

# Drug-resistant tuberculosis: challenges, consequences and strategies for control



Worldwide, more than nine million people develop active tuberculosis (TB) every year, with 1.7 million dying from the disease. TB had been considered conquered in many European countries, but it has re-emerged as a significant problem for the EU. There are a growing number of TB strains resistant to the commonly used antibiotics (first-line drugs), necessitating the use of more complicated, expensive and less well-tolerated treatment schedules with second-line drugs. Moreover, extensively drug resistant TB (resistant to first- and second-line drugs) has now been documented in more than 50 countries worldwide and threatens progress made previously in the control of TB. There are particular problems for TB in the European Union (EU) associated with HIV co-infection and with migration. Drug-resistant TB is an urgent crisis that has been created by poor infection control. There is much to be done across Europe, to use the currently available evidence to inform policy-making and to develop new healthcare products and services, and to fill the current gaps in the evidence base.

## Strengthening TB data collection and use across the EU

There is need to improve the collection and analysis of data, particularly strengthening capacity in some Central and Eastern European countries, which will require close collaboration between the roles of the European Centre for Disease Prevention and Control (ECDC) and the World Health Organization, working with the Member States to develop and co-ordinate capabilities. In particular, there is a need for the following:

- improving procedures for collecting and reporting national surveillance data;
- implementing standardised methodologies for drug sensitivity testing and characterisation of pathogen strains; developing a networked system of Reference Laboratories; and
- creating an interactive database of genetic and clinical information to understand better the molecular determinants of disease.

## Developing EU strategy in a global context

TB cannot be isolated from other public health issues, and the policy priorities for the EU cannot be isolated from the global context. The ECDC, with the wider scientific community, must clearly define strategies for the control of TB in all settings in the EU, and disseminate guidance on standards of care consistent with international recommendations. The disease-specific focus on TB should be made an integral part of the broader development of the capacity of health systems. The public health objectives for the EU and its immediate neighbourhood must be aligned with global policy needs. This requires the following actions:

- reform of the European Neighbourhood Policy;
- accepting a responsibility to help develop research and laboratory services outside the borders of the EU;
- supporting the increasing contribution of the European and Developing Countries Clinical Trial Partnership; and
- addressing the public health issues associated with an increasingly mobile population, particularly for migration and other international travel.

It is also necessary for the European Commission and Parliament to increase the visibility of drug-resistant TB management as a priority for Europe; to upgrade medical training to facilitate adoption of international standards of TB care; to inform the community-at-large so as to tackle misperceptions and stigmatisation; to stimulate commitment by political leaders and other decision-makers at national, European and global levels. To avoid previous problems of multiple initiatives proceeding without effective co-ordination, there must be better interaction between the EU institutions, intergovernmental organisations and non-governmental organisations to drive a shared public policy agenda.

## Support for new research

Despite the economic recession, it is essential for the European Commission and many Member States to increase funding for TB research – basic, clinical and translational – alongside better processes to identify, agree and direct multidisciplinary research priorities, and better connectivity to apply research advances in the development of new and improved diagnostics, drugs and vaccines. Among the research priorities are the following:

- understanding the biological and social determinants of TB strain resistance and fitness, and the interaction between pathogen and host in disease onset, progression and protection;
- identifying biomarkers to monitor disease activity; and
- socio-economic evaluation and mathematical modelling of trends in disease incidence and control.

## Support for innovation

There is continuing need for the European Commission, with international and philanthropic bodies, to encourage the public and private sectors to work in complementary ways, to support the translation of research findings and to enable the practical application of novel products and services, even in resource-poor settings. This requires the exploration of innovative health-financing mechanisms and effort to reduce R&D bottlenecks for companies, large and small, by rationalising regulatory requirements to promote innovation without compromise to quality, safety and efficacy of care.

### **Diagnostics**

More can be done to achieve consistent use of testing methodologies between Member States and to progress the validation and application of new tests. Public–private partnerships can capitalise on advances in the application of technology for provision of cheap, reliable, point-of-care testing. It is also important to optimise performance of

the older testing methods in parallel with developing new approaches.

### **Drug regimens**

There are urgent issues to tackle, to improve consistency in quality assurance of drug supply, to clarify and resolve the problems of drug interaction in HIV–TB combination therapies, and to design better drugs to shorten and simplify the drug regimen and counter emergence of resistance.

### **Vaccines**

There must be further strengthening of fundamental research underpinning the discovery of novel vaccine candidates for better efficacy and safety, accompanied by improved clinical trial capacity, incorporating the latest understanding of biomarkers as correlates of clinical protection.

It is important for all to understand that the EU has failed so far to respond adequately to the global TB threat, despite being on the frontline. The EU can draw on considerable strengths in its science and has a major opportunity to develop effective, co-ordinated public health capabilities. However, increasing awareness, funding and action across a broad front are needed for the urgent problem of drug-resistant TB to be tackled. The academies of science in the EU recognise their responsibility to catalyse ongoing discussion both on the nature of the scientific evidence available and on the scope of the policy agenda.

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EASAC – the European Academies Science Advisory Council – is formed by the national science academies of the EU Member States to enable them to collaborate with each other in providing advice to European policy-makers. It thus provides a means for the collective voice of European science to be heard.

Its mission reflects the view of academies that science is central to many aspects of modern life and that an appreciation of the scientific dimension is a pre-requisite to wise policy-making. This view already underpins the work of many academies at national level. With the growing importance of the European Union as an arena for policy, academies recognise that the scope of their advisory functions needs to extend beyond the national to cover also the European level. Here it is often the case that a trans-European grouping can be more effective than a body from a single country. The academies of Europe have therefore formed EASAC so that they can speak with a common voice with the goal of building science into policy at EU level.

Through EASAC, the academies work together to provide independent, expert, evidence-based advice about the scientific aspects of public policy to those who make or influence policy within the European institutions. Drawing on the memberships and networks of the academies, EASAC accesses the best of European science in carrying out its work. Its views are vigorously independent of commercial or political bias, and it is open and transparent in its processes. EASAC aims to deliver advice that is comprehensible, relevant and timely.

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