



CROSS BORDER HEALTH THREATS



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Executive summary

Disease does not respect national borders. Disease can spread from country to country in the time of an airplane journey. Within the EU, member states retain primary responsibility for healthcare, including responding to cross-border health threats such as the spread of disease. Given the freedom of movement within the EU, member states need to be well prepared to respond to these threats. However, the answer is not to close European borders, but rather to strengthen national healthcare systems, with proactive support from EU institutions, to prevent disease and protect European citizens.

The paper uses a framework of comparing novel and emerging threats through a case study of seasonal influenza, compared with a case study of tuberculosis, and its multi-drug resistant strain (MDR-TB), to assess long term endemic threats. From this framework, four key recommendations are made to European policy makers:

- 1. The EU should develop a public and defined framework for disease intervention in the event of a cross-border health threat emerging.*
- 2. The EU and its member states should develop a proactive vaccination plan, including monitoring coverage rates and supporting vaccination development, to prevent emerging threats such as seasonal influenza.*
- 3. The EU should strengthen political efforts to eradicate MDR-TB, with a focus on exacerbating factors such as social marginalisation, to deal with long term threats.*
- 4. The EU should enhance cooperation to deal with cross-border health threats, ensuring a level playing field between its member states to allow a proactive and preventative response.*

Cross-border health threats will always be a challenge in an EU with open borders. Disease does not stop at our national borders, so our health care systems in turn must be equally mobile, cross-national and proactive.

I. INTRODUCTION

Disease does not respect national borders. Neither should European healthcare.

Outbreaks no longer remain localized, so they are harder to contain. The WHO estimates more than two million people cross international borders each day. With these cross-border movements comes the spread of communicable diseases such as HIV-AIDS, malaria, tuberculosis, influenza, Q fever and Ebola. An infectious disease can spread as fast as an airplane can fly, depending on its incubation period.

Worldwide, infectious diseases are responsible for around 20% of all deaths (Saker et al., 2004). When they are not contained, diseases can have devastating impacts. Moreover, cross-border health threats are not solely linked to disease, but can also be created by environmental risks, bioterrorism, sanitation problems and more.

The situation in Europe

Freedom of movement in the EU has been a major achievement, but there are associated risks, not least the risk of health threats being easily transmitted across open borders. EU-wide coordination is necessary for an effective and sustainable solution. To date, health policy is managed at national level, with the EU in only an advisory role.

This paper will use the EU's own definition of a serious cross-border health threat, as a "life-threatening or otherwise serious hazard to health of biological, chemical, environmental or unknown origin" which risks spreading across the national borders of member states as defined in Decision 1082/2013/EU on serious cross-border threats to health. The focus of this paper is on EU-level action and responses, however it must be acknowledged that effective action at the international level is equally important.

When and how should the EU respond to cross-border health threats?

To make practical proposals to European healthcare policymakers and professionals, this paper will address the circumstances under which the EU should intervene in cross-border health threats. It will also outline the current gaps and inconsistencies with the current EU response to cross-border health threats.

For the purposes of this paper, we have divided infectious diseases into two broad categories where the response requires a similar, albeit not identical, framework:

- **Novel and emerging threats:** sudden and large scale threats, which require a single concentrated response such as influenza, Ebola, SARS or MERS.
- **Long term threats:** known or foreseeable threats that require a longer-term strategy, such as multi-drug resistant tuberculosis (MDR-TB), HIV, polio and STIs.

This paper will focus on influenza outbreaks as a novel and emerging threatcategory and MDR-TB as a long-term threat. The EU faces other significant public health challenges , but these examples permit a broad assessment of the framework.

Does the EU provide added value in preventing health threats?

The EU is ideally placed as a regional organization to protect EU citizens and member states from major public health threats, by acting to prevent health threats spreading and providing rapid responses when a threat emerges. Member states stand to benefit from increased international cooperation, starting at European level. Improved communication and coordination systems can support a faster and more effective response. In times of emergency, member states should respond in a mutually supportive way, rather than taking actions which could negatively impact each other.



Figure 1. Flight paths of Europe illustrating the constant movement of people across European borders. (Markieta, 2013)

II. SITUATION ANALYSIS

For every disease there is a unique response. However, to maximise existing funding, legislation and coordination mechanisms, we propose two broad categorisations of disease response. The first deals with novel and emerging threats and we illustrate this framework through a case study of influenza. But there are also long-term threats that can be foreseen, requiring a very different response, and to illustrate this we have focused on TB. Lessons learned from influenza and TB can be used for other diseases in our proposed framework.

The legal framework in a nutshell

The scope of EU action in health policy - as a shared competence - is set out in Article 168 of the Treaty on the Functioning of the European Union, . EU health policy complements and supports national policies on issues where coordination, cooperation and exchange of information, knowledge and best practice are essential.

EU legislation to control communicable diseases has been in place since 1998, replaced in 2013 by a new decision on serious cross-border threats to health (Decision 1082/2013/EU). Moreover, the existing framework on communicable diseases has been extended to cover coordination at EU level of preparedness and response planning¹.

- **EU alert systems:** if a member state detects a threat to citizens' health and safety, it notifies the European Commission through one of the EU's rapid alert systems. Furthermore, the Commission may recognise a public health "emergency situation" independently from the WHO to allow a quicker response.
- **EU Health Security Committee (HSC)** coordinates health security measures, and preparation and planning of the responses to an emergency (28 member states, Norway, Iceland and Switzerland, under the Commission's chairmanship).
- **European Centre for Disease and Control (ECDC)** is an EU agency designed to strengthen Europe's defences against infectious diseases, with a mission to identify, assess and communicate current and emerging threats to human health posed by infectious diseases.
- **EU-wide research networks**, funded by the European Commission, emphasise the role of research and development in the prevention of health threatCase study 1: Novel and emerging threats: Influenza

¹ Until 2013, member states were not legally bound to exchange information on their national preparedness plans. Sharing plans would avoid inconsistencies and help achieve a common and consistent vision.

Case study 1:

Novel and emerging threats: Influenza

A serious cross-border health threat that can be classified as a short-term, immediate threat is influenza, particularly an influenza pandemic. Influenza is an infectious disease caused by an ever-changing group of influenza viruses that spreads easily from person to person with an incubation period of only a few days. It is an airborne disease transmitted by coughing or sneezing as well as by contamination.

Seasonal influenza epidemics occur each winter; it is a common disease with up to 10% of adults worldwide becoming infected annually. The virus usually causes rapid-onset respiratory and systemic symptoms including fever and muscle pain. This tends to resolve within a week, but for high-risk groups (young children, those with chronic illnesses and the elderly), complications can lead to hospitalisation or death. The WHO estimates that seasonal influenza causes up to 500,000 deaths and 5 million cases of severe illness each year, with most influenza deaths in industrialised countries occurring in the over 65 year old population (World Health Organisation, 2014). There is significant annual variation but the ECDC estimates that influenza results in 38,500 excess deaths, many avoidable, each (non-pandemic) year in Europe (European Centre for Disease Prevention and Control, 2010).

The costs of an epidemic are not paid only in human terms; all influenza cases pose significant economic and social burdens to the EU through reduced workforce productivity and increased demands on health services. A seasonal influenza epidemic can in total cost developed countries €56.7 million per million people (Eliyahu & Meijer, 2009).

The ability to prevent death, serious illness and economic slowdown resulting from influenza makes this a vital issue for Europe to tackle. According to the WHO, influenza vaccination is the "most effective way to prevent the disease and/or severe outcomes" (World Health Organisation, 2014), particularly for those in high-risk groups. WHO recommends annual vaccination for:

- older adults (65+ years of age)
- pregnant women
- children (6 months to 5 years)
- individuals with chronic illnesses
- healthcare workers

Each year the major influenza viruses circulating in humans are slightly different as they accumulate small genetic changes in a process called antigenic drift. A new influenza vaccination must therefore be prepared annually, in light of the WHO Global Influenza Surveillance and Response System monitoring. WHO recommends vaccine compositions for the Northern and Southern hemisphere influenza seasons. It also works with countries' health systems to improve diagnostic capabilities, measure virus susceptibility to antivirals, and monitor outbreaks. Major epidemics and pandemics occur when the genetic change is significant and the population has little immunity to the new influenza strain. These antigenic shifts can also occur through interaction with animal viruses - which is thought to have happened in the 1918 influenza pandemic (Taubenberger, 2006).

The 1918 Spanish Flu pandemic had a devastating impact around the world, killing 3-6% of the population. (Taubenberger, et al., 2006). In this unprecedented pandemic, half a billion people were infected and it is estimated that 50 to 100 million people died. This unusually high mortality rate (up to 20%) compares to a 'normal' influenza case-fatality rate of 0.1%. (Patterson, & Pyle, 1991). As the emergence of a new pandemic strain is unpredictable, no one can tell when the next devastating pandemic will occur. Preparation is therefore essential.

In 2009, the Council of the European Union adopted the Council Recommendation on seasonal influenza vaccination, which called for "concerted action at the level of the European Union...to mitigate the impact of seasonal influenza by encouraging vaccination among risk groups and healthcare workers". Member states were encouraged to have their own plan and policies to improve vaccination coverage amongst their designated high-risk groups. The Recommendation aimed to ensure that 75% vaccination target for older age groups was met by the 2014-15 influenza season, and then to extend the same target to other risk groups. The ECDC considers it "unlikely that the target will be met in the 2014-15 influenza season" (European Centre for Disease Prevention and Control, 2015).

Influenza is not going away. It changes every year, but with a strategy focused on vaccination as a first priority, EU governments can be proactive in minimising deaths and economic damage.

Case study 2:

Long-term threats: MDR – TB

Tuberculosis (TB) is a bacterial disease that spreads from person to person through the air, often as a result of coughing or sneezing. It is one of the leading causes of death in the world, with 1.5 million dying in 2013. It is the second deadliest infectious disease (after HIV/AIDS), despite being both preventable and curable. In Europe alone, the disease infects 360,000 and kills 38,000 people each year (TB Europe Coalition, n.d.). As such, it constitutes a significant cross-border health threat for the European Union.

The growing prevalence of multidrug-resistant tuberculosis (MDR-TB) is a major concern. MDR-TB is a specific type of TB where the bacteria are resistant to the major first-line TB drugs. Drug resistance tends to result from antibiotic misuse, which can arise from inadequate or incorrect treatment, or from patients not completing the full treatment course. MDR-TB therefore occurs most often where strategies to effectively control TB have failed. It is therefore worrying that the WHO European region has some of the highest rates of MDR-TB in the world.

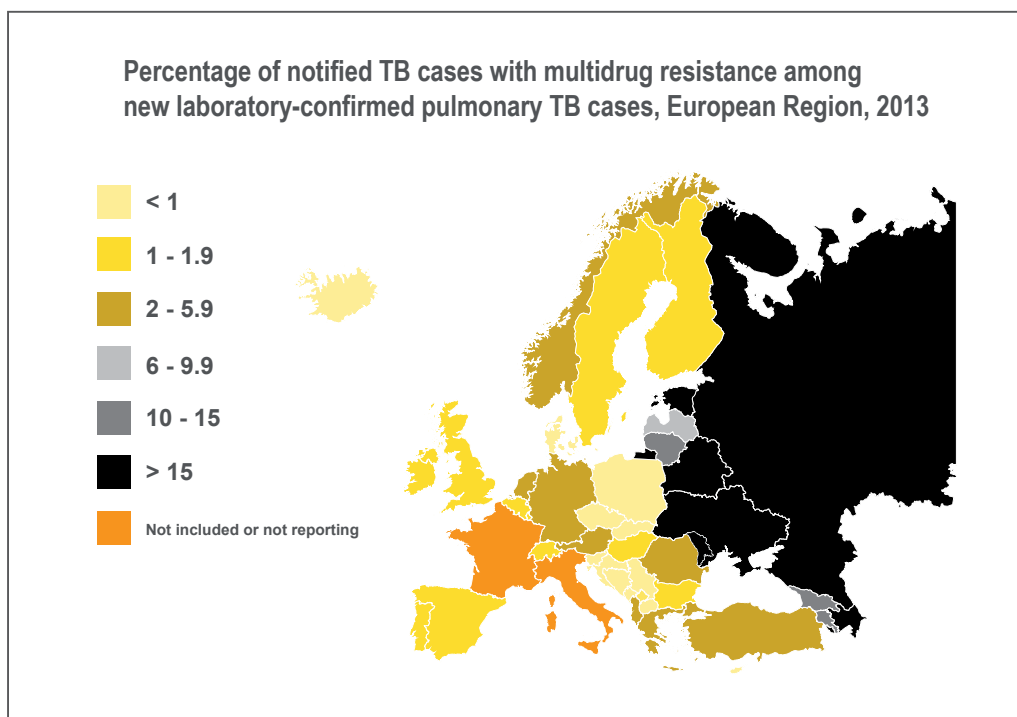


Figure 2. Percentage of MDR-TB amongst new TB cases in 2013. (European Centre for Disease Prevention and Control/WHO Regional Office for Europe, 2014)

As seen in Figure 2, four EU member states (Latvia, Estonia, Bulgaria and Lithuania) are in the 'red zone' of MDR-TB risk countries. A further 11 of the 27 countries with the highest MDR-TB burden worldwide are in the WHO European region, compounding the risk of MDR-TB further becoming a major cross-border health threat. Some member states are reporting that up to 35% of their new TB cases are drug-resistant with the associated difficulty and expense of treatment. (European Centre for Disease Prevention and Control/WHO Regional Office for Europe, 2014)

Europe has not yet effectively addressed the issue of MDR-TB. Over half of MDR-TB cases are not detected and fewer than 50% are cured (Boas, 2015). As a single TB patient can infect up to 15 other people in their community, drastic action is therefore required, including major political and financial commitments.

As in the rest of the world, there is a clear causal association between the disease of TB and poverty. Therefore the challenge of TB is not only to the medical community but also to social systems more broadly. TB is an opportunistic disease, and takes advantage of people whose immune systems are weakened from poor living conditions, malnutrition, drug or alcohol abuse or from diseases such as HIV - populations least able to self-refer and then to self-manage treatment. As a result, stigma surrounds TB diagnosis, so patients are further disadvantaged and discriminated against as well as discouraged from seeking treatment (Christodoulou, 2011). Because of the strong association with HIV infection, Eastern Europe, where HIV prevalence is five times higher than in Western Europe, is facing a disproportionate challenge .

One of the principal control strategies recommended by WHO, and at the centre of its STOP TB Strategy, is DOTS – that is Directly Observed Treatment, Short Course (World Health Organisation, n.d.) For DOTS to be effective, government commitment is required to support TB monitoring, recording and training, as well as standardised treatment observed by a healthcare worker, along with drug supplies and a standardized assessment of treatment efforts.

Cooperation on TB at the EU level started with the European Tuberculosis Surveillance Programme (EuroTB) in 1996. The European Tuberculosis Surveillance Network was set up as a continuation of EuroTB in January 2008. Jointly coordinated by the WHO Regional Office for Europe (WHO/Europe) and the European Centre for Disease Control (ECDC), the network of TB surveillance experts meets annually to discuss TB epidemiology in Europe and progress towards elimination.

WHO/Europe and ECDC publish joint annual surveillance reports on progress towards TB eradication. In 2008, the ECDC developed a Framework Action Plan to Fight TB in the EU, which provided analysis of the current issues, and identified capability gaps and recommendations for EU member states and EEA/EFTA countries, to be implemented at both national and EU level.

More recently, the Latvian Presidency of the European Council (January-June 2015) has identified TB prevention and control as a priority area of focus, leading to the first Ministerial Conference on TB and MDR-TB. In their Joint Declaration, EU leaders recognised that “TB and MDR-TB are also a cross-border health threat in the globalised world where overall the mobility of the population is increasing”. Conference participants agreed to implement the WHO End TB Strategy, seeking a 75% reduction in the number of deaths and a 50% reduction in the number of cases by 2025 (World Health Organisation, 2015).

However, implementation gaps continue across the EU. In most low-incidence countries, TB rates are stable or decreasing slowly, and incidences are concentrated amongst high-risk and vulnerable populations. On the other hand, countries with high overall TB incidence face much higher rates of re-infection and relapse, reporting many more cases of MDR-TB. There are also challenges with regard to equal access to social protection, health care, diagnostics, treatment and follow-up support.

As things stand, TB will be a problem for many years to come. However, building on the political will demonstrated by the Latvian presidency to make TB a priority healthcare issue, real action can have real impacts. A future-oriented policy to prevent the spread of TB both within and between EU member states is in the best interest of EU citizens and governments alike.

III. RECOMMENDATIONS

Disease is a fact of life. European freedom of movement is a fact of life. Therefore, we must accept the very real risk of novel and emerging health threats and longer-term infectious diseases spreading across EU borders if we do not take action. We therefore make four recommendations to avoid or mitigate the risks posed by cross-border health threats.

Recommendation 1:

The EU should develop a public and defined framework for disease intervention

The European Union is in a unique position to respond to cross-border health threats. But it must define a strategy under which this will happen, and make this publically available. This will create a predictable framework for intervention, with healthcare stakeholders well briefed on when to expect EU support. The EU does not have its own healthcare assets, infrastructure or staff to directly tackle an outbreak, and cannot therefore be a front-line responder in its own right.

The benefit of defined disease-measurement criteria would be to create a clear, consistent and predictable plan for EU intervention, rather than a rushed, ad-hoc intervention was was the case in the EU's response to Ebola. Although this is not an exhaustive proposal, we suggest that the European Commission develop a publicly available framework measuring the disease impacts in the table overleaf to assess when EU intervention is warranted.

If a disease was found to meet a certain degree of severity on the above criteria, it would then trigger a broad EU level response. The nature of the response would reflect whether the disease was a novel and emerging threat or a long-term challenge. Accordingly, the response would be different, to acknowledge the nature of the cross-border health threat. This could include further implementation of the facility for joint acquisition of treatment assets that was introduced after the H1N1 influenza pandemic. It could also include funding for treatment acquisition, joint actions to undertake prevention measures, or joint research efforts.

However, we would maintain the active and crucial role of national healthcare services as first-responders and initial coordinators of response. EU action in this respect would bolster, rather than replace, national health care systems.

Spread of infection	<ul style="list-style-type: none"> • Are at least three EU member states impacted? • What is the geographical spread of the disease (i.e. is the disease affecting neighbouring countries, or spreading ad-hoc)? • Is the disease widespread in densely populated urban communities? • Is the disease likely to impact agricultural production or enter food supplies? • Do EU borders need to be temporarily closed to prevent disease spread? • Do temporary quarantine restrictions need to be imposed to prevent spread of disease?
Treatment options and availability	<ul style="list-style-type: none"> • Do member states have stocks to treat the disease or do they need to be acquired? (e.g. Tamiflu stocks) • Can member states jointly procure medications and equipment and reduce costs? • Can solidarity measures be used to acquire medication for member states with no previous access to treatment?
Morbidity/ Incubation	<ul style="list-style-type: none"> • Does the disease have a high morbidity rate? • Does the disease have a quick or slow incubation period? Is it likely that carriers will transmit the disease without being aware of infection?
Known vs. Unknown Disease	<ul style="list-style-type: none"> • Is this disease a new one (e.g. SARS)? Or a new strain of an existing disease (e.g. annual influenza cycle) • Is joint EU research needed to find a solution to the disease? • What steps are needed to prevent the spread of a new disease?
Cost of treatment vs. non-treatment	<ul style="list-style-type: none"> • What is the cost per patient of EU-subsidised treatment? • What are the possible impacts on national health systems of treatment? • What is the impact of non-treatment – e.g. economic impact of workers taking time off, or more serious such as impairment or death?
Method of transmission	<ul style="list-style-type: none"> • Is the disease airborne, waterborne, spread by contact with infected bodily fluids or other? • Does the disease come from organic sources, or is there a possibility of a bio-terrorist origin?
Environmental and behavioural circumstances	<ul style="list-style-type: none"> • Do cultural aspects/beliefs have any impact on transmission? • Are there particular environmental challenges that could increase the rate of infection?

Recommendation 2:

Proactive plan for influenza prevention: Reduce the human and economic cost of influenza in Europe through an effective vaccination strategy and monitor vaccination coverage rates in all EU countries

Pandemic influenza is an excellent example of a short-term sudden health threat facing Europe that needs a pan-European response to effectively mitigate the impact. The cross-border threat from a new or potential influenza pandemic could be tackled using the framework proposed in Recommendation 1, bringing the EU's resources together to prevent a serious short-term threat if it meets appropriate criteria. Pandemic influenza would almost certainly meet the threshold for intervention and trigger a European reaction.

However, the EU must also combat the recurrent threat of seasonal influenza, which has an impact on the health of European citizens and businesses every year. At present, Europe has failed to achieve the 75% target of influenza vaccination coverage among high-risk groups. Just two countries, the UK and the Netherlands, have reached or almost reached this target for older age groups. Vaccination coverage among other risk groups is far from the 75% target, and in some countries little or no data at all is available. (European Centre for Disease Prevention and Control, 2015).

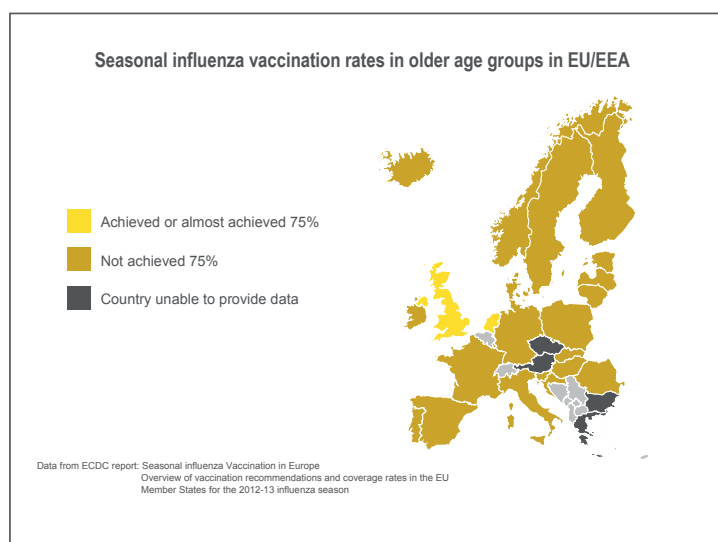


Figure 3. Seasonal influenza vaccination rates in older age groups. (Data from European Centre for Disease Prevention and Control, 2015)

If all European countries could reach the target of 75%, 9,000 to 14,000 deaths from influenza would be prevented, a significant and quantifiable impact ("The State of Health of Vaccination in the EU," 2014). Few member states have demonstrated an active commitment to vaccinating either their high-risk groups or the general population. Therefore, the risk of seasonal influenza presenting a major cross border health risk to the EU remains significant if the status quo continues. How to increase influenza vaccination coverage?

HOW TO INCREASE INFLUENZA VACCINATION COVERAGE?

Recommended Action Points for Member States:

- Influenza vaccination must become a priority in all member states. Vaccination is recognized by the ECDC as “most effective public health intervention to mitigate and prevent seasonal influenza” (European Centre for Disease Prevention and Control, 2015).
- Member states should achieve the 75% target for influenza vaccination amongst the older adult high-risk group by 2020 with agreed intermediate annual targets. Member states should produce action plans with concrete and measurable steps to reach these targets. Targets for other risk groups should also be developed and plans implemented.
- Member states should be obliged to measure and report influenza vaccination rates to the ECDC, including a breakdown of vaccination rates among high-risk groups. If the vaccination rates drop below agreed benchmarks for progress towards the 75% target, the ECDC will make recommendations and/or provide assistance on how to raise rates quickly.
- Member states should be encouraged to reduce financial hurdles to vaccination for those in risk groups. They should have a system in place so that access to yearly vaccination of all patients in risk groups is guaranteed, e.g. having free sample of the vaccine available. Those in risk groups are likely to have a lower income. The ECDC reports that in a third of member states, the cost of influenza vaccination is paid by the patient. For example, older adults were not reimbursed for vaccination costs in 10 member states and needed to pay an additional out of pocket payment in another 11 countries (European Centre for Disease Prevention and Control, 2015).

Recommended Action Points for the EU:

- The EU will coordinate a biannual meeting of government, industry and civil society stakeholders to exchange best practices on increasing vaccination uptake both in the general population and in high-risk groups. The forum could also be used for exchanges on influenza management more broadly, including treatment options and reducing impacts on economic output.
- Member states should harmonize the definition of high-risk categories of individuals who require influenza vaccination. At present, there are different recommendations among member states as to who is high-risk. Pregnancy is considered a risk in all but 3 countries. Furthermore, the qualifying chronic diseases vary across member states as do age cut-offs and whether household contacts of those at risk should be vaccinated. In order to present a coordinated European vaccination strategy, public health authorities should assess the evidence for each group’s risk status and the feasibility of standardizing the high-risk groups across the EU.
- The EU will implement a joint procurement plan produced ahead of the influenza season. The joint procurement plan will build on existing legislation on medical procurement. It will particularly focus on plugging capability and equipment gaps in member states, ensuring sufficient stocks of both vaccination and treatment medication. If required, the EU could consider special funding to ensure a level playing field among member states.
- The EU should support research and development into future influenza vaccines. Public health authorities have a far stronger case to promote wide vaccination with a more effective vaccine. This should become one of the research priorities for both industry and the European Commission.

When an effective vaccination strategy is in place to combat the recurrent threat of seasonal influenza at the member states and EU level, this strategy can be easily adapted in the case of a potential influenza pandemic.

More broadly, strong vaccination plans and procurement efforts are effective ways to tackle novel and emerging threats before they take hold and cross borders. The EU therefore must prioritize vaccination at all levels including research, production, procurement, and monitoring.

Recommendation 3:

Strengthen political efforts on TB eradication, with a focus on social marginalisation

In addition to its debilitating effects on patients, tuberculosis (TB) has a significant impact on the economy as the majority of sufferers are of working age (15 to 54 years old). The TB Europe Coalition estimates that TB, including MDR-TB, costs Europe €6 billion every year (Boas, 2015). TB treatment is expensive, and MDR-TB treatment even more so. Costs vary throughout Europe from €3,500 to €50,000 depending on the member state where the patient is treated and the strain of TB they have. Costs drastically increase for MDR-TB, which is why eradicating this should be a priority.

Without targeted action to tackle TB and to ensure that incidence of the MDR strain does not increase because of inadequate treatment patterns, the risk of TB becoming a major European cross-border threat increases.

In light of WHO calls for further analysis of the human factors behind the spread of MDR-TB, the EU should support major research efforts to identify and address why patients fail to follow a sufficient and correct treatment course for TB. In the short term, providing training and financial assistance to ensure treatment in the presence of a medical professional, i.e. DOTS, rather than self-managed treatment, could have immediate benefits including reducing MDR-TB developing in TB patients. However, both front-line medical workers and policy makers must be sensitive to the patient's needs, acknowledging that TB often strikes already vulnerable populations.

The EU must ensure a level playing field for treatment both of TB and of MDR-TB. Notably, support to member state health systems most under strain from the disease should be prioritised. The EU could consider the use of structural funds to ensure treatment in rural areas in particular, where treatment facilities are limited, hard to reach, or too expensive to access.

Access to treatment is linked also to the identification of TB patients at an early stage in their disease. Accordingly, member states must further develop concrete action plans to effectively respond to TB outbreaks and make efficient use of resources to prevent TB from spreading in the first place. Member state public authorities should be encouraged to make full use of support by the EU and other partners, and immediately flag to the EU any risk of a major cross-border spread of TB.

Poverty is both a cause of TB and a consequence. TB and MDR-TB cannot ever be eradicated without addressing the root socio-economic factors behind this link. It is beyond the scope of this paper to suggest fundamental changes to society. Policy makers must appreciate this in developing solutions. However, as an immediate intervention, we suggest the promotion of a 'one-stop shop' for TB patients where they can access not only supervised treatment, but also advice and practical help in housing, jobs, accessing the social security system and so on.

HOW TO REDUCE TB INCIDENCE IN EUROPE?

Recommended Action Points for Member States:

- Member states must commit to national action plans, based on the WHO DOTS Framework, to ensure the reduction and adequate treatment of standard TB. Those action plans should also target the eradication of MDR-TB as an urgent political and social priority.
- Member states which require support to provide equipment and training necessary for efficient diagnosis and care should request support from the EU and other partners such as the WHO.
- Member states must immediately notify the EU through the ECDC should a risk of TB spreading across borders become apparent.
- Member states should work together to exchange best practices and develop strategies so that professionals - healthcare workers, social workers, civil society representatives and educators in contact with high risk populations - are provided with the tools and information to identify potential TB and refer to health services for follow up, as well as providing support for patients to complete TB treatment.

Recommended action points for the EU:

- The EU must demonstrate firm political commitment, backed by significant funding, to work towards the eradication of MDR-TB in Europe. The aim should be to lift all EU member states and neighbouring European countries out of the WHO 'red zone' for MDR-TB rates in the coming years. This will ensure that MDR-TB does not spread further in Europe.
- The EU will develop a proposal for "one-stop shop" TB treatment facilities that provide not only supervised medical care but also access to social support, in an attempt to reduce the marginalisation of vulnerable groups.
- The EU will develop awareness campaigns for those on the front line of treatment and for the broader community, to explain symptoms and the importance of timely and complete treatment. Wider campaigns should attempt to reduce the current stigma associated with TB and highlight the highly curable nature of standard TB with the right treatment.
- The EU should investigate options for the prevention of TB through tackling poverty and other social determinants and what support can be provided to member states with long-term funding support.

Novel and emerging threats can have devastating and immediate consequences on the EU's health systems, but long-term threats such as TB can also have negative impacts. Without adequate political will, diseases such as TB can become drastically more threatening, developing into untreatable forms of MDR-TB. If these long-term threats are not given adequate attention, they can grow and spread across borders. Dedicating more resources, more research money and more attention from the European health community to TB is critical.

Recommendation 4:

Enhance EU cooperation on cross-border health threats and level the playing field between Member States

The considerable variations and the extreme diversity in the structure and performance of surveillance systems for communicable disease prevention and control between EU member states constitute a serious obstacle to EU-wide, effective response. Several reasons underlie these inequalities: a lack of trust, different infrastructure, insufficient capabilities, and a lack of treatment and products in emergency situations.

A number of diseases remain under-diagnosed and under-reported, complicating efforts to understand their occurrence and burden or to develop appropriate public health interventions. Some diseases are not under surveillance or are not routinely reported at EU level. For other diseases, reporting according to the agreed EU case definitions remains a significant challenge for some member states. Event surveillance at national and European level is critical for rapid detection and control. Variable capacities could be problematic if a state with weak public health capacity harbours infectious diseases that can spread.

Moreover, national economic difficulties and limited budgets in can mean cuts in public health spending and in research and development for new medicines and vaccines. It is increasingly difficult to provide resources for communicable disease control. This could harm existing communicable disease prevention and control activities, and widen the gap between the EU and member states.

This is why all member states should have effective systems in place to deal with serious cross-border outbreaks, along with the means to cooperate at EU-level. It is necessary to take care of the weakest parts of the chain, to contribute to a solid EU system of surveillance and prevention.

Therefore, effective interoperability of national healthcare systems is crucial. National and international preparedness plans and capacities should be constantly updated and functional. Sharing resources would allow member states to make more specific choices, tailored to the national situation, making the whole framework more effective. Our core proposals to improve interoperability are:

- Make broader use of joint procurement drawing upon the previous examples.
 - In 2006:** proposed joint procurement for Tamiflu was rejected.
 - In 2009:** some member states joined a joint procurement initiative to tackle the H1N1 pandemic
 - In 2014:** the Joint Procurement Agreement set out the modalities under which EU countries can jointly acquire pandemic vaccines and other medical countermeasures.
- Develop an open coordination instrument on European Public Health (with member states required to make a commitment to spend a certain percentage of their GDP on public health and prevention of cross-border health threats)
- Give the ECDC more means to ensure the reliability of collected data. If a country has an extremely weak surveillance system for some diseases, the ECDC should intervene to support the country.

Note should be taken of Decision 1082/2013/EU on cross-border health threats, which provides guidance on improving preparedness and strengthening capacities to respond to health emergencies. Engaging end-users and stakeholders on the specifics of the Decision is an important first step. Also useful would be the development of a network of public-health risk assessors to respond to emerging cross-border incidents. The decision also allows the EU to trigger its pharmaceutical legislation to accelerate the provision of vaccines and medicines in the event of a public health emergency, including pandemics.

Measures taken at national level must not counteract and reduce the effectiveness of measures taken in another EU member state or at EU level to prevent the further spread of infectious diseases. National preparedness plans and capacities must therefore be up-to-date and complementary.

To tackle cross-border health threats, member states need to develop and strengthen the capacities to respond to any health event, including coordination, command and control mechanisms, as well as communication between sectors and with national and local levels. This should also be coordinated, together with other member states, and should take into account what action the EU is taking to complement member state action. The use of shared resources would allow member states to make more specific choices, tailored to the national situation, making the whole framework more effective.

IV. CONCLUSIONS

As the EU becomes increasingly open, diseases are increasingly able to spread across borders. Therefore, governments must be prepared, proactive and always on the front foot to respond to new diseases immediately and to find solutions to long-term threats.

Our framework has divided cross-border health threats into novel and emerging threats requiring immediate deployment of research and development and seeking innovative solutions, and a second category of longer-term threats requiring political will and comprehensive approaches to lead to real solutions. The case studies used to outline these two frameworks – influenza and TB – provide a useful insight into the challenges and opportunities the EU faces in coordinating responses to cross-border health issues. However, we acknowledge the multitudes of other diseases, both known and unknown, that present major risks for the EU.

Therefore, our paper has focused on four key recommendations to European policymakers and healthcare stakeholders to provide realistic, achievable, but also ambitious responses to cross-border health threats. A public and common framework triggering EU intervention will ensure a coherent and predictable response. A strong focus on vaccine development and prevention is a useful response to novel threats, while strong political coordination and political will can have a real impact on long-term threats. Finally, EU member states must commit to cooperation, and use the EU's institutions and resources as a force multiplier for their own actions.

Cross-border health threats will always be a challenge in an open Europe. Those threats will include known diseases with a long-term impact on our health care systems, and new threats arriving without warning, or changing regularly. Disease does not stop at national frontiers, and therefore our health care systems must respond in kind. Our health systems must transcend national borders, beginning with the EU.

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DISCLAIMER

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