



TECHNICAL REPORT

ECDC country preparedness activities

2013–2017

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This report of the European Centre for Disease Prevention and Control (ECDC) was coordinated and written by Svetla Tsoлова.

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Abbreviations

AF	ECDC Advisory Forum
ASEF	Asia–Europe Foundation
ASPHER	The Association of Schools of Public Health in the European Region
CCB	ECDC Coordinating Competent Bodies
CEPOL	European Union Agency for Law Enforcement Training
CPS	ECDC Country Preparedness Support Section
DG ECHO	Directorate-General for European Civil Protection and Humanitarian Aid Operations
DG SANTE	Directorate-General for Health and Food Safety
EBSA	European Biophysical Societies' Association
EC	European Commission
EDA	European Defence Agency
EEA	European Economic Area
ENP	European Neighbourhood Policy
ERC	Emergency risk communication
ESCAIDE	European Scientific Conference on Applied Infectious Disease Epidemiology
EUPHA	The European Public Health Association
Europol	European Union's law enforcement agency
FAO	Food and Agriculture Organization of the United Nations
FRONTEX	European Border and Coast Guard Agency
GOARN	Global Outbreak Alert and Response Network of the World Health Organization
HEPSA	Health Emergency Preparedness Self-Assessment tool
HSC	Health Security Committee
IHR	International Health Regulations
NFP	ECDC National Focal Point
OCS	ECDC Office of the Chief Scientist
OIE	World Organization for Animal Health
OPCW	Organization for the Prohibition of Chemical Weapons
PHC	ECDC Public Health Capacity and Communication Unit
PHE	Public health event
PHEP	Public health emergency preparedness
PPE	Personal protective equipment
RIVM	National Institute for Public Health and the Environment, the Netherlands
RKI	Robert Koch Institute, Germany
RMC	ECDC Resource Management and Coordination Unit
SMAP	ECDC strategic multi-annual programme
SMT	ECDC Senior Management Team
SRS	ECDC Surveillance and Response Support Unit
UNISDR	United Nations Office for Disaster Risk Reduction
UNODA	United Nations Office for Disarmament Affairs
VHF	Viral haemorrhagic fever
WHO	World Health Organization
WHO EMRO	WHO Regional Office for the Eastern Mediterranean
WHO EURO	WHO Regional Office for Europe

Foreword

This report for the period 2013–2017 provides an overview of ECDC's sustained creative efforts to strengthen public health emergency preparedness in the European Union by supporting cross-border collaboration and a number of additional activities at the country level.

Health security in Europe benefits not only from early threat detection and risk monitoring but also from robust emergency preparedness. The exchange of experience and lessons learned among countries and different organisations with regard to response and management of cross-border threats to health is essential for policymakers and leads to better preparedness at the local, national and EU levels.

The European Centre for Disease Prevention and Control was established with Regulation (EC) No 851/2004 of the European Parliament and of the Council of 21 April 2004¹. One of the core missions of the agency is to support preparedness planning and strengthening the links between the public health and other key sectors.

In 2013, an EU Decision on serious cross border threats to health (1082/2013/EU) was adopted. ECDC supports the implementation of this Decision by providing technical expertise to the European Commission and the Member States of European Union and European Economic Area [6]. Thus, working relationships with the European Commission in the area of preparedness have been strengthened, for example by integrating a number of work plans. Links with WHO have also been further developed.

ECDC's National Focal Points (NFPs) for Preparedness and Response, as representatives of the Member States, are appointed by their respective health authorities (ECDC Coordinating Competent Bodies, CCBs). These experts are the main focal point with regard to preparedness activities and act as the gateway for collaboration with the public health institutes. The members of the NFP network are therefore a key source of advice and guidance for the work in the area of preparedness, while also the main target group for ECDC outputs.

Finally, ECDC also collaborates with countries from the European neighbourhood policy area and its European and global counterparts. European Union enlargement countries appoint preparedness and response experts as observers in meetings and other activities organised by ECDC. ECDC partners with international organisations, for example a) several major centres for disease control (US CDC, China CDC, Korean CDC, Africa CDC); b) UNISDR² (implementation of the Sendai Framework for Disaster Risk Reduction and the application of the Bangkok principles on health); c) Europol (joint initiatives for biosafety and capacity building); d) the Asia–Europe Foundation (risk communication workshops); e) the European Public Health Association (EUPHA) and the Association of Schools of Public Health in the European Region (ASPHER) on public health events; f) and research institutes and academia.

In the past few years, ECDC has dedicated efforts to improve public health emergency preparedness, based on close collaboration across ECDC teams, sections and units. Experts contributing to those activities often have a multi-disciplinary backgrounds ranging from medicine, epidemiology, social and political science, statistics, microbiology to public health.

The target audience for this report are ECDC NFPs for Preparedness and Response – both in their capacity as interested experts and their role as representatives for their country. This report may also serve as a useful review of achievements in the area of preparedness for the Directorate-General for Health and Food Safety (DG SANTE, C3: Crisis management and preparedness in health) and other key partners of ECDC.

¹ Available from: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0851&from=EN>

² United Nations International Strategy for Disaster Reduction. UNISDR was established in 1999 as a dedicated secretariat to facilitate the implementation of the International Strategy for Disaster Reduction (ISDR). It is mandated by the United Nations General Assembly resolution (56/195) to serve as the focal point in the United Nations system for the coordination of disaster reduction and to ensure synergies among the disaster reduction activities of the United Nations system and regional organisations and activities in socio-economic and humanitarian fields. It is an organisational unit of the UN Secretariat and is led by the UN Special Representative of the Secretary-General for Disaster Risk Reduction (SRSG).



December 2015 meeting: ECDC National Focal Points for Preparedness and Response



May 2017 meeting: ECDC National Focal Points for Preparedness and Response

Background

The concept of preparedness is aimed at the reduction of risks posed by communicable diseases. Emergency planning and preparedness can mitigate risks during a public health emergency, regardless of its scale (local, regional, national, European). This requires effective planning, coordination, early detection, assessment, investigation, emergency response, and risk and crisis communication.

EU/EEA Member States and local authorities are responsible for control measures for public health emergencies. Capacity planning at the national level should be flexible and sufficiently resilient to address all types of major communicable disease risks – from epidemics to biosecurity incidents and from well-known risks to new or re-emerging threats.

Preparedness for health threats in the field of communicable diseases depend, to a large extent, on the experiences gained from pandemic influenza preparedness planning. However, preparedness is gradually becoming part of a more generic approach towards planning as emergency preparedness tools, risk response, and risk mitigation are often similar, regardless of the nature of the threat.

Public health emergency preparedness requires coordination across multiple sectors because the provision of public health services and medical care is almost entirely dependent on critical infrastructure sectors, including law enforcement, transport and communications, water and electricity supply, etc. The new EU legislation on serious

cross-border threats to health [3] and the full implementation of requirements under the International Health Regulations [5] by the Member States are critical elements in achieving this goal.

Preparedness for communicable disease threats has been a priority for ECDC since its inception in 2005. Preparedness planning is essential in order to respond effectively to outbreaks and epidemics. Sharing and aligning activities at the European and international levels in the area of public health emergency preparedness adds value to the efforts of single countries which want to strengthen their capacities and ensure coordinated and effective support when faced with cross-border health threats.

Preparedness should be seen as a continuous quality improvement process, including planning, the identification and prioritisation of risks, training, simulation exercises, evaluation of lessons learned, and implementation of necessary organisational change. ECDC has taken steps to address all the different elements of this cycle, providing guidance to support Member States in several areas by offering assessment tools, case studies, literature reviews, and tutorials. Intersectoral aspects and interoperability of preparedness plans are a priority, also when dealing with preparedness for specific diseases (e.g. pandemic influenza and other respiratory threats, such as MERS-CoV; vector borne diseases; food- and waterborne diseases).

ECDC activities in the area of preparedness are in line with priorities set by the European Commission and the Health Security Committee in the area of health security and preparedness: providing support for enhanced preparedness capacity by offering technical assistance, guidance and protocols for preparedness practices, sharing after-event reviews and lessons learned, and organising tests of emergency plans through simulation exercises [14].

The legal landscape

At the operational level, the European Commission has circulated a draft of an action plan to strengthen preparedness for cross-border threats in the EU and support the use of the International Health Regulations. Priority areas identified for action in this document include:

- facilitating cross-sectoral capacity building, exchange of best practices and closer cooperation between Member States to strengthen preparedness and coordination of response;
- strengthening preparedness, including the implementation of IHR core capacity 5 (preparedness), developing standard operating procedures, business continuity plans, promoting the interoperability of national preparedness planning;
- strengthening the scientific evidence base on effective actions and facilitating the development, implementation and sharing of guidelines, tools and procedures in preparedness and response planning; and
- enhancing assessments and reporting under Decision 1082/2013/EU in coordination with the WHO IHR Monitoring and Evaluation Framework.

Article 168 of the Treaty of the Functioning of the EU (TFEU) [1] ensures a high level of human health protection by adoption of EU actions (complementary to Member States) to combat the major cross-border health scourges.

ECDC was founded (Regulation (EC) 851/2004) 'to enhance the capacity of the scientific expertise in the European Community and support Community preparedness planning' [2].

Article 4 of the Decision 1082/2013/EU on serious cross-border threats to health [3] refers to capacities to prepare for and respond to emerging threats. Information on progress in preparedness and response planning is collected at the EU level by reports regularly submitted by EU/EEA Member States (Implementing Decision) [4].

The International Health Regulations (IHR) [5] require development, strengthening and maintaining capacities to detect, assess, notify and respond to a public health emergency of international concern. Preparedness is one of eight defined core capacities [7]. The reporting of progress towards implementation of IHR is also embedded in Art. 4 of Decision 1082/2013.

The WHO Strategic Framework for Emergency Preparedness (2017) [8] identifies the principles and elements of effective country health emergency preparedness and lays out the planning and implementation process, supporting governance, capacities and resources.

Decision 1313/2013/EU [9] on a European Union Civil Protection Mechanism aims at a high-level protection against disasters by means of enhanced preparedness and rapid and efficient response.

The UNISDR Sendai Framework for Disaster Risk Reduction 2015–2030 focuses on enhancing disaster preparedness as one of four key priority areas [10]. The Bangkok Principles for the implementation of the

health aspects of the Sendai Framework [11] promote a whole-of-government, whole-of-society approach in disaster risk planning, which is in line with EU policy and plans on cross-border health threats.

The legal framework of Decision 1082 sets the requirements for national and international institutions to implement, monitor and evaluate progress in establishing sustainable planning processes, collaboration and well-functioning public health preparedness and response systems. Regular or ad-hoc reports on implementation of the legal basis and international agreements provide insights for further improvement and priority settings [12,13].

Within this legal and operational framework, ECDC provides technical support to address capacity building, support cooperation and exchange of practices, provide tools for risk assessment, support monitoring and evaluation of public health emergency preparedness, facilitate the implementation of core capacities, provide expert support to forecast and analyse health threats and their determinants, enhance collaboration between experts in events reviews and simulation exercises.

Strategic focus on preparedness

The overall aim is to provide sound scientific technical support to the key stakeholders in the field of public health preparedness in the European Union Member States and candidate countries to achieve functional and sustainable preparedness systems.

The ECDC Preparedness and Response Strategy includes five objectives:

- Enhance country capacities and capabilities through technical support in line with Regulation (EC) 851/2004 and Decision 1082/2013/EU in order to ensure a timely, efficient and effective response to events including local and national outbreaks of communicable diseases, especially those that have the potential to cross borders
- Develop and foster the exchange of knowledge and good practices among relevant professionals and organisations to further strengthen and keep up-to-date European Union competences and capabilities for health security
- Upgrade and operate the Early Warning and Response System (EWRS)
- Coordinate and support the rapid assessment of risks and the identification of options for response;
- Support national and international field response.

The Strategic Multi-Annual Programme (SMAP) 2014–2020 [15] and the respective annual and bi-annual programming documents guide ECDC's work, providing the foundation for direction and activities across ECDC's core functions and disease programmes.

In the area of preparedness, ECDC focuses on supporting the Commission in the implementation of Article 4 of Decision 1082/2013/EC concerning biological cross-border threats to health. ECDC activities in the field considers needs at three different levels: 1) organisational preparedness at ECDC, 2) support to the European Commission on EU-level preparedness against biological cross-border health threats, and 3) support to national planning and capacity-building to effectively react to biological cross-border health threats.

In its work, ECDC applies the following key principles in the area of preparedness: a) activities should seek to add value and address gaps that may exist at the Union and Member State level; b) activities should be complementary to those of the Commission and EU Member States; c) preparedness is one of the core public health functions; d) the interoperability of preparedness planning between countries and sectors should be a point of emphasis for preparedness support work.

Activities, outputs and outcomes

Support and expertise in the area of preparedness is provided to:

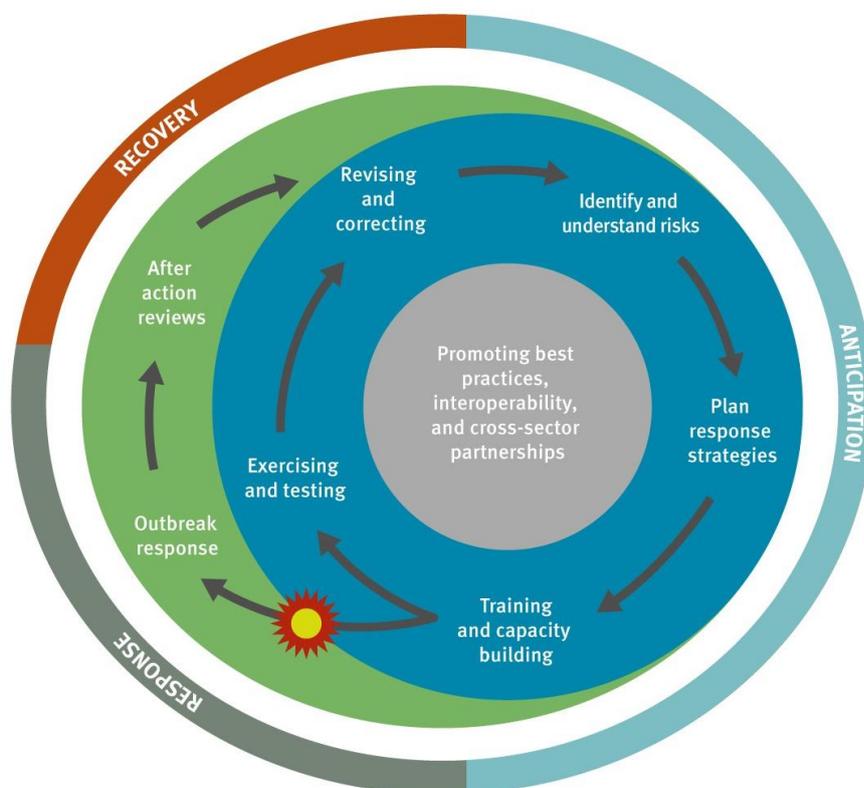
- the European Commission (EC): implementation of the provisions under the legislation on serious cross-border threats to health (Art. 4) and other related initiatives (including technical analysis to support the Health Security Committee);
- EU/EEA Member States: public health emergency planning, business continuity and interoperability through guidance, toolkits and simulation exercises (simulation exercise³ jointly with EC and regional partners such as the World Health Organization, Regional Office for Europe); and

³ Simulation exercises related to preparedness planning aim at strengthening monitoring and evaluation practices and support EU Member States in their capability to test the effectiveness of their preparedness plans.

- key stakeholders: discussing and sharing practices on matters related to public health emergency preparedness, including peer consultations, incidents review analysis, methodologies for risk ranking, planning, monitoring and evaluation. ECDC also supports initiatives to promote operational research in public health emergency preparedness in order to identify crucial vulnerabilities of public health systems.

All ECDC products developed in 2013–2017 were produced following the three core stages of the preparedness cycle: anticipation, response, and recovery.

Figure 1. The preparedness process



Source: Adapted from Suk, J. et al. [16] and: Ute Enderlein U, Schmidt T, Esenamanov V, Hommes F. *The International Health Regulations (2005) Monitoring and Evaluation framework and its implementation in the WHO European Region. Public Health Panorama.* 2018 Mar;4(1):1-146. Available from: http://www.euro.who.int/_data/assets/pdf_file/0003/364890/php-4-1-1208-health-regulations-eng.pdf

ECDC's supports countries in assessing, planning, implementing, and monitoring and evaluating their public health emergency preparedness. Outputs fall under one of the following categories: a) identification of good practices and evidence (literature reviews, case studies, expert meetings); b) dissemination of good practices (development of tools, discussions with experts, peer-review country visits; and c) capacity strengthening (training, simulation exercises, assessments and evaluations).

All activities were aligned with EU/EEA Member State priorities and responded to requests in the area of preparedness. The themes that were of interest to ECDC's key stakeholders included work on analysing and strengthening cross-sectoral public health emergency preparedness, risk communication, guidance on strategic preparedness planning, and tools for (self)assessment. Moreover, ECDC activities in the area of preparedness are increasingly tailored to specific needs of countries, expressed during consultations with ECDC NFPs for preparedness and response.

Achievements 2013–2017

Preparedness cycle: anticipation stage

Risk ranking

The threat of serious, cross-border infectious disease outbreaks in Europe is a significant challenge in terms of emergency preparedness. The types of threats and the pathogens involved are affected by numerous drivers, including agriculture, climate change, global travel, immigration patterns, antimicrobial consumption, environmental degradation, and social inequalities. In order to effectively target the use of resources and prioritise preparedness activities, it is necessary to calculate rankings and prioritise human and/or animal pathogens.

The ECDC risk ranking project was initiated in 2014. It began by reviewing existing risk ranking methodologies and resulted in the publication of a risk⁴ ranking tool for infectious diseases to support assessment and preparedness planning. The aim was to develop an easy-to-use methodology for the systematic pooling of expert opinions in order to distinguish pathogens according to their epidemic and societal impact, allowing for a relative comparison of the threats posed by these pathogens. But not only the results of the ranking exercises are important, the process itself is valuable for infectious disease preparedness planning because it requires structured discussions and information exchange among experts and stakeholders.

A review of best practices in ranking emerging infectious disease threats, published in 2015 [17,18] provides an evaluation of available approaches. In 2017, ECDC published a handbook and tool for the prioritisation of infectious disease threats [19]. This qualitative tool, implemented as an Excel workbook, is based on multi-criteria decision analysis (MCDA). It enables users to rank infectious disease threats in a transparent, comparable and methodologically reproducible manner. The tool enables the relative ranking of different infectious disease threats.

Preparedness planning

Strategic planning is critical to the preparedness process. Preparedness plans are needed to define, organise and coordinate a wide range of activities necessary to prepare, respond to, and assess actions to combat health threats. Preparedness plans set the strategic framework that guides considerations on governance and intersectoral collaboration, capacities and capabilities in the system, and mobilisation and utilisation of resources [8].

A comprehensive set of public health system elements needs to be reviewed and taken into consideration in strategic and operational plans. During preparedness planning, the involvement of as many stakeholders as possible is important for consensus building and for ensuring the interoperability of plans.

Two approaches were used to review preparedness planning: review of published preparedness and response plans and empirical research, such as case studies and peer-review country visits (see section on evaluation). Overall, the findings from this work emphasise the importance of preparedness planning and involvement of relevant stakeholders in all stages of the process. To operationalise a preparedness plan, it is necessary to carefully consider the availability and sustainability of resources and capacities, intersectoral connectivity and interoperability, and effective cross-border collaboration.

To support national planners during a Public Health Emergency of International Concern, a preparedness planning guide for diseases transmitted by *Aedes aegypti* and *Aedes albopictus* was developed [20]. These vectors pose a threat because they transmit Zika virus and other arboviruses, e.g. dengue, chikungunya and yellow fever. The aim of this guide is to highlight preparedness activities that can effectively contribute to reduce the risk of importation and local spread of pathogens transmitted by vectors. This is achieved by focusing national experts' attention to the following main components of preparedness plans: identification of risk areas, planning and coordination, early detection, response and risk and crisis communication.

ECDC published a policy briefing entitled *Preparing for Zika in the EU* [21] to highlight preparedness measures that can minimise the risk of Zika spreading in continental Europe. A guide for preparedness activities in Europe was developed in the context of Zika virus. The guide also outlines measures to ensure the safety of substances of human origin [22].

In 2017, ECDC and the WHO Regional Office for Europe published a technical report entitled 'Guide to revision of national pandemic influenza preparedness plans', which outlines good practices for pandemic preparedness planning based on lessons learned from the 2009 pandemic. Preparing for an influenza pandemic is a continuous process of planning, exercising, revising and translating these activities into national and subnational pandemic

⁴ Risk is defined as a combination of the consequences (impact) of an event or incident (hazard/threat) and the associated likelihood (probability) of a harmful effect to individuals or populations.

preparedness and response plans. The report helps experts identify gaps in pandemic preparedness, improve preparedness plans, prioritise resources, and advocate for additional resources to close preparedness gaps [51].

The intensive migration to EU/EEA countries over the last few years has highlighted a need for overarching preparedness strategies that can support experts in preparedness planning. A preparedness checklist tool [23] was developed to help public health authorities assess the capacity for communicable disease prevention and control at migrant reception/detention centres, both in routine situations and in the context of a sudden increased influx of migrants. The tool⁵ helps to identify gaps and set priorities for development. It was published together with a user guide that also explains the scientific basis of the tool [24].

Practical tools were produced to support public health experts and managers to survey the element of their systems in order to improve planning. An example of this approach is the HEPSA, the Health Emergency Preparedness Self-Assessment tool (HEPSA) [48]⁶.

The HEPSA tool aims to support leaders in public health emergency preparedness to self-assess the status of the preparedness infrastructure and functions in their countries and regions and identify potential gaps. The project went through several development stages. In a first step taken, existing tools were identified and assessed (particularly their advantages and disadvantages for policymakers and planners). The HEPSA tool was developed based on an extensive literature review and an expert consultation on indicators. It was piloted with preparedness leaders in three EU Member States, and its practicability and user-friendliness was assessed. The structure of the tool follows the public health emergency preparedness cycle. It was further revised after input from ECDC's NFPs for preparedness and response. HEPSA is a flexible tool and can easily be adapted by individual countries according to their needs for self-assessment and planning.

The preparedness of Member States (including alert mechanisms, risk assessments, management of cross-border threats, response coordination at the EU level) has been systematically tested during EU health events of low and medium severity.

ECDC worked in close collaboration with the EC and the WHO Regional Office for Europe to support the development of a reporting template for Decision 1082/2013 on cross-border health threats and on the analysis of the responses received by the EU/EEA Member States. In accordance with Article 4(2) of Decision 1082/2013/EU, Member States provided the Commission with an update on their preparedness and response planning at the national level. An analysis for the EC conducted by ECDC was presented as a progress report to the EU Health Security Committee (HSC), with the purpose of initiating a discussion. Two reviews of preparedness planning (reporting cycles 2014 and 2017) included information on the implementation of the International Health Regulations (IHR) [5,25], interoperability between the health and other sectors, and business continuity plans [12].

ECDC supported DG SANTE in four regional seminars for EU/EEA Member States in 2014 (Luxembourg, February; Rome and Vilnius, March; Dubrovnik, May) where participants discussed the new legislation on cross-border health threats.

In 2014, the Ebola crisis in Africa required international actions to contain the spread of the disease. During this event, ECDC preparedness activities were aimed at supporting the Commission and HSC with surveys of preparedness of EU/EEA Member States for importation of Ebola cases. The report was used for a comprehensive discussion among EU/EEA members of the Health Security Committee. Several EU enlargement countries participated in a survey, the results of which were reviewed at a meeting convened by the ECDC International Relations Section.

Upon request, ECDC also conducted peer reviews on Ebola preparedness in three EU Member States. To facilitate this, a country preparedness review methodology for viral haemorrhagic fever was prepared for use by peer-review teams and host countries.

⁵ The tool is a prototype in Microsoft Excel and contains pre-designed indicators and embedded automated analysis functions. Both the tool and the related handbook have been designed to be easily adaptable to the requirements of EU/EEA Member States.

⁶ <https://ecdc.europa.eu/en/publications-data/hepsa-health-emergency-preparedness-self-assessment-tool>

Preparedness cycle: response phase

The activities presented below refer to the stages that fall between preparedness planning and response and can be seen as a preparatory step towards an effective response to public health threats.

Simulation exercises

In May 2014⁷, ECDC published a simulation exercise handbook [26] to support organisations in the public health sector in strengthening their response to events involving communicable diseases, based on effective simulation exercises as a part of preparedness. It provides guidance on how to support decision-makers at the strategic level so they can establish a simulation exercise programme as part of preparedness plans. It also presents all necessary steps for conceptualising, designing, planning, coordinating, conducting and evaluating simulation exercises.

In addition to the handbook, practical exercises were held. In 2013–2014, a curriculum, training materials and a pilot course on 'Preparedness for public health emergencies in the EU and at the country level' were prepared. As training needs in preparedness are multi-disciplinary and involve experts with different backgrounds, working in different disciplines and sectors, an all-hazards approach was adopted for the course (with options for one- or three-day training courses). Participants came from EU/EEA countries. The learning objectives aimed at familiarising participants with the evolving legal framework for public health emergencies and enhancing their skills and competencies for crisis preparedness at the EU and international levels.

A training course on how to plan a simulation exercise, followed by an actual simulation exercise, was held in 2016. Participating experts came from the national level where they worked on preparedness planning and capacity building. This practical training course on exercise design was held in Sofia, Bulgaria, and open to participants from EU/EEA Member States, EU enlargement countries, and European Neighbourhood Policy (ENP) countries. Participants from 22 countries attended. The course was directed towards knowledge and skill qualifications, enabling participants to conceptualise, plan, conduct and evaluate a simulation exercise. The participants also learned to distinguish different types of simulation exercise; create scenarios; develop aims, objectives, scope and scale of a simulation exercise; assemble a master events list; and design an evaluation strategy.

A table-top simulation exercise was held right after the May 2016 training course in Sofia. The scenario was based on an outbreak of dengue fever with cross-border transmission. The simulation exercise involved 27 participating countries (EU/EEA, EU enlargement and ENP countries). International partners also participated in the exercise: DG SANTE, the WHO Regional Office for Europe, the WHO Regional Office for the Eastern Mediterranean, and invited experts (e.g. from Madeira, Portugal, which was affected by a dengue outbreak in 2013).

The simulation exercise showed the need to improve vector surveillance and develop national preparedness and emergency plans. Cross-border outbreaks were considered 'complicated' by the participants, especially with regard to cross-border communication and collaboration. At the end of 2017, ECDC used a similar training approach in Vienna, Austria: a training course on how to conduct a simulation exercise was followed by a table-top simulation exercise, this time with avian and human influenza as the disease scenario.

The exercise aimed at equipping the participants with the knowledge and skills that will enable them to conceptualise, plan, conduct and evaluate exercises in their countries. Experts also practiced approaches to respond to a major national and international communicable disease event/situation, including adoption of intersectoral and cross-border event management for avian/human influenza.

In addition to these simulation exercises, ECDC staff were invited as observers or participants to a number of planning and steering committees for simulation exercise events at the national level (e.g. 2014 in Portugal) and at DG SANTE:

- 'Operation Meliandou', held in Lisbon between on 31 October and 1 November 2014, tested the Portuguese draft Ebola preparedness plan, including several previously published technical guidance documents and protocols on general health service procedures. 'Operation Meliandou' was a command-post and field exercise on the management of Ebola cases in Portugal. The exercise involved a range of key players in the health sector. Two ECDC experts took part as external observers and provided peer assessment and feedback.
- A number of simulation exercises were organised by the European Commission. ECDC experts served on several evaluation panels and on planning or steering committees; they were also invited as observers (e.g. 'QuickSilver' and 'QuickSilver plus', 2015).

⁷ Two training workshops on 'How to develop simulation exercise in public health settings' were held in February and March 2011. Workshop participants discussed the handbook and refined the content.

- ECDC experts were invited to meetings for SHIPSAN⁸ and AIRSAN⁹. They also joined discussions and simulation exercises initiated by other international partners such as WHO (points of entry, IHR implementation, etc.)

Biorisk, biosafety and biosecurity

In 2014, ECDC published a tutorial for trainers in healthcare settings on the 'Safe use of personal protective equipment (PPE)' in the treatment of infectious diseases of high consequence [27]. It presented the fundamental concepts of PPE, aiming at strengthening capabilities and capacities in hospital preparedness across Europe and in other countries with equivalent standards in healthcare. The document's focus was on an extended set of PPE components, including goggles, respirators, gloves, coveralls and footwear. The main learning objectives were to present the technical requirements for procuring PPE and to convey the crucial aspects of PPE usage. In addition, a tutorial [28] and a video [29] on PPE, with subtitles in English, French, German, Portuguese, Spanish and Romanian, was launched.

As a first step in the development of EU cross-sectoral biorisk training, ECDC organised an expert workshop on 'Needs assessment for joint training for biological threats' at Europol headquarters, The Hague, Netherlands, in 2014. The workshop helped formulating core competencies and collect good practices for biorisk training. This was followed in 2016 by a pilot course entitled 'Intersectoral training on staff protection from biological hazards' at Robert Koch Institute, Berlin. Both courses were attended by representatives of several organisations who served as experts and evaluators: Europol, the Commission, CEPOL, Frontex, EDA, OIE, Interpol, FAO, EBSA, OPCW, UNODA, WHO and NATO.

In the context of the cooperation framework between ECDC and EUROPOL, ECDC held a cross-sectoral biorisk awareness and mitigation training course in Budapest, Hungary, in June 2017. This course used a regional approach with attendees from three different sectors. One of goals of the course was to establish preparedness partnerships between neighbouring countries and their law enforcement sectors, their public health/health emergency services and their civil protection services. Participants came from 11 EU/EEA Member States and four EU enlargement countries. Observers and invited speakers from several international institutions/agencies also attended: the Directorate-General for Health and Food Safety, the Directorate-General for Migration and Home Affairs; the Hungarian national police; the public health agency of Sweden; Robert Koch Institute, Germany; the Portuguese national police; RIVM, the Netherlands.



Personal protective equipment at the cross-sectoral biorisk awareness and mitigation training, June 2017, Budapest.

In the context of the Commission's joint procurement initiative (as laid down in the legal framework set by Decision 20182/2013), ECDC provided extensive support to DG SANTE by providing detailed specifications for the joint procurement of personal protective equipment.

⁸ EU SHIPSAN ACT is a European joint action funded by the European Commission that deals with the impact of the maritime transport of health threats due to biological, chemical and radiological agents, including communicable diseases.

<http://www.shipsan.eu/>

⁹ The AIRSAN project supports EU Member States in ensuring a well-organised and coherent response to public health threats.

<http://www.airsan.eu/Home.aspx>

Contribution to response actions



ECDC expert with colleagues from Guinea, 2014

ECDC participated in response efforts to contain the spread of Ebola disease that heavily affected several West African countries in 2013–2015. ECDC experts were deployed to Africa to collaborate with international partners. Back home, ECDC provided support to EU/EEA Member States and the Commission by reviewing preparedness plans and preparedness activities designed to prevent the spread of the disease to Europe. After the main peak of the epidemic, a European Council conclusion highlighted the need for reinforced preparedness measures in the EU [30].

Capacities, capabilities and competences in the area of preparedness

A comprehensive work programme was initiated in 2015 and a framework on core competences in the area of preparedness was developed. Both activities used the definition of public health emergency preparedness (PHEP) developed by Nelson et al. [31] who state that public health emergency preparedness is:

‘the capability of the public health and health care systems, communities, and individuals, to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities. Preparedness involves a coordinated and continuous process of planning and implementation that relies on measuring performance and taking corrective action.’

A logic model [32] was developed that allows PHEP systems to assess capabilities and capacities as proxies for outcomes¹⁰ and use them as a first step for the development of competency-based¹¹ training curricula and pilot training courses. The second stage included the development of a public health preparedness competency model for EU/EEA Member States as a framework for competency-based training curricula for experts working in the area of preparedness. Several sources of information were used to support the development of the model: a preliminary list of PHEP competencies based on the logic model; existing competency statements, especially those developed by ECDC for public health epidemiologists [33], microbiologists [34] and healthcare infection control experts [35]; scientific literature about PHEP; and a consultation process with experts involved in preparedness planning, communication and training, and practitioners in emergency preparedness and response. In the next phase, the finalised public health preparedness competency model [36] will be used for the development of training curricula.

Another aspect of public health emergency preparedness is community engagement. The success of institutional preparedness plans depends upon acceptance and, to some extent, implementation of these plans by communities. Community engagement can be an enabler or a barrier to preparedness, depending on how it is handled and is constructed. As part of a three-stage programme on community preparedness, a literature review [37] was conducted to identify the enablers and barriers for emergency preparedness in communities and institutions. The report proposed nine key messages aimed at improved communication and additional synergies between communities and institutions. In 2017, ECDC conducted two case studies – one in the Netherlands and one in Spain – on how to review community preparedness and learn from good practices. Both studies focused on tick-borne diseases. The development of a reference guidance document on community preparedness was discussed.

¹⁰ Capacities represent the resources – infrastructure, policies and procedures, knowledgeable and trained personnel – that a public health system has to draw upon. Much of what public health preparedness organisations do on a day-to-day basis – planning, training, and acquiring equipment and supplies – is intended to build capacity for future emergencies. Capabilities, on the other hand, describe the actions a public health system is capable of taking to effectively identify, characterise, and respond to emergencies. For example, in the case of communicable diseases, having strong laboratories and skilled staff may be insufficient if they cannot be mobilised in a timely manner.

¹¹ ‘Competency based’ means that training participants acquire knowledge and skills based on a defined set of core competencies (combinations of knowledge and skills that are required to perform a task effectively). The term ‘competence’ refers to the knowledge and skills that an individual person possesses.

In 2016, ECDC and the Asia–Europe Foundation (ASEF)¹² held a workshop in Stockholm entitled ‘How can we be better prepared for the next global health threat? Planning and implementing emergency risk communication’. Public health experts in the area of preparedness planning, communication and training from two continents discussed the need for strengthening the link between emergency risk communication, training and preparedness planning [38]. The overall aim of this workshop was to strengthen institutional links (communication, training and preparedness) and underline the importance of integrating the emergency risk communication into planning and training for public health emergency preparedness.

The preparedness theme was also explored during ECDC’s annual summer school. A training module on preparedness was delivered to healthcare professionals and ECDC Fellowship Programme¹³ coordinators. Information sessions on preparedness were also provided to delegations from partnering centres for disease control and experts from countries outside the EU/EEA visiting ECDC, for example the China CDC or the Korean CDC.

Preparedness cycle: recovery/evaluation stage

Measuring the effectiveness of preparedness is a complex task due to the fact that many different elements and factors can influence the outcomes. In emergency preparedness, different elements of public health and healthcare systems interact, and critical sectors outside of public health may be involved. To add to the complexity, there is no set of indicators agreed at the EU level on how to measure preparedness.

After-event/incident reviews¹⁴ can improve preparedness by showing good practices and learning from past events. ECDC initiated an expert consultation and several evidence reviews (2015–2017) to formulate agreed principles for good practice for after-event reviews. A literature review was conducted, aimed at identifying and describing the best methods of preparing incident reviews for the purposes of improving public health emergency preparedness and response planning.

The review found that there is no common or standardised approach; the challenges for establishing best practices were discussed in expert consultations in 2016 and 2017. The best choice of a methodology depends on the impact and severity of the incident itself, the immediacy of the improvements required, and the resources available for the review. Based on this, a checklist is under development to help decision-makers to use a standardised template for identifying key elements when analysing an incident.

Peer review visits are another approach to foster improvements in public health preparedness and to facilitate exchange of experiences. These visits were focused on different threats in the period 2013–2017, depending on the ‘emergency of the day’ and foreseen threats from infectious diseases. These activities were jointly executed with relevant ECDC disease programmes (Table 1) as well as external partners (Member State representatives, WHO, European Commission).

Table 1. Peer review assessments (case studies)

Topic	Countries	Year	Resources/ECDC Disease programmes (DP)
Respiratory viral pandemic (MERS-CoV) [39]	Greece, Spain and UK	2014	Lot 2, framework contract ¹⁵ + experts from PHC unit (CPS) and SRS/OCS units (IRV DP)
Pandemic preparedness	Iceland	2016	Team composed of experts from PHC unit (CPS, COM) and SRS/OCS units (IRV DP) and 4 experts from other EU/EEA Member States (Finland, Norway, Spain, the UK)
	Bulgaria	2017	Joint mission with WHO Regional Office for Europe
Polio [40]	Cyprus and Poland	2015	Lot 2, framework contract + experts from PHC unit (CPS) and SRS/OCS units (VPD DP)
Ebola (highly contagious viral haemorrhagic fever) [41]	Belgium [42], Portugal [43] and Romania [44]	2014	Team composed of experts from PHC unit (CPS), SRS/OCS units (EVD DP) and experts from other EU/EEA Member States (Bulgaria, Germany, the Netherlands, Norway, Spain, and the UK)
Mosquito-borne diseases	Malta	2016	Team composed of experts from PHC (CPS, COM) and SRS/OCS units (EVD DP) and experts from other EU/EEA Member States (France, Italy, Portugal/Madeira)
Community preparedness	Netherlands and Spain	2017	Team composed of experts from PHC (CPS) and

¹² ASEF is an intergovernmental not-for-profit organisation representing the 53 Asia-Europe Meeting (ASEM) Partners; 20 Asian and 32 European (29 EU/EEA) countries, plus the Association of Southeast Asian Nations (ASEAN) Secretariat and the European Union.

¹³ <https://ecdc.europa.eu/en/epiet-euphem>

¹⁴ Such reviews have diverse names, including ‘critical incident reviews’, ‘after-action reviews’, or ‘look-back learning reviews’.

¹⁵ For more details see Section on ‘Financial mechanisms’.

Topic	Countries	Year	Resources/ECDC Disease programmes (DP)
visits			SRS/OCS units (EVD DP) or experts from diseases networks of EU/EEA Member States.

Public health emergency preparedness planning is a complex framework that contains many elements of the health system that need to be reviewed by decision makers (e.g. patient pathway; surveillance, communication, laboratory analysis; etc.). Therefore, having a clear outline of processes and procedures could be helpful when defining the roles for the various sectors, institutions and agencies involved in preparedness and response. Moreover, the relationship between the national and local levels is critical for ensuring continuity between policy and implementation.

ECDC has been extensively involved in the technical assessment of surveillance and response systems of EU enlargement countries. The Centre also developed an assessment methodology [45] and a related toolkit [46] and engaged in field work (including production of assessment reports and follow-up country visits and discussions). ECDC also held meetings and workshops for EU ENP countries. Preparedness was assessed for all EU candidate countries (Table 2).

Table 2. Assessment of EU enlargement and candidate countries

Year	Country
April 2012	Croatia
December 2012	Iceland
June 2013	Montenegro
October 2013	Serbia
April 2014	Moldova
June 2015	Turkey
October 2015	Ukraine
October 2016	The former Yugoslav Republic of Macedonia
September 2017	Albania

In collaboration with the WHO Regional Office for Europe, preparedness experts participated in joint external evaluations in EU/EEA (2017, Latvia) and in several meetings with key stakeholders to discuss the methodology of the joint external evaluation tool and the benefits of peer reviews. Other ECDC work included the evaluation of programmes and the development of assessment and evaluation methodologies, e.g. microbiology capacity self-assessment framework, protocol for the evaluation of diseases programmes, external evaluations, and internal evaluation of public health events (Ebola) [49].

Collaborative approach

ECDC applies a cross-organisational and collaborative approach for performing its activities and the development of technical reports and peer-reviewed articles. The Centre also organises task forces; it offers a forum for discussion on issues related to emergency preparedness planning and response, particularly with regard to the public health discussion on migrants' health, socio-economic determinants of disease, and the impact of climate change on infectious diseases.

Collaboration with EU/EEA Member States has always been a top priority for ECDC. ECDC's activities are closely aligned to the needs of the Member States, adding European value to national activities in the area of public health emergency preparedness. During consultations with the ECDC NFPs for Preparedness and Response, the Centre collects suggestions and ideas for activities and incorporates them into its annual preparedness activity plan.

Close collaboration with the Directorate-General for Health and Food Safety and the WHO Regional Office for Europe helps the Centre to align its action plans and (bi-)annual activities in the field of public health preparedness with those of its partners. Collaboration with UN bodies (e.g. UNISDR) was intensified after the adoption of the Sendai Framework for Disaster Risk Reduction [10]. Upon request from the newly established Africa Centres for Disease Control and Prevention (Africa CDC), the Centre provided technical support on establishing surveillance networks and other activities in the field of public health preparedness.

ECDC preparedness experts shared their knowledge at the annual ESCAIDE conference and co-organised activities with EUPHA, ASPHER, and the European Health Forum Gastein. ECDC experts also participated in an initiative of the European Space Agency and discussed future threats and 'planetary protection'.

In 2016, ECDC organised an international expert meeting with researchers and academics to support the exchange of knowledge in the area of public health preparedness and foster research. At the end of 2017, a meeting at ECDC on the preparedness aspects in the context of 'One Health' was organised to strengthen collaboration between sectors and further align common objectives. The overall objective was to secure better health by mitigating cross-border threats to health and strengthen the state of preparedness in the EU [50].

Financial mechanisms

Framework service contracts were used to facilitate the execution of activities/projects and meet the objectives of the ECDC preparedness work plan. The contracts were signed in 2014 and provided a solid financial mechanism to perform the planned activities (Table 3). Additional contracts (through open or negotiated procedures) were signed with public health institutes from EU/EEA Member States, research teams from universities and agencies, and individual experts to obtain expertise and produce materials supporting ECDC preparedness activities.

Table 3. Framework service contracts

Framework service contract	Lot	Contractor
'Public Health Emergency Preparedness activities in support of EU/EEA, EU Enlargement and European Neighbourhood Policy Partner countries' (five lots)	Lot 1 (Literature reviews): Literature reviews and evaluations of guidance documents in the field of public health emergency preparedness	Bazian Ltd., UK
	Lot 2 (Case studies): Case studies on cross-border and intersectoral preparedness and business continuity	Umeå University, Sweden
	Lot 3 (Tools): Develop tools, templates and guidance supporting EU Member States' self-assessment of core capacities for preparedness and response planning, in line with the IHR	Public Health England/PERPHECT consortium (Public Health England, UK; EpiConcept SAS, FR; Insitudo de Salud Carlos III, ES; Insitudo Superiore di Sanita, IT; Robert Koch Institut, DE)
	Lot 4 (Workshops): Organise and facilitate preparedness good-practice sharing workshops with EU Member States and disseminate workshop outcomes; technical and logistics services	Umeå University, Sweden
	Lot 5 (Training): Prepare and run courses/training sessions on health emergency preparedness topics in EU Member States; technical and logistics services	Public Health England/PERPHECT consortium
Ranking infectious disease risks to support public health prioritisation in the European Union.		RIVM – Rijksinstituut voor Volksgezondheid en Milieu, Netherlands

Annex 1. Chronology of activities

Note: Participation in preparedness activities organised by ECDC was open to EU/EEA Member States, EU enlargement and ENP countries, and invited experts and representatives from international organisations.

2013

- Supported the European Commission in establishing a concept on capacity assessments in the area of preparedness
- Technical support to the Commission on development of the legal framework on cross border health threats: Decision 1082/2013/EU
- Supported the Commission and EU Member States in pandemic preparedness as component of general preparedness activities
- Supported EU/EEA Member States in the implementation of cross-border health threat legislation (Decision 1082/2013) – preparation of a framework/indicators for the assessment of the preparedness plans in the EU Member States.

Name of the meeting	Objectives	Place	Dates	Number of participants
Joint ECDC/WHO Regional Office for Europe meeting on the consultation on pandemic and all-hazard preparedness	Focus: a) to provide an overview of the preparedness landscape and explore gaps in preparedness implementation across the EU; b) to discuss pandemic preparedness in the context of all-hazard preparedness planning. Specific objectives: a) to discuss development, monitoring and synergies between IHR core capacities, pandemic preparedness, and capacity provisions included in the EU Decision on cross-border health threats; b) to discuss practical implications of the new Decision on serious cross-border health threats for Member States and their interactions with ECDC and WHO, as well as synergies with IHR; c) to identify and share good practices and potentially agree on key areas for inter-country collaboration; d) to advise ECDC and the WHO Regional Office for Europe on priority areas of preparedness work for the coming years.	Slovakia, Bratislava	20-21 November	70

2014

- Technical support to the European Commission on the development of a reporting template under Article 4 (Preparedness) of Decision 1082/2013/EU
- Participation as observers of activities organised by the European Commission on implementation of Decision 1082/2013/EU (simulation exercises, workshops to discuss the legal framework, expert meetings)
- In August 2014, the Ebola preparedness of EU Member States became a top priority for the Commission and the EU Health Security Committee. Surveys were conducted to assess the Member States' preparedness to manage Ebola cases. Training tutorials for European health professionals on the correct use of personal protective equipment were developed.

Name of the meeting	Objectives	Place	Dates	Number of participants
Ad hoc advisory meeting on preparedness	Overall aim: to receive guidance from a small group of National Focal Points on the activities of the Country Preparedness Support section of ECDC in order to ensure their alignment with countries' expectations and priorities, and to serve as a sounding board for issues to be brought to the attention of all Focal Points during the plenary meeting of National Focal Points for Preparedness and Response on 15–16 October. Specific objectives: to advise on the preparation and agenda of the annual meeting of National Focal Points; to review and provide comments on projects and draft deliverables produced by ECDC (e.g. case studies, training programmes, literature reviews); to provide guidance on ECDC's 2015 work plan on preparedness.	Sweden, Stockholm	15-16 May	28
Expert workshop 'Needs assessment for joint training in response to biological threats'	Outcome: to develop the basics for an up-to-date curriculum for a joint training programme on biological threats. Outputs on concept and content: a) identify real-life demand for capacities and capabilities for the detection and management of biological threats; b) formulate the core competencies for effective preparedness and response to biological threats in a wide variety of institutions and linking them to other competencies needed in an all-hazard preparedness approach; c) identifying fields in biohazard preparedness that benefit from enhanced intersectoral and interdisciplinary cooperation; d) presentation of existing concepts for bio-hazard training for a multidisciplinary or intersectoral audience; e) identifying the right audiences and methods for the delivery of effective biohazard training courses.	Netherlands, The Hague	17-19 June	36
Annual meeting of ECDC's National Focal Points for Preparedness and Response	Overall aim: to contribute to building a preparedness community of practice at European level. Specific objectives: a) facilitate the exchange of good practices between Member States in public health emergency preparedness; b) work collaboratively towards the definition of common scientific approaches and terminology in the field of preparedness; c) discuss ECDC projects and ways to maximise their added value for Member States.	Sweden, Stockholm	15-16 October	50

2015

- ECDC experts deployed in West Africa (with WHO and the Global Outbreak Alert and Response Network (GOARN))
- Analysis of Art. 4 of Decision 1082/2013/EU (preparedness issues)
- Launched a series of projects to strengthen preparedness in Member States in response to the migrant/refugee crisis
- Peer review preparedness visits to three EU/EEA Member States: Belgium (16–19 March), Romania (19–21 March), and Portugal (30 March–1 April), with a focus on how countries respond to the management and treatment of Ebola cases. The reports identified best practices in countries through a standardised peer-review approach and identified areas where ECDC support was needed.
- Developed training modules for simulation exercises; revised simulation exercise handbook for public health emergencies.
- Published aggregated case study report to review preparedness for respiratory diseases (MERS-CoV) and vaccine-preventable diseases (polio), with a focus on potential for outbreak and cross-border spread.
- Publication of outputs from risk-ranking project
- Launch of two projects on preparedness for the sudden influx of migrants

Name of the meeting	Objectives	Place	Dates	Number of participants
How to plan for pre-hospital management of suspected viral haemorrhagic fever patients (training course)	Aim: to equip the trainees with a set of competencies related to planning for a scenario of a transport of a suspected viral haemorrhagic fever case from an airport or a primary care/community setting to a designated treatment facility; to provide the opportunity to pilot test and subsequently adapt the training to specific contexts in the countries.	Sweden, Stockholm	17-18 March	20
Expert consultation on ranking and prioritising emerging infectious disease threats for preparedness	Aim: to provide multi-disciplinary input for an ECDC project on developing a handbook and methodology for risk ranking exercises. Outputs: a) an exchange on best practices in risk ranking methodologies; b) the identification and weighting of key criteria that should be used to rank emerging infectious disease threats; c) a preliminary ranking of the key emerging infectious disease threats facing the European Union; d) brief meeting report.	Sweden, Stockholm	25-26 March 2015	40
How to set up, run and evaluate simulation exercises in EU public health settings; a practical course	Aim: a) to disseminate knowledge and to update the 'Handbook on simulation exercises in EU public health settings'; b) to provide the participants with knowledge and a set of skills to conceptualise, plan, conduct, and evaluate simulation exercises in their countries; to teach the course in their home countries.	Sweden, Stockholm	7-9 July	15
Annual Meeting of NFP Preparedness and Response; with participation of EU enlargement countries observers in the area of preparedness and response	Overall aim: to contribute to building a preparedness community of practice at European level. Specific objectives included: a) facilitate the exchange of good practices between Member States in public health emergency preparedness and response; b) build on the lessons learned from recent cross-border threats to health (e.g. Ebola, MERS, polio, etc.) to identify needs for further scientific work and derive concrete actions at the technical level; c) identify priority support areas for ECDC, review ongoing projects, and discuss ways to maximise their added value for Member States; d) contribute to improve integrated actions and activities within the areas of preparedness and response.	Sweden, Rosersberg	8-9 December	71

2016

- Training course on how to organise a simulation exercise and a table-top simulation exercise with a number of EU Member States, enlargement countries and several European neighbourhood policy countries; preparedness of different sectors to tackle the growing concerns on vector-borne diseases.
- Peer review visits on pandemic influenza preparedness (Iceland, 9–11 November) and mosquito-borne diseases (Malta, 4–6 July)

Name of the meeting	Objectives	Place	Dates	Number of participants
Scoping meeting: towards a research agenda for preparedness of infectious disease threats in Europe – addressing knowledge gaps in infectious disease emergency preparedness in Europe.	To address the following questions: a) what are the most important knowledge gaps related to infectious disease preparedness in Europe across the three principle phases (anticipation, response, recovery); b) what research is being undertaken that addresses these gaps; c) what needs to be done to ensure the optimal design, implementation, and iterative improvement of infectious disease preparedness plans; d) what practical tools and approaches exist that can support preparedness planning and optimisation in Europe; and e) how can ECDC support the undertaking and dissemination of applied preparedness research.	Sweden, Stockholm	16-17 February	33
Expert workshop: 'State of the art of the use of critical incident reviews in public health emergency preparedness'	Aim: a) to review the evidence for the most effective conduct and use of critical incident reviews; b) to support public health practice and development of country health emergency capabilities; c) develop ECDC guidance for conduct and practical application of critical incident reviews (along with ECDC guidance on the use of simulation exercises).	Sweden, Stockholm	17-18 February	26
Training course on the effective planning, implementation and evaluation of simulation exercises, (17-18 May 2016) and simulation exercise (19-20 May 2016)	Main objectives: a) to equip the course participants with the knowledge and skills that will enable them to conceptualise, plan, conduct and evaluate exercises in their countries and/or organisations building upon the ECDC 'Handbook on simulation exercises in EU public health settings'; b) to practice public health emergency preparedness of the participating countries based on a major national and international communicable disease event/situation, including particular references to both intersectoral and cross-border event management.	Bulgaria, Sofia	17-20 May	32/74
Joint ECDC and ASEF Workshop, How can we be better prepared for the next global health threat? Planning and implementing emergency risk communication [38]	Overall aim: to strengthen the link between emergency risk communication (ERC) and public health emergency (PHE) preparedness planning. Specific objectives: a) to recognise the complexity and the role of ERC before, during and after public health emergencies; b) to understand the PHE preparedness cycle and the integral part ERC plays in PHE preparedness plans; c) to identify the components needed in a PHE preparedness plan to ensure coordinated, coherent and consistent ERC; d) to identify the competencies required to secure the implementation of ERC, as defined in a preparedness plan; and, subsequently, how to build capacities and capabilities; e) to draw recommendations and conclusions on actions needed in order to be prepared for future public health events and ERC.	Sweden, Stockholm	6-8 September	90
Joint ECDC/EUPHA/ASPHER workshop on core competencies	Objectives: to discuss how institutional preparedness for public health emergencies can contribute to 'health for all'	Austria, Vienna	9-12 November	8

2017

- Technical support to the preparedness working group under the Health Security Committee
- Set of competencies on public health emergency preparedness published
- Literature review on community preparedness published
- Technical report: Towards One Health preparedness published

Name of the meeting	Objectives	Place	Dates	Number of participants
Expert meeting on ranking and prioritising emerging infectious disease threats for preparedness	Aim: ranking emerging infectious disease threats with a multi-disciplinary, EU-wide approach. Experts worked in small groups in order to rank approximately 30 diseases from an EU perspective. Outputs: a) a set of recommendations and/or suggestions to improve the ranking tool; b) brief meeting report.	Sweden, Stockholm	14-16 February	37
Good practice in review of public health emergencies: expert consultation	A second meeting to follow up the initial expert consultation and literature review (early 2016), which generated a number of proposed principles of good practice in the planning, conducting, and reporting of post-event reviews. Aim: to identify and assess principles for ECDC guidelines on good practice for the review of public health emergencies.	Germany, Berlin	30-31 March	21
ECDC expert consultation on strategic planning for public health emergency preparedness and HEPESA tool	Overall objective: to follow-up on the online questionnaire regarding the statements/recommendations Specific objectives: a) to present the methodology and results of the online expert consultation on strategic planning for public health emergency preparedness; b) to discuss statements/recommendations included in the online consultation that were not directly selected or rejected, according to an analysis of the responses; c) to discuss the applicability and practicability of the associated handbook on strategic planning for public health emergency preparedness; d) to present an associated tool under development, the Health Emergency Preparedness Self-Assessment Tool (HEPSA).	Netherlands, Utrecht	10-11 April	22
Joint meeting for National Focal Points for Preparedness and Response & National Focal Points for Threat Detection, EWRS and IHR	Overall aim: a) to discuss ongoing activities, developments and future plans in the areas of threat detection, response and preparedness; b) to ensure effective cooperation between ECDC and partners. Specific aims: a) to present and discuss the ECDC preparedness strategy and current EC and IHR action plans for preparedness; b) to discuss with Member States, the European Commission and meeting participants the main needs and priorities to be considered in the planned new version of the EWRS platform; c) to discuss developments and challenges in the global field response to international public health events and the role of ECDC and Member States; d) to discuss and further develop with Member States the ECDC strategic work plans 2018–2019 on threat detection, preparedness and response.	Sweden, Stockholm	17-19 May	96
Cross-sectoral biological risk awareness and mitigation training	Overall aim: train-the-trainer course for a multisectoral audience from key areas: law enforcement, public health and civil protection. Main objective: to allow participants to increase their knowledge of biological threats and principles of protection from biological hazards.	Hungary, Budapest	6-8 June	67
Simulation exercise and training on how to organise a simulation exercise	Main objectives: a) to equip the course participants with the knowledge and skills that will enable them to conceptualise, plan, conduct and evaluate exercises in their countries; b) to practice the public health emergency preparedness of the participating countries in response to a major national and international communicable disease event/situation, including inter-sectoral and cross-border event management (avian/human influenza).	Austria, Vienna	22-24 November	60
Expert consultation on One Health preparedness	Participants, including senior research experts, opinion leaders, partners including WHO, FAO, OIE and the European Commission, and ECDC, discussed three major questions: a) Based on the key risk drivers and disease threats facing Europe, what sectors and disciplines should be prioritised for collaboration? b) What can be learned from the public health response to past zoonotic disease outbreaks? c) How can intersectoral preparedness strategies best be implemented in a One Health context (i.e. what operational and research priorities exist in Europe for implementing One Health preparedness)? The aim was to identify disease threats and drivers, cross-cutting themes, and suggested actions to enhance intersectoral coordination and address research gaps.	Sweden, Stockholm	11-12 December	40

Annex 2. Technical reports

- Handbook on simulation exercises in EU public health settings: How to develop simulation exercises within the framework of public health response to communicable diseases [26].
- Safe use of personal protective equipment in the treatment of infectious diseases of high consequence. A tutorial for trainers in healthcare settings [27]
- Tutorial – Critical aspects of the safe use of personal protective equipment (PPE) [28] 2014
- Public health emergency preparedness for cases of viral haemorrhagic fever (Ebola) in Belgium: a peer review. 16-19 March 2015 [42].
- Ebola preparedness peer review mission, Romania. 19-21 March 2015 [44].
- Public health emergency preparedness for cases of viral haemorrhagic fever (Ebola) in Portugal: a peer review. 30 March–1 April 2015 [43].
- Ebola emergency preparedness in EU Member States. Conclusions from peer-review visits to Belgium, Portugal and Romania [41].
- Best practices in ranking emerging infectious disease threats. A literature review [18].
- Preparedness planning for respiratory viruses in EU Member States. Three case studies on MERS preparedness in the EU [39].
- Handbook on using the ECDC preparedness checklist tool to strengthen preparedness against communicable disease outbreaks at migrant reception/detention centres [24].
- Handbook on implementing syndromic surveillance in migrant reception/detention centres and other refugee settings [47].
- Zika virus disease epidemic: Preparedness planning guide for diseases transmitted by *Aedes aegypti* and *Aedes albopictus* [20].
- Zika virus and safety of substances of human origin. A guide for preparedness activities in Europe [22].
- Case studies on preparedness planning for polio in Poland and Cyprus [40].
- A literature review on community and institutional emergency preparedness synergies [37].
- ECDC tool for the prioritisation of infectious disease threats [19].
- Public health emergency preparedness – core competencies for EU Member States [36].
- HEPSA – health emergency preparedness self-assessment tool – user guide and tool [48]
- Towards One Health preparedness [50]
- Guide to revision of national pandemic influenza preparedness plans: Lessons learned from the 2009 A(H1N1) pandemic. [51]

Annex 3. Peer-reviewed publications

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