



ECDC **CORPORATE**

ECDC strategic
multi-annual programme

2014–2020

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Working together to reduce the burden



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Abbreviations

AF	Advisory Forum
AIDS	acquired immunodeficiency syndrome
AMR	antimicrobial resistance
ARHAI	Antimicrobial resistance and healthcare-associated infections
ASPHER	Association of Public Health Schools in the European Region
cCB	Coordinating Competent Body
CB	Competent Bodies
CJD	Creutzfeldt–Jakob disease
DG	Directorate-General
DPO	Data protection office(r)
EAAD	European Antibiotic Awareness Day
CHAFAEA	Consumers, Health and Food Executive Agency (before 1 January 2014: Executive Agency for Health and Consumers, EAHC)
EARS-Net	European Antimicrobial Resistance Surveillance Network
EASA	European Aviation Safety Agency
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EEA	European Environment Agency
EEAS	European External Action Service
EFSA	European Food Safety Authority
EMA	European Medicines Agency
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
ENP	European Neighbourhood Policy
EPIET	European Programme for Intervention Epidemiology Training
EPIS	Epidemic Intelligence Information System
ESAC-Net	European Surveillance of Antimicrobial Consumption Network
ESBL	Extended spectrum beta-lactamase
EU	European Union
EUCAST	European Committee on Antimicrobial Susceptibility Testing
EUPHEM	European Public Health Microbiology Fellowship Programme
EVD	Emerging and vector-borne diseases
EWRS	Early Warning and Response System
FETP	Field Epidemiology Training Programme
FRA	European Union Agency for Fundamental Rights
FWD	Food- and waterborne diseases
HAI	healthcare-associated infection
HAI-Net	Healthcare-Associated Infections Network
HCV	hepatitis C virus
HIV	human immunodeficiency virus
HR	Human resources
ICT	information and communication technologies
IHR	International Health Regulations
IT	information technology
JRC	Joint Research Centre
MB	Management Board
MDR TB	multidrug-resistant tuberculosis
MMR	measles, mumps and rubella vaccine
MRSA	meticillin-resistant <i>Staphylococcus aureus</i>
OECD	Organisation for economic co-operation and development
PDR	Pan-drug-resistant
RSV	respiratory syncytial virus
SARS	severe acute respiratory syndrome
SLA	Service level agreement
STEC	<i>Shiga</i> -toxin-producing <i>Escherichia coli</i>
STI	sexually transmitted infection
TB	tuberculosis
TESSy	The European Surveillance System
UN	United Nations
US	United States of America
VBD	vector-borne disease

vCJD	variant Creutzfeldt–Jakob disease
VPD	Vaccine-preventable disease
WHO	World Health Organization
XDR TB	extensively drug-resistant tuberculosis

Foreword by the Chair of the Management Board

When it comes to the fight against infectious diseases, no country can afford to stand alone. No one knows this better than the Member State officials responsible for protecting citizens in the EU from these diseases. This is why ECDC's Management Board, which is made up of these officials, as well as representatives from the European Commission and European Parliament, has put such a lot of effort into developing this Programme. The EU-level element of infectious disease prevention and control may be only a small part of the overall public health activity in this area – most of which takes place at national, regional or local level – but it has a high degree of importance.

The Board strongly endorsed the central theme of this new 'ECDC Strategic Multi-annual Programme: Working together to reduce the burden'. The title recognises that reducing the burden of infectious diseases in the highly interconnected Europe of today is always a collaborative effort: between countries, between the EU level and Member States and between the EU and international partners such as the World Health Organization. It also recognises that we live in difficult times. The resources available for disease prevention and control activities have either been cut, or are under pressure, in most Member States. At the same time, though, the level of threat we face has stayed the same – or is even rising. The challenge for ECDC was to identify a limited number of areas of strategic importance where Member States could achieve more working together at EU level than they could individually. I believe we have succeeded in doing that. With guidance, input and support from its Management Board, ECDC has identified the 'core business' of the Centre in supporting EU-level cooperation against infectious diseases. This is a Programme that focuses relentlessly on the areas where ECDC can provide the most 'added value' to Member States and the EU Institutions.

We live in difficult times, but they are also a time of opportunity. The Serious Cross-Border Health Threats Decision should lead to a more robust legal framework for cooperation against infectious diseases, while new diagnostic and data processing technologies open the prospect of 'finger printing' microbes and tracing their spread with a level of speed and accuracy that was previously unimaginable. ECDC's Programme will enable us to take advantage of these new possibilities. It acknowledges that while ECDC's core activities and goals will stay fairly constant over the coming years, the way the Centre conducts those activities and achieves those goals might well change substantially.

Dr Françoise Weber

Chair, ECDC Management Board

Foreword by the Director

ECDC's first Strategic Multi-annual Programme, which covered the period 2007–2013, gave us a road-map for building, then consolidating, a set of core public health functions and establishing programmes on the major infectious diseases of EU-level interest. Our goal over the next seven-year period (2014–2020) is to further refine and improve the services and programmes ECDC offers to the EU and its Member States. This means making sure that our services and programmes are sustainable during a period when the resources available to ECDC and its partners are unlikely to grow, and may well decrease. However, it also means taking advantage of the opportunities offered by new technologies and new ways of working.

Our new programme is a blend of hard-headed realism and innovative thinking. It is an approach we think can deliver a reduction in the burden of infectious diseases in the EU, even during a period when the resources available for public health are likely to be limited.

In her Foreword, the Chair of our Management Board, Dr Weber, stresses that 'reducing the burden of infectious diseases in the highly interconnected Europe of today is always a collaborative effort'. The final success of this Programme will depend on ECDC's collaboration with all its different partners: the European Commission, the European Parliament, other health-related EU Agencies such as the European Food Safety Authority and the European Medicines Agency, and of course, the World Health Organization (WHO). However, the most critical success factor will be the ability of our partners in the Member States to participate in, and benefit from, the Programme.

Since becoming Director of ECDC I have had the opportunity to visit many different Member States and see the 'public health reality' of my counterparts there. I have been struck by the huge diversity of EU countries, not just in terms of culture and climate, but also in terms of how their public health systems are organised and the resources available to them. For example, my counterparts in some Member States have world class laboratories and hundreds of infectious disease experts at their disposal. In other Member States they have just a handful of experts and a laboratory that can perform only the most basic diagnostic tests. Our new Programme takes account of this reality and seeks ways to facilitate cooperation between the less-well-resourced countries and those which have laboratories using cutting-edge diagnostic techniques. Above all, though, it seeks to eliminate ECDC actions that Member States regard as unnecessary burdens and prioritise those actions that Member States, and EU Institutions, find most valuable.

Dr Marc Sprenger

Director, ECDC

ECDC 2020 in a nutshell

The decision to create ECDC stems from the necessity to address gaps and shortfalls in the EU's defences against communicable diseases.

In this context, article 3 of ECDC's Founding Regulation¹ stipulates that ECDC should concentrate on communicable diseases and outbreaks of unknown origin with the objective to become a centre of excellence as regards information and scientific knowledge directed at the detection, prevention and control of communicable diseases. Moreover, the Founding Regulation calls upon ECDC to actively support the strengthening of the EU's and its Member States' capacity to improve communicable disease prevention and control.

State-of-the-art prevention and control systems to best protect EU citizens not only contribute to ensuring a high level of human health protection. It is also an integral part of Europe 2020 objective of smart, sustainable, and inclusive growth². To envision such a future requires clear strategic choices as a multitude of factors and (partly unknown) developments contribute to the ultimate goals. Thus many disciplines, many stakeholders, health systems and political interests are involved. This strategic programme presents the strategic orientations decided by ECDC along with the related multi-annual goals and deliverables.

ECDC's work and even more particularly its multi-annual programme is deeply influenced by the Member State capacities. Several Member States are facing pressure on health public budget. This could negatively affect the existing communicable disease prevention and control activities and result in widening the gap between EU Member States for the future.

In our organisation surveillance, epidemic intelligence and response form a cluster of core activities, in close conjunction with preparedness, an area which also links to capacity building in Member States. Scientific advice, microbiology support, training and health communication also belong at the heart of ECDC's functions. For all these areas, the focus should clearly be on the EU dimension. Combining information, resources and competences should result in a series of products, services and support that go beyond the national efforts.

Disease programmes are considered to be a vital second tier to achieve ECDC's mission, mirroring in varying degrees the core functions, in order to address specific communicable disease threats.

Those strategic choices can be briefly summarised as follows:

- Surveillance is a core function which will undergo substantial changes up to 2020. On the one hand the burden for delivering data should be decreased, while on the other, new developments need to be implemented. This requires a changing paradigm of surveillance at the European level, aligning indicator- and event-based surveillance, setting standards, and adapting to rapidly evolving molecular typing techniques. On top of this the European surveillance data should be made easily available to a wide audience: What ECDC gets, it gives back in more interactive user-minded outputs. All this requires a certain shift in expertise, but not necessarily a decrease.
- Epidemic intelligence and Response will accommodate new developments to increase the EU's defences in a methodological and up-to-date way. Resources are anticipated to remain at a stable level.
- Preparedness is a core function, but the remit of ECDC in this field depends on developments at the European Commission. Well-directed objectives therefore await further decisions.
- Scientific advice in its various forms remains at the heart of ECDC's contribution to the EU. Especially the further development and EU-wide implementation of more harmonised, evidence-based advice in public health. This will result in more transparent and credible products enabling policy decisions. Moreover, a reallocation of resources is foreseen to strengthen a 'horizon-scanning' function for Member States and ECDC.
- Training will continue to make a significant contribution to capacity building in the EU and neighbouring countries. ECDC will look for more partnerships and outsourcing to meet growing demands. The aim is to ensure that all countries benefit from ECDC training. Similarly, deliberate choices between efforts and resources in short courses and EPIET/EUPHEM will have to be made.
- Health communication remains a cornerstone in making the best available evidence, scientific information guidelines and support for risk communication easily available to various audiences. The web portal will be the main channel for communication. More than in the past, ECDC will invest in understanding the audiences to reach its goals. Pure scientific information alone may not suffice to bring about sensible public health choices and the desired behavioural changes. In particular, risk communication is an area of EU-wide interest where Member States may seek support and training.

¹ Regulation (EC) No 851/2004 of the European Parliament and of the Council of 21 April 2004 establishing a European Centre for disease prevention and control. OJ L 142, 30.4.2004, p. 1.

² Commission Staff Working Document Investing in Health - SWD(2013) 43 Final

Ideally a strategic multi-annual work plan should be independent of the present organisational structure. Several core functions, however, largely coincide with organisational units. Other functions are more widely spread over the organisation and this carries the potential schism of 'vertical silos' versus 'horizontal programmatic approaches' needed to fight communicable diseases effectively. To avoid unfruitful polarisations ECDC would rather use the metaphor of spider webs. The seven disease programmes all aim to catch different bugs. Strong radial fibres form the basis and attachment sites for circular threads to form flexible, yet strong structures. As the chemical nature of the radial and circular fibres in a web differ, so do the functions in ECDC differ, yet they serve the same purpose. The different sets of expertise make a unique web to serve specific contributions that the disease programmes have at EU level. What the disease programmes have in common is an emphasis on ensuring full maturity of the different networks by 2020. This may include a broadening of the scope from epidemiological and microbiological expertise to prevention skills, health communication competencies, health economic models, and aspects of what is coined as programme science.

Those strategic principles are driven by several guiding principles:

- ECDC values an evidence-based approach for all its activities and outputs from guidance for public health professionals and policy makers to information for citizens and scientists.
- ECDC considers equity in health as a fundamental value and therefore considers across all its activities the social determinants driving health inequalities and pays specific attention to underserved and disadvantaged populations particularly vulnerable to communicable diseases.
- ECDC wants to be a strong, responsible and reliable partner in the alliances and networks that continue the process of capacity building as a common, national and European responsibility.
- ECDC aims at delivering across all its activities the best scientific evidence in the most appropriate communication forms, from social media to *Eurosurveillance*.

This can only be realised if our governance and administrative procedures meet the external requirements and serve the internal organisation in the best possible way. In view of the critical role of ICT as the major enabling technology, this strategic multi-annual work plan dedicates a separate chapter on the way ICT could reduce the burden and increase the impact of ECDC's role in communicable disease prevention and control.

1. Introduction

Covering the period 2007–2013, ECDC's first Strategic Multi-annual Programme was developed during the early stage of the development of the Agency after its creation in 2005. As such, the identified objectives and targets to be achieved under this first programme focused on the development of ECDC's core functions and programmes. Those are now well established and a second external evaluation will identify areas for improvement and further investment, and this will be reflected in the review of the current document, adjusting it on further demands and needs identified as priorities.

Building upon this first programme and related achievements, the new ECDC 2014–2020 Strategic Multi-annual Programme will now focus on:

- maximising the effectiveness and value for money delivered by ECDC's existing functions and programmes
- improving the alignment between EU-level priorities and national priorities in the area of control and prevention of communicable diseases.

In accordance with this and the overall ambition of 'Working together to reduce the burden', the objectives of ECDC's SMAP 2014–2020 should therefore be to:

- make the maximum possible impact in reducing the burden of communicable diseases in the EU
- provide EU-level services and programmes that reduce the work that ECDC's national partners need to do
- minimise the administrative and technical burden that ECDC might place on its national partners.

The Strategic Multi-annual Programme 2014–2020 reflects the role of the ECDC in providing support to the European Commission on the implementation of Decision 1082/2013/EU of the European Parliament and of the Council of 22 October 2013 on serious cross border threats to health and repealing Decision No 2119/98/EC ("Decision"), in the following areas:

- Upon request and within its mandate, ECDC will provide support to the European Commission on the implementation of the provisions under the new legislation and other Commission initiatives related to preparedness.
- The ECDC's mandate provided by the Regulation 851/2004 covering surveillance, detection and risk assessment of threats to human health from communicable diseases and outbreaks of unknown origin remains unchanged and ECDC will continue to provide its input.
- The ECDC will continue to operate the Early Warning and Response System by maintaining 24/7 functioning of the IT tool; the IT Tool is extended to new threats, without extending the risk assessment functions.

2. Guidance from the Management Board and input from stakeholders

Following stakeholder consultations on possible future scenarios in public health, the future priorities for ECDC were discussed in November 2012 at the 26th meeting of the Management Board (MB). Those discussions were completed by input previously received during the Joint Strategy Meeting (held in September 2012), documents prepared by ECDC staff and feedback from members of the Advisory Forum collected during their meeting in December 2012.

At the 27th Management Board Meeting in March 2013, a number of common opinions emerged as well as different interests. The MB stressed the necessity to maintain the major focus on ECDC core functions of surveillance, epidemic intelligence and response as well as scientific advice. Along with training, ECDC disease programmes were similarly considered as crucial, with antimicrobial resistance and healthcare-associated infections identified as areas of increasing importance for the next period. Small or low-resourced countries especially value the (rapid) risk assessments and scientific advice, but wish to be able to benefit more from the public health training programmes. Molecular surveillance and usability of data were on the other hand topics for concern, and communication to general audiences was regarded as an area where ECDC efforts should be critically reviewed. Efforts to tackle cross-border health threats are linked to preparedness and more concrete multi-annual action plans await development of the Commission's initiative. Although the crucial importance of the core functions was recognised, it was nevertheless concluded that certain budget cuts would be inevitable in the context of the EU's multi-annual financial framework and announced staff reduction to be applied to all EU institutions and agencies thereby making a seamless operation with other international organisations and agencies even more pressing.

3. ECDC's mandate

While the new Decision on serious cross-border threats to health³ attributes new tasks to ECDC especially in the area of preparedness, it does not affect its mandate and the remit of its activities. As such, ECDC's founding regulation⁴ and current mandate on communicable diseases and outbreaks of unknown origin remain the reference point in developing the 2014–2020 strategic framework⁵.

The upcoming conclusions of the second ECDC external evaluation could feed into a revision of this strategic programme later on in accordance with the Founding Regulation that calls upon ECDC to adopt a 'revisable' multi-annual programme. Similarly, significant changes in financial and personnel resources might lead to revisions.

4. The structure and logic of the current document

The structure of the current document follows the logic of ECDC's tasks as stated in the Founding Regulation.

After a brief overview of the context in which ECDC operates and the changes and challenges that will affect communicable diseases in the EU Member States and EEA countries in 2014–2020, the document provides an analysis of ECDC's unique assets and areas where ECDC's contribution is most valued and complementary to national activities.

The document then focuses on the overall programme priorities 2014–2020 and more particularly ECDC collaboration and cooperation with partners, and the technical areas where ECDC contributes to strengthening the Union's and Member States capacity against communicable diseases. This includes the identification of specific deliverables to be achieved by 2020.

Finally, the document considers ECDC independence policy, organisational development, administrative excellence and the directional choices for ICT, and introduces the planning, monitoring and indicators for the Strategic Multi-annual Programme 2014–2020.

³ Decision No 1082/2013/EU of the European Parliament and of the Council of 22 October 2013 on serious cross-border threats to health and repealing Decision No 2119/98/EC, OJ L 293, 5.11.2013, p. 1

⁴ Regulation (EC) No 851/2004 of the European Parliament and of the Council of 21 April 2004.

⁵ Whenever in this document it is indicated that 'ECDC will support Member States to ...' or similar phrases, this implies the express agreement of the Member State concerned.

5. The context of ECDC in the future

This chapter will deal with three issues that ECDC will have to face in the coming years.

5.1 The need to further increase our effectiveness and impact

The consequences of the continuing economic crisis on the availability of resources for public health in the EU, coupled with changes in the threat from communicable diseases (driven by demographic evolution, climate change, and the persistent threats of antimicrobial resistance and healthcare-associated infections, HIV, TB, viral hepatitis, and influenza) reinforce the necessity for ECDC and its partners to consider the following fundamental questions:

- How can we use our resources more effectively and efficiently?
- Can we better align EU-level and national priorities on communicable diseases? Also see text box.

Health inequalities are ubiquitous in the EU, and all indications suggest that they will continue to widen both within and between Member States through to 2020. Widening inequalities will be driven by a myriad of factors, including the effects of the current financial crisis, demographic transitions including population ageing and migration, and climate change. Microbes do not respect national and socio-economic borders and boundaries. Thus reducing the gaps between and within the Member States, by prioritising the less-resourced countries and paying specific attention to underserved and disadvantaged populations, is not only an act of solidarity but is also an approach benefitting the overall health of Europe.

In the coming years a reduction of ECDC staff is foreseen. According to the multi-annual staff policy plan the number of Temporary Agents will decrease from 200 posts to 180 by 2018, and therefore based on this provisional scenario, ECDC activities need to be reconsidered accordingly. Feedback from stakeholders provides some preliminary guidance on the areas to be reconsidered with notably suggestion to narrow the communication focus and leave direct communication to European citizens to the Member States. Suggested reduction in microbiological efforts would however compromise the viability of ECDC's role in this field and is therefore not an option for consideration. Since other functions along with the Disease Programmes are considered to be core to ECDC and vital, ECDC will apply a proportional reduction to these activities. This proportional reduction, however, will take into account the impact on cross-border threats and the topic of antimicrobial resistance and healthcare-associated infections.

Moreover, each small efficiency step counts and this will require managerial attention to ring-fence core functions as far as possible. A further reduction of the proposed deliverables could be needed and this will be decided on a regular basis in the annual working programmes.

5.2 Interdependence between ECDC and its partners

Public health is characterised by strong interdependencies. Professionals with a wide variety of expertise depend upon each other; they have different roles, mandates and skills and operate under specific financial systems to reduce the burden of disease. None of them can achieve the expected results on their own. Interdependence in this area was underpinned by the creation of international and EU-level networks and organisations.

The establishment of ECDC led to a stronger and more stable EU-wide 'disease prevention and control system'⁶. For example, the system of having EU-level surveillance data collected by several project-based disease networks was replaced by a more standardised system, with ECDC collecting surveillance data through officially nominated national contact points; the incorporation into ECDC's disease specific programmes gave a more stable, long-term perspective.

One of ECDC's major assets is to act as a hub for national and supranational networks. However, networks need not only to be nurtured, but also need to become fully functional and mature in the coming years.

Given the need to reduce the burden of communicable diseases and the pressure on public health resources in the Member States, the strategic plan must pay attention to the areas of support and services. What can ECDC offer the Member States and the Commission until 2020, and how can we avoid duplication, minimise the administrative and technical burden that ECDC might place on its national partners, and effectively address communicable diseases threats?

ECDC aims to focus its contribution on three areas: systems, support and service. Public health systems are organisations or structures (financial, political, professional and legal) that have a defined public health purpose. Services are (essential) public health activities/processes that support systems and have defined mandated and accountable actors, e.g. surveillance, epidemic intelligence, EU-level training, communication. Support aims at enhancing both systems and services at various levels. It is limited in time, and the outcome is handed over to those requesting the support, e.g. outbreak support and specific trainings.

ECDC's support to the Commission and Member States has to foster the most valuable and unique capacities and competencies at EU level. ECDC's service should complement the work of national public health institutes, and reduce their workload.

5.3 Major developments and potential effects on communicable diseases

There is little reason to expect major changes in the communicable disease trends as such in the EU over the next seven years, and existing problems will likely continue to be of major concern. The factors that could influence this panorama may rather be political and economic than biological or ecological.

Four broad categories of drivers of change may be discerned:

- Globalisation and environmental change
- Social and demographic change
- (Public) health systems change
- Technological advances

⁶ According to the Founding Regulation the Mission and tasks of the Centre are:

1. In order to enhance the capacity of the Community and the Member States to protect human health through the prevention and control of human disease, the mission of the Centre shall be to identify, assess and communicate current and emerging threats to human health from communicable diseases. ... In pursuing its mission the Centre shall take full account of the responsibilities of the Member States, the Commission and other Community agencies, and of the responsibilities of international organisations active within the field of public health, in order to ensure comprehensiveness, coherence and complementarity of action.
2. Within the field of its mission, the Centre shall:
 - (a) search for, collect, collate, evaluate and disseminate relevant scientific and technical data;
 - (b) provide scientific opinions and scientific and technical assistance including training;
 - (c) provide timely information to the Commission, the Member States, Community agencies and international organisations active within the field of public health;
 - (d) coordinate the European networking of bodies operating in the fields within the Centre's mission, including networks arising from public health activities supported by the Commission and operating the dedicated surveillance networks; and
 - (e) exchange information, expertise and best practices, and facilitate the development and implementation of joint actions.
3. The Centre, the Commission and the Member States shall cooperate to promote effective coherence between their respective activities.

Globalisation and environmental change

The **climate** has a direct impact on the epidemiology of many communicable diseases. The vector-, food- and waterborne diseases are particularly sensitive to changes in temperature, wetter climates and more extreme weather events like floods. Other **environmental factors** such as changes in agricultural practices and recreational activities also play a role in creating the potential for pathogens and vectors to thrive, as well as increasing human exposure to them.

Travel and tourism affect many diseases, but this is probably not a major factor. Spanish flu spread quite well by boat and train and air traffic as such was not decisive. Although the number of flights will continue to increase in the coming years a more important factor is the changing pattern in tourism which may lead to exposure of more 'exotic pathogens'. Similarly health tourism and cross-border healthcare is quite significant and poses new challenges regarding, for example, healthcare-associated infections.

Migration to and within the EU is likely to increase, as reported in figures for the EU⁷, and plays a significant role for several diseases, for example TB, HIV and malaria. However, the possible spread of disease in the EU will probably vary by country and disease, like extensively drug-resistant TB through migration from Eastern Europe and migration resulting from the unrest in the Mediterranean region. However, general conclusions across the whole of the EU seem of little value.

International trade will affect mostly food-borne diseases (but also some vectors) as food will continue to be transported across vast distances. Increasingly centralised genetic stock – e.g. the majority of egg-laying hens in the EU come from one 'great-grand-parent' flock in the UK – suggests a reduced genetic variability and a subsequent increased vulnerability. Trade will also increasingly be responsible for the importation of exotic mosquitoes.

Animal husbandry and food production certainly pose a potential threat as intensive farming leads to an increased risk for emerging diseases among humans, which may therefore affect ECDC's activities.

Social and demographic change

The population of the EU is known to be **ageing**⁸. This increases the burden of those diseases that disproportionately affect older people (e.g. influenza, pneumococcal disease) and increases the number of people requiring long-term care.

Social determinants are known to affect health. Some groups are at higher risk for an array of diseases, and most notably those with low education, limited access to healthcare, poor adherence to health messages, and unequal access to increasingly used electronic media, will require special attention.

Trust and reputation. Public health authorities are facing a diminishing trust from a variety of social groups. An obvious resistance to 'classic' measures, such as isolation/quarantine will not disappear. Moreover, the lack of compliance with treatment may lead to even further antibiotic resistance developing. Anti-vaccine activists influence public opinion and safety and effectiveness issues will increasingly draw attention among the general public.

Given the general trend of reduced confidence in authorities and the increasing use of social media as the main source of information, ECDC has to review the use of communication channels accordingly.

⁷ Rechel B, Mladovsky P, Ingleby D, Mackenbach JP, McKee M. Migration and health in an increasingly diverse Europe. 2013 Apr 6; 381(9873):1235-45.

⁸ Eurostat. Demography report 2010: Older, more numerous and diverse Europeans. Luxembourg, Publications Office of the European Union; 2011. Available from http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KE-ET-10-001/EN/KE-ET-10-001-EN.PDF

(Public) health systems change

Healthcare systems are under economic pressure, as seen in several Member States. When resources are scarce, acute healthcare services are often prioritised over prevention activities. Hence, the risk for delayed diagnosis and for spread of communicable diseases increases. Further, threats may arise from delayed treatment and increased risk for HAI. At the national level an increase in movement of patients between healthcare facilities and the community raises risks for spreading AMR; similar risks are related to cross-border healthcare.

New medicines are definitely needed, but there are almost no new antibiotics in the pipeline and some novel vaccines may be too expensive for common application.

Surveillance, reporting and data linkage will offer new control possibilities as in 2020 patient records (and lab results) will be electronic in most countries. Within ECDC's remit of data protection, it might be possible to have instantaneous on-line reporting to local, national and EU level, supporting the rapid detection of disseminated outbreaks if digital feed forward would be more real-time.

Technological advances

The reduced cost and increasing availability of genome-based molecular characterisation of pathogens will require a fundamental review of procedures for early detection and investigation of outbreaks.

The development of point-of-care tests will have a significant impact on the way we conduct surveillance. It will require the adjustment of case definitions but create opportunities to gather additional information that will give a more complete picture of the disease. It will also pose challenges to current culture-based reference laboratory testing for pathogen characterisation.

In conclusion, economic and political factors will influence the communicable disease threats to public health in the EU over the next seven years as much as demography, biology or ecology.

6. Legislative and policy landscape in the EU

The Treaty of the European Union stipulates that a high-level of health protection shall be ensured in the definition and implementation of all EU policies and activities. This has been underpinned by a series of initiatives such as the new Decision on serious cross-border threat to health that aim at improving health security in the European Union and protecting citizens from a wide range of health threats. ECDC is committed to contributing to this objective by supporting the European Commission and the Member States as a technical EU Agency in the field of communicable diseases and unknown threats to human health providing impartial evidence base scientific opinions and scientific and technical assistance for all involved in EU decision making in the area of prevention and control of communicable diseases.

ECDC's priorities and actions are in line with and in support of the overall objectives and principles of the EU Health Strategy. This strategy aims to foster good health in an ageing Europe by promoting good health throughout the lifespan. This strategy also sets out several cross-cutting principles to guide the public health activities, e.g. solidarity, the need to reduce inequities in health, to promote investment in health, and to mainstream health in all policies.

This not only contributes in achieving a high level of human health protection but also participates in achieving the Europe 2020⁹ objective of smart, sustainable and inclusive growth. Over the past years, policy priorities have focused on ways to recover from the financial and economic crisis.

In this context, health is considered as an important driver for growth: only healthy populations can contribute fully in achieving the goals set. This is notably stressed in the Commission policy paper on 'Investing in Health'¹⁰, which covers three areas: investing in sustainable health systems to bring efficiency gains and secure better health outcomes; investing in people's health to boost economic growth; and investing in reducing inequalities in health. The emphasis is put in particular on health promotion and disease prevention, addressing vulnerable populations, and re-emphasising the necessity of 'health in all policies' approach, three areas in which ECDC contributes to improve Europe's health.

7. ECDC's unique assets, a brief description

In the ECDC Founding Regulation, the importance of existing disease networks was recognised and their sustainable future safeguarded by bringing them under the umbrella of an EU agency. Together, they form an indispensable part of the system the EU has established to reduce the burden of communicable diseases. However, concrete actions are needed to specifically address how and where the impact of these networks can reduce that burden. This Strategic Multi-annual Programme 2014–2020 specifically addresses generic developments and also identifies goals and targets that are intrinsically disease-specific.

ECDC has created and/or operated a number of shared resources, either system such as the Early Warning and Response System (EWRS), software platforms like TESSy for surveillance and EPIS for threat detection or services like the rapid risk assessments or the round-the-clock epidemic intelligence duty system. In times of economic crisis, the use of shared resources would allow the Member States to make more specific choices tailored to the national situation, for example monitoring vaccine effectiveness.

In close conjunction with the Commission, the coordinating Competent Bodies and the Advisory Forum and the coordinating Competent Bodies, ECDC can in fostering seamless cooperation with partners at the European level and also at global level through strategic partnerships and working platforms at the level of WHO, national CDCs, NGOs, and learned societies.

Because of its position, ECDC has a convening function which not only serves the networks and core functions, but can also be used to bring together experts to serve country needs as well as the wider European perspective and for mediation, for example in scientific issues, case definition problems or quality issues.

ECDC has created also a pool of public health and disease experts with different cultural, scientific and professional backgrounds. This mix of expertise can act quickly in concerted actions and bring together the necessary competence and network knowledge to help solve supranational issues. This could serve to enhance systems, support and services to reduce the threat of communicable diseases.

⁹ European Commission. Communication from the Commission. Europe 2020: A strategy for smart, sustainable and inclusive growth. COM(2010) 2020 final. Brussels, 2010. Available from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>

¹⁰ European Commission. Commission staff working document. Investing in health. SWD(2013) 43 final. Brussels, 2013. Available from http://ec.europa.eu/health/strategy/docs/swd_investing_in_health.pdf

This set of unique assets results in a number of products, systems and services that are highly valued (see text box). ECDC will continue to deliver these products and services to a high standard.

Valuable ECDC contributions most frequently mentioned during the Joint Strategy Meeting in 2012 were:

- (rapid) risk assessments,
- the infrastructure of the surveillance systems
- disease programme on AMR and HAI
- coordination
- training activities
- scientific advice and expertise
- setting standards for surveillance and diagnostic procedures
- outbreak detection and response
- evaluation and monitoring of best practices and guidelines
- molecular surveillance integration into TESSy
- ensuring lab capacities

A balanced set of complementary competences represents another asset for ECDC. On one hand, highly qualified public health scientists, on top of the latest developments in their field of expertise, are leading scientific and technical work in ECDC. On the other hand, ECDC builds its programmes on large networks of disease experts in the Member States animated by skilled network managers with a sound understanding of the issues at stake.

Member States may have a different appreciation of these unique assets. The larger, well-resourced countries would rely less on ECDC since they can afford to perform many functions on their own account. Smaller or less well-resourced countries rely more on ECDC's epidemic intelligence and response, preparedness support, scientific advice and risk assessments, etc. For all countries, however, these activities save resources and increase coherent appraisals of health threats. These differences in public health structure and resources contribute to a Strategic Multi-annual Programme combining different needs under common objectives. Not every Member State will benefit equally from all efforts, but all will benefit from a stronger EU structure in disease prevention and control, in particular on cross-border threats and for co-ordinated international actions. Moreover, there is added value in strong networks of specialists with a common concern to protect the EU against communicable diseases through provision of timely information, assessments and shared expertise.

7.1 Overall programme priorities 2014–2020

This multi-annual programme deals mainly with future developments and ECDC's focus on its response to emerging challenges, opportunities, and 'untamed' problems. Thus ongoing, unchanged activities in the areas of its mandate and founding regulation are not described in detail¹¹, apart from those areas for improvement, where specific deliverables are addressed. To make the strategic aspects as clear as possible, the context and future outlook for ECDC's primary tasks are briefly described, resulting in a multi-annual focus part in which specific deliverables that span longer periods than just annual work plan items are formulated.

Three mainly externally-oriented parts of the programme activities are 'collaboration and cooperation', the 'core and support functions' and the 'disease programmes' (chapters 8 to 10). The 'independence policy', 'resource management and organisational development' and 'information and communication technologies' are dealt with in chapters 11 to 13.

¹¹ A comprehensive overview of all on-going activities is published in the yearly annual work plan, which is outside the scope of this strategic multi-annual plan.

8. Collaboration and cooperation

Context and future outlook

Communicable disease threats that cross continents are likely to further shape the international work of ECDC, increasingly calling for global cooperation on diverse issues. For virtually all infectious diseases and health topics falling under ECDC's mandate, pooling data, evidence and research efforts at global level, beyond the EU, adds scientific value. From a technical point of view, cooperation can only enrich the knowledge base and avoid duplication of work to help contain threats faced by the EU and beyond.

Global threats require global responses, to be formulated in close partnership with key international actors. By 2020, ECDC shall be recognised as an authoritative reference point for reliable and timely evidence, assessment, and scientific advice on communicable diseases at EU level. This calls for ECDC to work closely and efficiently with other public health actors in a well-coordinated and complementary manner.

8.1 ECDC in the 'family' of European Institutions and Bodies

ECDC works closely with the European Commission, in particular with DG Health and Consumers, including its Consumer, Health and Food Executive Agency (CHAFAEA) that implements the EU Health Programme and DG Research and Innovation, through effective coordination and exchanges at technical and management levels. In the coming years ECDC will further strengthen this cooperation, within the established institutional framework for relations between agencies and the Commission, to enhance the timely flows of information and to further ensure the coherence of actions.

ECDC aims to establish, through DG Health and Consumers, stronger working arrangements with other relevant Directorates-General, in particular with DG Research and Innovation, and the EEAS when necessary, (e.g. to provide technical expertise, scientific advice, support to humanitarian missions).

ECDC is one of the more than 30 decentralised independent EU Agencies established to carry out specific legal, technical or scientific tasks that would otherwise have to be done by the Member States or the Commission. Decentralised EU Agencies work independently; they collect and share information, and provide scientific advice to support policy makers in the development and implementation of national and EU policies.

To enhance cooperation with other EU Agencies, ECDC will further initiate and evaluate projects of common interest, jointly carry out expert work, co-publish scientific outputs, and implement other joint activities under signed bilateral agreements (e.g. the European Environment Agency (EEA), European Food Safety Authority (EFSA), European Medicines Agency (EMA), European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), European Aviation Safety Agency (EASA), Europol, Frontex, and the European Union Agency for Fundamental Rights (FRA)). ECDC aims to increase the number of co-productions with EFSA and EMA and expand on existing ones such as *The European Union Summary Report on antimicrobial resistance in zoonotic and indicator bacteria from humans, animals and food*. ECDC will also continue to be an active member of the network of EU Agencies and its sub-networks providing a platform to exchange information, best practice, to formulate positions on matters of common interest.

Deliverables:

1. Yearly updates of joint projects and reports, periodically presented to ECDC's governing bodies.
2. Clear procedures in place for ECDC support to relevant Commission Directorates-General, in particular to operations with the Monitoring and Information Centre at DG Humanitarian Aid and Civil Protection.

As an Agency funded from the EU budget, ECDC is subject to scrutiny by the European Parliament in the context of the EU budgetary process. It is explicitly foreseen in the Centre's Founding Regulation (Article 7) that the Parliament can request scientific opinions from ECDC, and there is an institutional expectation that ECDC's Director will appear before Parliamentary committees when this is requested. Since becoming operational in 2005, ECDC has established a positive and sustained working relationship with the European Parliament committee responsible for public health and has an important annual dialogue with Parliament's Budgetary Control Committee. Maintaining and further developing contacts with the European Parliament will continue to be a key priority for ECDC in the period 2014–2020.

Deliverables:

3. Biannual invitation for a delegation from the EP Committee for the Environment, Public Health and Food Safety to visit ECDC.

8.2 Working with the European Union Member States

Two developments need special attention. One is the cooperation between ECDC and the national coordinating Competent Bodies; the second one is a programmatic alignment of national and ECDC multiannual working programmes.

As already started in 2011, the coordinating Competent Bodies (cCB) will be the major channel for cooperation with the Member States. The need to limit the burden that ECDC may put on the national institutes has been clearly articulated. ECDC will increase efforts to scrutinise its own requests and implement system changes to facilitate cCBs' response to those requests. However, systematic feedback from the cCBs and National Public Health Institutes is also indispensable in order to adapt procedures and requests. ECDC will monitor the interactions with Member States and the burden that may be created, while internal coherence at ECDC will be increased.

The alignment of ECDC and national programmes has a number of aspects to it. First, ECDC should avoid undertaking work at EU level that is better carried out at national level; second, ECDC's outputs and activities should feed into work being done at national level in a way that supports the attainment of national priorities; and third, ECDC should provide targeted technical support and 'knowledge transfer' to Member States only if this can make a significant difference to advancing national priorities. Finally, it needs to be fully acknowledged that the work done by Member States also contributes to the structure of ECDC and supports ECDC in its tasks.

As explored earlier in this document, success in public health is rarely attained by one player on its own. The EU-level work of ECDC will have more impact if it is supported by the Centre's national partners. ECDC already receives some feedback on the Member States' national programmes via its Management Board and Advisory Forum. Moreover, country visits could form a second layer to develop a deeper understanding of the Member States' priorities and programmes, which will help ECDC steer its own programmes in a way that maximises their impact. What is proposed for the period 2014–2020 is to gather this information in an even more structured and systematic way from those Member States that wish to have a more intense dialogue with ECDC on priority setting and programme alignment. This will involve a high-level delegation from ECDC visiting the country to get an in-depth understanding of their 'public health reality', the priorities of their national programme and how ECDC could contribute to their national priorities. This alignment will be developed stepwise. The above can be summarised by stating that the objective in working with the EU Member States is to achieve a high level of effective communication and coordination between ECDC and its Competent Bodies. The satisfaction of cCB's will be measured annually through a stakeholder survey.

Deliverables:

1. The Customer Relation Management system (CRM) will be developed stepwise to streamline workflows and communication processes.
2. ECDC will organise meetings with coordinating Competent Bodies to align priorities and organise systematic feedback on collaboration.

Objective	Indicator	Target	Verification
Achievement of a high level of effective communication and coordination between ECDC and its Competent Bodies	Satisfaction of the Coordinating Competent Bodies on the communication with ECDC	80 % satisfied with communication and coordination	Measure to be integrated into the annual stakeholder survey

8.3 Cooperation with the World Health Organization (WHO)

The Joint Declaration between the European Commission and the World Health Organization Regional Office for Europe (WHO/EURO including its Roadmap for collaboration on health Security is the framework within which ECDC cooperates with WHO. The Roadmap for collaboration on Health Security, which is one of the elements of the Commission/WHO cooperation, sets out the priority areas for collaboration and includes ECDC where necessary. These priority areas are the International Health Regulations, pandemic and emergency preparedness, HIV/AIDS, tuberculosis, vaccine-preventable diseases, antimicrobial resistance, and general surveillance. The ECDC will support the Commission in the implementation of the Roadmap for collaboration on Health Security with an adequate focus on general surveillance. In addition, ECDC and WHO/EURO have signed an Administrative Arrangement to help European countries assess and improve their preparedness and response systems and facilitate communication on major public health events. Cooperation and coordination of efforts between the Commission/ECDC on the one hand and WHO/EURO on the other hand is of particular importance for closer alignment of the strategic planning and implementation of relevant surveillance and epidemic intelligence activities.

Coordination of technical activities and identification of joint projects between ECDC and WHO/EURO will continue to be the focus of collaboration. Joint planning becomes increasingly important in particular in relation to surveillance of communicable diseases in enlargement countries.

Regarding preparedness and response, ECDC will continue to support WHO-facilitated efforts in deploying technical teams to countries, where appropriate and possible (see 9.2).

Deliverables:

1. Sustained strategic review and coordination through ECDC–WHO/EURO Joint Coordination Committee meetings together with the European Commission. Progress reports will be presented to the Management Board regularly.
2. Joint annual work plans and follow-up on their implementation to achieve better synergies, including the use of resources.
3. The roles and responsibilities regarding surveillance of communicable diseases, in particular in the EU enlargement countries, are clarified, decisions and procedures documented, and the implementation has been initiated.
4. The evaluation of the results and added value of joint work conducted in 2015 and the outcome presented to the ECDC Management Board in 2016 leading to a renewed agreement.
5. A lasting transparency on yearly resources spent on the collaboration from ECDC and WHO/EURO side has been achieved.

8.4 Working with non-EU countries

EU enlargement countries

ECDC will, partly with specific Commission funding when relevant, continue strengthening the capabilities of countries towards implementation of the *acquis* on communicable diseases in the enlargement process. In this regard, ECDC will provide technical support to the European Commission in assessing existing capabilities and progress. This will mean significant investment from ECDC up to 2020 in carrying out technical country assessments and setting up regular cooperation and support structures. By 2020 EU enlargement (pre-accession) countries will all have been through initial assessments of capacities in prevention and control of communicable diseases and initiated the implementation of technical collaboration action plans with ECDC. Gradually their involvement in ECDC activities will increase and they will be observers in most activities. This will enhance their collaboration with EU Member States and other partners.

ECDC will continue to further develop and implement the strategy on progressive integration of EU enlargement countries into the EU surveillance activities taking into account the existing capabilities of these countries.

For some of these activities – technical assistance in the form of training, workshops, and specific missions ECDC would seek support from the Instrument for Pre-accession Assistance (IPA) Transition Assistance and Institution Building Component on the Participation in EU Agencies.

Deliverables:

1. The technical assessment of two EU enlargement countries per year in collaboration with the European Commission.
2. An annual follow-up report to the Commission on the implementation of the joint ECDC–EU enlargement country technical action plan after the assessment visit (report after first year, visit during second year) for each individual country.
3. Policy and action plan developed on engaging the EU enlargement countries in the EU surveillance activities.
4. Ongoing IPA project implemented and final report submitted to the European Commission.
5. Upon request of the European Commission, ECDC will maintain the EPIS South and the EPIS North platforms.

European Neighbourhood Policy countries

ECDC's cooperation with ENP countries supports the overall policy objective of bringing neighbouring countries closer to EU standards by strengthening their capacities and aligning practices and legislation. When relevant and feasible, ECDC will favour a regional approach towards cooperation rather than a series of bilateral initiatives, taking into account thematic priorities appropriate for eastern and southern neighbourhood countries. In this regard ECDC will continue to support the MediPIET project for capacity building through field epidemiology training involving both EU enlargement and ENP countries. This project is financed by the European Commission.

Ultimately, all of the above could result in regular participation of ENP countries in jointly identified ECDC activities and cooperation with those countries will move from a time-limited project-based approach to a self-supported sustainable cooperation.

By 2020, ECDC aims for well-established and sustainable procedures, tools and contacts for technical cooperation with ENP countries, within the wider framework of the agreements in place between the EU and these countries. These will support an alignment of standards with the EU in the field of communicable disease prevention and control as well as an efficient and timely technical cooperation between EU and ENP experts.

Deliverables:

1. All ENP countries have nominated national ECDC correspondents and ECDC has established contacts with them (2014).
2. The European Neighbourhood and Partnerships Instrument (ENPI) project has been initiated and the first annual work plan implemented (2015).
3. Sustainable procedures are in place for technical cooperation between ECDC and ENP countries.
4. MediPIET has contributed to capacity building and networks with ENP countries.

Other non-EU countries

ECDC will systematically monitor and evaluate the use made of the agreements and Memoranda of Understanding it has signed with other CDCs. This exercise will help to assess the added value of existing agreements.

International organisations and multilateral fora

Partnerships will remain a cornerstone of ECDC’s work to monitor communicable disease threats that are shared across continents.

In the coming years ECDC will –depending on resources and if requested by the Commission– seek to strengthen its technical participation to the activities of the Northern Dimension Partnership on Public Health and Social Well-being (NDPHS) and the South Eastern Europe Health Network (SEEHN). This could bring synergies in areas such as ongoing EU technical assessments of the EU enlargement countries or enhancing links to eastern ENP countries, or on issues such as AMR or HIV.

There are several other bodies operating in the field of communicable diseases in Europe and internationally. In the future, there might be a need to explore possibilities, within the context of the existing cooperation between the Commission and these organisations, possibilities to collaborate with, for example, the International Organisation for Migration (IOM) on issues on communicable diseases and migration; or Global Alliance for Vaccine and Immunisation (GAVI) on matters related to vaccination programmes.

ECDC will continue its cooperation with learned societies, such as ASPHER (Association of Public Health Schools in the European Region), ESCMID (European Society for Clinical Microbiology and Infectious Diseases), and EUCAST (European Committee on Antimicrobial Susceptibility Testing) to enhance common interests.

This wide variety of activities with non EU countries and different actors and stakeholders aims on the one hand to support the Commission and relevant countries in the implementation of EU enlargement and ENP policies and on the other hand to maintain and establish functioning working relations with international partners. To prevent fragmentation no individual indicators and targets are set, but a more generic completion score is used to review the program towards sustainability.

Objective	Indicator	Target	Verification
Achievement of timely and sustainable support to the Commission and relevant countries in the implementation of EU enlargement and ENP policies. Established and functioning working relations with relevant international partners.	Completion of an agreed list of joint activities established between ECDC and its international partners	-90 % activities referred in SMAF successfully finalised by 2020 -Degree of completion of the list	Review of the list of activities with enlargement/ENP countries and international partners

9. Core and support functions

9.1 Surveillance¹²

Context and future outlook

The surveillance of diseases planned for eradication, e.g. measles, will become more intensive and focussed on case detection rather than monitoring trends. Moreover, between 2014 and 2020, the EU might enlarge beyond what is envisaged for 2013, or at least become much more closely related to a number of countries in the south-east and east of Europe. Likely to have fewer public health resources than most of the current Member States, the newly joining countries would nevertheless have to be integrated into European communicable disease surveillance, its technical platforms and networks. Their surveillance systems will have to be assessed; their epidemiologists and data managers will need to be trained in compliance with legal disease reporting duties, EU case definitions and TESSy metadata requirements. Potential changes to the way ECDC and WHO cooperate in surveillance may affect this plan at a later stage.

ECDC is expected to increase the availability of surveillance data to inform the public about the health status of EU populations. In the age of social media, there will be continuing pressure for increased timeliness of reporting and interpreting event-based surveillance. So it will become more of a challenge to meet the demands for information for more timely threat detection and better data visualisation.

At the same time, with increasing awareness of data protection issues, public health experts in charge of surveillance will have to justify that the information and data gathered are actually being used to advance public health and prevent disease.

Under pressure to spend less, yet possibly facing more countries under surveillance, ECDC will have to raise the issue of stricter prioritisation of diseases under surveillance and identify alternative cost-efficient ways to obtain surveillance data, e.g. through periodic, population-based surveys. While reduction of surveillance staff and resources could, at least to some extent, be compensated by increased automation of data collection, validation, analysis and dissemination, reduced investment in databases and relevant communication platforms might prevent adequate innovation and, ultimately, timely threat detection.

The most significant change in the coming years for surveillance at the EU level is related to the implementation of molecular surveillance. Surveillance activities will become increasingly laboratory-driven. The linkage between the expanding laboratory-based surveillance data with epidemiological surveillance data will help to detect and monitor outbreaks and enable better understanding of otherwise unexplained epidemiological changes. The capability to link both types of data will have to be established where needed.

Increasing standardisation of laboratory diagnostic and typing methods, definition of European surveillance system and data quality standards, wider application of EU case definitions and disease-specific reporting protocols and further refinement of automated data validation in TESSy will lead to higher data quality and better comparability across Member States.

The dynamics of communicable diseases requires maintenance and updates of surveillance to realise the goals of Article 6 of Decision 1082/2013/EU. EU surveillance standards for communicable diseases will be co-developed with the Member States, stating the rationale for surveillance at EU level, its objectives and added value, the type and frequency required to meet the objectives, case definition, type of analysis, thresholds for action and expected outputs.

This will allow surveillance to be optimised, ensure a cost-effective approach and provide room for adapting surveillance; for instance by switching to sentinel surveillance for some common diseases.

Better integration and analysis of both event-based and indicator-based surveillance data in a more systematic and complementary way is currently implemented for travel-associated Legionnaires' disease and will be extended to all diseases for which it is relevant. This will bring surveillance and epidemic intelligence and response closer together.

One of the main challenges will be to keep up with the advances in information science and best use these technological advances in routine public health surveillance. Several EU countries have engaged in this direction. ECDC should promote this approach to Member States and support them by developing guidance, tools and standards.

¹² Also see the Long-term surveillance strategy 2014 -2020 that forms the basis for this chapter <http://www.ecdc.europa.eu/en/publications/Publications/long-term-surveillance-strategy-2014-2020.pdf>

ECDC focus

ECDC will focus on supporting Member States to embark on automated transfer of surveillance data into TESSy through direct machine-to-machine communication. Once established, this should decrease the amount of manual data management required while boosting data quality and timeliness of reporting.

The European Surveillance System (TESSy) will benefit from increased computing power. Access to real-time surveillance information through an interactive interface will provide insight into observed changes of epidemiological patterns in the data. In particular, detection of increased reporting of cases will be automated, with unexpected changes triggering alerts that will require verification and assist epidemiologists to review data in areas where changes have been detected.

The reorganisation of ECDC surveillance outputs aiming for better timeliness of access to European surveillance data will continue to be rolled out for an increasing number of diseases. This will improve data use in informing public health policy at all levels: information for action.

The rapid advances in information science will expand the possibility to link with, or merge, the more traditional public health surveillance data with other important data sources not available traditionally in public health. Current technology allows these linkages that could be facilitated by ECDC, but would mainly be carried out at the national level.

Surveillance will be gradually expanded to cover behavioural information for relevant diseases. This will allow EU-level monitoring of public health interventions targeting behavioural changes for disease prevention.

Vector monitoring currently relies on uncoordinated Member State initiatives. Given the rise in vector-borne disease concerns, vector monitoring will be enhanced and harmonised in the EU.

ECDC wants to identify Member States willing and able to develop mortality or syndromic surveillance systems, or to help develop further what they already have in place. ECDC could then lead and coordinate actions in these countries, collect and analyse the resulting data at European level and promote the outputs of such systems to demonstrate their usefulness.

Increasing use of analytical epidemiology, spatial analysis and advanced statistics (e.g. time-series analysis) will allow ECDC to dramatically increase its added value by identifying relations in data, provide thresholds for action, and produce more solid evidence.

It is very likely that with the continued explosion of social media and ubiquitous use of smart phones, direct ascertainment of disease symptoms from persons in a population, including their location and movements, has great potential for near-real-time information on behaviours. ECDC will embark on studying this potential for augmenting both event-based and indicator-based communicable disease surveillance.

In more specific terms the deliverables show what ECDC wants to achieve in order to reach four broader objectives that will increase the value of surveillance in the EU. These objectives, indicators and targets are described in the table below.

Deliverables: by 2020, ECDC should:

1. Be providing better service to Member States, i.e. easier uploads, improved data access, better linkage between notified cases and laboratory data (when information is available) and more friendly output consultation.
2. Have developed and implemented an agreed set of routinely generated indicators for data quality and comparability, and timeliness.
3. Have reviewed the list of health conditions to be reported routinely through indicator-based (TESSy) or event-based (EPIS/EWRS) integrated surveillance systems, as well as the reporting processes (data to be collected, frequency, etc) on the basis of standards for surveillance developed in close cooperation with the Member States.
4. Have reduced the burden on Member States by facilitating automated machine-to-machine transfer of surveillance data to TESSy for Member States wishing to do so, and resources permitting.
5. Have enabled more user-friendly access to surveillance outputs (dashboards...) providing enhanced insight through the use of advanced statistics, spatial analysis, dynamic mapping and intelligent data mining.
6. Have cautiously expanded surveillance to include molecular and other laboratory-based components, where relevant, taking into account available resources, through a continuous dialogue with Member States and reasoned decision making.
7. Have enabled the Member States to use the surveillance assessment tool for internal audits.
8. ECDC has started an action plan based on the commissioned external evaluation of: a) the TESSy platform, its architecture, functionality and user acceptability to guide future system upgrades; and b) the more general set-up, carrying out and public health usefulness of EU surveillance.

Objective	Indicator	Target	Verification
Support to the Commission and the Member States in the implementation of the epidemiological surveillance of communicable diseases and special health issues according to Article 6.5 of Decision 1082/2013/EU	Proportion of diseases and special health issues for which surveillance standards have been developed and agreed with the National Surveillance partners	All diseases and special health issues under surveillance reviewed by 2020	Steps to verify 100% achievement: <ul style="list-style-type: none"> - Yearly list of diseases for which the standards have been agreed - Yearly report from TESSy on the number of diseases following these standards
High level of user friendliness and quality of uploading surveillance data.	Level of positive feedback from the Member States using machine to machine to upload TESSy data	-100 % response to all requests -80% users satisfied -'Dashboard' on quality indicators available to MS by 2016 ¹³	- Measure to be integrated into the annual stakeholder survey
Interactive outputs available for all diseases under surveillance	Proportion of diseases under surveillance for which online interactive outputs are available	-100 % by 2020 (all diseases) -All tools available by 2016 -80% satisfaction with functionality	Outputs used measured by web statistics Measured in annual stakeholder survey
Substantially increased power of surveillance by implementing molecular characterisation for selected diseases	-Proportion of evaluated business cases for selected pathogens. -Proportion of pathogens with molecular surveillance modules in TESSy	All selected business cases evaluated by 2020. 60% coverage of pathogens included in the strategy.	Results of the pilot phase are verified by the Advisory Forum opinion Note: the decision process might lead to a review of targets in 2017

¹³ An interactive online dashboard links the different data exploration options or user-customised online queries providing an intuitive and integrated epidemiological overview by disease and common relevant indicators. See for one of the many examples: <http://www.cdc.gov/flu/fluview/reports/report1213/trends/index.htm>

9.2 Epidemic intelligence and response

Context and future outlook

Much of the context as described for surveillance also applies to epidemic intelligence and response. A notable development is the Decision on serious cross-border threats to health (1082/2013/EU) that may impact the way ECDC will conduct epidemic intelligence and response in support of the Commission and the Member States. In particular, the scope of the threat detection will be expanded to cover all serious cross-border threats to health.

Major changes could emerge in the field of outbreak investigation. Although speculative, new techniques could evolve. For example, patients associated with outbreaks linked to a possible common source of exposure could be asked to provide, on a voluntary basis, access to personal information that would assist with rapid detection of the source of transmission. Similarly, patients with Legionnaires' disease of a suspected environmental origin might voluntarily provide access to the geo-localisation information on their smartphone, to allow cross-referencing with information from other cases to identify areas most likely to include the source of infection.

The financial crisis experienced by the EU is likely to continue in the coming years to impact negatively on the resources devoted by Member States for public health, threat detection, assessment and response.

Growing demands and expectations are unlikely to be met. In particular, the human resources necessary to perform threat detection and assessment activities are likely to be stretched throughout the system, in the Member States as well as in ECDC.

ECDC's focus:

The most significant change in the coming years for threat detection, assessment and response at the EU level is related to the timely availability of molecular microbiological information. This will result in a massive change in the way ECDC conducts its assessments activities, and will increase the ECDC added-value by allowing timely comparison of strains to enable sporadic cases to be linked in clusters and thus facilitating implementation of control measures.

Another significant development will be the implementation of joint approaches for threat assessment across the various areas of expertise in the EU. Lessons learned from recent outbreaks in Member States have shown the need to ensure seamless risk assessment and support to implementation of public health measures that draw on aspects of public health, food safety, animal health, microbiology, clinical medicine and others.

A one health approach requires that ECDC develops explicit standard operating procedures for interacting with other relevant EU Agencies and WHO. Another area for developing explicit procedures is the cooperation with the national authorities in the field of blood transfusion, tissues and cells, and organ transplants, which are briefed regularly on the communicable diseases relevant for transplantation and transfusion medicine. Specific risk assessments will be developed for these communicable diseases, which will allow national authorities to mitigate and correct these risks proactively. The developed knowledge will also form a basis for any ad hoc advice that may be needed.

One of the main challenges will be to keep up with advances in information science and apply these new ideas to threat detection and assessment activities. These developments will allow epidemic intelligence systems to become more flexible in order to adjust to expanding health information needs and to use the best technology to deliver the data when and where they are needed. Significant progress will be made in increasing the capacity of ECDC to filter relevant information, to provide access for review in news aggregators, and to link this information with existing surveillance and other relevant information allowing a more in-depth understanding.

The tools for crowd-sourcing are increasingly being used to monitor crisis situations and will be integrated into ECDC epidemic intelligence tools to increase insight on rapidly evolving public health events. The amount of public information which will be incorporated into ECDC's screening tools will exponentially increase until 2020.

ECDC supports the implementation of Decision 1082/2013/EU on serious cross-border threats to health by the operation of the *extended* EWRS. "*Extended*" means, that the EWRS tool will allow for notifications of the threats other than communicable diseases and related special health issues.

Moreover, in the coming years, ECDC's focus will be to establish strong functional links with the various public health emergency centres in the EU ('crisis centres' or 'situation centres'). This will result in agreed protocols, interoperable standard operating procedures, dedicated communication lines and joint exercises. As an example, a strong link will be developed with the alert networks between Member States' competent authorities on blood, tissues, cells and organs, in order to allow for optimal passing of alerts of communicable diseases that pose a particular risk to transfusion and transplantation medicine. For communicable diseases of repetitive risk, maps with concrete areas of outbreak can be prepared for use in the national blood donation services.

Through these activities ECDC will provide relevant, timely and high quality risk assessments concerning biological cross-border threats to health, which support the risk management carried out by the Member States and the

Commission in the context of the new legislation. We will measure the progress on this objective by the number of timely rapid risk assessments and the positive reception by stakeholders.

In summary, ECDC will serve Member States and the Commission that they can consult systems for information on emerging threats, their assessment, and guidance on appropriate responses. Through the broader operation of the communication platforms for coordination of measures (EWRS) and the provision of the communication platforms for threat assessment (EPIS platforms) ECDC:

1. enables the exchange of information among all those who need to be involved - Member States as well as EU and international partners, including WHO;
2. addresses threat-specific needs in term of clinical and microbiological support;
3. facilitates the smooth technical operation of new EWRS functionalities required by Decision 1082/2013/EU;
4. opens as needed these communication platforms globally to increase their added value, based on the successful example of the EPIS platform for food- and waterborne disease outbreaks covering many non-EU countries;
5. enables the network expertise to be drawn on to provide the best evidence-based assessment and response guidance;
6. provide information about threats for EU citizens, whether they reside in the EU or abroad; and
7. facilitates the needed processes by providing algorithms and workflows.

By 2020, ECDC:

1. Has become the main source of information on global communicable disease threats for European public health and healthcare professionals;
2. Is providing evidence-based rapid assessments of emerging threats leading to rapid, appropriate and coordinated measures across the EU;
3. Is providing support to Member States through outbreak response teams;
4. Has made available to Member States epidemic intelligence and rapid assessment methodology, toolkits for investigating and responding to emerging threats as well as lessons learned during investigation of emerging threats and response support to Member States.

Objective	Indicator	Target	Verification
Provision of relevant, timely and quality rapid risk assessment to support the risk management carried out by the Member States and the Commission	<ul style="list-style-type: none"> - Number of timely rapid risk assessments - Proportion of rapid risk assessment assessed positively by Member States through the annual stakeholder survey 	<ul style="list-style-type: none"> - 80% of rapid risk assessments produced within 48 hours of initial decision - 100% within 4 weeks - 80 % yearly satisfaction of respondents 	<ul style="list-style-type: none"> Quality: annual stakeholder survey Timeliness: RRA statistics

9.3 Preparedness

Context and future outlook

Preparedness for communicable diseases, regardless of the scale (local, regional, national, European), aims to minimise the risks posed by pathogens and mitigate their impact during a public health emergency. This entails having the capabilities and capacities for effective planning, coordination, early detection, assessment, investigation, response and communication on public health emergencies.

Surveillance is crucial to detect emergencies as early as possible and already significantly pre-determines the scale of response. Member States and local authorities are the first responders to public health emergencies. EU institutions and international partners add further value to support necessary capacity building and response to public health threats of cross-border relevance.

Preparedness for health threats in the field of communicable diseases builds, to a large extent, on the experience gained from pandemic influenza preparedness planning. However, future preparedness needs to become more integrated in a generic approach, as planning processes and other tools necessary for emergency preparedness, mitigation and response are similar regardless of the nature of the hazard. The capacity of the national health sectors should be strong enough to face all types of major communicable disease risks, from epidemics to biosecurity accidents, from well-known risks to new or emerging threats such as an influenza pandemic or bioterrorism.

Experience from pandemic preparedness planning shows that communicable disease preparedness (especially when it comes to communication and governance) requires coordination across multiple sectors, as the provision of public health services and medical care is almost entirely dependent on the preparedness of critical infrastructure sectors, such as law enforcement, transport and communications, essential services (like water and electricity). This needs to be taken into account in the planning and organisation at national and more local levels.

ECDC's focus

In the area of preparedness, a crucial development is the new EU legislation on serious cross-border threats to health and the full implementation by the Member States of requirements under the International Health Regulations. ECDC will focus 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 should consider 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. It should be noted that preparedness against national and local health threats is the responsibility of the Member States. Member States, however, could be informed by general guidance on risk assessment and evidenced-based options for operational response planning and toolkits developed by ECDC. The activities of ECDC should thus be complementary to, and add a European value to, national capacities.

Given the broad scope of preparedness outlined above, many of the ECDC activities described in other chapters of this multiannual programme also strongly contribute to the enhancement of national capacities and EU-level preparedness. However, in addition, ECDC will – within its mandate - need to work on a number of *specific* preparedness activities, mainly:

- Upon request provide support to the European Commission on new, upcoming issues in the implementation of the provisions under the new legislation on serious cross-border threats to health and other Commission initiatives;
- Support public health emergency management, business continuity and interoperability at EU and national levels through guidance, processes, toolkits and EU-level simulation exercises, jointly with EU and regional partners such as WHO EURO;
- Further strengthen crisis management within ECDC to support EU responses to emergencies through the emergency operation centre infrastructure, tools, procedures, processes and internal simulation exercises;
- Provide, within the Centre's remit, operational guidance, tools and evidence-based options for risk management and criteria for their prioritisation, with particular focus on outbreak situations that involve cross-border issues or European-level coordination;
- In collaboration with EU and international partners, develop tools and methods for self-assessment of the national preparedness plans;
- Within available resources respond to specific requests for assistance from single Member States.

All these activities serve the overall objective of a better preparedness planning as indicated in Article 4 of Decision 1082/2013/EU. ECDC will support within its mandate in particular the improvement of interoperability and consistency of national preparedness planning, intersectoral coordination and business continuity planning by technical guidance and assessment reports. ECDC will follow the progress by measuring the endorsement of our products by the Health Security Committee. Moreover, we will measure the completion of our planned technical support activities as an indicator to reach the objective. Assessment reports should finally verify preparedness parameters at national levels (see table below)

Deliverables by 2020:

1. ECDC internal preparedness and crisis management is at a constant high level based on well-tested (exercises and real events) infrastructure, processes and procedures;
2. Within its mandate, ECDC has provided guidance and tools to facilitate the development and self-assessment of preparedness plans and preparedness in the Member States;
3. Within its mandate ECDC has provided support to Commission-initiated simulation exercises related to preparedness planning and supported Member States in their capacity to test the effectiveness of their plans;
4. Within its mandate ECDC has provided updated communication platforms and support to networks of public health and other relevant professionals in order to support the collaboration on matters related to public health emergency preparedness between Member States and other stakeholders;
5. Within its mandate ECDC has, on request and within available resources, provided specific support to countries.

Objective	Indicator	Target	Verification
Support to the Commission and the Member States in the implementation of the preparedness Article 4 of Decision 1082/2013/EU as endorsed by the Health Security Committee, in particular in improving the interoperability and consistency of national preparedness planning, intersectoral coordination and business continuity planning.	- Proportion of planned ECDC activities (guidelines, seminars, workshops, exercises) undertaken to reach the objective	90% by 2020	ECDC assessment reports of preparedness at national level for communicable diseases upon request of the HSC -Verified by HSC meeting minutes
	-Proportion of ECDC products endorsed by the Health Security Committee	50% by 2020	

9.4 Scientific advice

Context and future outlook

ECDC's output of scientific advice is highly valued by most of our stakeholders. It provides a European dimension and saves resources by performing systematic reviews and applying an evidence-based approach in one place instead of in 28.

Work at ECDC has concentrated on developing evidence-based methods that are suited to public health issues rather than the present methods that apply more to clinical medicine, and this development must continue. These developments have also been widely shared with public health experts in the Member States. Using evidence-based methods not only improves the value of scientific advice, but also addresses the increased scrutiny towards such output from the public and stakeholders.

Public health structures and communication, social and environmental conditions, and behavioural patterns are markedly different between societies and across the EU. The EU's enlargement will amplify these differences even more. Scientific advice has to consider these differences, and provide tailored and realistic products. Hence, ECDC should promote the development and use of an 'integrated approach' for scientific advice, also taking into account the latest results and methods from behavioural and prevention science. With respect to the increasing financial constraints in the EU, evidence-based public health, health economics, and burden of disease methods and applications will gain more importance over the coming years.

There is also a need for harmonised procedures in the production of scientific advice, not just within ECDC, but also between ECDC and other EU Agencies. This work has recently started, and aims to save resources by sharing ideas and methods for processes such as: selection of experts (and possibly common expert databases), handling issues around conflicts of interest, use of evidence-based methods, shared terminology, etc. ECDC needs to pay attention to these needs, and develop IT systems for scientific advice (including expert databases) that are able to cope with this.

It is also important to work closely with the Member States around scientific advice: firstly to have their input on ECDC's priorities, and secondly to diminish the risk of redundant (and costly) work by Member States and EU Agencies. Here, the Advisory Forum plays an important role in both aspects.

Finally, many Member States have expressed the need for ECDC to have a kind of 'foresight function', which tries to identify trends in disease development, in society and in the environment that could influence the future of communicable disease control and prevention. Elements of such a function already exist, but not with a clearly defined structure.

ECDC's focus

While the regular processes go on, ECDC should take the lead in the field of evidence-based public health and in harmonisation of scientific advice across the EU. Collaboration with other health-related EU Agencies needs to be stronger and better aligned to avoid scientific advice gaps. The work of cross-agency coordination needs to be firmly established to regularly align activities.

ECDC strives to become the prime information hub in the area of communicable diseases. In 2020, public health professionals, and to a certain extent, the general public, will use the ECDC website as their portal to gain access to information, statistics, methods, examples of best practice, networking and contacting peers across the EU.

ECDC is already one of the main driving forces of evidence-based public health in the EU. A working group comprising relevant experts in this field has been established, and new methodological and operational initiatives have been launched. To make scientific advice outcomes more evidence-based, and to provide the tools and methods that are necessary to do so, will be one of the main tasks of ECDC in the field of scientific advice within the coming years.

The scientific expert directory and laboratory directory are examples of ongoing initiatives in the direction of promoting ECDC into an information hub. Other initiatives are for ECDC to provide valuable infrastructures like databases of scientific advice, of processes and methods, of public-health-related learned societies, of vaccination programme mapping, of social and behavioural determinants and epidemiological data, etc.

'Horizon scanning' for what may be around the corner is to some extent an academic activity, but needs to be closely connected to the day-to-day activities of communicable disease prevention and control. Many of the Member State public health institutes cannot afford such a function, and there have been repeated requests for ECDC to further develop this.

Efforts in the focus areas mentioned above will result in specific deliverables by 2020. However, these are part of the higher aims to support the Commission and Member States by producing quality scientific publications in the area of the priorities and mandate of the Centre. The added value of ECDC's scientific advice activities is to be responsive to requests for scientific opinions by providing high level of timely and adequate response through the provision of authoritative and reliable evidence-based scientific opinions and guidance to Member States, Commission and Parliament. ECDC will measure progress on the indicators and targets set as described in the text below.

By 2020, ECDC will have:

1. Continued to deliver targeted, high quality scientific advice that impacts policy decisions.
2. Become such a trusted source of scientific advice for all the Member States that they feel that they do not have to duplicate the work themselves.
3. Contributed to an EU 'horizon scanning' function to support its own work and the work of the Member States.
4. Achieved a harmonised, integrated, transparent process of scientific advice that is a significant contribution to the EU's communicable disease control, in collaboration with the Member States, the other EU Agencies, and other stakeholders.
5. Offered training to Member States and stakeholders in new methods for evidence-based public health.

Objective	Indicator	Target	Verification
High level of support of the Commission and Member States by producing quality scientific publications in the area of the priorities and mandate of the Centre	Quality of ECDC scientific publications in peer-reviewed journals remains high i.e.: - Average journal Impact Factor - Average number of citations of each article	IF > 4.0 > 15	Quality and citations base on the following databases: Scopus, PubMed and Embase
High level of timely and adequate response to requests for scientific opinions by providing authoritative and reliable evidence-based scientific opinions and guidance to Member States, Commission and Parliament	- Proportion of prioritised scientific topics executed. - Proportion of requested items for scientific advice (ad hoc and planned) timely delivered - Use of evidence-based opinions and guidance produced by ECDC	80 % of prioritised actions integrated in annual work programme 80 % >80 % of opinions and guidance by 2020	- Source: comparison between IRIS (tool for scoring scientific priorities by the AF) and the approved Work Programme - Source: SARMS (internal database on external scientific advice requests) - Source: annual stakeholder survey

9.5 Public health training

Context and future outlook

The defence against communicable diseases in the EU depends on a continuously available competent workforce at all levels. This is reiterated in article 4 of the Decision 1082/2013/EU on serious cross-border threat to health which addresses amongst others the efforts to develop, strengthen and maintain the national capacities for preparedness and response planning. This requires high-quality graduate and postgraduate training within the national universities and schools of public health, but it also requires life-long professional learning and on-the-job training.

The spectrum of the public health systems for communicable disease control are characterised by diversity with regards to job descriptions and career sustainability. Furthermore, the demographic profile of public health professionals differs between countries, and some countries will, within the next seven-year period, be facing the retirement of substantial parts of the public health workforce. Training of national and sub-national public health experts is the responsibility of the individual Member States. Existing training services and postgraduate programmes in the countries are tailored to specific national needs and there is a gap between these national needs and the EU's needs to have a workforce also capable of addressing cross-border health threats in a uniform way.

It is of strategic EU importance to ensure training focused on the core competencies required for the provision of essential public health services and operations at national and international levels. Core competencies in the fields of epidemiology and public health microbiology have been defined through ECDC initiatives, but are yet to be developed for more specific functions, e.g. national TB, HIV and immunisation programme managers and risk communicators.

ECDC-coordinated training efforts have proven successful in filling competence gaps at national and EU levels. An added value of these efforts beyond what could be offered by schools of public health is the strong inclusion of highly dedicated teachers, facilitators and supervisors, having their daily work in the national public health institutes. These senior experts are highly aware of the practical public health needs and requirements and have a wealth of practical experience in addition to theoretical knowledge.

ECDC's focus

Coordination of the training programmes EPIET and EUPHEM will remain the cornerstone in order to strengthen and sustain the workforce at the EU level. The two-year 'learning-by-doing' training programmes not only train individuals, but also more broadly support sustainable training infrastructures and capacities in the EU in order to have a competent workforce to carry out essential public health functions. This will be continued through technical support to the national training sites, including training of national trainers and supervisors able to cascade training down to regional and local levels. The future balance between EPIET and EUPHEM will be based on needs, and the overall size of the programmes as well as the balance between ECDC-funded and nationally-funded fellows will depend on available resources. At the Member State level, ECDC aims to support countries to the point that associated national FETP-like programmes are independent of ECDC resources, yet associated to the EU-wide training network as EPIET Associated Programmes.

Some countries may not fully benefit from EPIET/EUPHEM. These countries should be offered national and/or regional shorter training courses that are tailor-made to their specific needs, as far as resources permit. Given its limited resources, the further ECDC training efforts (shorter training modules and 'sharing good practice' workshops) will mainly concentrate on the cross-border dimensions of communicable disease prevention and control, with a strong focus on interoperability and cooperation across national borders. These training services from ECDC will therefore mainly address professionals that are expected to deal with cross-border communicable disease prevention and control, e.g. within the various ECDC-coordinated networks. This approach should add EU value and be complementary to existing training and educational services at national level and not duplicate the curricula of the national schools of public health, which are best suited to provide basic theoretical skills in subjects like epidemiology.

In order to ensure complementarity of the ECDC training services, ECDC aims for synergy within an EU-wide network of a multitude of training partners. ECDC will further develop the collaboration with the Association of Schools of Public Health in the European Region (ASPHER) in the definition of additional core competencies in the field of communicable disease control and stimulate a debate for it to be more prominently included in the curricula of these schools.

With porous borders, there is a need to also create partnership networks in areas bordering the EU. With the establishment of the Mediterranean Programme for Intervention Epidemiology Training (MediPIET), ECDC is developing a strong training network within the Mediterranean Region that closely collaborates with ECDC-led training activities.

While it is a national responsibility to cater for the training needs of the local and regional public health workforce, there is an added value in reusing ECDC-developed training material at all levels, and professionals trained by ECDC should be able to cascade EU-relevant training down to the sub-national and local levels.

With the approach of coordinating network-based training activities and the ambition of cascading learning activities, the need for a training centre function and further development of training material is important. ECDC will develop all its training materials under the Creative Commons system, and will encourage network partners to do so as well. ECDC aims to use modern tools in e-learning to achieve the maximum training effect within the available resources. The FEMWIKI that has been developed by ECDC will be further developed to become the central tool for knowledge transfer for ECDC-related training networks, engaging and involving training partners across Europe and globally.

All activities within training aim to strengthen the workforce capacities and within this diversity the most important deliverables for the next period are listed below. Within the more overarching objective to strengthen the workforce and capacities ECDC follows the progress using the indicators mentioned in the box which include the three dimensions reaction, learning and behaviour commonly used in the assessment of the effect of training.

By 2020:

1. A sustainable level of EPIET and EUPHEM fellows has been established, and any further expansion of the fellowship programme is seen through an increased number of national EPIET Associated Programmes;
2. With sufficient Commission funding, MediPIET has been firmly established. While the responsibility has been fully handed over to the participating countries, the network retains its strong links to the ECDC-led training networks in the EU;
3. The ECDC virtual training centre makes available online training resources, including e-learning and tools for knowledge transfer, allowing the countries to cascade training to regional and local levels;
4. Further core competencies have been defined and are guiding the curricula of ECDC training initiatives;
5. ECDC has delivered short training modules and 'sharing good practice' workshops targeting national experts at midcareer and senior level in ECDC networks, with focus on the international dimensions of disease prevention and control.

Objective	Indicator	Target	Verification
With special emphasis on the core capacities referred to in Article 4 of Decision 1082/2013/EU, a strengthened workforce in the Member States through adequate and relevant training.	Reaction: Participant satisfaction with ECDC training activities.	> 80 % satisfaction	Course evaluations.
	Learning: Achievement of agreed learning objectives in relation to core capacities in ECDC fellowship programmes (EPIET/EUPHEM).	> on average 80 % achievement by all fellows	-Incremental progress reports (IPR), -Competencies Development Monitoring Tool (CDMT), mid-term and final reviews with fellows and supervisor
	Behaviour: Number of scientific articles of public health relevance by EPIET/EUPHEM fellowship during and 2 years after graduation	> 50% increase compared to the 2-year period before entering the programme	Bibliometrics (PubMed, Scopus)

9.6 Microbiology support

Context and future outlook

The 2005 International Health Regulations mandate each country to develop capability to detect, rapidly assess and contain health threats of potential international concern. However, far better integration and consolidation of existing epidemiological and microbiological surveillance and alert systems will require long-term effort to ensure preparedness.

In a fast-moving field, rapid microbial and drug resistance screening tools are now reaching the point-of-care diagnostic market. Whole genome analysis, beyond tracing evolution and spread of microbial pathogens, can rapidly uncover novel markers of virulence and drug resistance. Yet, there is a largely unmet need to critically assess the accuracy and public health effectiveness of new technology for disease prevention and control. In addition, national reference laboratories need access to training and external quality assurance schemes for novel microbiological technologies to ensure comparability of data used for EU surveillance.

In keeping with the EU Health Strategy, every Member State should have access to routine and emergency diagnostic and reference laboratory services to detect, identify, characterise and subtype human pathogens of public health significance, either locally or through cooperative agreement, as required for informing disease management, control and prevention measures. In 2008–2011, several pan-EU surveys of national public health microbiology capacities mapped a diversity of models for reference laboratory service provision and identified areas for improvement. The EU is facing serious threats to laboratory capacity due to financial cutbacks in health services, shortage of trained medical specialists, and decreased interaction between microbiologists and clinicians following consolidation of microbiology services into large private laboratories. These challenges underline the need for encouraging collaboration between clinical and public health microbiology services. They also highlight the importance of maintaining the laboratory capability at clinical, national and supranational reference levels that is required for effective surveillance, alert and response to communicable disease threats throughout the EU.

ECDC has a mandate of 'encouraging cooperation between expert and reference laboratories' and will continue to 'foster the development of sufficient capacity within the Community for the diagnosis, detection, identification and characterisation of infectious agents which may threaten public health'. Support to Member States faced with limited resources can be provided through development of cross-border synergies for advanced microbiology testing of rarely occurring or emerging diseases, including using novel technologies. Part of the future will therefore consist of follow-up of the EURLOP project (European Reference Laboratories System for Human Pathogen Options Project, 2010–2011). This project aimed at appraising the strengths and gaps in the existing laboratory capacity across the EU and defined strategic options and models towards a responsive EU reference laboratories system based on principles of solidarity between Member States and economy of scale afforded by enhanced technical cooperation.

ECDC's focus

ECDC should continue advising the Commission and Member States on laboratory technology assessment studies and appraising the scientific evidence of public health effectiveness of new diagnostic and epidemiological typing methods. More specifically ECDC has previously formulated four strategic objectives up to 2020.

The first is to consolidate the capacity of the EU public health microbiology system. Microbiology coordination will support the disease programmes by facilitating sharing of best practice across disease networks, developing ECDC standards for outsourcing microbiology work to ensure consistency in terms of laboratory network coordination, evaluation and reporting. Monitoring of capability of the EU networks of national reference laboratories will guide ECDC priority actions in consultation with the Advisory Forum, National Microbiology Focal Points, the Commission and WHO.

Microbiology Coordination will support Public Health Training in aligning the EU public health microbiology training programme (EUPHEM) activities to ECDC priorities. Development of short-term professional training opportunities in public health microbiology will also be explored.

ECDC will encourage adoption of EU and ISO quality assurance standards for reference laboratory services by its partners in EU laboratory networks. ECDC will encourage microbiology experts participating in disease-specific EU networks to develop evidence-based technical guidance on microbiological testing for diagnosis of infection and further characterisation of human pathogens of public health relevance. Harmonisation of laboratory methods will be encouraged, including of common laboratory testing standards and definitions (EUCAST) for surveillance of antimicrobial resistance to enable data comparability between countries and between human and animal health. ECDC will encourage the development of evidence-based guidance on application of innovative laboratory methods in public health microbiology. It will support Member State access to improved technologies by organising training workshops, external quality assessment schemes as well as task sharing for specialised testing within European networks of laboratories.

ECDC will provide information about public health microbiology projects and activities supported by the Centre, the Commission, the Member States and international bodies. A searchable directory of expert and reference laboratories that are available in the EU for human pathogens will be developed and maintained.

The second goal is to identify essential components of microbiology services for public health surveillance and disease prevention and control, and to implement a system for monitoring these key microbiology laboratory capabilities as required for surveillance of communicable diseases and epidemic preparedness in the EU. Based on consensus criteria and indicators of public health microbiology capability at Member State and EU network levels, ECDC will analyse data annually from Member States for monitoring key capabilities and identify priorities for action at Member State and EU levels.

The third goal is to further refine and implement the ECDC roadmap for integration of molecular typing into EU-wide surveillance in a stepwise manner based on disease-specific objectives in consultation with the Advisory Forum, and the National Microbiology and Surveillance Focal Points. The goal is to build upon existing typing activities performed at national level and enable synergistic use of the data by offering a technical platform for data sharing and joint analysis within TESSy as well as quality assurance and training where needed. This roadmap will be discussed on a pathogen by pathogen basis with disease programme and disease network experts based on a systematic business case assessment of added value, feasibility, resource needs and cost-effectiveness for ECDC and Member States. The proposed targets for consideration for enhanced EU-level outbreak detection or surveillance will focus on well validated and easily exchanged gene-sequence typing systems for *Salmonella*, STEC, *Listeria*, *M. tuberculosis*, influenza, legionella, meningococci, multidrug-resistant gonococci and HIV, extensively drug-resistant Enterobacteriaceae, *Acinetobacter* and methicillin-resistant *S. aureus*. Evaluation of the roadmap implementation outcomes starting with evaluation in 2014 of the pilot phase based on predefined success criteria will be annually reviewed. Assuming positive evaluation of the pilot phase, further developments of the molecular surveillance system in terms of wider country participation, sampling strategies, data management or addition of new pathogens will be jointly decided with all Member States in consultation with the Advisory Forum.

Finally, to further integrate EU surveillance and alert systems for AMR in food-borne pathogens (see 10.1) and improve the scope, comparability, resolution and timeliness of such surveillance, an integrated EU system will be jointly developed for the Commission by EFSA and ECDC with the support of EUCAST guidance.

To obtain the objective to ensure sufficient microbiology capacity within the EU, to detect and manage infectious threats, we will work to implement the ECDC microbiology strategy. Within this strategy the indicator to follow the development of capacity is divided into three targets. As this process is in development the appropriateness of this indicator needs attention and may need modification. Within its mandate of 'encouraging cooperation between expert and reference laboratories' and equally to 'foster the development of sufficient capacity within the Community for the diagnosis, detection, identification and characterisation of infectious agents which may threaten public health' ECDC will continue to work on the four deliverables for 2020 listed below.

By 2020, ECDC has achieved:

1. Consolidation of the capacity of the EU public health microbiology system for EU-wide surveillance of communicable diseases and epidemic preparedness, this will result in a more efficient use of existing microbiology capacities in the EU;
2. Development and implementation of a system that assists Member States in monitoring critical microbiology laboratory capabilities for EU-wide surveillance of communicable diseases and epidemic preparedness;
3. The gradual integration of selected molecular typing data into EU-wide surveillance and epidemic investigations for priority diseases and transmissible drug resistance threats after agreement with Member States;
4. Further integration of EU clinical laboratories and other public health laboratories in the surveillance and alert systems for human and zoonotic pathogens (see 10.1).

Objective	Indicator	Target	Verification
Implementation of the ECDC microbiology strategy to ensure sufficient microbiology capacity within the EU, to detect and manage infectious threats.	Proportion of Member States having microbiological core capabilities and capacity, as defined by the ECDC Microbiology Strategy	- Annual monitoring of three components i.e. primary diagnostics; national microbiology reference laboratory services and laboratory-based surveillance and epidemic response support. -Administer the indicators to maintain and/or improve the EU microbiology capabilities in public health -Assess the agreed EQA performance levels.	Verification by technical audits of Member States and other components. [NB. The midterm evaluation may result in the formulation of specific targets and options for action.]

9.7 Health communication and *Eurosurveillance*

Context and future outlook

The communication landscape has in recent years become immensely more complex with the rapid development of social media, resulting in a paradigm shift in communication from top-down, one-way communication (often limited to national contexts) to peer-to-peer communication in ever-changing networks of common interests at all different levels (personal-local-national-global). Within the sphere of social media, the spread of messages is in real time and new actors like health bloggers draw large audiences, all putting new and large communication demands on the public health community.

The 2009 influenza pandemic put international and national risk and crisis communication to the test and exposed many weak points. Many of the failures related to the management of the pandemic at all levels were due to poor communication and an inability to monitor, understand and react to public perceptions. One of the main lessons learned from the pandemic was that the competence in crisis and risk communication in the countries needs to be enhanced. Efficient and continuous risk communication, starting before a crisis, builds trust in public health – a trust that may be indispensable in a later crisis situation. This also relates to articles 11 and 17 of Decision 1082/2013/EU where – in appropriate cases - the Health Security Committee in liaison with the Commission will be supported by provision of scientific input to crisis communication in case of communicable diseases events /emergencies.

It is increasingly realised that traditional interventions are not enough to effectively prevent and control major health threats such as antimicrobial resistance, measles, and HIV. Research shows that properly designed behaviour-based health communication activities can have a significant positive impact on health-related attitudes, beliefs, and behaviours. Understanding the population's knowledge and perceptions of communicable diseases is the basis for better and more focused planning of communication campaigns and interventions. Successful implementation of prevention, preparedness and response strategies requires a positive public perception, trustworthiness and legitimacy of health organisations implementing these strategies.

During the previous planning period of 2007–2013, partnerships with leading experts and academics from the EU and globally in the area of behaviour change, risk communication, social marketing and health promotion have been established. ECDC has carried out extensive research in the area of health communication and behaviour change with focus on communicable diseases, forming a sound basis for its further support to the countries in this area.

ECDC's focus

ECDC will strive to further establish its communication outputs as the main source in the EU of authoritative and independent scientific and technical information in the areas of its mandate. Based on previous research and audience segmentation, the Centre will in its external communications focus on the following target audiences: health professionals, policy makers, the media, and health communicators. ECDC is generally not communicating directly with the general public, but rather supports the national authorities and other stakeholders on specific topics (e.g. European Antibiotic Awareness Day and immunisation programmes). Establishing a sustainable and credible reputation will also hinge on relevance, building on strong partnerships across the EU to ensure that ECDC's work is utilised and focussed on our users' needs.

The web portal is foreseen to remain the main vehicle for presenting and storing ECDC outputs. However, it will need adaptation to its audiences and to technical developments, including new platforms such as smartphones and other mobile devices. A new generation of media (infographics, dynamic spread sheets, visual tools, maps, open databases, apps, etc.) will become the norm. Social media will be increasingly utilised to support and complement more traditional communication channels, especially as it could be foreseen that the boundaries between traditional and social media will become increasingly blurred over the years. Social media will also be increasingly used to better understand the needs and perceptions of the ECDC audiences.

Language will remain an issue where quality and accessibility will need to be weighed against each other. The technical advances during the period will make machine translated texts increasingly viable. ECDC will support the process through multi-language vocabularies and term lists. However, input from Member State experts will remain vital to put ECDC messages into national contexts.

During public health events, coordination of key messages is crucial and ECDC will continue to support the activities on risk/crisis/outbreak communication of the Health Security Committee communicators' network. The ECDC-developed training course on risk communication will be rolled out to the Member States.

To support national prevention efforts, knowledge and principles of behaviour change and risk communication will become fully integrated in ECDC's disease programmes with a specific focus on:

1. Increased vaccine uptake, mainly, but not exclusively, MMR and influenza vaccines;
2. Prudent use of antimicrobial agents and improved hygiene in healthcare and other settings;
3. Basic hygiene measures in the home and in the community, with a focus on respiratory and gastro-intestinal hygiene;
4. Sexual health;
5. Reducing the spread of tuberculosis within risk groups.

Within the priority areas, ECDC will support the Member States' efforts to integrate behaviour change and risk communication strategies in their communicable disease prevention programmes and public health campaigns. The different contexts in the EU create a unique opportunity for the Member States to share different ideas, resources, information, examples, experience, and expertise on health communication.

ECDC is in the unique position to strengthen partnerships and facilitate professional networking as well as to facilitate development of guidelines and tools to support health communication in a consistent way, e.g. developing guidance on health communication strategies and plans, as well as easily adaptable, targeted and ready-to-use guidance documents, training and communication materials concerning behaviour-based prevention of communicable diseases in specific populations.

These activities aim to achieve the following three objectives: the publication of topical online information within ECDC's remit through the web portal and social media channels; the support to Member States and Commission in regard to public health campaigns and provide training and tools for risk communication and the provision of scientific input to crisis communication in case of communicable diseases events /emergencies coordinated by the Health Security Committee in liaison with the Commission according to articles 11 and 17 of Decision 1082/2013/EU. Relevant indicators and targets have been formulated so that by 2020:

1. ECDC has through its efficient external communications increased its reputation as the main reference point for European-level technical and scientific data and advice in the areas of its mandate;
2. ECDC is a trusted and valued partner with Member States and the Commission, in relation to risk and outbreak/crisis communication support and co-ordination;
3. Effective behaviour-based communication strategies is an integral component of ECDC disease programmes, supporting national prevention efforts;
4. ECDC has further strengthened its current position as the main European hub for scientific advice and guidance on behaviour and risk communication related to communicable diseases in order to support Member States in their communication activities.

Objective	Indicator	Target	Verification
Publication of topical online information within ECDC's remit through the web portal and social media channels	Usage of the ECDC web portal and social media channels	+200% web visitors and social media followers by 2020 (2014 year of reference) - Certification by an external party (HON)	-Web and social metrics used for verification. -Measure on quality will be in annual stakeholder survey Health on the Net http://www.hon.ch
Support to Member States and Commission in regard to public health campaigns and provide training and tools for risk communication.	Activities and actions delivered according to approved planning	100% delivery within agreed timelines	Records on file of activities and actions
Provision of scientific input to crisis communication in case of Communicable diseases events /emergencies coordinated by the Health Security Committee in liaison with the Commission according to articles 11 and 17 of Decision 1082/2013/EU	Proportion of LTTs, press material shared	100% input to all critical events	Quality and timeliness verified by feedback from Commission on HSC actions and decisions

Eurosurveillance

Eurosurveillance has been very successful and gained a good reputation among its target audience in Europe and beyond. On many occasions the journal provided ECDC scientists and external stakeholders with a respected outlet to share and disseminate information relevant for the prevention and control of communicable diseases.

Eurosurveillance is well known among epidemiologists and scientists from the field of applied public health and academia who work in the field of communicable diseases, mainly in Europe. However, it is also increasingly well known in North America and Australia and to a lesser extent in Asia and Africa. It was the fastest journal to publish epidemiological information during the 2009 influenza A(H1N1)pdm pandemic and the large outbreak of enterohaemorrhagic enteroaggregative, Shiga toxin-producing *Escherichia coli* O104 in 2011. During these events the journal's major strength – to facilitate the rapid sharing of scientific information – was acknowledged by many scientists worldwide.

In June 2012, the journal received its first impact factor. The figure allocated for 2011 was 6.15, the SCImago Journal Rank for the same year placed *Eurosurveillance* number 61 of around 1 600 journals in the field of medicine, and it was certified by the Health on the Net (HON) Foundation as adhering to the HON code of conduct (HONcode) in 2010.

Eurosurveillance remains one of the leading peer-reviewed journals in its field and crucial part of ECDC's activities. It continues to serve public health in the EU by providing an attractive outlet for (rapid) sharing of scientific information related to the outcome from European-wide communicable disease surveillance, new tools in surveillance and evidence-based public health. The journal closely follows new developments in publishing and sharing large datasets and implements them where appropriate. *Eurosurveillance* supports capacity-building activities and attempts to contribute to closing the gap in the available evidence base in international scientific databases with respect to surveillance, prevention and control of communicable diseases. *Eurosurveillance* uses social media strategically and adapted to available resources to ensure good visibility of the journal.

Deliverables, by 2020:

1. *Eurosurveillance* as an attractive scientific journal and crucial part of ECDC's activities will continue to serve public health in the EU by providing quality scientific information related to outcome from European-wide surveillance, new tools in surveillance and evidence-based public health.
2. New developments in publishing and widely sharing large datasets are closely followed and implemented if relevant.
3. Social media are strategically used and adapted to available resources to ensure good visibility of *Eurosurveillance*.
4. *Eurosurveillance* supports capacity building activities and attempts to contribute to closing the gap in the available evidence base in international scientific databases with respect to the prevention and control of communicable disease in the EU.

10. Disease programmes

Disease programmes mirror the functions in ECDC, but it is equally fair to acknowledge the differences in the programmes. To all disease programmes the functions of surveillance, microbiology and (risk) communication are key elements. However, the determinants for the prevention and control of the various diseases and conditions differ widely. Thus although (core) functions are represented in all disease programmes, their relative importance varies. Prevention control programmes play a bigger role in antimicrobial resistance and healthcare-associated infections than health inequalities and climate change. In contrast, emerging and vector-borne diseases and food- and waterborne diseases are more affected by climate change. Health inequalities are important determinants in the tuberculosis and HIV, sexually transmitted infections and viral hepatitis programmes, but these programmes are quite different in terms of health communication. In the present cultural climate, vaccine-preventable diseases ask for a more than average effort in health communication and knowledge on behaviour change. Similarly, general preparedness is important but the efforts for pandemic preparedness are more obvious for influenza. So the 'programmatic nature' of communicable disease control differs over the various programmes. If the relative contribution of certain determinants or functions would change significantly, this might be a reason to revise the Strategic multi-annual programme 2014–2020.

The overall objective is the same for the programmes as they aim to strengthen Europe's defences against infectious diseases. A common set of indicators has been defined for all the disease programmes. It consists of the number of tools, products and activities aimed at implementing the SMAP through the annual work programme. In addition, for each of the disease programmes, the level of satisfaction of ECDC stakeholders (Commission, Parliament, and Member States) will be measured in the annual stakeholder survey. Finally each of the programmes will be evaluated on a five year periodicity, including on the added value of its work. ECDC will establish a roadmap to plan when each of the Disease Programme will be evaluated, on a rolling basis.

In the following chapters more specific directions and deliverables are presented for each individual disease programme.

Objective	Indicator	Target	Verification
Strengthened Europe's defences against infectious diseases by dedicated programmes aiming at the best possible knowledge and implementation for prevention and control.	Number and type of tools, products and activities aimed at realising the SMAP deliverables.	90%	Measured and verified by Management Information System
	Satisfaction by the member states on the value of the Disease Programmes	> 80% satisfaction by two-third of the respondents	As measured by the annual stakeholder survey
	Added value of the disease programmes is periodically evaluated	Each programme is evaluated every 5 years and a follow-up plan is made and executed.	

10.1 Antimicrobial resistance and healthcare-associated infections

Context and future outlook

The issues of antimicrobial resistance (AMR) and healthcare-associated infections (HAI) have been high on the EU agenda during 2007–2013 and are expected to be at least at a similarly high level during 2014–2020.

The issues of prudent use of antimicrobials, infection prevention and control, and the need for new antibiotics will continue to be the focus of European initiatives. Especially, the alarming trends of increasing resistance in gram-negative bacteria to last-line antimicrobial agents will require close surveillance and concerted efforts at international level.

In addition to the human aspect, there will certainly be more focus on the role of use of antimicrobials in food-producing animals and its impact on human health, and actions to preserve antibiotics that are critically important for treating infections in humans.

There are a few key points for AMR and HAI, in general and that apply specifically to the period 2014–2020:

1. Resistance to existing antimicrobial agents will more than likely increase, and new resistance mechanisms will emerge as a result of mutations and gene transfers;
2. Misuse of antimicrobial agents will continue due to insufficient awareness and lack of understanding of the need for a more prudent use of these medicines, and more generally about AMR;
3. Infection prevention and control, starting with standard precautions such as hand hygiene, will remain the most important measure by which to reduce HAI and the spread of multidrug-resistant bacteria.

It is likely that the period 2014–2020 will witness an increasing number of reports of extensively drug-resistant Gram-negative HAI (or colonised patients). The period is also likely to witness the first properly described cases of pandrug-resistant HAI (or colonised patients), i.e. the responsible bacteria will be resistant to all available antibiotics.

Similar to what has happened in other parts of the world, community-acquired infections due to multidrug-resistant bacteria (e.g. MRSA skin infections, ESBL-producing *E. coli* urinary tract infections) are likely to become more common in the EU.

In general, new clones of multidrug-resistant bacteria will necessarily emerge as a result of mutation, gene transfer and/or selection. Given the suitable environment (e.g. suboptimal infection prevention and control practices and/or poor antibiotic stewardship) such clones may spread widely across the EU.

Considering the current state of the antibiotic R&D pipeline and that at least 10 years are required for R&D and authorisation, it is unlikely that a new antibiotic with a novel mechanism of action will be available for patient treatment before 2020.

Despite recent efforts and successes at Member State level, at EU level and globally, there is still, in many Member States, poor awareness among the general public and healthcare professionals about the need for prudent use of antibiotics and for infection prevention and control measures.

Examples of best practice and success stories in preventing and controlling AMR and HAI are rarely shared between Member States. One reason is the language barrier and this will remain in 2014–2020.

Some diagnostic tools, in particular for the rapid, point-of-care tests for the diagnosis of infections, are already on the market and more such tests will continue to become available. The uptake of such tests, in particular because of their cost, is likely to remain limited and vary greatly between countries.

Antibiotics and other antimicrobials are used in all sectors of our society and all these sectors contribute to the rise and spread of AMR. Nevertheless, there are still gaps in our understanding of the role of the use of antimicrobials in animals and its impact on human health.

Similarly, the impact on human health of antibiotics and other antimicrobials in the environment is still poorly understood.

ECDC's focus

Improved quality and availability of surveillance data for AMR, antimicrobial consumption and HAI will enable meaningful comparisons between countries and across the ARHAI networks (EARS-Net, ESAC-Net and HAI-Net), with better use and integrated analysis of existing data. In particular, the burden and cost of HAI and AMR in the EU must be better assessed to guide political/regulatory action, e.g. to stimulate the development of antibiotics with a novel mechanism of action. ECDC should also develop a mechanism for better coordination on AMR issues across disease programmes, as well as provide guidance on electronic collection of HAI surveillance data. ECDC should lead the development of the structured integration of molecular typing and epidemiological data into surveillance of AMR, in particular to monitor the emergence and cross-border spread of MDR/XDR/PDR clones and genetic vectors that require public health interventions.

ECDC will provide a platform for exchange of experience and best practice on surveillance, prevention and control of AMR and HAI, and promotion of prudent use of antimicrobial agents. This will include work on a mechanism for engaging on AMR and HAI issues with hospitals and healthcare professionals, in particular through professional societies.

European Antibiotic Awareness Day (EAAD) will continue to be developed alongside its ECDC platform to raise awareness about prudent use of antibiotics among the general public and professionals. Campaigns on the prudent use of antibiotics present an opportunity for public health authorities and national health insurance funds to save money. The experience from Belgium and France shows that public campaigns result in cost savings from non-issued, and therefore non-reimbursed, antibiotic prescriptions.

In addition, ECDC will involve global partners to establish 18 November as a World Day to raise awareness on the prudent use of antibiotics. Further, it will contribute to international collaboration on surveillance, prevention and control of AMR and HAI, starting with the US–EU collaboration in the Transatlantic Task Force on Antimicrobial Resistance (TATFAR).

By 2020, ECDC will be:

1. The reference centre that Member States, EEA and neighbouring countries consult for surveillance data and scientific advice to prevent and control AMR and HAI.
2. The hub of harmonised and efficient European surveillance systems, including molecular surveillance, on AMR, antimicrobial consumption and HAI for the purpose of policy making.
3. A key contributor to the European 'One Health' approach to AMR prevention and control by providing technical support to increase synergies between the human and veterinary sectors (see 10.3: food- and waterborne diseases).
4. A key partner in international cooperation initiatives to prevent and control AMR and HAI, in which ECDC will effectively coordinate the EU/EEA side of public health activities on AMR and HAI, including antimicrobial consumption.
5. A leading institution in the EU to support Member States in the promotion of prevention and control measures, such as campaigns in hand hygiene and the European Antibiotic Awareness Day.

10.2 Emerging and vector borne diseases

Context and future outlook

Emerging and vector-borne diseases pose a special challenge to ECDC and national public health authorities due to the biological complexity of the transmission system. In recent years, several vector-borne disease outbreaks have occurred in Europe (dengue outbreak in Madeira, large outbreak of West Nile fever, chikungunya in Italy, malaria in Greece) and an increased establishment and spread of invasive mosquitoes has been observed. It is to be expected that there will be an increasing trend for novel and unusual outbreaks of vector-borne disease with progressive endemicity in some areas (see 5.3).

From a public health point of view several types of vector-borne disease situations can be identified, and each one presents a different threat. Most vector-borne diseases have their own complex epidemiological features, like seasonality and periods of pathogen persistence without detection of the disease (asymptomatic human infections, presence of reservoir hosts, persistence in vectors and their progeny) and can quickly (re-)emerge or be (re-)introduced under the right conditions. Furthermore, truly new diseases might also appear.

Efforts to monitor and control these usually uncommon diseases are hampered by often limited regional capacity for detection (laboratory capacity to detect a wide range of pathogens, surveillance efforts in place, questionable efficiency of vector control, etc.).

ECDC's focus

To understand and assess the risks linked to the different emerging and vector-borne disease situations in Member States, not only disease data are needed, but also data on pathogen presence (in human or reservoir hosts) and on the occurrence of vectors. Therefore, the following changes in the field of work of the EVD programme are needed in the future:

- Integrate a worldwide perspective regarding surveillance of emerging and vector-borne diseases in humans.
- Integrate more precise (timely, geo-referenced, harmonised) data on a wide range of variables that would include the environment, vectors, reservoir hosts, and animal diseases (for anthro-zoonoses) (see 9.1).
- Develop improved assessment tools like risk mapping, risk forecasting and orientation of control strategies, through better epidemiological, spatial and time-series modelling approaches (see 9.1).
- Follow-up with projects that have an impact on ecological and environmental changes (i.e. landscape modification, agricultural change, animal population change, genetically modified organisms), for their potential effect on vector and disease distribution.

Given the fact that emerging and vector-borne diseases are usually uncommon, ECDC's day-to-day contribution is to share knowledge among Member States through real-time mapping of cases during transmission seasons, giving national health authorities (e.g. blood transfusion authorities) timely information for decision making (see 9.1).

In the event of an emerging situation, ECDC can coordinate and support response efforts with daily threat assessment and consultation of specialised pan-European laboratory networks (see 9.3, 9.7). Communication and data sharing can be encouraged between countries and multidisciplinary teams of experts via a secure web-based platform for exchanging information (see 9.1).

ECDC could, furthermore, provide and promote coordinated training opportunities for medical entomology and specialised microbiology that will contribute to building capacity in the Member States (see 9.6, 9.7).

Other activities would focus on longer term surveillance, providing Member States with analysis of disease trends, on pathogen presence (in human or reservoir hosts) and the occurrence of vectors on a European scale. Further research activities on components of vector-borne diseases will aim to provide Member States with guidance for preparedness, prevention and response (see 9.2, 9.3). Appropriately disseminating tools and information developed by ECDC to the right people will be an important part of the strategy (see 9.7).

By 2020, ECDC will have:

1. Contributed to general preparedness, included training, for emerging and vector-borne diseases by providing relevant and timely surveillance information on vectors, reservoirs, animal and human disease.
2. Produced scenarios for Member States based on risk maps and models, and provided guidance and access to expertise and training.
3. Provided technical support to assess the effects of social and environmental changes (including climate change) on vector-related threats.

10.3 Food- and waterborne diseases

Context and future outlook

The food- and waterborne diseases and Legionnaires' disease are prone to outbreaks and clustering of cases due to contaminated food, water, environment, or infected animals and humans. This epidemiological characteristic, along with their potentially large economic impact makes the detection and investigation of outbreaks particularly important. It requires multidisciplinary collaboration and regular communication between food safety, veterinary, environmental and public health authorities to implement timely control and prevention measures. In addition to investing in detection and investigation of outbreaks, a robust enhanced long-term surveillance, integrating laboratory, clinical and epidemiological data, is essential to monitor trends, assess the public impact of prevention and control measures in the food and environmental sector, and to identify disease-specific epidemiological characteristics in the EU-wide human population. The linkage of surveillance of human disease with the monitoring of prevalence in food and animals is essential to produce appropriate public health risk assessments, both on an ad hoc basis and for a longer-term perspective.

ECDC's focus

As a result of earlier investments, more dispersed multi-country outbreaks will be detected. The strategic focus should move towards improved epidemiological investigations of cross-border outbreaks and promoted analysis and use of collected surveillance data.

ECDC should coordinate the development of rapid detection and investigation of food- and waterborne outbreaks through integrated databases for human, food, feed, animal and environmental data (linkage of strains through molecular typing data). It is foreseen that molecular typing data from different sources would be collected into two separate databases (public health data at ECDC and food/veterinary data at EFSA) but cluster analyses with anonymised data should be performed in a common database.

The strategic focus should move from consolidation of surveillance to analyses and use of collected data in epidemiological disease-specific overviews, including food, animal and environmental data. Routine surveillance should be gradually improved to ensure monitoring of appropriate well defined surveillance indicators, comparing the trends in humans with those in food/animals, and to assess the long-term public health impact of prevention and control programmes in food/animal and public health sectors. For Legionnaires' disease the daily surveillance of travel-associated cases identifies clusters at an early stage and control measures are put rapidly in place to prevent further cases.

The large STEC outbreak in 2011 highlights the need to consider broadening the scope of surveillance to cover all forms of pathogenic *E. coli*. By 2020, a need for syndromic surveillance for severe enteric infections (hospitalised cases) should be assessed, including all forms of *E. coli* and STEC-related haemolytic uraemic syndrome.

The main risk factors for vCJD have changed from infected bovine materials to healthcare-associated risks, particularly risks related to blood and organ transfers (SoHo), thus categorising this as iatrogenic CJD. The prion diseases may play an increasing role in HAIs (see 10.1) and assessment of the need for surveillance of all forms of CJD would become necessary. A lift of the ban on using animal protein in feed requires careful monitoring of occurrence of vCJD cases. Furthermore, a hypothesis of iatrogenic transmission of other neurodegenerative diseases (e.g. Parkinson's disease, Alzheimer's disease, Gerstman–Sträussler–Scheinker syndrome), particularly through neurosurgery, has been raised.

Monitoring of antimicrobial resistance (AMR) in *Salmonella*, *Campylobacter*, and *E. coli* isolates, particularly spread of extended-spectrum beta-lactamase (ESBL)- and carbapenemase-producing strains and responsible genes (see 10.1) requires well defined reporting of high quality data that will enable comparison with AMR data from food and animals. The quantitative reporting of antimicrobial susceptibility testing data from public health reference laboratories using standard methods is foreseen to be implemented and strengthened.

Multidisciplinary studies, particularly through linking human data collection with EFSA's EU-wide baseline surveys in the food and animal sector, would enable pooling together human data with EFSA's food/animal data as well as with Eurostat's geographical and other statistical data so that public health risk assessments and broader scientific epidemiological overviews could be produced. This should serve as a basis for assessing the needs for different types of public health guidance.

A need to perform serological population-based surveys on prevalence of selected diseases should be assessed, e.g. for toxoplasmosis, hepatitis A and hepatitis E. Further, multinational epidemiological studies on risk factors should be coordinated and promoted, e.g. for *Campylobacter* and STEC. Virulence factors of *Listeria monocytogenes* strains in human infections are not well known and would benefit from further studies.

By 2020, ECDC will have:

1. Facilitated collaboration at all levels between the public health and veterinary sectors as well as between epidemiologists and microbiologists so that we have fast, reactive public health and food safety/veterinary networks of experts who cooperate on detection, investigation and prevention of multi-country food/animal-borne outbreaks.
2. Produced epidemiological tools addressing diseases combining human, food, feed and animal data from partner European agencies within the 'One Health' approach.
3. Produced and published scientific overviews and systematic outbreak investigation reports within the spirit of 'One Health'.
4. Developed a protocol for multi-country outbreak investigations, including partner agencies and the veterinary sector, starting with *Salmonella* and – resources permitting – broadening to *Listeria* and *E. coli* as a part of the 'One Health' approach
5. Developed routine surveillance based on up-to-date real time molecular typing information from laboratories, leading to the early detection of multi country outbreaks.

10.4 HIV, sexually transmitted infections and viral hepatitis

Context and future outlook

In general, blood-borne infections remain an area for concern and attention at the epidemiological level for diseases caused by substances of human origin (SoHo) is needed, which should also be reflected in ongoing epidemic intelligence and response functions (see 9.2).

At the global level, in 2011 the UN General Assembly adopted the *Political Declaration on HIV and AIDS: Intensifying Our Efforts to Eliminate HIV and AIDS*. On the European level two important strategies guide the HIV/AIDS response. The first relates to national commitments made in the 2004 *Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia*. The second is contained in the *EU Commission Communication and Action Plan on HIV/AIDS in the European Union and Neighbouring Countries 2009–2013*. Both strategies may be updated or extended and this will guide ECDC work in the years to come.

The number of countries with a high burden of HIV/AIDS and viral hepatitis that face challenges in diagnosing and treating patients is likely to increase. A number of countries have implemented national control programmes for HIV/AIDS, viral hepatitis and, to a lesser extent, sexually transmitted infections (STIs). However, available national resources are likely to decline due to the current economic situation.

Technical improvements in reporting systems (see 9.1) will allow the production of more timely surveillance reports. However, standard surveillance data have many limitations for diseases with a chronic and often asymptomatic nature so modelling studies will be required in order to obtain better prevalence estimates.

For HIV, STI and hepatitis B and C there is evidence that a substantial proportion of patients remains undiagnosed. Tests for recent HIV infection are increasingly being used by countries as a part of routine surveillance; collecting data on this, as well as AMR monitoring, can be considered at European level. Rapid testing with non-invasive and reliable methods may become more widely available for HIV and hepatitis B and C. Rapid testing for syphilis is currently being evaluated and this new technique would be very much needed to simplify syphilis diagnostics in the future.

Monitoring the quality of care and treatment through collection of data complementing routine surveillance would help future developments in the national healthcare systems regarding financing, human resources and organisation of service delivery. Hepatitis B is a preventable, as well as treatable, disease and continued vaccination may result in a well-protected population and result in fewer new infections. Hepatitis C is a curable disease but the wide availability of treatment is challenged by the current high costs of drugs. Optimal STI control requires preferred oral treatment with antibiotics for chlamydia and gonorrhoea and injectable treatment for syphilis and also includes partner notification (testing and treating). As treatment options for gonorrhoea become limited, antibiotics need to be prescribed with vigilance, especially when co-infections with chlamydia are being treated. Re-infection and co-infection with HIV will become an increasing problem as the number of people living with HIV continues to increase.

Globally there is a threat that gonorrhoea will become an untreatable disease due to the emergence of multidrug-resistant strains (see 10.1 ARHAI). The implementation of response plans requires close monitoring of the infected population as well as the actions taken nationally and internationally. It seems realistic to expect that there will be gonorrhoea cases with resistance to all drugs before 2020. ECDC, supported by international union against STI, continues to facilitate a monitoring system for treatment failure.

It is expected that several new tools (drugs and diagnostics) for HIV and hepatitis C will become available. Vaccines for HIV and HCV (or STIs) are not expected in the near future and are unlikely to be available before 2020. Several rapid diagnostics are currently under development and it is expected that some will become available before 2020. Rapid diagnostic tests that facilitate early diagnosis will enhance the timely detection and treatment of patients. Advances in testing technologies are facilitating changes in biological sample-types, including the use of less invasive, smaller volume and easily transportable samples. Such technological advances can open up opportunities for more accurate testing, provision of rapid results, or non-invasive sampling.

Before 2020, several new drugs will be introduced for treatment of HIV and hepatitis C, and possibly hepatitis B, that will contribute to easier treatment with less side-effects and longer longevity with increased quality of life. 'Treatment as prevention' will become increasingly important in the coming years for both HIV and hepatitis C.

ECDC's focus

A strategy for HIV is in place, but gaps exist in relation to the development of strategies for the control of STIs as well as for hepatitis B and C in Europe. HIV, STI and hepatitis control activities included in the new EU-wide strategy need to be considered at national level where innovative approaches can be implemented and evaluated. Country experiences need to be actively shared and ECDC can strengthen these efforts by engaging with all EU/EEA countries.

By coordinating networks of disease experts, ECDC can:

- Improve country-level surveillance including estimations of the prevalence and burden of disease, and modelling of trends in relation to the implementation of disease control strategies;
- Improve laboratory services for STI control;
- Monitor the response to the HIV epidemic at national and EU level while supporting the implementation of the EU communication and action plan to fight against HIV/AIDS;
- Establish a framework for hepatitis B and C prevention and control as well as a comprehensive framework for STI control;
- Develop guidance for prevention, key interventions, and for the effectiveness of public health programmes including programme implementation;
- Provide a platform for the exchange of expertise across individual countries;
- Ensure that international developments are adapted and adopted at EU level and within countries.

By 2020, ECDC will have:

1. Provided guidelines for early detection by regular and early screening procedures for key populations to reduce the proportion of HIV infections that either have a (too) late diagnosis or even go unnoticed.
2. Guided and inspired national programmes through ECDC's evidence-based guidance and disease control frameworks, with a special focus on vulnerable populations to support the implementation of comprehensive approaches to HIV, hepatitis B/C and STI prevention and control in Member States.
3. Ensured that the 'EU-plus' countries are informed about relevant developments for HIV, STI and hepatitis B/C control by participation in the European disease networks. The networks will increase their impact by sharing and learning on best practices and experiences in surveillance, prevention and control from other countries.
4. Achieved that the European Commission has received adequate and timely scientific advice to guide them in their decision-making on strategies related to HIV, STI and hepatitis B and C prevention and control. Technical support will aim mainly at vulnerable groups. It will include programme science methods and tools for prioritisation based on cost-effectiveness of screening and include support for decision making on resource (re-)allocation in times of economic austerity.

10.5 Influenza and other respiratory viruses

Context and future outlook

Seasonal and pandemic influenza

Vaccines and vaccination strategies

Influenza immunisation recommendations for the EU will expand across Europe, in accordance with the EU Council Recommendation of 2009¹⁴. It is possible that the number of targeted risk groups will increase to include, for example, pregnant women and children.

There will be technical advances in seasonal and pandemic influenza vaccines with newer, more effective, vaccines being tailored to particular risk groups. These new influenza vaccines will be expensive and effectiveness will need to be closely monitored, including some comparative (head-to-head) effectiveness studies. This will, in turn, require development of better laboratory tests that correlate to protection (serology) and support observational studies (virus identification and typing).

The regulation of seasonal influenza vaccines will move from serological efficacy and simple safety testing (concerns limited to licensure) to an emphasis on post-marketing effectiveness and safety. Serological efficacy testing in isolation will be less used as a marker of immunity in vaccine studies. However, virological surveillance will remain important to detect strain changes in the absence of a universal vaccine. Attempts will be made to develop new surrogate markers of protection but it will remain essential to conduct standardised yearly field effectiveness studies in a few Member States, preferably funded centrally.

In addition, virological risk assessment will also play a significant role in the event of prioritisation and development of new pandemic vaccines, as will serology. Implicit will be a stronger emphasis on the 'One Health' approach, virological surveillance of animal influenzas and improved development of early diagnostics and seed vaccines against higher risk viruses.

Influenza vaccination will be delivered in a broader range of settings, not only involving family doctors but also pharmacists, supermarkets, etc. While facilitating access, this will make data gathering on vaccine coverage more of a challenge. Demand for vaccines will vary and will depend on things like pandemic threats and economic crisis. Consequently, stockpile-related issues could affect the vaccination policy and the strategy of companies. The EU will have to take this potential challenge into account in trying to establish joint procurement along the lines of what is done in other Regions; it is envisaged for a pandemic as this will reduce costs. Under its vaccine mandate ECDC will provide technical support to the Commission and Member States and liaise with the pharmaceutical industry.

¹⁴ Council Recommendation of 22 December 2009 on seasonal influenza vaccination (2009/1019/EU). Official Journal of the European Union. OJ L 348, 29.12.2009, p. 71.

Diagnosics for influenza disease, antiviral treatment and antiviral susceptibility

Use of antivirals will probably increase as the results of observational studies become better known. New antivirals against influenza will start to become available. Monitoring antiviral susceptibility will become even more important, and there will be an increased need for evidence on antiviral effectiveness and safety.

Molecular tests will increasingly be used for diagnosis. This will have an impact on the availability of viral isolates (which are based on cell culture and so expensive to obtain) for typing of circulating influenza strains – the basis for vaccine development and strain selection.

Pandemic preparedness

Work to improve pandemic plans, preparedness and practice will continue and build on the lessons learned from 2009 will be done, in the context of the initiative on serious cross-border threats to health (see 9.3).

Other respiratory viruses

It is likely that new respiratory viruses will continue to emerge. Disease caused by the respiratory syncytial virus (RSV) will receive more attention as it the most burdensome and is already monitored by laboratories in a few EU Member States with new vaccines being developed.

ECDC's focus

In the light of these developments ECDC's role would be to:

- Continue to lead and coordinate monitoring/assessing influenza vaccine coverage and vaccine effectiveness, make estimations comparable between Member States and between seasons; ensure vaccine studies and communication of results that are seen to be independent of industry influence; coordinate international collaborations in the field of vaccines; and based on this evidence, credibly promote vaccination.
- When needed, promote safety investigations in support of the regulatory process and public health policy.
- Through the existing EU Vaccine Task Force on Influenza, ensure close collaboration between ECDC, EMA and DG Research in the context of existing and new seasonal influenza vaccines.
- With the Member States and WHO, assess severity of, and coordinate the response to, major influenza epidemics/pandemics at the EU level.
- Strengthen health communication as part of a prevention strategy including vaccination (see 9.7). Strengthen the laboratory activities through external quality assessment and training and coordinate the early detection of viruses at the EU level and their molecular typing.

By 2020, ECDC will have:

1. With international partners established standardised agreed protocols and serological approaches for investigation of outbreaks of acute respiratory infections including SARS-like or other unknown pathogens, including pandemic influenza viruses.
2. In addition to existing surveillance through primary care and virologists, routine sentinel systems will be in place for detecting risk factors for severe influenza disease and deaths; the result of strategic partnerships with Member States and their hospitals and especially intensive care units for any severe respiratory infections.
3. As indicated in the EU Council Recommendation contributed to an increase of vaccination coverage and a reduction of the annual burden of influenza by a) supporting Member States to measure vaccination coverage in specific risk and healthcare worker groups and b) by supporting evidence-based guidance on ways of increasing vaccination coverage and the benefits thereof.
4. Subject to adequate funding, further established and supported routine, independent sentinel Member State systems that can routinely estimate vaccine effectiveness and highlight and investigate plausible safety signals.

10.6 Vaccine-preventable diseases

Context and future outlook

The European Region was declared polio-free in 2002. In the post-eradication phase one focus will be to minimise the risks of poliovirus re-introduction and monitor the potential emergence of circulating vaccine-derived poliovirus.

By 2015 endemic measles and rubella transmission in the European Region should also have been stopped. Further, by 2020 all EU Member States should have fully implemented the process for verification of measles and rubella elimination and should strongly support the global effort for measles and rubella eradication. However, accumulation over time of non-immune people and social and geographical clustering of under-vaccinated people will continue to be of particular concern for measles and rubella control in the EU.

A shift in the burden of traditionally childhood diseases towards older age groups has been observed and new vaccines are being licensed and indicated for adults. Adult vaccination, immune-senescence and vaccine immunology will constitute central topics of interest also recognising the ageing demographic and the EU commitment to healthy ageing. At the same time, more diseases will become preventable as new vaccines are developed. Hence, a life-long vaccination schedule in the EU will become the norm.

However, the continued increase of population mobility within the European Union poses a considerable challenge to national immunisation programmes, because the number of doses, timing and vaccine combinations are different across the EU. Moreover, an increase of population mobility beyond the European Union should raise attention on the immunisation status of migrants (inclusion issue).

The current economic situation in the EU (see 5.3) may have a severe and long-term impact on immunisation programmes. Cost-effective ways of providing access to vaccination will have to be explored. Likewise, the cost-effectiveness of introducing new vaccines to the routine immunisation schedules will become a critical factor requiring health economic and modelling input.

Anti-vaccine feelings, scepticism and hesitancy among the general population may well become more widespread and the public health sector may not be equipped to cope with the resulting vaccine refusal.

ECDC's focus

Monitoring the impact and evaluation of vaccination programmes is fundamental to the definition of public health strategies, and conducting such assessments on very large populations going beyond national borders yields much more reliable data that can be used by all Member States.

Monitoring and evaluation should cover not only the burden of the disease but also AMR, post-marketing effectiveness surveillance, specific characteristics of the diseases such as serotype/serogroup replacement, emergence of particularly virulent strains and expression of different antigens than those contained in the vaccines. Vaccine effectiveness monitoring and efficient assessment of safety signals will be paramount for newly introduced vaccine products.

Providing transparent results from vaccine safety monitoring at the EU level will be essential to engage in an informed debate on vaccination. ECDC will continue piloting comprehensive measures effective to increase vaccination coverage and will support culturally adapted interventions in the area of health promotion/behaviour change (see 9.7).

ECDC will continue working on harmonisation of data reporting methods, consensus protocols such as has been done on flu vaccine effectiveness and assessments of new technologies for diagnosis and molecular surveillance. It will also continue training, mapping and building laboratory capacities in the countries.

Innovative ways to collect information on vaccine-preventable diseases (VPDs) that are not covered by routine surveillance should be developed, like sentinel-based surveillance (e.g. networks of paediatric services) and active surveillance or syndromic surveillance. Use of geographic information systems and new software applications for the analysis of the surveillance data should be explored.

ECDC will establish one network that will gather all functions needed to support immunisation programmes at EU level. It will be able to respond to needs as and when they arise (e.g. safety signals, changes in epidemiology, new or escaped strains, etc.) and will include laboratory experts. It will also draw on specialists involved in monitoring and evaluation modelling, health economics and behaviour change.

ECDC will provide guidance in order to highlight research gaps in the area of vaccinology. In particular, in the coming years, research in the field of adjuvants will be needed, together with the development of improved vaccines against the 'classic' VPDs and new delivery methods for both adult and childhood vaccination should be explored. ECDC will provide the evidence to support policy decisions in the area of vaccinology and work to promote specific training in this field.

ECDC will facilitate the work of healthcare providers to ensure continuity in childhood vaccination schedules for those families moving across the EU. In this context, a common schedule could have a significant positive impact on the vaccination systems¹⁵.

By 2020, ECDC will have:

1. Monitored vaccination programmes, with particular reference to vaccine coverage, effectiveness and impact at the EU level.
2. Contributed to the 2015 measles and rubella elimination targets providing technical support to increase vaccine coverage, to identify underserved groups, also using new technologies for monitoring vaccine coverage and outbreaks. These efforts will continue if the original targets have not been reached, including the sustained communication activities.
3. Provided scientific advice regarding new vaccines and developed generic models to estimate health economic consequences, in order to overcome inequality issues.
4. Helped Member States to increase vaccination coverage up to recommended levels by providing technical support on a) communication best practice b) evidence on best practice in vaccination c) policy options d) detection of pockets of low coverage and e) arising scientific issues that may impact on vaccination schedules (such as waning immunity).
5. Facilitated the proposal of a life-long vaccination calendar at the EU level by providing evidence for comparative cost-effectiveness and elements for national decision making.

10.7 Tuberculosis

Context and future outlook

The ECDC policy for collaboration with 'third' countries is very likely to increase the number of countries included in the TB network and potentially requesting support from ECDC.

Many 'third' countries and some EU countries have a high burden of (drug-resistant) TB and are facing challenges in diagnosing and treating all TB cases. On the other hand, several EU Member States have embarked, or will embark, on eliminating TB from their country. This difference in epidemiology and programmatic focus necessitates a different approach for the two groups of countries.

EU-plus countries¹⁶ with a low burden of TB often report a large number of TB cases in individuals of foreign origin. To a large extent, the trends in TB incidence in these countries will depend on migration trends (see 5.3). If migration from TB high-burden countries increases up to 2020, currently available strategies for reducing TB in migrants, such as screening, would need to be re-assessed and adapted. Even with decreasing migration, rates of TB can remain high in settled migrant groups.

TB is a disease of the socio-economically disadvantaged. In EU-plus countries, TB patients often belong to risk groups such as the homeless, prisoners and alcoholics. Diagnosing and treating patients from risk groups requires extensive human and financial resources and innovative strategies such as targeted active case finding.

The World Health Organization (WHO) and the Stop TB Partnership will define post-2015 targets for TB prevention and care and develop a new global strategy. The new targets and strategy are applicable to EU-plus countries. ECDC will need to assist EU-plus countries to implement this strategy.

These developments imply the following for the Framework Action Plan:

TB control commitment, TB awareness and capacity of health systems:

ECDC together with WHO Euro will play a role in advocating for political commitment to high-quality TB control and for sufficient resources.

Surveillance:

ECDC jointly with WHO Euro will support countries to improve and standardise data collection to ensure availability of high-quality data of all diagnosed TB patients.

¹⁵ See also 'Six Months in the Service of a Stronger Europe: Overview of the Hungarian

Presidency of the Council of the European Union' page 85, referring to the Council Conclusion on Childhood Immunisation. Available from: http://www.eu2011.hu/files/bveu/documents/HUPRES_EREDMENYEK_EN.pdf

¹⁶ 'EU-plus countries' include, for the purpose of this document, EU Member States, candidate, potential candidate, and European Neighbourhood Policy countries, as appropriate.

Laboratory services:

In TB low-burden countries, the number of persons that need to be evaluated for TB is decreasing. This poses the challenge of keeping up a network of high-quality laboratories and might require centralisation of laboratory services. In TB high-burden countries, high-quality TB diagnosis and drug sensitivity testing is not yet available for all. In addition, new diagnostic tests will become available that need to be strategically introduced in laboratory networks. ECDC will therefore continue to support the national reference laboratories in improving the national laboratory networks and ensuring quality diagnosis for all. To monitor (cross-border) transmission, molecular typing for all TB cases will be established.

Prompt and quality TB care

Optimal TB prevention and control requires that all individuals with TB infection or disease are identified, diagnosed and treated promptly. This requires a well-functioning and accessible healthcare system which may be jeopardised by economic conditions (see 5.3). In addition, some EU-plus countries with a low burden of TB will encounter challenges in timely identification of TB due to clinicians' and laboratories' lack of experience. ECDC will assist countries in developing strategies to maintain an accessible health system and to maintain knowledge of TB in low-burden countries.

Multidrug-resistant (MDR) and extensively drug-resistant (XDR) TB

In EU/EEA Member States, the trend in MDR TB seems to be stable whereas in candidate, potential candidate and neighbouring countries, the limited data suggest that MDR TB is increasing. TB resistant to all currently available drugs is likely to emerge before 2020. The TB programme will keep MDR TB as a priority and continue the collaboration with WHO Euro in implementing the Consolidated Action Plan to Prevent and Combat M/XDR TB. For TB cases resistant to all currently available drugs, palliative care and prevention of further transmission needs to be organised.

TB–HIV co-infection

Few countries report data on TB–HIV co-infection to ECDC. Therefore, the extent of TB–HIV co-infection epidemic is not known. ECDC will support countries in collecting and analysing these data and in collaborating with HIV services to effectively identify and address the problem.

New tools for TB control

It is expected that several new tools (drugs, diagnostics and approaches) for TB will become available. A new TB vaccine will not be available before 2020. Whether new diagnostic tests for TB infection and disease will be useful in the EU context depends on their test characteristics. Together with the established European Reference Laboratory Network for TB, ECDC will assess the usefulness of new tests in the EU context and assist countries with their introduction by providing guidance and scientific advice.

We anticipate that several new drugs will be introduced for treatment of TB and MDR TB. ECDC will assist countries, through scientific advice and guidance, with the introduction of new drugs in TB treatment regimens. Regulatory and procedural advice on marketing authorisations will need to come from the Medicines Agency and Member States.

EU-plus countries with a low burden of TB will be able to move to strategies for controlling latent TB infection within their resident populations. ECDC will support countries through guidance on such new approaches.

Build partnership and collaboration with countries

Since public health is a shared competence in the EU, collaboration with partners such as WHO, other EU Agencies, non-governmental organisations, civil society and countries will remain important.

ECDC's focus

The focus for the coming years should be on coordinating a network of EU-plus countries to improve TB control in the EU together with WHO Regional Office for Europe as ECDC is uniquely positioned for this. To focus TB control at the EU level the Framework Action Plan to Fight Tuberculosis in the European Union will be updated. Activities performed by the network and facilitated by ECDC include: Improve TB surveillance at national and European level; Improve laboratory services for management of TB; Detect, monitor and control international TB outbreaks through molecular surveillance; Support national TB control efforts, especially in high-burden countries; Organise and coordinate guidance development; Coordinate exchange of expertise between countries; Adapt international developments to the EU level and facilitate adoption in countries.

By 2020, ECDC will have:

1. Provided the EU-plus countries with guidance documents and support to manage TB according to the latest available evidence. This will include guidance on the introduction of new drugs/drug regimens and diagnostics.
2. Facilitated an integrated strong pro-active tuberculosis disease network covering surveillance, laboratory, and prevention and care. The network focuses on exchange of best practices, unique expertise and training needs.
3. Updated the Tuberculosis Framework Action plan and facilitated the implementation of the updated action plan.

11. Ensuring independence

ECDC's advice and guidance will only be acted on by EU Institutions, Member States and citizens if they regard ECDC as credible and reliable. For this to happen, they need to perceive ECDC as an independent centre of excellence that acts in the public interest.

This is explicitly recognised in ECDC's Founding Regulation. It contains numerous references to the need for ECDC to produce scientific advice that is both independent and rigorous and includes requirements for ECDC's Director, its Management Board, Advisory Forum and members of ad hoc scientific panels established by ECDC to make declarations of interest. ECDC's success in ensuring its independence and excellence was recognised by the European Parliament in its March 2011 resolution on the EU-level management of the 2009 influenza A(H1N1) pandemic, which called for ECDC's role in future public health emergencies to be further strengthened.

Nonetheless, ECDC must continue to strive to maintain its good reputation. We know from the experience of other scientific bodies, including other EU agencies, that just one incident of perceived impropriety can cause huge reputational damage. Opinion as to what constitutes good practice in avoiding, and managing, potential conflicts of interest continues to evolve in the EU. In December 2012, following several months of consultation and discussion, ECDC's Management Board agreed¹⁷ a new policy on independence that aligns the Centre with the very best practice within the EU family. In particular, the new policy:

- Extends the requirement to make an annual declaration of interest to all ECDC staff (the Director, Management Board members, Advisory Forum members and members of scientific panels have always been required to make such declarations by ECDC)
- Provides that declarations have to be scrutinised by a Compliance Officer of ECDC
- Makes provision for potential conflicts to be referred to a Declaration of Interest Review Committee.

The ECDC independence policy is in place and being implemented since January 2013. During 2013 and 2014 the focus of implementation will be on ensuring the policies and processes within ECDC are adapted to the independence policy. In particular, conducting the first all-staff annual declaration of interest exercises in 2013 and 2014 will involve development of new processes and imply significant work for staff across ECDC.

In 2014–2015 ECDC will focus on automating the workflows for making declarations of interest. This will facilitate the processes of verifying, checking and – if needed – further investigating declarations. It will also facilitate the access to declarations by interested parties within and outside ECDC, while respecting relevant EU data protection legislation.

There will be annual reports from the Compliance Officer to the Director on the operation of the independence policy. These will include proposals for adapting, or further refining the system.

¹⁷ The MB agreed the policy subject to any comments that the Commission's DG HR might have concerning the compatibility of the independence policy with the EU's Staff Regulation.

Throughout the period, the Compliance Officer will stand ready to initiate proactive investigation should any information come to his attention about potential breaches of trust by external experts, staff members or members of ECDC Governing Bodies.

From 2015 onward, once the independence system is operating smoothly and is supported by ICT tools, the focus of the Compliance Officer will shift from implementation and refinement of the system to an even more proactive role in the auditing and investigation of compliance.

In applying the independence policy, the Compliance Officer will have regard to all the key principles of ECDC's Founding Regulation, including the need for close cooperation with the Commission, Member States and WHO, and the need for ECDC to produce timely advice. Independence will be assured, in a way that is workable and appropriate to the realities of ECDC and its partners in the prevention and control of communicable diseases. ECDC will measure the progress on the implementation of the independence policy as the proportion of approved annual and specific declarations of interest for delegates to Governing Bodies, ad hoc scientific panels, invited experts and ECDC staff members before participation to the specified activities as defined in the policy.

Deliverables:

1. Annual declaration exercises for Governing Bodies, staff and members of scientific panels and annual report to the Director (2013 onwards)
2. Easy-to-search database of declarations of interest available to appropriate interested parties (2015 onwards)
3. Mid-term review and cost–benefit analysis of independence policy (2016).

Objective	Indicator	Target	Verification
Implementation of the independence policy of the agency	Proportion of approved annual and specific declarations of interest for delegates to Governing Bodies, ad hoc scientific panels, invited experts and ECDC staff members before participation to the specified activities as defined in the policy.	100 %	Data from the compliance officer

12. Resource management and organisational development

12.1 General

The main goal is to manage the resources (financial and human) for the whole organisation in an efficient and effective way in order to enable the Centre to carry out its mission. In the coming years even higher emphasis has to be placed on the efficiency and effectiveness of the organisational setup given the decreasing availability of resources. Due to the nature of the field of activity, some of the long-term strategic goals remain relatively constant, e.g. to ensure the reliability of the accounts and the legality and regularity of the underlying transactions. However, an emphasis will be laid on developing smoothly working systems and aligned internal processes. We aim to follow the progress on our main goals in generic terms as described in the table. The main objective is to ensure the full implementation of the SMAP by 2020 through the implementation of the annual work programmes and to ensure the best use of financial resources, timely correlated to the implementation of activities of the work programme.

Progress on specific deliverables which are described for organisational development and efficiency will be followed in the annual work plans and are therefore not specified under the general objectives and indicators.

Objective	Indicator	Target	Verification
Implementation of the <i>annual</i> work programmes, aligned with the SMAP in order to ensure the full implementation of the SMAP by 2020	Proportion of activities implementation of the Annual Work programme	90%	Verified by Internal Audit Services
Ensured best use of financial resources, timely correlated to the implementation of activities of the work programme.	Percentage of budget committed (C1) and percentage of payments executed (C1) in the same year as the commitment Percentage of invoices paid within the time limits of the ECDC Financial Regulation	100% committed 80% paid 80%	Verified by Internal Audit Services

Resource Management in the agencies is bound by EU rules and regulations with only a small margin to adapt to the local conditions (Implementing Rules). In the coming years it can be expected that the current tendency to standardise and harmonise certain processes between agencies will increase. This includes changes in the legislation, e.g. Financial Regulation, Staff Regulation, but also a closer scrutiny from the Budgetary Authority and the Court of Auditors. As a result of the Inter-Institutional Working group a roadmap was developed which ECDC strives to implement in good time and effectively.

It means essentially that resource management needs to be a cost-conscious, efficient operation using modern, user-friendly IT solutions. All areas of resource management (finance, procurement, human resources, facility management and legal) have to be scrutinised for potential efficiency gains. Processes have to be assessed in terms of their necessity and effectiveness.

Deliverables by 2020:

1. Being in the upper quartile of the benchmark for EU Agencies.
2. All areas of resource management in ECDC are cost-conscious, efficient operations using modern IT solutions.
3. Administrative processes are transparent, known throughout the Centre and running in a synchronised way aligned with key operational processes.
4. All areas of resource management are working paperless as much as possible.
5. Clear descriptions of roles facilitate synergy and avoid duplication of work.

12.2 Human resources

In order to be able to achieve organisational objectives with reduced financial and human resources ECDC requires an increasing number of staff to have broad skills and the flexibility to employ those skills on a wide range of tasks. The organisation therefore needs to focus on staff development and the provision of learning opportunities. The use of less costly development practices such as coaching by line managers, in-house development programmes, internal knowledge-sharing events and e-learning will optimise use of the financial resources. To guarantee high-level organisational performance it is essential that the staff have a good performance environment. This includes a healthy workplace with well-developed staff performance processes in which the organisational and the individual staff member's objectives are aligned. To retain competent staff and to attract the best candidates, the organisation needs to provide high quality HR services including excellent recruitment and smooth administrative processes as well as relocation and 'living in Sweden' support.

Budgetary cuts and reducing posts as well as the reduction of services and entitlements of staff may have an adverse effect on employee satisfaction. This would require more HR support to staff and managers as well as interventions of organisational development nature in order to manage change while maintaining leadership, trust and engagement in the organisation. By developing the competence of the organisation's managers, the Centre will enhance staff satisfaction and motivation. An increased attention to aspects of employee wellbeing will be also of key importance to maintain motivated and well-performing workforce.

Deliverables, by 2020:

1. The staff performance process has been further developed and is the main driver for organisational performance.
2. The Centre supports the staff development that ensures operational flexibility and sustainable good performance.
3. The Centre is well developed as regards to being a healthy workplace where staff welfare is of key importance for maintaining a motivated workforce.
4. The administrative processes implementing the Staff Regulations and Implementing Rules are efficient and simplified while still ensuring compliance with external procedural requirements.
5. Issues of relocation, integration and living in Sweden for staff and their families are well catered for by providing practical support and guidance.

12.3 Finance and accounting

Due to the nature of the field of activity, the long-term strategic goals of the area remain constant i.e. to ensure the reliability of the accounts and the legality and regularity of the underlying transactions. On a yearly basis there is an evaluation by the European Commission and Court of Auditors.

Deliverables by 2020:

1. The new Financial Regulation is fully implemented.
2. A modern assets management system is established and integrated into ABAC.
3. A fully accepted and implemented electronic financial workflow is in use, in accordance with the Financial Regulation and the Court of Auditors.
4. High quality of *ex ante* verification ensures that all transactions are in accordance with the provisions of the Financial Regulation.

12.4 Legal

Fewer opportunities in the market both for employment and provision of services and products mean a higher likelihood of legal challenges to procurement and grant awards and non-renewal of commercial and employment contracts. The need to strategically address these challenges in a proactive and informed manner and to negotiate effectively to try to effect dispute resolution at an early stage is essential. However, it is envisioned that there will be a proportional increase in cases where this is not possible, resulting in legal action.

Revision of the Staff Regulations and Financial Regulations will require ECDC policies and internal rules and procedures to be aligned in an effective manner, acceptable to the institutions.

Finally, there is a need to safeguard and reinforce the independence of the Data Protection Officer (DPO).

Deliverables by 2020:

1. Working in an independent manner there is an ongoing and proactive approach to ensuring that all proposed and ongoing operations are in compliance with the legal framework.
2. Expert advice is provided on proposed strategic decisions and all reasonable measures are taken to safeguard the ethics and integrity of the Centre.
3. The commitment to ensuring a fully functioning and independent DPO function is consistently met. Staff members are clear on obligations and rights in the area of personal data protection as a direct result of the support made available by the DPO.

12.5 Procurement

An effective system for monitoring upcoming, ongoing and past procedures will be essential as the Centre matures, together with a well-organised archiving system for paper documents. A comprehensive contract database and archive is vital to respond efficiently to both internal and external control exercises. Procurement procedures need to be transparent, effective and seamless.

The general trend started from the Commission to apply through the Agencies and the Public governmental Bodies is the EU Green Public Procurement Policy. The aim is to use environmental criteria in procurement procedures and subsequent contracts which can lead to innovations in the products and services offered by suppliers.

Deliverables by 2020:

1. Procurement and contracting at ECDC is of a consistently high and legally compliant standard. Sufficient support staff to manage these procedures and processes is in place.
2. Clear guides on 'how to' in all fields related to procurement and contracts will be accessible to staff online and regular training will be provided.
3. E-procurement is fully in place.
4. By applying the EU Green Public Procurement Policy environmental criteria are used as much as possible in procurement procedures and subsequent contracts.

12.6 Internal control coordination

Good internal control contributes to ensuring an efficient and effective management of ECDC, thereby saving time and money, and ensures that ECDC maintains a good reputation among its stakeholders.

The main objective is to make sure a high quality internal control system is in place and is functioning as intended. Increased attention will be given to testing the quality of the internal control system in place by performing assessments, *ex post* controls and compliance reviews.

Deliverables by 2020:

1. Annual assessments of the Internal Control Standards are performed, showing that they are fully implemented, complied with and work effectively.
2. Assessments of Internal Procedures/Policies are performed, showing that they are in place, being used and complied with.
3. The Director's Declaration of Assurance, and the underlying building blocks, confirms that the quality of internal control in ECDC is high.
4. High quality *ex post* verifications are performed, in accordance with annual plans.
5. Audit observations are followed up regularly and implemented in due time.
6. High quality advice is given on the design of control systems, as well as useful training on the Internal Control Standards and other related internal control subjects.

12.7 Performance management

Performance management is a key element in the activity-based management of EU Agencies, with a focus on results and measurements. The planning process in place is aligned with established practices across EU Agencies and ensures that the overall ECDC strategy is implemented in a coherent and efficient way across the Centre. It focuses on the delivery of timely and measurable high quality products and services, through efficient project management, seamless internal processes supported by a solid culture of quality management, regular feedback through internal and external evaluations, and state-of-the-art business intelligence capacities.

Deliverables by 2020:

1. Based on standardised EU Agencies' practices, the annual planning cycle supports the identification of resources needed and the monitoring of their use, with a multiannual perspective.
2. The Management Information System supports the planning cycle and business intelligence capacities allow in-depth analysis of data for increased transparency, better understanding and timely insight into the use of our resources, including a fully developed activity-based budget.
3. A mature project management culture ensures the smooth implementation of the plan and an efficient use of resources (budget, staff and time). In addition, the quality management system ensures that seamless business processes contribute to the efficiency of ECDC in delivering consistently high quality outputs.
4. Regular feedback from external evaluations of the agency as well as internal evaluations will be used to drive continual improvements in the organisation.
5. Cascading all levels of work will ensure that individual staff objectives and assessment are fully integrated with the implementation of the ECDC work programme, the organisational objectives and ECDC missions.
6. Ensure the efficiency of our processes and the quality of our outputs through a quality management policy further evolving towards robust tools and widely recognised methodologies. If needed, certification processes could be envisaged in some sensitive areas, to ensure their robustness.

12.8 Security and facility management

The aim is to ensure a functional, safe and comfortable workplace for all those working for, and visiting, ECDC, in an environmentally friendly and cost-effective way.

Currently, ECDC is located in four buildings which are too small to house the present staff. The Centre's lease agreement runs until 31 January 2018. Whether to renew the current contract or to move into new premises will be a major decision to be made at the beginning of the next multi-annual period. Current premises will be evaluated while an implementation of immediate action plan is essential in order to improve the health, safety and security of ECDC staff and visitors.

Deliverables by 2020:

1. ECDC is located in premises which ensure the health, safety and security of ECDC staff and visitors and efficiency of work.
2. A security policy is approved and enforced.

12.9 Missions and meetings

The responsibilities encompass venue, hotel and supplier contract negotiation, invitee management, ongoing management of all suppliers, detailed project management and reporting.

1. An electronic (paperless) mission order workflow is implemented to guarantee compliance with regulations, reduce the processing time spent in paper management.
2. A quality process is in place to monitor and control the planning activities for the meeting and event organisation.

12.10 Internal communication and knowledge services

There are a number of initiatives within the Commission and other agencies that concern the future of sharing, storing and retrieving information that are also relevant for ECDC. New and interactive tools (social media: blogs, podcasts, internal social networks, etc.) and personalised information will be offered progressively in internal communication and the intranet.

Concerning library services, open access and curation of information via depositories, there are a number of upcoming issues that ECDC will follow closely, e.g. European and global initiatives on linking data, using EU-standardised, reusable semantic assets. The internal communication and knowledge service functions should support ECDC's administrative operations by contributing to transparency and efficiency through strong involvement of all parties concerned. The improved understanding of common work and values will be part of striving towards a good reputation for ECDC.

The internal communications team will collaborate with ECDC senior and middle managers, human resources, the staff committee and other groups in order to enhance staff engagement and motivation, contribute to their well-being and a good working environment. In addition, internal communication complements external communication ensuring information sharing throughout the overall organisation. All staff should be able to communicate the organisation's key priorities and vision and have a positive attitude towards the Centre; this will contribute to building a strong organisational culture and have a positive impact on ECDC's reputation. Positive staff attitude and reputation should mutually reinforce each other. For this purpose it is important to establish channels for rapid, consistent information and knowledge-sharing and retrieval.

Deliverables, by 2020:

1. The library services, open access and curation of information via depositories assess new initiatives for their usability at ECDC, as, for example, the relevant European and global initiatives on linking data, using EU-standardised, reusable semantic assets.
2. Internal communication provides assistance, tools and methods to radiate consistent, quality-controlled and up-to-date information through a variety of channels. Thereby they contribute to transparency and consistency within the organisation.
3. Knowledge services support the provision of e-health approaches and provide reusable content structures for numerous ECDC activities and systems and actively support their interoperability and thus foster synergy.
4. The development of integrated filing and archiving systems ensures transparency and active management of documentation and data retained.

13. Information and Communication Technologies

The main goal of Information and Communication Technologies (ICT) is to deliver ICT studies, tools, applications and infrastructures to ECDC’s operational and administrative stakeholders to support their missions, taking into account the Centre’s current priorities and potential urgencies in case of public health event. These services are efficiently managed regarding existing standards and applicable policies in the specific fields of governance, architecture, project management, development, maintenance, hosting, support to end-users and security. Moreover, *ex ante* value-for-money analysis will receive more specific attention.

In order to achieve these goals in a context of constant evolution of technologies, of business and user expectations, specific efforts need to be invested in proper governance of existing and newly acquired ICT assets:

- Ensuring the existence of an upgradable and sustainable architectural framework, aligned with EU policies and standards regarding ICT and public health specificities, which would permit the query of data and the interoperability, scalability, maintainability of the systems at most effective costs.
- Implementing sound managed decision making processes for the production, development or acquisition, maintenance and closure of all ICT products. As such, the ICT general governance will be reviewed, permitting the definition and sharing of roles and responsibilities, the evaluation and prioritisation or re-prioritisation of necessary investments, the follow-up of results and the implementation of continuous improvement processes.

Regarding infrastructure, the Centre’s capacity to ensure business continuity must be further developed according to needs and the ‘single sign on’ functionalities enforced to facilitate the use of ICT.

A technical watch capacity must be created, to ensure the Centre’s alignment with the evolution of new technologies, new generations of devices and new ways for end-users to use the applications, tools and devices.

Deliverables by 2020:

1. Agency-level ICT general governance implemented.
2. All new ICT investment is estimated regarding ECDC best value for money.
3. Architecture board implemented, aligned with The Open Group Architecture Framework (TOGAF) standards, or equivalent, and public-health-related applicable policies; Technology watch function ensured.
4. Developments aligned with Capability Maturity Model Integration (CMMI) principles.
5. ICT infrastructures and applications are hosted securely; ICT business continuity ensured on critical scope.

While all the deliverables described above are needed to reach and maintain a mature level of ICT services and organisation, the end objective is to ensure the agencies operations by maintaining constant availability of IT services elements to ensure a smooth running of the Centre’s activities (dedicated applications, databases, web portal). We will use the performance indicators in the table and adapt them if needed and based on future exercises on efficiency.

Objective	Indicator	Target	Verification
Ensured agencies operations by maintaining constant availability of IT services elements to ensure a smooth running of the Centre’s activities (dedicated applications, databases, web portal)	Performance of ICT services in regards to: - availability of enterprise infrastructure services and backend systems, - availability of hosted applications under service level agreement (SLA), - proportion of ICT Front-Office incidents resolved as per SLA. [- Efficiency indicator to be defined later based on future exercises]	99% each, 100% each 90%	

14. Resources

As regards ECDC's financial resources, the content and scope of ECDC's Strategic Framework for the next seven years has been adjusted to the realities of the expected financial resources for the Centre. The projections presented in the following table are based on the premise that the Centre's mandate will continue to be limited only to communicable diseases.

In its Communication (2013)519 final (10.7.2013) the Commission proposed the following budget and adaptation to the original establishment plan for ECDC¹⁸:

	2014	2015	2016	2017	2018	2019	2020
Budget (in million EUR)	56,766	56,766	56,766	56,766	56,766	57,901	59,059
Temporary agents (original establishment plan 200 temporary agents)	194	190	186	182	180	180	180

The current plan is based on these provisional figures and although this requires rearrangements over various activities, ECDC would be capable of performing its main tasks as laid down in the Founding Regulation. Further changes in budget and personnel would require reprioritisation to be discussed with the Management Board.

15. Monitoring and indicators

The set of indicators presented here aim to show the status of what ECDC wants to achieve by 2020. ECDC aims to contribute to reduce the burden of communicable diseases, and acknowledges the great contribution by the member states in executing its specific tasks. The indicators reflect the progress on those efforts that ECDC can control.

The set of indicators developed for the SMAP have been streamlined with the annual work programme, in order to have only one set of indicators. This is necessary as from 2016, following the new EU Financial Framework Regulation, both multi-annual and annual work programmes should be integrated in a single programming document, which should be revised yearly. The targets of the indicators have been adapted to the work programme 2014 and changed accordingly where they differ from the targets set for 2020. The indicators of the work programme will continue to be reported annually to the Management Board, as part of the annual report, and also with a more long term perspective showing how the SMAP is implemented during the next seven years. The way of measuring the indicators are explicitly explained with the indicators. Among the tools to be used, an annual stakeholder survey should provide feedback to ECDC on the level of satisfaction of its stakeholders (in particular, the Member States, Commission and Parliament).

ECDC will regularly review the results of its operations using the set of indicators. This will be used as a guidance to make the necessary adjustments, with a view to improve performance. To increase our performance management, the indicators will in particular feed into the existing quality management system and the internal evaluation process to be launched in 2014, and contribute to the internal evaluation of ECDC's activities and outputs or the improvement/reengineering of the Centre's internal work processes. The results will also contribute to the discussions of the Quality Management Steering Committee and the Senior Management Team in order to improve the efficacy of the Centre (this is already done e.g. monthly review by the SMT of the ECDC's internal management's dashboard, or ad-hoc as a result of Member States' surveys). When presented annually to the Management Board, an action plan will be attached to address and improve areas where performance is not considered satisfactory.

In addition, as part of the annual review of the SMAP in the new single programming document, the ECDC business processes will be reviewed to ensure their appropriateness. If necessary, adaptations will be performed as relevant to the indicators, while keeping overall a sufficient level of stability, to ensure comparability of the measurements over the 7-year period.

¹⁸ This proposal needs to be approved by the European Parliament and the Council.

	Strategies / Activity areas	Objective	Indicator	Target	Verification
1	Collaboration and cooperation	Achievement of timely and sustainable support to the Commission and relevant countries in the implementation of EU enlargement and ENP policies Established and functioning working relations with relevant international partners.	Completion of an agreed list of joint activities established between ECDC and its international partners	-90 % activities referred in SMAP successfully finalised by 2020 -Degree of completion of the list	- Review of the list of activities with enlargement/ENP countries and international partners
2		Achievement of a high level of effective communication and coordination between ECDC and its Competent Bodies	Satisfaction of the Coordinating Competent Bodies on the communication with ECDC	80 % satisfied with communication and coordination	Measure to be integrated into the annual stakeholder survey
3	Surveillance	Support to the Commission and the Member States in the implementation of the epidemiological surveillance of communicable diseases and special health issues according to Article 6.5 of Decision 1082/2013/EU	Proportion of diseases and special health issues for which surveillance standards have been developed and agreed with the National Surveillance partners	All diseases and special health issues under surveillance reviewed by 2020	Steps to verify 100% achievement are: - Yearly list of diseases for which the standards have been agreed - Yearly report from TESSy on the number of diseases following these standards
4		High level of user friendliness and quality of uploading surveillance data.	Level of positive feedback from the Member States using machine to machine to upload TESSy data	-100 % response to all requests -80% users satisfied -'Dashboard' on quality indicators available to MS by 201619	- Measure to be integrated into the annual stakeholder survey
5		Interactive outputs available for all diseases under surveillance	Proportion of diseases under surveillance for which online interactive outputs are available	100 % by 2020 (all diseases) All tools available by 2016 80% satisfaction with functionality	Outputs used measured by web statistics Measured in annual stakeholder survey
6		Substantially increased power of surveillance by implementing molecular characterisation for selected diseases	-Proportion of evaluated business cases for selected pathogens. -Proportion of pathogens with molecular surveillance modules in TESSy	All selected business cases evaluated by 2020. 60% coverage of pathogens included in the strategy.	Results of the pilot phase are verified by the Advisory Forum opinion Note: the decision process might lead to a review of targets in 2017
7	Epidemic intelligence and response	Provision of relevant, timely and quality rapid risk assessment to support the risk management carried out by the Member States and the Commission	- Number of timely rapid risk assessments - Proportion of rapid risk assessment assessed positively by Member States through the annual stakeholder survey	- 80% of rapid risk assessments produced within 48 hours of initial decision - 100% within 4 weeks - 80 % yearly satisfaction of respondents	Quality: annual stakeholder survey Timeliness: RRA statistics

¹⁹ An interactive online dashboard links the different data exploration options or user-customised online queries providing an intuitive and integrated epidemiological overview by disease and common relevant indicators. See for one of the many examples: <http://www.cdc.gov/flu/fluview/reports/report1213/trends/index.htm>

	Strategies / Activity areas	Objective	Indicator	Target	Verification
8	Preparedness	Support to the Commission and the Member States in the implementation of the preparedness Article 4 of Decision 1082/2013/EU as endorsed by the Health Security Committee, in particular in improving the interoperability and consistency of national preparedness planning, intersectoral coordination and business continuity planning.	- Proportion of planned ECDC activities (guidelines, seminars, workshops, exercises) undertaken to reach the objective -Proportion of ECDC products endorsed by the Health Security Committee	90% by 2020 50% by 2020	ECDC assessment reports of preparedness at national level for communicable diseases upon request of the HSC Verified by HSC meeting minutes
9	Scientific advice	High level of support of the Commission and Member States by producing quality scientific publications in the area of the priorities and mandate of the Centre	Quality of ECDC scientific publications in peer-reviewed journals remains high i.e.: - Average journal Impact Factor - Average number of citations of each article	IF > 4.0 > 15	Quality and citations base on the following databases: Scopus, PubMed and Embase
10		High level of timely and adequate response to requests for scientific opinions by providing authoritative and reliable evidence-based scientific opinions and guidance to Member States, Commission and Parliament	- Proportion of prioritised scientific topics executed. - Proportion of requested items for scientific advice (ad hoc and planned) timely delivered - Use of evidence-based opinions and guidance produced by ECDC	80 % of prioritised actions integrated in annual work programme 80 % >80 % of opinions and guidance by 2020	- Source: comparison between IRIS (tool for scoring scientific priorities by the Advisory Forum) and the approved Work Programme - Source SARMs (internal database on external scientific advice requests) - Source: annual stakeholder survey
11	Public health training	With special emphasis on the core capacities referred to in Article 4 of Decision 1082/2013/EU, a strengthened workforce in the Member States through adequate and relevant training.	Reaction: Participant satisfaction with ECDC training activities. Learning: Achievement of agreed learning objectives in relation to core capacities in ECDC fellowship programmes (EPIET/EUPHEM). Behaviour: Number of scientific articles of public health relevance by EPIET/EUPHEM fellowship during and 2 years after graduation	> 80 % satisfaction > on average 80 % achievement by all fellows > 50% increase compared to the 2-year period before entering the programme	Course evaluations. Incremental progress reports (IPR), Competencies Development Monitoring Tool (CDMT), mid-term and final reviews with fellows and supervisors. Bibliometrics (PubMed, Scopus)
12	Microbiology support	Implementation of the ECDC microbiology strategy to ensure sufficient microbiology capacity within the EU, to detect and manage infectious threats.	Proportion of Member States having microbiological core capabilities and capacity, as defined by the ECDC Microbiology Strategy	- Annual monitoring of three components i.e. primary diagnostics national microbiology reference laboratory services and laboratory-based surveillance and epidemic response support. -Administer the indicators to maintain and/or improve the EU microbiology capabilities in public health -Assess the agreed EQA performance levels.	Verification by technical audits of Member States and other components. [NB. The midterm evaluation may result in the formulation of specific targets and options for action.]

	Strategies / Activity areas	Objective	Indicator	Target	Verification
13	Health communication	Publication of topical online information within ECDC's remit through the web portal and social media channels	Usage of the ECDC web portal and social media channels	+200% web visitors and social media followers by 2020 (2014 year of reference) - Certification by an external party (HON)	Web and social metrics used for verification Measure on quality will be in annual stakeholder survey Health on the Net (HON) http://www.hon.ch for reference
14		Support to Member States and Commission in regard to public health campaigns and provide training and tools for risk communication.	Activities and actions delivered according to approved planning	100% delivery within agreed timelines	Records on file of activities and actions
15		Provision of scientific input to crisis communication case of Communicable diseases events/emergencies coordinated by the Health Security Committee in liaison with the Commission according to articles 11 and 17 of Decision 1082/2013/EU	Proportion of LTTs, press material shared	100% input to all critical events	Quality and timeliness verified by feedback from Commission on HSC actions and decisions
16	Disease programmes	Strengthened Europe's defences against infectious diseases by dedicated programmes aiming at the best possible knowledge and implementation for prevention and control.	Number and type of tools, products and activities aimed at realising the SMAP deliverables.	90%	Measured and verified by Management Information System
17			Satisfaction by the member states on the value of the Disease Programme	>80% satisfaction by two-third of the respondents	As measured by the annual stakeholder survey
18			Added value of the disease programmes is periodically evaluated	Each programme is evaluated every 5 years and a follow-up plan is made and executed.	
19	Ensuring independence	Implementation of the independence policy of the agency	Proportion of approved annual and specific declarations of interest for delegates to Governing Bodies, ad hoc scientific panels, invited experts and ECDC staff members before participation to the specified activities as defined in the policy.	100 %	Data from the compliance officer
20	Resource management	Implementation of the annual work programmes, aligned with the SMAP in order to ensure the full implementation of the SMAP by 2020	Proportion of activities implementation of the Annual Work programme	90%	Verified by Internal Audit Services
21		Ensured best use of financial resources, timely correlated to the implementation of activities of the work programme.	Percentage of budget committed (C1) and percentage of payments executed (C1) in the same year as the commitment Percentage of invoices paid within the time limits of the ECDC Financial Regulation	100% committed 80% paid 80%	Verified by Internal Audit Services

	Strategies / Activity areas	Objective	Indicator	Target	Verification
22	ICT	Ensured agencies operations by maintaining constant availability of IT services elements to ensure a smooth running of the Centre's activities (dedicated applications, databases, web portal)	Performance of ICT services in regards to: - availability of enterprise infrastructure services and backend systems, - availability of hosted applications under service level agreement (SLA), - proportion of ICT Front-Office incidents resolved as per SLA. [- Efficiency indicator to be defined later based on future exercises]	99% each, 100% each 90%	