pandemic – have provided a useful foundation for preparing against Ebola.

### Main measures proposed by ECDC

- A national Ebola exercise, testing the full sequence of events and all interactions between the various institutions and authorities, should be undertaken to further improve preparedness.
- Preparedness could be further strengthened by the development of national guidance on certain key areas (e.g. ‘donning’ and ‘doffing’ of PPE), by further investment in training, and by holding a national Ebola preparedness exercise. ECDC could support these efforts by training material on the proper use of PPE, including an instructional video in Romanian.
- Romania could benefit from the experiences from avian influenza, the A(H1N1) pandemic and Ebola through a comprehensive ‘lessons-learned’ exercise, which should include critical incident reviews of the handling of suspected cases.
- The experience gained from Ebola preparedness should be used to develop a generic, integrated, cross-sectoral infectious disease preparedness plan.

## Portugal

### Main findings

- The review team concluded that Portugal has effectively implemented comprehensive and integrated Ebola emergency preparedness measures, tested and improved through the structured management of several probable cases (none of them positive).
- It is apparent that key responder organisations within and outside the health service have gained much from their activities on Ebola preparedness.
- Portugal should shift into its planned evaluation phase in order to consolidate the gains made in preparedness for highly infectious communicable diseases (staff skills, organisational preparedness, physical infrastructure).

### Main strengths in preparedness planning, organisation and functions

- Portugal has achieved full preparedness for Ebola infection through a well organised and well communicated infrastructure.
- There was intensive involvement of key stakeholders in the planning and response phases.
- Staff skills and knowledge have improved in the preparedness process.
- Documentation and structural arrangements (e.g. organisational policies and protocols) were made available for the management of highly infectious diseases such as Ebola infection.
- Information systems are used for the reporting and the analysis of data; there are data links with other sectors (e.g. airport and maritime port authorities). Most of the time, however, authorities used the telephone and contacted on-call duty personnel for initial contacts or preliminary discussions on suspected cases.
- A number of simulation exercises and training activities were conducted, involving all levels of the healthcare system (primary, secondary, tertiary), as well as national and regional authorities.

### Challenges and lessons learned

- Staff skills: health authorities need to ensure that the skills, competencies and capacities for the management of highly infectious diseases are maintained at all responder organisations.
- Designated hospitals: staffing capacity and capabilities for the effective and safe care of Ebola patients may be a challenge if the duration of treatment of a single case is too long or if there are a number of cases simultaneously. A need for comprehensive business continuity plans for the affected specialist hospital services has been acknowledged.

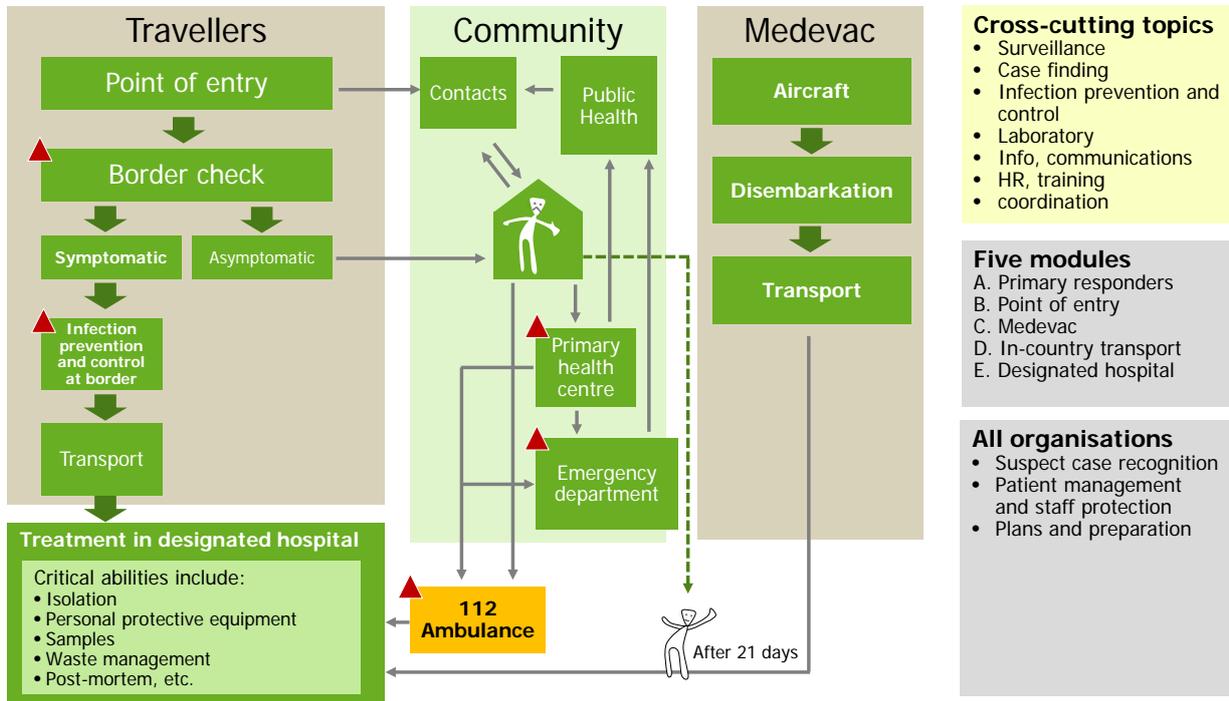
- Use of sophisticated multilayer personal protective equipment (PPE) has been recognised as an issue. Therefore, equipment and guidelines will be further reviewed; this includes a potential simplification of PPE.
- Guidance and protocols have been regularly reviewed, yet an update in the light of experience with probable (or confirmed) cases and international recommendations is needed.
- To facilitate efficient tracing and monitoring and avoid a definition which compromises sensitivity, patient contacts may need to be classified by level of risk.

#### Main measures proposed by ECDC

- Monitoring and support of healthcare workers returning from service in affected countries in West Africa: guidance should be developed for the monitoring and support of healthcare workers returning from clinical, laboratory or epidemiological support work in the affected countries.
- Points of entry: assess awareness of procedures for managing highly infectious patients in undesignated ports.
- Designated hospitals need to discuss the mutual provision of medical and specialist nursing staff in the event that one of them admits a confirmed case.
- Protocols need to be developed for the monitoring of the clinical environment and the laboratory staff involved in the care of Ebola patients. Protocols should use a reasonably sensitive definition for the initiation of investigations in the event of illness and define the roles of occupational health for all hospital services (e.g. medical, psychological, and counselling) involved in Ebola patient care.
- Further expert review of the PPE to be initiated, with a view to a possible agreement somewhat simplified specifications; PPE requirements should be adjusted to risk and ensure reasonable clinical efficacy and a long duration of use.
- An evaluation of Ebola preparedness should include reviews of critical incidents from probable case assessments, subjective feedback from system participants, and the analysis of proxy information on system operation.

# Annex

**Figure 1. Viral haemorrhagic fevers: pathways and potential responders, conceptual scheme**



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