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GOOD PRACTICES IN STRENGTHENING HEALTH SYSTEMS FOR THE PREVENTION AND CARE OF TUBERCULOSIS AND DRUG-RESISTANT TUBERCULOSIS

Abstract

In response to the burden of multidrug- and extensively drug-resistant tuberculosis (M/XDR-TB), the Consolidated Action Plan to Prevent and Combat M/XDR-TB in the WHO European Region, 2011–2015, was prepared for all 53 Member States and endorsed at the sixty-first session of the WHO Regional Committee for Europe. In order to improve the transfer of knowledge and experience among countries and to improve the health system approach, the WHO Regional Office for Europe has been collecting and disseminating good examples of the prevention, control and care of TB and M/XDR-TB in the Region. In this second compendium, 45 examples of good practices in strengthening health systems for the prevention and care of TB and drug-resistant TB are presented from 21 countries, including 14 countries of high priority for MDR-TB and countries with high and low incidences of TB. This compendium complements the final report of implementation of the Consolidated Action Plan 2011–2015 and can be used to scale up effective interventions in line with the new TB Action Plan for the WHO European Region 2016–2020. It is intended as a resource for stakeholders at all levels of health systems.

Keywords

DELIVERY OF HEALTH CARE

EXTREMELY DRUG-RESISTANT TUBERCULOSIS – prevention and control

TUBERCULOSIS, MULTI-DRUG RESISTANT – prevention and control

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ISBN 978 92 890 51293

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GOOD PRACTICES IN STRENGTHENING HEALTH
SYSTEMS FOR THE PREVENTION AND CARE OF
TUBERCULOSIS AND DRUG-RESISTANT TUBERCULOSIS

CONTENTS

Abbreviations and acronyms	iv
Foreword	vi
Preface	vii
Executive summary	viii
Introduction and background	1
Stewardship and governance	7
Azerbaijan. Strengthening the voices of people with TB	8
Kyrgyzstan. Improving TB infection control	10
Netherlands and Turkey. Role of nongovernmental organizations as drivers of sustained country ownership of TB control	12
Russian Federation. High-level working group on TB	14
Russian Federation. Comprehensive reform of diagnosis and treatment of M/XDR-TB in Voronezh region	16
Tajikistan. A national, multi-stakeholder coalition to fight TB more effectively.	19
Uzbekistan. Unified order: effective strategy for controlling M/XDR-TB	21
Financing the system	23
Armenia. Reforms in financing mechanisms to strengthen inpatient and outpatient TB services	24
Belarus. Pilot implementation of a financial model of reallocation of funding for inpatient care to outpatient care of patients with TB in remote rural areas in Mogilyov region	26
Kyrgyzstan. Changes to the support of patients with MDR-TB	28
Republic of Moldova. Generating evidence on the effectiveness of incentives for improving health outcomes	30
Netherlands. Costing treatment and control of TB, MDR-TB and XDR-TB.	32
Health service delivery	35
Azerbaijan. Ensuring the continuity of TB treatment and care for ex-prisoners	36
Czech Republic. Establishing a central unit for treatment of MDR-TB in a department of respiratory medicine	38
Georgia. Transport of sputum samples via the Georgian post	39
Georgia. Collaboration with the Georgian Orthodox Church for early detection of TB and adherence to treatment	41
Kazakhstan. Comprehensive approach to the care of patients with MDR-TB	42
Kyrgyzstan. Palliative care for patients with drug-resistant TB	44
Portugal. Outreach work on TB: a local experience of cooperation	46
Republic of Moldova. Provision of access to adequate TB diagnosis and treatment to homeless people	48
Republic of Moldova. Outpatient treatment for MDR-TB	51
Russian Federation. Comprehensive reform of the diagnosis, care and management of M/XDR-TB in Arkhangelsk region.	53

Tajikistan. Improving detection of TB among women in community structures	55
Ukraine. Support for patients with MDR-TB at the outpatient stage of treatment	57
Ukraine. Early detection of TB among vulnerable groups	59
Ukraine. Treatment of TB concomitantly with opioid substitution therapy	60
United Kingdom. London TB contact tracing team	62
Human resources for health	65
Azerbaijan. Training centre on prevention and control of TB in prisons	66
Azerbaijan. Home treatment and support on adherence for patients with DR-TB	68
Belarus. DR-TB consilium	70
Estonia. TUBIDU project: empowering public health systems and civil society to fight the TB epidemic in vulnerable groups: and addressing the needs of people who inject drugs	72
Hungary. Forming an expert team for TB surveillance	74
Serbia. Building human resource capacity for ambulatory care of patients with M/XDR-TB	76
Slovakia. Addressing the needs of the most vulnerable and hard-to-reach groups: the case of the Roma community	78
Uzbekistan. Improving educational processes in TB services	80
Health technologies and pharmaceuticals	83
Georgia. Introduction of new drugs for the treatment of DR-TB as part of programme management of M/XDR-TB	84
Latvia. Rapid diagnostics and new drugs: delamanid and bedaquiline for treatment of MDR-TB	87
Uzbekistan. Surgical treatment of pulmonary and pleural MDR-TB	89
Uzbekistan. Use of rapid diagnostic tests for TB	91
Health information and health information systems	93
Belarus. Introduction of a public electronic register for TB	94
Belarus. Cohort event monitoring of the safety and effectiveness of linezolid in combination TB therapy	96
Finland. Creating an online database of TB medications	98
Georgia. Introducing an electronic information system to strengthen TB surveillance	99
Tajikistan. Improving case notification through screening and innovative approaches	102
United Kingdom. British Thoracic Society Multidrug-resistant Tuberculosis Advice Service	104

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Acknowledgements

From the Joint Tuberculosis, HIV/AIDS and Hepatitis Programme, WHO Regional Office for Europe: Dr Andrei Dadu, Dr Pierpaolo de Colombani, Dr Soudeh Ehsani and Dr Martin van den Boom provided expert input. Dr Nonna Turusbekova, WHO temporary adviser, assisted in the work.

The Regional Office for Europe would like to thank the national health authorities, country representatives and national and international experts from the WHO European Region who contributed to and/or provided support for the submission of good practices received during this initiative. Special thanks are due to the following (in alphabetical order) for reviewing the cases for technical content: Dr Silviu Domete, health systems analyst, WHO Country Office, Greece; Ms Eva Nathanson, First Secretary for Health, Embassy of Sweden to Zambia; Dr Bernd Rechel, European Observatory on Health Systems and Policies and London School of Hygiene & Tropical Medicine; and Dr Viorel Soltan, Director, Centre for Health Policies and Studies, Chisinau, Republic of Moldova.

Abbreviations and acronyms

BCG	bacille Calmette-Guérin
DOTS	directly observed treatment, short course
DR	drug-resistant
DS	drug-susceptible
DST	drug susceptibility test
INTILISH	Republican Educational Resources Information Centre (Uzbekistan)
MDR	multidrug-resistant
MSF	Médecins Sans Frontières
NGO	nongovernmental organization
NTP	national tuberculosis programme
TB	tuberculosis
USAID	United States Agency for International Development
XDR	extensively drug-resistant



FOREWORD

Following publication of the *Compendium of best practices in M/XDR-TB control and treatment in the European Region* in 2013, I am pleased to herald this second compendium of good practices in health systems strengthening for the prevention and care of tuberculosis (TB) and multidrug and extensively drug-resistant (M/XDR)-TB. Both compendiums were designed for use as resources for continued implementation of the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-resistant Tuberculosis in the WHO European Region 2011–2015.

After four years of implementation of the Plan, it is time to reflect on the achievements and gaps. With the strong commitment of Member States and partners, including civil society organizations, and with strong support from the WHO Regional Office and country offices, the incidence of TB has been falling at about 6% per year, which is the fastest decrease in all six WHO regions. The WHO Regional Office, in line with the European health policy Health 2020, has been working with Member States to strengthen their health systems in order to introduce and sustain patient-centred, integrated TB care. As a result, today, all patients with MDR-TB in the Region are treated, as compared with 63% in 2011. In addition, with better treatment and the introduction of new models of care, the proportion of cases of MDR-TB among previously treated patients has stabilized over the past four years.

Despite accelerated progress, 1000 people still fall sick with TB disease each day, and only half of all estimated MDR-TB cases are detected. MDR-TB poses a serious burden to patients and their families, as treatment lasts about two years and has many serious side-effects. Household and national economies are affected by loss of work and a direct loss of productivity. The latest data on the treatment outcomes of MDR-TB patients are similar to those in other WHO regions: only half of all patients are cured. Our major challenge is therefore to achieve satisfactory treatment outcomes for all, in order to curb the MDR-TB epidemic.

Europe is in a position to lead prevention, care and the innovation of new tools in the fight against TB and to pave the way for TB elimination. This work is exemplified in this compendium. Sharing of knowledge and experience among countries is important for formulating and improving health strategies to achieve the ultimate goal of ending the TB epidemic. Through inter-sectoral collaboration, strong health systems, sustained financing and use of good practices, we can achieve our goal, so that our children will live in a world free of TB.

Dr Zsuzsanna Jakab

WHO Regional Director for Europe

PREFACE

MDR-TB is a continuing challenge in many parts of the world and particularly in the WHO European Region: of the 27 countries worldwide with a high burden of MDR-TB, 15 are in the European Region. An estimated 75 000 new cases of MDR-TB occurred in the Region in 2013, of which approximately 10% were XDR-TB.

In response to the alarming problem of drug-resistant (DR) TB, the WHO Regional Director for Europe established a special project in 2010 linking (MDR) TB control with health systems strengthening. The WHO Regional Office led a consultative process with the 53 Member States, civil society and partners to develop the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-resistant Tuberculosis in the WHO European Region 2011–2015. The Consolidated Action Plan and resolution EUR/RC61/R7 were unanimously approved by the 53 Member States of the WHO European Region at the Regional Committee meeting in Baku, Azerbaijan, in 2011.

Since adoption of the resolution, several initiatives have been undertaken to strengthen health systems and financing for TB control in the Region. Few of the initiatives, however, have been scaled up, and not enough is known about the barriers to health systems strengthening or about innovations for better TB and M/XDR-TB outcomes and more efficient health spending.

To further improve health outcomes and to move towards TB elimination, health systems strengthening initiatives must be scaled up in a robust fashion, and domestic financing and system efficiency must be increased. These actions are well reflected in the new Tuberculosis Action Plan for the WHO European Region 2016–2020, to be presented at the 65th Regional Committee meeting in Vilnius, Lithuania.

This compendium of *Good practices in strengthening health systems for the prevention and care of tuberculosis and drug-resistant tuberculosis* brings together innovative practices in health systems for more effective management and control of TB and M/XDR-TB. While no one practice is suitable for all, much is to be learnt here about TB and the communities and health systems it affects.

The aim of the compendium is therefore to contribute to a better understanding of what is needed to achieve better integration of TB and M/XDR-TB control into health system reform in countries. Within the Health 2020 European Health Policy Framework, the WHO Regional Office will continue to support Member States in improving disease control and health security by transforming health systems to make them more people centred and efficient.

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EXECUTIVE SUMMARY

In 2011, in consultation with Member States and national and international stakeholders, the WHO Regional Office for Europe prepared the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-resistant Tuberculosis 2011–2015. The Plan and its accompanying resolution EUR/RC61/R7 were endorsed by all 53 Member States at the 61st session of the WHO Regional Committee for Europe.

In order to improve the transfer of knowledge and experience among countries and to improve the health system approach, the Regional Office has been collecting and disseminating good examples of the prevention, control and care of TB and M/XDR-TB in the Region. In 2013, with examples from nearly half the Region, a first compendium of *Best practices in prevention, control and care for drug resistant tuberculosis* was presented, at the 63rd session of the WHO Regional Committee for Europe.

In order to continue scaling up effective interventions to strengthen health systems for the prevention and care of TB and M/XDR-TB, the Regional Office launched a second call for good practices, on 28 May 2015. National health authorities, including national TB programmes (NTPs), partners and nongovernmental organizations (NGOs) working to control TB and M/XDR-TB in the Region, were invited to submit examples. The call was opened to all stakeholders and partners. Examples of good practices were collected over three months, between June and August 2015. At the end of the collection period, all reported practices were compiled and evaluated against predefined selection criteria.

In this second compendium of *Good practices in strengthening health systems for the prevention and care of tuberculosis and drug-resistant tuberculosis*, 45 examples from 21 countries, including 14 high-priority countries for MDR-TB and countries with high and low incidences of TB, are presented. They are categorized according to the most relevant health system “building blocks” and seven areas of intervention of the Consolidated Action Plan.

This compendium complements the final report of implementation of the Consolidated Action Plan and may be used to scale up effective interventions, in line with the new action plan for the WHO European Region 2016–2020. It is intended as a resource for stakeholders at all levels of health systems. The examples presented are the sole work of the authors listed. The Regional Office encourages continued submission of good practices (to tuberculosis@euro.who.int) for possible inclusion in an open access database of good practices and future compendiums.



INTRODUCTION AND BACKGROUND

The global burden of TB

About one third of world's population is latently infected with (TB) and thus acts as a reservoir of *Mycobacterium tuberculosis*, the agent that causes active TB disease. More than 50 years after the first TB chemotherapeutic drugs were introduced, TB remains a leading cause of death and life-threatening illness, which disproportionately affects low- and middle-income countries. Worldwide in 2013, there were an estimated 9 million new cases of TB, and 1.5 million people died from the disease.¹ Treatment success rates have been severely compromised in recent years by the increasing prevalence of MDR-TB and XDR-TB.^{1,2} Although the global rates of new TB cases have been falling since 2005, meeting Millennium Development Goal targets,³ M/XDR-TB is a concern, with nearly half a million estimated new cases occurring annually.¹

TB and M/XDR-TB in the WHO European Region

In the WHO European Region, 1000 people contract TB every day. The burden of TB is geographically and socioeconomically disparate, the incidence ranging from less than one case per 100 000 population in some Member States to over 200 per 100 000 in others. Even in low-incidence countries, certain cities and areas have high incidences of TB.⁴ In 2013, there were an estimated 360 000 incident TB cases and 38 000 deaths in the Region.⁵

Overall, rates of TB in the Region have been improving, at the fastest rate of all the WHO regions (6% per year since 2009), and there has been a constant decline in mortality over the past 10 years.⁴ Despite these achievements, M/XDR-TB remains a major concern. The WHO European Region has 15⁶ of the world's 27 countries with a high burden of M/XDR-TB, and 25% (75 000 in 2013⁴) of all MDR-TB cases of the world are in Europe. Fig. 1 shows the prevalence of primary MDR-TB among new TB cases in the Region.

The global and regional response to the threat of M/XDR-TB

In 2007, in response to the alarming problem of TB, the Berlin Declaration on Tuberculosis was endorsed by all Member States in the WHO European Region, which committed themselves to respond urgently to the re-emergence of TB in the Region. The commitment was echoed in the 2009 Beijing Declaration, in which ministers from the 27 countries of the world with a high burden of M/XDR-TB met in Beijing, China, to address this alarming threat. Subsequently, in May 2009, the Sixty-second World Health Assembly in resolution WHA62.15 urged all Member States to achieve universal access to diagnosis and treatment of M/XDR-TB by 2015, as part of the transition to universal health coverage, thereby saving lives and protecting communities.

The WHO Regional Director for Europe confirmed WHO's commitment to the fight against TB and M/XDR-TB as a regional priority in 2010 by establishing a special project and preparing the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-resistant Tuberculosis (2011–2015).⁷ The Plan was endorsed by the 61st Regional Committee in September 2011. Under this Plan, all Member States committed themselves to adapt their national action plans, improve patient-centred services, increase public awareness and work closely with stakeholders including civil society organizations to implement the Plan.

1 Global tuberculosis report 2014. Geneva: World Health Organization; 2014 (http://www.who.int/tb/publications/global_report/en/, accessed 26 August 2015).

2 Abubakar I, Zignol M, Falzon D, Raviglione M, Ditiu L, Masham S, et al. Drug-resistant tuberculosis: time for visionary political leadership. *Lancet Infect Dis* 2013;13:529–39.

3 Murray CJL, Ortblad KF, Guinovart C, Lim SS, Wolock TM, Roberts DA, et al. Global, regional, and national incidence and mortality for HIV, tuberculosis, and malaria during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2014;384:1005–70.

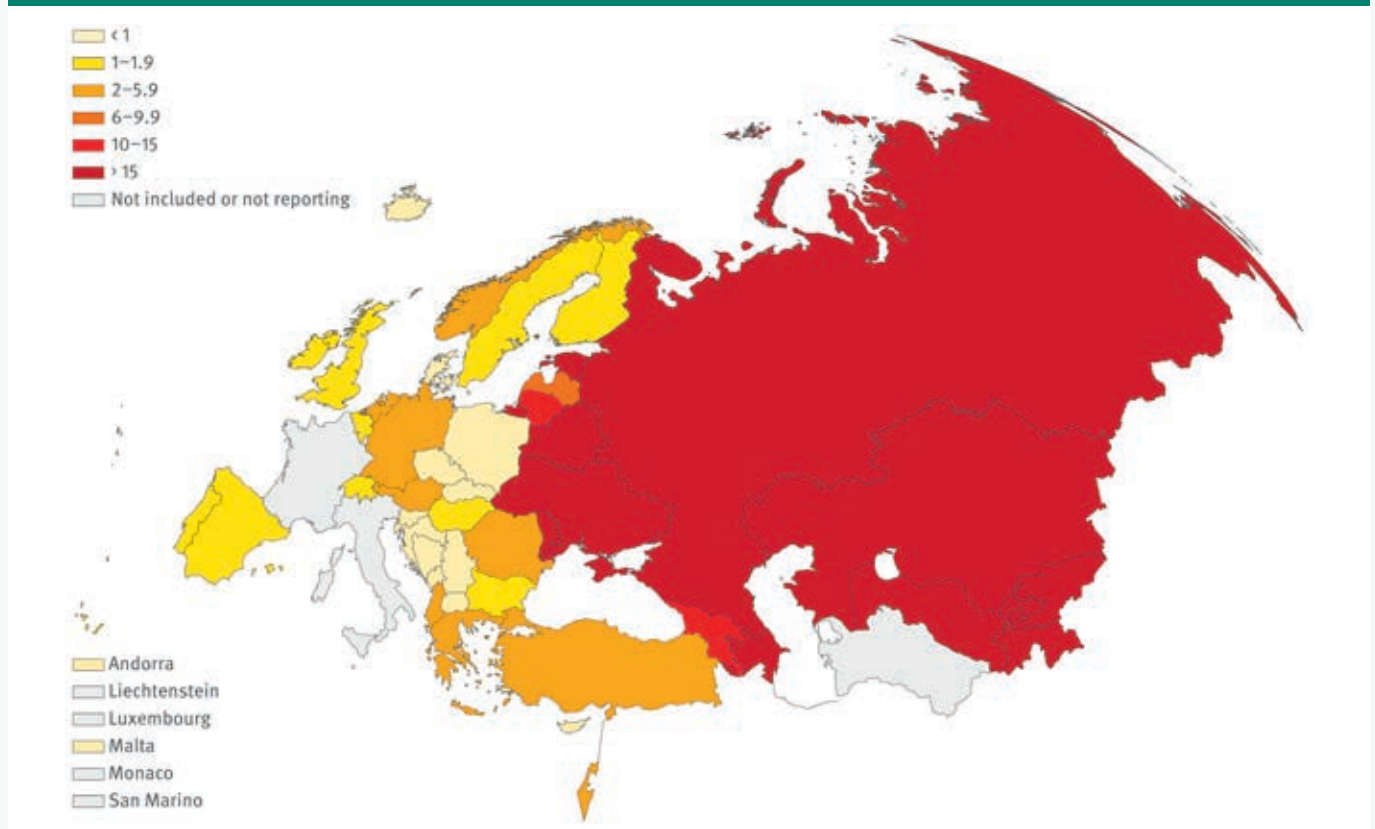
4 Kruijshaar ME, Abubakar I, Dedicoat M, Bothamley GH, Maguire H, Moore J, et al. Evidence for a national problem: continued rise in tuberculosis case numbers in urban areas outside London. *Thorax* 2012;67:275–7.

5 European Centre for Disease Prevention and Control and WHO Regional Office for Europe. Tuberculosis surveillance and monitoring in Europe 2015. Stockholm: European Centre for Disease Prevention and Control; 2015 (<http://ecdc.europa.eu/en/publications/Publications/tuberculosis-surveillance-monitoring-Europe-2015.pdf>, accessed 26 August 2015).

6 The 15 countries in the WHO European Region with a high burden of MDR-TB are: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

7 Roadmap to prevent and combat drug-resistant tuberculosis. Copenhagen: WHO Regional Office for Europe; 2011 (http://www.euro.who.int/__data/assets/pdf_file/0014/152015/e95786.pdf, accessed 26 August 2015).

Fig. 1. Prevalence of primary MDR-TB among new TB cases in the WHO European Region per 100 000 population



Source: Tuberculosis surveillance and monitoring in Europe 2015. Stockholm: European Centre for Disease Prevention and Control; 2015

Outline of the Consolidated Action Plan

Goal

To contain the spread of TB by ensuring universal access to prevention, diagnosis and treatment of M/XDR-TB in all Member States in the WHO European Region by 2015.

Targets

The aims of the Plan are, by the end of 2015, to:

- » decrease by 20 percentage points the proportion of MDR-TB among previously treated patients;
- » diagnose at least 85% of all estimated cases of MDR-TB; and
- » treat successfully at least 75% of all patients notified as having MDR-TB.

Strategic directions

The six strategic directions of the Consolidate Action Plan are to:

1. identify and address the determinants and underlying risk factors of the emergence and spread of DR-TB (areas of intervention 1, 4, 6 and 7);
2. strengthen the ability of health systems to provide accessible, affordable, acceptable services with patient-centred approaches (In order to reach the most vulnerable

populations, all barriers to access must be removed, and treatment must remain truly free of charge; innovative mechanisms are to be introduced to remove barriers to equitable access to diagnosis and treatment of DR-TB and create incentives and enablers for patients to complete their course of treatment.) (areas of intervention 1, 2, 3, 4, 5, 6 and 7);

3. work in national, regional and international partnerships in TB prevention, control and care (area of intervention 6);
4. foster regional and international collaboration for the development of new diagnostic tools, medicines and vaccines against TB (areas of intervention 2, 3 and 6);
5. promote the rational use of existing resources, identify gaps and mobilize additional resources to fill the gaps (area of intervention 6); and
6. monitor the trends of M/XDR-TB in the Region, and measure the impact of interventions (area of intervention 5).

Areas of intervention

The seven areas of intervention of the Consolidated Action Plan to achieve a reduction in the burden of DR-TB, as stated in the objectives of the Global Plan to Stop TB 2011–2015, are to:

1. prevent the development of M/XDR-TB;
2. scale up access to testing for resistance to first- and second-line TB drugs and access to HIV testing and counselling of TB patients;
3. scale up access to effective treatment for all forms of DR-TB;
4. scale up TB infection control;
5. strengthen surveillance, including recording and reporting, of DR-TB, and monitor treatment outcomes;
6. expand countries' capacity to scale up the management of DR-TB, including advocacy, partnership and policy guidance; and
7. address the needs of special populations.

Main achievements since 2011

By close collaboration and with the commitment of Member States, most of the milestones of the Consolidated Action Plan have been achieved. Not only is the decrease in the number of cases of TB the fastest of all WHO regions but also detection of MDR-TB has increased from less than one third of the estimated number in 2011 to half, and MDR-TB treatment coverage has increased from 63% in 2011 to universal coverage. The proportion of cases of MDR-TB among previously treated patients has also levelled off. Compendiums of best and good practices have been prepared to summarize country achievements and to catalyse their scaling up and replication in other countries.

Towards ending TB in Europe through a new regional TB action plan 2016–2020

In the final year of the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-resistant Tuberculosis, several challenges to TB control remain to be addressed. Transmission of MDR-TB continues, as shown by the increase in the proportion of MDR-TB among new cases. As a result, it is becoming more difficult to treat the disease successfully; the rate of treatment success for MDR-TB remains as low as in other regions, fewer than half of all patients being cured. In addition, TB remains one of the leading causes of death among people living with HIV, and this deadly combination is increasing in the Region: the prevalence of HIV infection among TB patients increased from 3.4% in 2008 to 7.8% in 2013.⁴

As the Global Plan to Stop TB 2006–2015 comes to an end this year, WHO has prepared an ambitious post-2015 global “End TB Strategy”, which was endorsed by the World Health Assembly in 2014 in resolution WHA67.1.⁸ The Strategy has three main pillars, several milestones for 2020 and 2025 and targets for 2030 and 2035, with the goal of ending the TB epidemic.

8 Draft global strategy and targets for tuberculosis prevention, care and control after 2015. Geneva: World Health Organization; 2014 (http://apps.who.int/gb/ebwha/pdf_files/WHA67/A67_11-en.pdf?ua=1, accessed 26 August 2015).

To continue to move forward and address the challenges to TB and M/XDR-TB prevention and care, the WHO Regional Office for Europe has prepared a new action plan for the Region for 2016–2020 through wide consultation with Member States and other stakeholders. The new action plan (summarized in Table 1) builds on the achievements of the Consolidated Action Plan 2011–2015 and addresses emerging challenges. The plan and accompanying resolution will be submitted for consideration by the Regional Committee at its 65th session in Vilnius, Lithuania, in September 2015.

The role of health systems and health systems strengthening

Well-functioning national health systems are essential for effectively addressing the spread of TB. The prevention and control of TB are complex and require action at all levels of the health system. The new TB action plan for the WHO European Region 2016–2020 emphasizes health systems strengthening in its six strategic directions and three pillars of intervention (integrated, patient-centred care and prevention; bold policies and supportive systems; and intensified research and innovation). The new TB action plan is also closely aligned with the Health 2020 European policy framework, which emphasizes the central role of health systems strengthening in improving the health and well-being of populations and reducing health inequalities.

In identifying health systems as one of its four policy action areas, Health 2020 reaffirms that investment in health systems and improving their performance are essential for improving the health of all members of society. The *World Health Report 2000*⁹ defines a health system as “all activities whose primary purpose is to promote, restore or maintain health”. National health systems working to control TB will therefore effectively promote awareness about TB among people with the disease and the larger population who might be at risk, restore health to those suffering from TB and maintain the health of people who have had TB. In order to achieve these goals, health systems have several building blocks. In the WHO European Region, the following six building blocks are stressed:¹⁰

- » stewardship and governance
- » financing the system
- » health services delivery
- » human resources for health
- » health technologies and pharmaceuticals
- » health information and health information systems.

9 The world health report 2000 – health systems: improving performance. Geneva: World Health Organization; 2000 (<http://www.who.int/whr/2000/en/>, accessed 18 June 2015).

10 Everybody's business: strengthening health systems to improve health outcomes – WHO's framework for action. Geneva: World Health Organization; 2007 (<http://www.who.int/healthsystems/strategy/en/>, accessed 4 September 2015).

Table 1. Outline of the TB action plan for the WHO European Region 2016–2020

Vision	An end to the TB epidemic, with zero affected families facing catastrophic costs due to the disease
Goal	To end the spread of drug-susceptible (DS) and DR-TB by achieving universal access to prevention, diagnosis and treatment in all Member States in the WHO European Region, thereby contributing to the End TB Strategy goal of ending the TB epidemic.
Targets (to be achieved by 2020)	» a 35% reduction in deaths due to TB
	» a 25% reduction in TB incidence
	» a 75% treatment success rate among patients with MDR-TB
Strategic directions	
<ol style="list-style-type: none"> 1. Work towards elimination of TB by strengthening the response of health systems to the prevention, control and care of TB and DR-TB. 2. Facilitate intersectoral collaboration to address the social determinants and underlying risk factors of TB. 3. Work in national, regional and international multi-stakeholder partnerships, including civil society and communities. 4. Foster collaboration for the development and use of new diagnostic tools, medicines, vaccines and other treatment and preventive approaches. 5. Promote the rational use of existing resources, identify gaps, and mobilize additional resources to ensure sustainability. 6. Ensure that the promotion of sound ethics, human rights and equity is embedded in all areas of the strategic interventions against TB listed above. 	
Areas of intervention	
<ol style="list-style-type: none"> 1. Integrated, patient-centred care and prevention <ol style="list-style-type: none"> A. Systematic screening of contacts and high-risk groups B. Early diagnosis of all forms of TB and universal access to drug-susceptibility testing, including with rapid tests C. Equitable access to high-quality treatment and a continuum of care for all people with TB, including DR-TB, and support to facilitate treatment adherence D. Collaborative TB and HIV activities and management of comorbid conditions E. Management of latent TB infection, preventive treatment of people at high risk and vaccination against TB 2. Bold policies and supportive systems <ol style="list-style-type: none"> A. Political commitment, with adequate resources, including a universal health coverage policy B. Strengthening all functions of health systems, including well-aligned financing mechanisms for TB and human resources C. Regulatory frameworks for case-based surveillance, strengthening of vital registration and of the quality and rational use of medicines, and pharmacovigilance D. Airborne infection control, including regulated administrative, engineering and personal protection measures in all relevant health care facilities and congregate settings E. Community systems and civil society engagement F. Social protection, poverty alleviation and actions on other determinants of TB, such as migration and imprisonment 3. Intensified research and innovation <ol style="list-style-type: none"> A. Discovery, development and rapid uptake of new tools, interventions and strategies B. Research to optimize implementation and impact and promote innovation 	

In their pursuit of these goals and in order to strengthen these building blocks, all 53 Member States of the WHO European Region have further endorsed the Tallinn Charter: Health Systems for Health and Wealth,¹¹ which states the values underlying all health systems strengthening and has helped stewards of health systems (ministries of health) to place a commitment to solidarity, equity and participation at the heart of their decision-making. How this commitment is translated into the health systems building blocks listed above is briefly described below.

Stewardship and governance lie with ministries of health, who set the vision for health system development. They have the mandate and responsibility for legislation, regulation and enforcement of health policies, as well as for gathering intelligence on health and its social, economic and environ-

mental determinants. To improve health outcomes, health ministries should promote inclusion of considerations of health in all policies and advocate their effective implementation in all sectors to maximize health gains. Monitoring and evaluation of health system performance and balanced cooperation with stakeholders at all levels of governance are essential to promote transparency, accountability and, ultimately, good governance.

While there is no single best approach to **financing a health system**, all models comprise mixes of revenue collection, pooling and purchasing arrangements according to need, their historical, fiscal and demographic context, and their social priorities and preferences. Moving towards universal health coverage is a cornerstone of the health and social policy of Member States in the European Region and a key mechanism whereby health systems will deliver on the commitments in the Tallinn Charter. In promoting universal health coverage, the aim of Member States is to narrow the gap between health needs and use, improve the quality of

11 The Tallinn Charter: Health Systems for Health and Wealth. Copenhagen: WHO Regional Office for Europe; 2008 (<http://www.euro.who.int/en/health-topics/Health-systems/health-technologies/publications2/2008/tallinn-charter-health-systems-for-health-and-wealth-2008>, accessed 8 June 2015).

care, ensure financial protection and enhance equity by identifying and protecting vulnerable and marginalized groups. Financing arrangements should also provide incentives for the efficient organization and delivery of health services, link the allocation of resources to providers on the basis of their performance and the needs of the population and promote accountability and transparency in the use of funds. The overall allocation of resources should strike an appropriate balance between health care, disease prevention and health promotion to address current and future health needs.

In the **delivery of health services**, it is important to ensure a holistic approach to services, including health promotion, disease prevention and integrated disease management. Population-based interventions and individual services are equally important. These services can be made more people-centred by moving away from reactive, disease-based, episodic service delivery towards a proactive approach, involving coordination among a variety of providers, institutions and settings in both the public and the private sector and including primary care, acute and extended care facilities and people's homes. Policy-makers throughout the Region value and strive to ensure the provision of high-quality services for all, particularly for vulnerable groups, in response to their needs, and to enable people to make healthy lifestyle choices.

Human resources for health are an essential input to health systems, and improving health outcomes depends on their availability, accessibility, acceptability and quality. In a rapidly globalizing world, the provision and management of human resources with the education and training that gives them the appropriate skills and competence requires long-term planning and investment in order to respond to changing health care needs and service delivery models. Investment in the health workforce has implications not only for the investing country but also for others, because of the mobility of health professionals. The international recruitment of health workers should be guided by ethical considerations and cross-country solidarity and ensured by a code of practice. Improving the performance of health workers and promoting innovative, cost-effective practices will require more effective management and reward systems, to ensure an attractive working environment. Effective retention strategies are needed to deploy and to keep health workers where they can best make a positive difference to population health. Ensuring that the health workforce can quickly respond, in line with the International Health Regulations (2005), is an important element of this building block.

Ensuring the availability of and equitable access to cost-effective **health technologies and pharmaceuticals** is important for health systems. Improving access to essential medicines and medical devices involves establishing and using transparent systems and processes for (i) selection of

medical products to be authorized for use in Member States; (ii) pricing and coverage of medical products with public funds; and (iii) direct procurement of medical products by public or quasi-public agencies. These transparent systems and processes should be based on health technology assessments, models for the rational use of medicines and careful review, with due regard for public health relevance and evidence on efficacy, safety, comparative effectiveness, cost-effectiveness and equity. The vision and directions of pharmaceutical policy in Member States should be defined on the basis of international evidence and contextualized situation diagnosis through a participatory process, in consultation with stakeholders. The appropriate use of medical products and making pharmaceutical services an integral part of primary health care should be supported.

Health information and health information systems are the foundations for strengthening health systems and health policy.¹² Not only the information content but also the information systems themselves should be strengthened, including health information platforms and infrastructure and e-health systems. Data and information collection, analysis, reporting and dissemination should be improved for continuous monitoring and assessment of the health status of the population and the performance of health systems. In-depth analyses should be conducted to provide evidence for policy-makers. In addition, it is important to harmonize and standardize health information. Translating evidence into sound policies and practices requires up-to-date, user-friendly information systems at all levels of the health system, to allow not only transfer of data but also the decisions that are most appropriate to the situation and setting. Mechanisms to evaluate the effectiveness of implemented policies can be established to ensure continuous learning and progress.

Good practices in health systems strengthening for the prevention and care of TB and M/XDR-TB

In order to facilitate scaling up of effective strategies for strengthening health systems for prevention and care of TB and M/XDR-TB and following publication of the compendium of best practices in M/XDR-TB control and treatment in the European Region in 2013,¹³ the WHO Regional Office for Europe prepared this second compendium, which describes good practices in health systems strengthening for the prevention and care of TB and M/XDR-TB. This initiative should enable countries to share and adopt successful strategies at both national and regional levels.

For the purposes of this compendium, good practice is defined as any practice that achieves the targets of the Con-

12 World Health Assembly resolution WHA60.27

13 Dara M, Acosta CD. Best practices in prevention, control and care for drug-resistant tuberculosis. Copenhagen: WHO Regional Office for Europe; 2013 (http://www.euro.who.int/__data/assets/pdf_file/0020/216650/Best-practices-in-prevention,control-and-care-for-drugresistant-tuberculosis-Eng.pdf?ua=1, accessed 26 August 2015).

Table 2. Selection criteria for good practices in health systems strengthening for the prevention and care of TB and M/XDR-TB

Relevance*	Must address one of the targets or areas of intervention of the Consolidated Action Plan (or otherwise addresses the control of MDR-TB) and health systems as outlined above
Sustainability*	Implementable or could be maintained over a long period (including policy decisions) without massive additional resources
Efficiency*	Must produce results with a reasonable level of resources and within a reasonable time
Ethical appropriateness*	Must respect current ethical rules for dealing with human populations
Equity, gender	Addresses the needs of vulnerable populations and/or women in an equitable manner
Effectiveness	Must work and must achieve measurable results
Possibility for scale-up	Could be scaled-up to a larger population
Partnership	Involves satisfactory collaboration among several stakeholders
Community involvement	Involves participation by the affected communities
Political commitment	Has support from the relevant national or local authorities
* Required	

Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-resistant Tuberculosis, 2011–2015, or otherwise works for the prevention and care of M/XDR-TB through health systems strengthening as promoted in the Tallinn Charter, and could provide lessons to other countries. A good practice should address one or more of the health system building blocks described above: stewardship and governance; financing the system; health services delivery; human resources for health; health technologies and pharmaceuticals; and health information and health information systems. In addition, a good practice should be relevant, sustainable, efficient and ethically appropriate, with one or more of the additional criteria listed in Table 2.

Good practices could include: national health strategies that have clearly outlined targets or a visions for managing M/XDR-TB; poverty alleviation initiatives and actions to address other determinants of M/XDR-TB; community media campaigns for strengthening and/or coordinating with civil society; coordination among different levels of care or services (including primary health care, hospitals, social services, prison services); introducing services in non-traditional locations to ensure better access to care; financial incentives to promote certain models of service delivery; intersectoral alignment of funds to promote patient-centred service delivery; training of health professionals on prevention or management of M/XDR-TB; re-/profiling health workforce skills to better serve patient needs; financing schemes that provide coverage for medications; investments in public research and development of medicines for care and prevention; and mobilizing m-health or innovative technologies to improve prevention and care of of M/XDR-TB.

National health authorities, including NTPs, partners and NGOs working to combat TB and M/XDR-TB in the Region,

were invited to submit examples of good practices by an open call and submission form available online in English and Russian. The call for good practices was launched on 28 May 2015 and further disseminated on the Regional Office website and social media. The call was open to all stakeholders and partners. Examples were collected over 3 months, between June and August 2015. At the end of the collection period, all the reported practices were compiled and evaluated against the selection criteria listed in Table 2.

Good practices presented in this compendium

In this compendium, 45 examples from 21 countries including 14 high MDR-TB priority countries, as well as those with high and low incidences of TB are presented. The case studies are categorized according to the most relevant health system building block. In addition, the area of intervention of the Consolidated Action Plan 2011–2015 that each practice addresses is identified at the top of each case study.

The examples presented are the sole work of the authors listed for each practice. This compendium is not intended to be a comprehensive collection of all the excellent, indispensable work being carried out in health systems strengthening for the prevention and care of TB and M/XDR-TB in the Region. Rather, it represents good practices compiled during the three-month period. Many other programmes, partners and organizations may not have been aware of the initiative or may not have been able to make a submission due to time constraints or other logistical difficulties. The Regional Office encourages continuous submission of good practices (to tuberculosis@euro.who.int) for possible inclusion in an open access database of good practices and future compendium editions.

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AZERBAIJAN

Strengthening the voices of people with TB

Background

Azerbaijan is one of the 18 countries of the WHO European Region that is a high priority for TB and one of the world's 27 countries with a high burden of MDR-TB. In a national survey of resistance to TB drugs in 2013, 72 (13%) new and 66 (28%) previously treated patients had MDR-TB; of these, 38% of new and 46% of previously treated cases had XDR-TB or signs of XDR-TB.¹

A Country Coordination Mechanism for TB has been in place in Azerbaijan since September 2008. In addition to Government and private constituencies, nongovernmental organizations (NGOs) and civil society organizations active in TB control also have a voice in this mechanism. In 2014, six civil society organizations were working on TB in Azerbaijan. These organizations can play an important role in preparing strategic plans that in turn inform policies for TB prevention and management. Until 2014, however, there was no organization or group of former TB patients that directly represented the interests of TB patients and TB-affected communities in the country.

Health system challenge

As a national strategic plan on TB for 2016–2018 was required for a concept note for funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria and in view of the vital role that patients play in preparing such plans, an organization was needed that could represent the interests of patients with TB and TB-affected communities.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

The Saglamliga Khidmat Public Union, a national NGO, undertook establishment of a patient organization. The aim was to empower a TB patient organization to participate actively in TB advocacy and in Global Fund-related pro-

cesses. The project was supported financially by technical assistance from the Stop TB Partnership.

In June 2014, the patient organization Veremsiz Dunya (World Free of TB) was established. It comprised former TB patients and focused on developing skills and knowledge with regard to the TB situation in the country and globally, prevention strategies, advocacy, the Global Fund and preparation of a national strategic plan for TB to comply with the new funding mechanism of the Global Fund. Meetings were held with the NTP and the Vice-Chair of the Country Coordination Mechanism to promote the newly formed organization.

A member of Veremsiz Dunya was elected as a member of the Country Coordination Mechanism in August 2014 as the representative of TB-affected communities, giving TB patients and communities a voice in the Mechanism, so that they could provide input and feedback to the national strategic plan and Global Fund concept note. The members of the organization often meet with TB patients and visit TB-affected communities throughout Azerbaijan.

Outcomes

The Saglamliga Khidmat Public Union thus helped to establish the first TB patient organization in Azerbaijan. Members



¹ Alikhanova N, Akhundova I, Seyfadinova M, Mammadbayov E, Mirtskulava V, Rüsç-Gerdes S, et al. First national survey of anti-tuberculosis drug resistance in Azerbaijan and risk factors analysis. *Public Health Action* 2014;4(Suppl 2):S17–23.

of the organization participated in preparing the national strategic plan and the concept note for the new Global Fund funding mechanism. The Union also helped the group to be represented in the Country Coordination Mechanism so that they could play an active, meaningful role in discussions and decisions on TB care and control. This also contributed to a dialogue between national and international technical partners, civil society groups, affected populations and populations at greatest risk, the NTP, the Country Coordination Mechanism and the TB working group in Azerbaijan.

Potential for scaling up and future areas of development

This experience will be shared with other TB NGOs working in the country.



KYRGYZSTAN

Improving TB infection control

Background

In 2012, there were 42 cases of TB among the staff of health care facilities in Kyrgyzstan, an important indicator of ongoing TB transmission. The national infection control guidelines and activities recommended by the health epidemiology services and applied in TB facilities up to 2012 were thus not in accordance with the latest international recommendations on prevention of TB transmission. In TB hospitals, there was generally no appropriate separation of patients with DR- and DS-TB or between smear-negative and smear-positive patients. Consultation rooms and nurse stations were inside TB wards, where the risk for infection was very high. Respirators for staff were available but were not used correctly, and surgical masks for patients were not used at all. It was clear that urgent measures had to be taken to improve control of TB infection.

Health system challenge

National infection control guidelines were not in accordance with the international recommendations. Therefore, administrative, environmental and personal respiratory protection activities in TB facilities were inexistent or poorly organized.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In 2012, a working group on infection control was established with assistance from the United States Agency for International Development (USAID) TB CARE I project. The members of the group were representatives of the Republican Centre for Infection Control, the Health Epidemiology Service and the NTP. The first task of the group was to prepare national TB infection control guidelines. The leading specialist of the working group was trained at an international course for TB infection control consultants and mentored by joining one of the TB infection control technical visits. KNCV Tuberculosis Foundation provided technical assistance and reviewed the guidelines to ensure their compliance with international standards, including WHO recommendations. Subsequently, the guidelines were approved by the Ministry of Health and distributed to all TB facilities.

TB infection control interventions were first tested at seven pilot sites, which were facilities at different levels of health care: national, provincial, municipal and a rehabilitation centre. Training in TB infection control and a workshop were organized for 126 staff members from these facilities. During the workshop, participants prepared draft TB infection control plans for their facilities, which were finalized and approved by the facilities' administrations within two months of the workshop. KNCV specialists visited the facilities to give supportive supervision and continued training in applying the guidelines.

Each TB infection control plan was budgeted, and, through the Ministry of Health, the facilities obtained funds from various grants to ensure implementation of TB infection control interventions. Administratively, the facilities began separating patients on the basis of drug resistance patterns and infectiousness and introduced zoning into low- and high-risk areas. Quarterly staff screening based on clinical symptoms was introduced. The health care workers, who already had respirators procured by the Global Fund, began to use and store them properly, and the facilities procured "fit-testing" equipment and regularly tested their staff members in order to procure the suitable sizes and models of respirators. Monitoring checklists were prepared in collaboration with specialists from the Health Epidemiology Service to be used during their visits to TB facilities.

In the pilot project in 2013–2014 and at two training sessions in 2014 when the activities were rolled out at provincial level, 152 health care workers and 24 Health Epidemiology Service specialists were trained. All key staff members of the Health Epidemiology Service have now been trained, with two from each city and province. The experts were supplied with equipment to assess the effectiveness of environmental infection control measures, such as anemometers for extractor fans and radiometers for ultraviolet lamps. As knowledge on airborne infection control is not restricted to TB, the Health Epidemiology Service can apply it to other diseases spread through the air.

Outcomes

In each year (2013 and 2014), 24 cases of TB were diagnosed in health care workers. Personnel involved in TB infection control at the pilot sites reported significant improvements, including shorter delays in diagnosis of TB, proper separation of patients and installation of sputum collection rooms, in accordance with the guideline. The facilities reported improved respiratory protection practices by staff members and the use of surgical masks by patients.

Currently, all seven provinces, Bishkek and two national facilities have TB infection control plans. The infrastructure in several facilities was changed, and they began to hospitalize only DR- or DS-TB patients in order to decrease the risks for nosocomial infection.

Important factors for success

Work had to be done at the national level in order to create TB infection control guidelines, so that each facility could design a suitable legal and methodological framework. Involvement of different stakeholders in preparing the guideline sensitized them to the latest evidence-based

knowledge in TB-infection control and increased their commitment to use the guideline. Training for facility staff and preparation of a draft facility TB infection control plan at the workshop improved the staff potential and helped finalize the TB infection control plans once they returned to the work places, where they were additionally supported by technical assistance and supervision.

Ensuring sustainability

TB CARE I supported preparation of a national infection control regulation to enforce use of the TB infection control guideline. The regulation was adopted by the Ministry of Health in the second half of 2013 in a form of a decree, and experts at the Health Epidemiology Service started monitoring infection control measures in TB facilities. The TB infection control plans are updated yearly and are financed from the State budget through the new financing mechanism, which gives the NTP more flexible funding for use to maintain and continue improving TB infection control. Primary health care and other facilities previously supported by TB CARE I continue to receive USAID support through the Defeat TB project.

NETHERLANDS AND TURKEY

Role of NGOs as drivers of sustained country ownership of TB control

Background

NGOs have traditionally played a key role in TB control in many European countries. Their role changed during the past century, as national and local governments took up TB control tasks and service delivery. Many NGOs continue to contribute complementary support to TB control, such as advocacy, public information, training of professionals and guideline development. We describe how the role and financing of two European NGOs in TB control evolved during the past century in their respective countries (The Netherlands and Turkey).

Health system challenge

The Dutch and Turkish contexts are distinct from those of more centrally organized European countries, where TB control is usually implemented by the government, often through NTPs. We suggest that countries with a high TB incidence could benefit from stronger involvement of NGOs and other civil society organizations in TB control.

KNCV Tuberculosis Foundation, the Netherlands

The KNCV Tuberculosis Foundation is an NGO founded in 1903 as NCV, the “Nederlandsche Centrale Vereeniging tot bestrijding der tuberculose” (Netherlands Central Association for TB Control). At that time, private TB control associations existed in all the large cities and provinces of the Netherlands to support patients in need. NCV’s role was to coordinate and support these activities nationally. By 1930, the local TB associations had organized 130 TB clinics in their communities. These were financed by local and national public fund-raising activities as well as legacies and endowment funds.

In 1953, the K (Koninklijk) was added to the name of the organization when it received royal status. In that year, KNCV also established a multidisciplinary committee for policy and guideline development (Committee for Practical TB Control), which is still the body that makes policy. In the 1980s, when TB (and infectious disease) control became the responsibility of local government, the activities of local and provincial TB associations were transferred to munic-

ipal public health services. At present, 25 municipal public health services provide the TB services that are within the domain of public health service. In response to the decrease in the number of TB patients, the supporting infrastructure for TB public health clinics is increasingly being centralized.

Ensuring sustainability

At its centennial celebration in 2003, KNCV merged with fund-raising bodies such as the Emma Collection and Christmas seal sales, and its name was changed to the KNCV Tuberculosis Foundation. To formalize the public health responsibility and authority in 2005, the Government established the Centre for Infectious Disease Control at the Institute for Public Health and the Environment, which includes TB in its mandate. The KNCV Tuberculosis Foundation and the Centre agreed on a new division of tasks, in which the Foundation handed over the National Tuberculosis Register and surveillance to the Centre; the Foundation continued to support guideline development, quality policy and coordination and technical advice, financed by the Government. The Foundation also receives financial support from the Friends Lottery, the Lotto Lottery and through private fund-raising, for complementary support of TB control, such as training, health information leaflets, the *Dutch Tuberculosis Journal* and advocacy.

From the mid-1990s, the KNCV extended its activities to other countries in Europe and to Africa and Asia, thus evolving into a leading global TB organization. In Europe, the KNCV and the International Union against Tuberculosis and Lung Diseases organized the first Wolfheze Workshops in 1991. These now take place every other year, organized jointly with the WHO Regional Office for Europe and the European Centre for Disease Prevention and Control.

Since 2000, the KNCV Tuberculosis Foundation has led the Tuberculosis Coalition for Technical Assistance, a coalition of international organizations in TB control. In 2014, KNCV, as lead of the coalition, was commissioned by the USAID for the fourth consecutive time to implement their 5-year programme on global TB control, Challenge TB.

TB associations, Turkey

The Fight against Tuberculosis Society was founded in 1918, during the Ottoman Empire period. The association has issued publications on TB and, at some stages, also provided treatment for TB patients by establishing two dispensaries in Istanbul. In 1920, after the First World War and the subsequent occupation of Istanbul, the association was obliged to stop its activities. In 1923, TB associations were founded in İzmir and Balıkesir in western Turkey. The Tuberculosis Association in Istanbul was rebuilt in 1927. By 1948, 48 local TB associations had been established, and the National Tuberculosis Association was founded. The number of associations reached 222 in 1980 and decreased to 120 in 2014. The name of the national association was changed in 1987 to the National Federation of Tuberculosis Associations.

TB associations were established mainly to provide outreach and support to TB patients. Another mission is to ensure financial and social support for provincial TB dispensaries. Large urban associations, such as those in Istanbul, Ankara, Antalya, Adana and Konya, also operate TB dispensaries and TB laboratories. Of the 133 dispensaries in 1965, 46 were operated by associations; by 1980, only 33 of the 257 dispensaries were operated by associations. Now, 16 dispensaries are still run by associations; 12 of these are in Istanbul.

Associations also have a role in training the personnel of TB dispensaries. The Turkish Federation of Tuberculosis Associations organizes a national congress every 2 years. The Federation and the major associations are members of the permanent advisory committee of the Turkish TB control programme.

Ensuring sustainability

In acknowledgement of their role, the TB associations receive financial assistance from municipalities, which supplements traditional fund-raising activities. According to Law No. 6237, issued in 1948, 10% of the taxes that municipalities levy on entertainment activities such as cinemas and horse-racing is given to the TB association of the province.



*"TB disease is not finished. We continue to fight"
Istanbul Tuberculosis Association*

The Law also states that if there is no association in a city, the money must be spent directly on TB patients. This Law remains in force and is an important source of revenue for TB associations, especially those in large cities like Istanbul.

According to Law No. 5368, enacted in 1949, the Ministry of Health is authorized to provide monetary and in-kind assistance to TB hospitals and dispensaries operated by associations, to help them continue their activities. The Ministry of Health is authorized to send doctors, nurses, pharmacists and laboratory assistants to these institutions as deemed necessary.

Potential for scaling up and areas of development

The experiences of these two countries demonstrate how NGOs and government TB services can work together synergistically and sustainably for TB care and control. Countries with high incidences of TB may benefit particularly from this model, as seen in many countries that received support from the Global Fund during the past decade. These countries should consider continuing such collaboration after Global Fund funding ends, e.g. by contracting out TB control services to NGOs and other civil society organizations.

RUSSIAN FEDERATION

High-level working group on TB¹

Background

International cooperation contributes significantly to the control of TB in the Russian Federation, with the introduction of forward-looking international strategies at national level. International cooperation facilitates exchanges of knowledge and experience between TB specialists; it provides access to information on modern international standards, scientific literature and reviews and presents opportunities for Russian TB specialists to take part in international conferences and seminars and receive the support of international experts at local and federal levels.

Health system challenge

In view of the value of international cooperation, a platform was needed in the Russian Federation to more effectively facilitate discussions between Russian and international specialists on strategies and for exchange of experience in TB care and control.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

A high-level working group on TB was set up in August 1999 in a joint initiative of the Ministry of Health of the Russian Federation and WHO. It was established as a joint international coordination and advisory body to serve as a platform for constructive dialogue between Russian and international specialists and for drafting recommendations on strategies and tactics for TB control in the Russian Federation.

The group has facilitated effective communication, promoted coordination of activities between Russian and international experts on provision of TB care, taken part in TB control in the Russian Federation, defined priorities in accordance with the Stop TB strategy and made recommendations on policies and practices in TB control, including MDR-TB and TB/HIV co-infection.

The high-level working group currently comprises representatives of the Ministry of Health of the Russian Federation, the Federal Penitentiary Service, the Federal Service for Health Care and Social Development, the Federal Service for Consumer Rights and Welfare, the Central Tuberculosis Research Institute, the federal research institutes for phthisiopulmonology and TB, the Central Research Institute for the Organization and Computerization of Health Care and WHO (headquarters, the Regional Office for Europe and the WHO Country Office in the Russian Federation). Representatives of the Ministry of Health and WHO chair the group's plenary sittings on a rotating basis.

The practice of the group consists mainly of joint discussions by experts and the authors of regulatory and methodological documents on the organization of activities for TB prevention and early detection, improvement of TB care, including algorithms, laboratory methods and radiological TB diagnosis, optimization of TB chemotherapy regimens with antimicrobial and TB drugs, the organization of health and anti-epidemic activities in TB facilities, epidemiological surveillance and monitoring of TB, including its DR forms, professional training of specialists and awareness-raising. The group also addresses the provision of social protection to TB patients and analyses international experience. At present, the group is preparing recommendations and proposals for activities for controlling MDR-TB, XDR-TB and TB/HIV co-infection.

Outcomes

Effective partnership of Russian and international organizations within the high-level working group resulted in joint projects, such as the establishment of centres of excellence in several regional TB services, the design and introduction of a monitoring system, selecting the best models of TB care in penitentiaries and the civil sector and the provision of psychological and social support to increase adherence to treatment. The group made a substantial contribution to the current national recommendations on TB chemotherapy, approved by the Ministry of Health. Three laboratories in federal research institutes were designated as centres of

¹ Adapted from Gabbasova LA, Pashkevich DD. Fifteen years of successful cooperation between the Ministry of Health of the Russian Federation and WHO: the high-level working group on tuberculosis in the Russian Federation. Public Health Panorama 2015;1.

excellence in the network of supranational reference laboratories. In accordance with recommendations of the 24th meeting of the group, measures have been taken to improve the provision of social and psychological support to TB patients to ensure their adherence to treatment. The efficacy of the work will be evaluated, and sustainable models for improving treatment adherence will be developed.

In accordance with the End TB Strategy, adopted at the Sixty-seventh session of the World Health Assembly, and the TB Action Plan for the WHO European Region for 2016–2020, which is being prepared, an immediate task of the high-level working group will be improvement of activities for early

detection, diagnosis and care of M/XDR-TB and TB/HIV, optimization of reporting forms, designing a unified, case-based TB case registration system and prevention of TB and HIV infection in migrants.

Ensuring the sustainability of the project

A distinctive feature of the high-level working group is the sustainability of its work, as it has stood the test of time, with the support of the Ministry of Health. The group serves as a platform for discussing new evidence-based knowledge and generalization and implementation of accumulated Russian experience in TB and MDR-TB control. This model may be recommended for use in other countries of the Region.

RUSSIAN FEDERATION

Comprehensive reform of diagnosis and treatment of M/XDR-TB in Voronezh region

Background

During the last decade of the 20th century, the Russian Federation witnessed an increase in TB incidence throughout the country. The Voronezh region is no exception, having experienced a twofold increase in the TB incidence rate, from 36.7 per 100 000 in 1990 to 73.9 per 100 000 in 2000, and an increased mortality rate, from 5.5 per 100 000 in 1990 to 11.9 per 100 000 in 2000. By 2005, the TB incidence rate had decreased to 53.7, but the mortality rate had increased to 14.9 per 100 000 population.

The prevalence of MDR-TB also increased, having doubled over the past 5 years, from 14.9 per 100 000 in 2009 to 27.5 per 100 000 in 2015. Cohort analyses indicate that the rate of MDR-TB cases has also doubled, among both new cases (from 14.6% in 2009 to 30.0% in 2014) and relapsed cases (from 26.4% in 2009 to 57.1% in 2014).

Difficulties in drug supply, prescription of inadequate chemotherapy regimens and insufficient social support for patients are some of the reasons for the increase and wide distribution of MDR-TB. In addition, the poor material and technical infrastructure of the TB laboratory service limited detection of drug resistance in *M. tuberculosis*. External quality control of drug-susceptibility testing was only partial, and use of the concentration method resulted in three months of “blind” therapy while waiting for test results. The social significance of TB persists, creating additional difficulties for timely diagnosis and continuous treatment. The numbers of socially disadvantaged, unemployed patients with newly diagnosed TB who are in need of additional social support remains high. As a result, in 2010, the treatment success rate among new smear-positive TB cases was only 66.1%.

Health system challenge

Given the complexity and array of the barriers to TB control in the Voronezh region, a multi-pronged approach to reform MDR diagnosis and treatment was necessary.

Good practices in health system strengthening to improve prevention and care of M/XDR-TB

Several interventions were introduced to address the rising TB incidence in the Russian Federation, which can be grouped into six categories.

Improving health sector governance and the inter-sectoral approach to TB control

The centralized administration of the region increased control of all TB control activities by introducing the most effective management at all levels of the health care system. In 2010, a unified regional consilium for MDR-TB patients was created.

The region also established an interagency committee on TB control. A decree of the government of Voronezh region in 2002 called for a regional interagency committee on TB control, chaired by the first deputy head of the government. This improved coordination of activities among the regional offices of various agencies to ensure early TB detection, especially in at-risk groups, and continuity of treatment for all TB patients. The committee was instrumental in coordinating the work of the health care system and of other services of the region for timely detection, treatment and provision of social support to TB patients and individuals in high-risk groups. The sectors engaged included the penitentiary and judicial sector, the social protection sector, labour and employment, migration, sanitation and education.

Pursuing innovative, evidence-based technologies

The region has introduced modern medical technology for the diagnosis of TB and modern, high-quality tests for TB in order to ensure timely selection of the optimal chemotherapy regimen. In 2010, modern approaches to TB diagnosis and treatment were introduced, which included increasing the availability and quality of bacteriological testing for TB by means of an automated system (BACTEC MGIT960). Evidence-based national standards for TB treatment were introduced, as was directly observed treatment (short-course) (DOTS). In 2010, a harmonized regional MDR-TB monitoring system was created. The access of MDR-TB

patients to new high-quality TB drugs also increased, partly due to the work of the Green Light Committee project. In 2010, the project provided high-quality second-line drugs for 140 MDR-TB patients in the general population and 10 in penitentiaries. In 2012, rapid diagnostic molecular genetic tools were introduced (real-time polymerase chain reaction and GeneXpert).

In 2014, a program for monitoring treatment and ensuring continuity of services was introduced. This program, PATIENT, which is used to aggregate and regularly update data on each TB patient, can be accessed by medical staff to record daily diagnostic findings, medical and social risk factors, and administered treatments. The program allows timely detection of changes in patient adherence and helps medical staff to take pro-active measures to prevent treatment failure.

Scaling up infection control in the TB facility

In 2010, infection control measures were introduced into the TB facility, with proactive isolation of infectious patients, a bacteriological laboratory, procurement of modern bacteriological ultraviolet radiation machines and biosafety cabinets, use of respirators when working with smear-positive patients, and training of medical staff and patients on infection control measures.

Reorganization of services to increase the responsiveness of the system

The region has introduced a more patient-oriented approach, extension of the range of outpatient care and use of non-traditional places of treatment to improve patients' adherence. The region introduced three inpatient departments with 220 beds for the intensive phase of chemotherapy for MDR-TB. In parallel, the region adopted and scaled-up patient-oriented outpatient treatment for MDR-TB in the continuation phase.

In 2013, comprehensive organizational approaches to TB treatment were introduced with the AVRAL project. Rapid TB diagnosis with cartridge-based technology before initiation of chemotherapy was introduced to reduce the time between detection of symptoms and diagnosis to 72 h, to initiate suitable chemotherapy regimens, help isolate the flow of infectious patients and reduce the risk for exposure to DR-TB. The region has introduced a new protocol in which all new smear-negative cases are isolated in a department of the TB dispensary until their culture results become available. The department has a block of five rooms (16 beds) that serves as a "triage unit" for patients from the admissions department, who are tested with GeneXpert, for 12–24 h.

On the basis of GeneXpert rifampicin resistance, patients are then admitted to one of the five therapeutic inpatient departments of the TB dispensary, for:

- » differential diagnosis,
- » new rifampicin-susceptible TB cases,
- » rifampicin-susceptible re-treatment cases,
- » new rifampicin-resistant cases and
- » rifampicin-resistant re-treatment cases, with two separate rooms for XDR-TB cases.

Scaling up social support for patients

The region has scaled up social support for TB patients with the involvement of international partners, which contributes to reducing treatment loss-to-follow-up rates. Efforts have been focused on socially disadvantaged groups of patients. In rural settlements, staff at general health care facilities and TB dispensaries conduct DOTS in day-care facilities, at home and in TB offices. Since 2011, the options for where patients can receive DOTS have increased: it can now be accessed in medical examination rooms, where nurses distribute TB drugs, at home by district nurses on a daily basis (except Sundays), through the Nursing on Wheels programme, in any of the four city polyclinics by general health care nurses or within the Support project, which works with the most difficult patients in high-risk groups.

Since 2014, TB services have been cooperating with the social services of the region to extend the possibilities for social support for TB patients. Two medical–social support cabinets have been opened at the regional TB dispensary.

Engaging the media to promote population awareness

TB services have begun to conduct campaigns to increase awareness of the TB situation in the region, of modern approaches to TB prevention and of detection and treatment options. These have included speeches on central TV and radio and round tables with journalists and media representatives. In 2014, with support from the Eli Lilly M/XDR-TB Partnership, a photography exhibition "Your health is in your hands" was organized in one of the largest regional trade and entertainment centres.

Outcomes

As a result of these reforms, coverage of TB patients with Xpert MTB/RIF testing increased. Over 19 months (May 2013–December 2014), coverage of patients admitted to the dispensary reached 99.4% (1383 of 1392 patients who were tested), including 91.8% (1268 patients) tested within the first 2 days after admission. Bacilli excretion was diagnosed in 42.4% (586 patients) of tested individuals, including

39.8% (233 patients) with rifampicin-resistant TB, who were prescribed adequate MDR-TB treatment within the first 3 days. The rate of confirmation of rifampicin susceptibility on liquid media was 99.5%, and the rate of confirmation of rifampicin resistance was 96.7%, both in conformity with the permissible technical parameters of the Xpert MTB/RIF analyser.

The treatment success rate in new smear-positive TB cases increased from 66.1% in 2009 to 76% in 2013, and the treatment success rate among DS-TB cases increased from 80.6% to 84.0% during the same period. The treatment loss-to-follow-up rate was reduced by a factor of two (from 4.8% in 2009 to 2.9% in 2013), and the aggregated rate of transferred out and loss-to-follow-up was reduced from 7.8% to 4.8%.

The treatment success rate in TB risk groups also increased. In the Support project, the treatment success rate was 88.7% among people who abused alcohol, 80.0% among ex-prisoners and 73.5% among patients who had interrupted their treatment more than once. The MDR-TB treatment success rate increased by 25.4% between 2010 (33.5%) and 2012 (42.0%). In the Support Project, the MDR-TB treatment success rate was 79%.

The epidemiological situation of TB in Voronezh region improved between 2010 to 2014:

- » The rate of TB relapses fell by a factor of two.
- » The TB incidence fell by a factor of two, from 53.7 per 100 000 in 2010 to 25.4 per 100 000 in 2014.
- » TB prevalence in the region was decreased by 42.7%, from 126.9 per 100 000 in 2010 to 72.7 per 100 000 in 2014; in comparison, the rates are 22.6% in the Russian Federation and 31.5% in the Central Federal District.

- » The prevalence of smear-positive TB has been reduced by 49.7%, from 68 per 100 000 in 2010 to 34.2 per 100 000 in 2014; by comparison, the rates are 22.1% in the Russian Federation and 35.2% in the Central Federal District.
- » The prevalence of MDR-TB was reduced by 40.7%, from 27.5 per 100 000 in 2005 to 18.8 per 100 000 in 2014, whereas the Russian Federation has seen an overall increase of 13.2%; the prevalence was reduced by only 15.4%.
- » In 2014, the TB mortality rate decreased by a factor of two, to reach 5.2 cases per 100 000 population.
- » The TB incidence among the staff of TB facilities decreased from 440.5 per 100 000 in 2009 to 51.3 per 100 000 in 2014. Since 2013, the beginning of the AVRAL project, no TB cases have been registered among staff of the TB dispensary.

Important factors for success

The comprehensive approach described above to reform the organization of TB control activities resulted in a sustainable model and attained the region's main goal of reducing the TB and MDR-TB burden. This has increased the region's likelihood of reaching and further improving on the targets of the Russian State Programme for Health Care Development for 2014.

Ensuring sustainability

The commitment of the regional administration to integrating the approach into its strategic directions and health system performance indicators will ensure not only its long-term sustainability but also further improvement. Proactive approaches by the service that coordinates and monitors all TB control activities in the region will be vital for successful implementation and development of the practice.

TAJIKISTAN

A national, multi-stakeholder coalition to fight TB more effectively

Background

The civil society organization Young Generation of Tajikistan started work in TB in 2013 and conducted a stakeholder analysis of TB organizations. Many strong national and international partners were identified, but an absence of coordination and lack of focus was found in the work of many organizations. Many projects assured services for TB prevention and treatment, but advocacy, patients' rights, reducing stigma and discrimination and organizational capacity-building were addressed insufficiently.

Health system challenge

The gap between health care workers and civil society organizations and activists meant that decision-makers were not always aware of the needs of patients. All the stakeholders admitted that coordination was lacking and that it was important that someone take the lead.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

A five-day regional network meeting on TB in April 2014 was organized by Alliance Ukraine and the TB Europe Coalition, with the support of the German Corporation for International Cooperation (also known as GIZ), to strengthen the capacity of civil society in 12 countries of eastern Europe and central Asia. The objectives of the meeting were to help activists and civil society organizations to network and to learn to participate more effectively in the Global Fund processes for MDR-TB. It was an opportunity for Young Generation of Tajikistan to meet a former MDR-TB patient from the country. They discussed the absence of an institutional approach to organizing TB patients, their families and other TB-affected populations. They decided to work together to engage former TB patients in the TB response.

With the assistance of project HOPE in Tajikistan, the Young Generation of Tajikistan and patients' representatives were shown over the Republican TB Centre (of the NTP), which welcomed their interest. They decided to start informally, not to create a legal entity right away, on the basis of lessons learnt during previous unsuccessful experiences. A

draft regulation or charter and a memorandum were drawn up with the advice of technical experts, who volunteered to help lay the foundation for the future partnership. It was decided that the partnership would focus on gaps such as coordination among TB stakeholders and the involvement of (former) TB patients, in order to avoid duplicating other programmes. Quality Project (USAID) helped the group to conduct a meeting on 30 July 2014, where 76 representatives of TB patients, their families, TB civil society organizations and the mass media decided to form Stop TB Partnership Tajikistan.

The structure of the Partnership includes a secretariat, the lead organization of which rotates every 2 years. The Partnership has a Council consisting of 32 people affected by TB and civil society organizations working on TB; the supreme body of the Partnership is the general meeting. Government organizations and the Country Coordinating Mechanism are also members of the Partnership.

The Partnership asked for and received technical assistance from the global Stop TB Partnership to participate in national strategic planning for TB and in preparing the TB concept note. Stop TB Partnership Tajikistan also conducted training in patients' rights, gender issues in TB and the new funding model. The Partnership collected information on the needs of TB-affected communities and prepared recommendations for the Global Fund concept note. The main recommendations were to include TB patients in monitoring implementation of the grant and to use the community systems strengthening-community response module to strengthen the capacity of civil society to implement TB activities.

Stop TB Partnership Tajikistan thus participated in preparation of the Global Fund grant concept note. One important change from the previous grants, which was proposed and accepted by the Country Coordination Mechanism, was to increase the amount and the duration of the grants to civil society sub-recipients. Previously, the average duration of the grants was 8 months, which did not give enough time

to complete TB treatment, limiting the effectiveness of the work of the civil society sub-recipients. After a course on grant writing held for Partnership members, one large proposal was prepared for addressing stigma and discrimination of TB-affected people and treatment adherence. The last of three courses was on strategy development, so that TB organizations could assist the Partnership's members in strategic and operational planning. This technical assistance project was useful for reviewing the goals and objectives of the Stop TB Partnership Tajikistan; as a result, it was decided to focus more on coordination and community mobilization.

Outcomes

For community mobilization, Partnership members created an action committee made up of several former TB patients from various regions of the country. Their work will be supported by local fund-raising activities. The action committee's primary task is to monitor implementation of the TB response and to collect regular information on the needs of patients throughout the country. Partnership members regularly exchange information to promote coordination. The strategic plan of the Partnership will be finalized at the next general meeting.

Important factors for success

The initiators of the Stop TB Partnership Tajikistan were united by one goal: to join efforts to cater to the needs and

improve the services provided to the people and communities affected by TB. Mutual support was an important factor in its success; former patients started to help patients who were still on treatment. Organizations working on the TB response that already had funding supported the Partnership voluntarily; e.g. the NTP offered its premises, information material and stationery for training.

Ensuring the sustainability of the project

The civil society organization Young Generation of Tajikistan will fund a paid staff member to assist the voluntary Partnership secretariat in strengthening communication and coordination among its members. The sustainability of the Stop TB Partnership Tajikistan depends on the ability of its leadership to motivate and guide the volunteer members. The example of local funding and membership-based funding of the action committee will be extended in order to achieve sustainability without relying on external donors.

Potential for scaling up the project and future areas of development

Future plans include training and mobilizing volunteers to engage in active case finding in communities, to help TB patients adhere to treatment and to educate their families about TB, and building the capacity of the organizations working in TB control to achieve sustainable services for vulnerable groups.

UZBEKISTAN

Unified order: effective strategy for controlling M/XDR-TB

Background

In Uzbekistan, improvement of the care and prevention of diseases of public health significance, including TB, is an important item on the political agenda and an important area of the work of health care institutions. In view of the losses to the national economy due to TB and the social determinants of the spread of TB, a significant step was taken to reduce transmission of this disease. The leaders of the country and the Ministry of Health made TB control a top priority.

The epidemiology of TB worsened at the end of the past century, in Uzbekistan and worldwide. Thus, in 2001, the incidence of TB had increased from 57.5 to 79.2 cases per 100 000 population, and TB incidence and mortality rates peaked in 2002. A law on protection of the population from TB (2001) and a strategic programme to prevent and reduce the incidence of TB in 2003–2008, endorsed by the Emergency Anti-epidemic Committee, resulted in certain progress in reducing and stabilizing TB indicators. Despite this progress, by 2010 the epidemiological situation was alarming, with many unresolved issues facing the TB service. Dispensary classification was cumbersome, with long periods of observation; patients who had had TB received seasonal chemoprophylaxis; and health norms and regulations did not comply with TB infection control requirements. There was no unified algorithm for detecting DS and DR forms of TB, and no diagnosis or care standards for M/XDR-TB were available.

Health system challenge

Before issuance of statute no. 62 on additional measures to reduce the TB incidence in Uzbekistan in 2011–2015 by the Cabinet of Ministers in March 2011 and endorsement of the State Programme for TB Control for 2011–2015, there had been no regulatory documents that complied with current standards and no unified standard for the responsibilities, skills or knowledge of TB physicians. Furthermore, the work of physicians in TB services was not systematized. The working procedures at all TB facilities therefore required urgent revision, as did the available regulatory documents, which often contradicted each other.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

A unified regulatory document that reflected the WHO Stop TB strategy, 2011–2015, was therefore required for the provision of TB care for the population of Uzbekistan. Pursuant to the law on protection of the population from TB within the State programme adopted by statute No. 62 of the Cabinet of Ministers on additional measures to reduce the incidence of TB, the Unified Order on Improvement of TB Control in Uzbekistan was issued, in cooperation with international partners and with the technical support of WHO. The Unified Order contains 22 annexes that define in detail the approaches to TB prevention, diagnosis, management and care.

The Unified Order:

- » complies with international standards based on WHO clinical guidelines and takes into account new WHO definitions;
- » defines new norms and regulations for TB facilities, including infection control requirements;
- » provides a new algorithm for TB detection in primary health care facilities, with an expanded bacteriological component of TB diagnosis;
- » harmonizes TB case recording, with subdivision into new and re-treated cases, simplifies the classification of cases and shortens the duration of observation for each group;
- » provides protocols for managing individuals at risk for TB in the primary health care system, with activities and their frequency;
- » suggests novel approaches to management of TB in children, including vaccination of newborns with bacille Calmette Guérin (BCG) and use of modern diagnostic equipment for timely TB diagnosis and care in accordance with new paediatric regimens and doses of TB drugs;
- » suggests new principles for preventive treatment of TB contacts and HIV-infected individuals (discontinues seasonal chemoprophylaxis and preventive therapy for TB risk groups);

- » provides new approaches to ensuring universal access to treatment of DS and DR forms of TB, with greater use of outpatient care, use of a shortened, 9-month regimen for DR-TB in a pilot region and testing of new drugs in M/XDR-TB treatment;
- » provides unified criteria for work permits for individuals who have had TB;
- » establishes a system for performance monitoring and evaluation of health facilities at all levels of the TB service; and
- » provides for organization of health education and awareness-raising activities, including advocacy, communication and social mobilization.

Outcomes

The revision of certain statutes and of the regulatory framework for TB services represents a new stage in TB control in Uzbekistan, resulting in standardization of epidemiological TB indicators for ultimate elimination of this dreadful disease.

The new regulatory framework will promote use of the updated diagnostic algorithm for detection of TB, including its M/XDR form, by rapid detection of *Mycobacterium tuberculosis* and its resistance patterns, separating patient flows in strict accordance with infection control requirements and early initiation of adequate treatment. It will also ensure that primary health care physicians follow the diagnostic

algorithm, focusing on laboratory examination of sputum samples.

Universal access to diagnosis and treatment for smear-positive TB, including DR-TB, will prevent further spread of all forms of the disease in Uzbekistan.

Important factors for success

Every TB physician is professionally responsible for abiding by the Unified Order, with interagency collaboration of primary health care, AIDS and health epidemiology services.

The Unified Order abrogates outdated regulations, provides a full legal basis for universal access to diagnosis and treatment of DS and DR forms of TB and will promote prevention of the spread of M/XDR-TB in Uzbekistan.

Ensuring sustainability

Since the Unified Order was issued in October 2014, the Ministry of Health and NTP specialists have been implementing it by broad training, organized with the technical support of WHO and other partners, thus increasing the sustainability of the new regulatory document. The sustainability of practice is ensured by State funding for building and rehabilitating TB facilities to meet TB infection control requirements and also by a gradual transition to State-funded procurement of TB drugs.

ARMENIA

Reforms in financing mechanisms to strengthen inpatient and outpatient TB services

Background

TB is one of the main public health problems in Armenia. Its development and transmission, including MDR and XDR forms, present a major medical and public health threat. DR-TB is the result of uncontrolled or suboptimal treatment, and nosocomial infection often facilitates its transmission.

As in other countries of the former Soviet Union, most TB services are delivered as inpatient care. A study of TB services in Armenia in 2013 showed that more than 65% of cases were detected in inpatients, and almost 95% of all TB patients were admitted to hospitals during the intensive phase of chemotherapy; in 2014 in Yerevan, the hospital admission rate was 74.4%.

Most hospitalized patients did not meet the WHO criteria for hospital admission. This was due mainly to the financing mechanisms for TB care in Armenia: payment for outpatient TB services was based on the size of the population served (capitation standard rate), whereas payment for inpatient TB services was based on the number of bed-days, which could not exceed the approved treatment cost per case. This system encouraged hospital admission for most patients and a maximum hospital stay, as the cost per bed-day included not only the cost of treatment (drugs) and food for patients but also other services, such as remuneration of health providers and other staff, cleaning and other expenses.

Health system challenge

As a result of the excessive hospital admission, in 2013, about 80% of TB funding was allocated for inpatient services and only the remaining 20% for outpatient services. This resulted in underestimation of the role of outpatient services in TB diagnosis, treatment and prevention and under-utilization of this potential. Reorganization of the administration, human resources and finances for TB services was therefore needed.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

To address these problems in TB services, new criteria for hospital admission and discharge were introduced in 2014,

with new financing mechanisms for both inpatient and outpatient TB services.

The new financing mechanism for hospital TB services involved division of fixed hospital expenses and variable expenses (additional funding for each patient) and was put into practice on 1 October 2014. The basic or fixed hospital costs include the salaries of medical staff and other hospital personnel and no longer depend on the number of hospitalized patients, thus decreasing the incentive of health providers to maximize the length of hospitalization. The new criteria for hospitalization, in accordance with WHO recommendations, include admission only of new smear-positive TB cases, relapses or MDR/XDR-TB up to bacteriological conversion, and smear-negative heavy or widespread forms of pulmonary or extra-pulmonary TB. Other TB patients who may be hospitalized are those with co-infections or co-morbid conditions, such as HIV/AIDS, diabetes, peptic ulcer disease or chronic obstructive pulmonary disease, complicated cases of TB, pulmonary heart, kidney or liver failure, and cases that require surgical intervention. Patients with presumptive TB are hospitalized only if the diagnosis is difficult or requires invasive endoscopy. This approach has minimized the number of inpatients and shortened their hospital stay.

To strengthen outpatient services, regularize financing of these services and strengthen the incentive of health care providers, per capita financing was replaced by financing based on performance indicators. This approach requires reorganization of the administration of TB services. The first step will be to eliminate the 47 hospital beds in Yerevan and then to create a single outpatient centre at the Yerevan TB Dispensary and units for continuous outpatient treatment with DOTS by health care providers.

Outcomes

As a result of the reorganization of the financial system, 656 fewer TB patients were admitted to the National Centre for Tuberculosis in 2014 than in 2013 (4447 patients; 87 570 bed-days), and the number of bed-days was reduced by

21 759. In 2014, the average duration of hospital stay was 17 bed-days. This approach saved US\$ 58 082. Comparison of the hospital admission rate, bed occupancy rate and funding in the first half of 2015 with corresponding data for 2013 and 2014 demonstrated further reductions of 887 hospital admissions, 595 bed-days and an average hospital stay of 19 days. As a result, savings in the first half of 2015 amounted to US\$ 28 726 in comparison with the same period in 2013. Thus, not only hospital admissions and bed occupancy but also expenditure associated with hospitalization of patients were reduced in January–June 2015 in comparison with the same period in 2013 and 2014.

Important factors for success

The effectiveness of the new system depends directly on more active screening for TB, the provision of skilled care in

outpatient settings and strict compliance with the criteria for admission and discharge of patients from hospital.

Ensuring the sustainability of the project

Changes introduced in accordance with WHO recommendation for reducing the number of unjustified hospital admissions of TB patients resulted in greater financial efficiency, allowing allocation of resources for improving TB services and reducing potential nosocomial TB transmission.

Potential for scaling up the project and future areas of development

To evaluate the impact of the new model of financing on the quality of care, further analyses should be conducted, and administrative and staff reorganization should be undertaken in TB services.

BELARUS

Pilot implementation of a financial model of reallocation of funding for inpatient care to outpatient care of patients with TB in remote rural areas in Mogilyov region

Background

Between 2009 and 2014, national notification data indicated positive epidemiological indicators for TB, the incidence rate having decreased by 26.5%, from 45.9 to 33.8 per 100 000 population. The potential financial saving to be achieved by reducing the number of beds in TB facilities has not, however, been realized, for two reasons. The first is that funding for TB services would be reduced as it is currently paid per number of beds; the second is lack of a mechanism for paying supplementary benefits to primary health care providers and social support to outpatients. The result is that TB patients have clinically unjustifiable hospital stays, and vulnerable groups of TB patients residing in remote rural areas are more likely to be lost to treatment follow-up.

Health system challenge

In Belarus, as in many countries in the Commonwealth of Independent States, financing of hospitals is based on the number of beds, resulting in unnecessary hospitalization. A better solution to the problem of DR-TB would be to use the funding to motivate health care workers and improve adherence of patients to treatment.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

After a workshop held in November 2013 with support from the WHO Regional Office for Europe, a pilot project was set up to test a modified funding model. Money that became available after a reduction in the number of beds in one TB hospital would be used to incentivize health workers providing DOTS to outpatients in remote rural areas, following the example of Estonia.

The pilot project started on 1 April 2014, by order of the Ministry of Health, when the Mogilyov Regional Council of Deputies decided to pay incentives to health care workers from local budget funds secured by eliminating five beds at the regional TB dispensary.

A working group at the Ministry of Health, in consultation with the WHO Regional Office for Europe, prepared instruc-

tions on the continuity of care after patients' discharge from inpatient facilities, with standard contracts and reporting forms for accrual of supplementary benefits for primary health care workers delivering DOTS. The benefits were the equivalent of US\$ 1 per visit of a TB patient to the health facility and US\$ 4 for each home visit to a TB patient, taking into account the additional time and transport expenditure incurred by health care workers. Paying supplementary benefits was cheaper than a hospital stay, as a 1-day stay in the TB dispensary cost about US\$ 27.

Of the 13 patients enrolled in the pilot project, four had DS-TB (duration of treatment, 6 months), and nine had DR-TB (duration of treatment, 18–24 months). By 1 December 2014, three patients had completed category I treatment without treatment loss-to-follow-up. The success rate of treatment of new cases of pulmonary TB at 9 months was improved, from 62% in 2013 to 70% in 2014. Health care workers were better motivated to provide DOTS, receiving benefit payments of US\$ 40–120 per month. Between 1 April and 1 December 2014, about US\$ 11 000 had been saved.

The project increased the satisfaction of both primary health care workers, who received supplementary benefits, and patients, who could be discharged early from inpatient care. No treatment lost-to-follow-ups were recorded among the most vulnerable and complex category of patients, including those with alcohol dependence and those living in remote rural areas.

Outcomes

In addition to improving outpatient treatment funding, the pilot project strengthened health care, as additional funds were redistributed for targeted support to peripheral primary health care facilities. Financial compensation for the additional work involved in organization of DOTS helped to increase the satisfaction of primary health care workers, and patients welcomed transfer to outpatient DOTS early in the course of TB chemotherapy.

Important factors for success

The pilot project prevented interruptions of treatment in the most vulnerable groups of patients, due to collaboration between the Ministry of Health, the oblast executive council and the management and staff of the inpatient facility. Reallocation of finances is thus both efficient and favourable for treatment outcomes.

Ensuring sustainability

Progress in the pilot project was reported to the collegium of the Ministry of Health, and the board of the Ministry

recommended that the experience be extended to all the districts of at least one region of Belarus. In 2015, the Health Department of the Mogilyov Regional Executive Committee is planning to conduct the interventions of the pilot project in two additional districts, Bobruyskiy and Osipovichskiy. Funding for extension of the project in 2016–2018 had been incorporated in the concept note submitted to the Global Fund.



KYRGYZSTAN

Changes to the support of patients with MDR-TB

Background

The rate of success of treatment for MDR-TB in Kyrgyzstan in 2009 was only 42.6%, with a loss-to-follow-up rate of 33.8%. The full range of WHO-recommended tests could not be performed due to laboratory-diagnosed side-effects. Furthermore, outpatients had to purchase drugs for preventing and managing the side-effects themselves.

Health system challenge

The MDR-TB programme used up to 2012 did not achieve the goals set by the national health care system of Kyrgyzstan.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

The NTP, with support from the Global Fund, revised the programme and modified the mechanism of incentives for MDR-TB patients and health care workers, the procurement of drugs for prevention and management of side-effects and laboratory diagnosis.

Food parcels that had been purchased with grant money and distributed among MDR-TB patients, regardless of their adherence to treatment, were replaced by wire transfers of the monetary equivalent of the cost of food parcels to patients' bank accounts only if they had taken all the doses of TB drugs or had missed fewer than five doses with a plausible excuse. Patients who miss three to five doses without a plausible excuse lose the right to the incentive payment for 1 month, and patients who miss more than five doses without a plausible excuse are denied the right to incentive payments for 3 months. During introduction of the new methods to improve patients' adherence to treatment, all patients received money to cover the cost of travel to the health care facility.

Standard additional payments to all health care workers have been replaced by outcome-based payments. Programme managers receive additional payments for each TB case detected and for treatment outcomes. Targets have been set for all districts. If they are met at 80–100%, payment is made in full; if they are met at 60–80% or < 60%, the additional payment is 80% or 50% of the set value, respectively.

Attending physicians receive an additional payment for every case of sputum conversion and successful treatment outcome. The amount is increased if they have examined all sputum samples obtained during 1 month by smear microscopy, culture and drug-susceptibility tests (DSTs).

Adherence of MDR-TB patients to treatment depends strongly on access to diagnosis, prevention and management of side-effects. Therefore, external laboratories have been subcontracted to conduct the entire set of conventional biochemical tests recommended by WHO for monitoring MDR-TB patients enrolled in treatment. The procurement of drugs for the management and prevention of side-effects has also been changed, from cheaper bulk-packaged drugs to unit-of-use packaging, to allowed distribution not only to inpatient units but also to primary health care facilities for treatment of individual outpatients.

Outcomes

The treatment success rate of MDR-TB patients increased from 42.6% in 2009 to 62.7% in 2012, and the proportion of patients who were lost-to-follow-up on treatment dropped from 33.8% in 2009 to 16.4% in 2012.

Use of new instruments and the transition from food parcels to money transfers to patients' bank accounts not only increased the treatment success rate but also facilitated socialization of patients who had previously not had a passport or bankcard. Patients could decide for themselves how to spend the money transferred to their bank accounts.

Important factors for success

The key parts of the intervention were the conditional incentives given to patients, depending on adherence, and the performance-based benefits to health care workers.

Ensuring sustainability

The mandatory health insurance fund already uses the new practice of outcome-based funding for other diseases. It is therefore to be hoped that the TB-related initiatives will be sustained through institutionalization.



REPUBLIC OF MOLDOVA

Generating evidence on the effectiveness of incentives for improving health outcomes¹

Background

TB re-emerged as an important public health problem in the Republic of Moldova between 1990 and 2005, when the number of notified TB cases (new and relapses) doubled. While there has been a decrease in notified cases since 2005, the rate has been modest and slow. The incidence of TB in 2013 was estimated to be 159 (142–180) cases per 100 000. In addition, the problem of DR-TB has assumed alarming proportions and is increasing. Surveillance of drug resistance in 2014 showed that 24% of newly diagnosed and 64% of previously treated patients had MDR-TB, which were higher percentages than in 2006 (19% and 51%, respectively). During 2007–2011, the rates of loss to treatment follow-up among patients on first-line TB drug regimens were high, at 10–12%, and those among MDR-TB patients were even higher, at around 25%.² To improve treatment adherence, a system of incentives for patients after hospital care was introduced in 2009, with countrywide coverage (except in the Transnistria region) by the end of 2010. The incentives depended on the availability and source of funding (the Global Fund, the national health insurance company, local public administrations) and the type of patient (DS-TB, urban or rural residence, treatment phase).

Health system challenge

The system of incentives in the Republic of Moldova had to be assessed to guide the Ministry of Health in making an informed decision about improving effectiveness and sustainability.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

A study was conducted to assess the system of incentives by comparing the treatment outcomes of new adult patients (aged ≥ 18 years) with DS-TB who were registered for treatment before (2008) and after (2011) the introduction and

countrywide coverage of incentives. Given the variable implementation of incentives in 2009 and 2010, we chose 2008 as the control cohort to reflect TB patients who had definitely not receive any incentives. Patients in the Transnistria region and in prison were excluded because there was no system for giving them incentives during the study period; we also excluded patients found not to have TB after registration or found later to have MDR-TB.

Five types of incentive – “small” cash, “bigger” cash, vouchers for food or hygienic products, reimbursement of transport costs and other support – were given in four combinations and timings by the Global Fund and in six combinations by the national health insurance company; other support was provided by local administrations. The four combinations were “small” cash only, “small” and “bigger” cash, reimbursements and a combination of cash and non-cash incentives (including other support from local administrations). The patients in the “small” cash group received 315 MDL³ per month during outpatient treatment, which was stopped if they interrupted their treatment for ≥ 5 days. Patients in the “small” and “bigger” cash group received, in addition to the above, 1450 MDL (equivalent to an average monthly salary of a nurse) at completion of treatment. Patients were reimbursed for transport costs or received vouchers daily if they lived in an urban area or monthly. Some patients received a mix of all the incentives, and 12 patients also received “other support”, such as clothes and firewood, as decided by the local administration.

Outcomes

Of 2378 patients registered in 2011, 1895 (80%) received incentives (cash, food vouchers, travel reimbursement). In comparison with 2492 patients who received no incentives, in 2008, those registered in 2011 had a higher treatment success rate (88% vs 79%; $p < 0.001$) and lower rates of unsuccessful outcome and loss-to-follow-up (5% vs 10%; $p < 0.001$), deaths (5% vs 6%; $p = 0.03$) and treatment failure (2% vs 5%; $p < 0.001$). In multivariate analysis (log–binomial

¹ Adapted from the original article: Ciobanu A, Domete L, Soltan V, Bivol S, Severin L, Plesca V, et al. Do incentives improve tuberculosis treatment outcomes in the Republic of Moldova? *Public Health Action* 2014;4(Suppl 2):S59–63.

² National Centre of Health Management. SYME TB Database. Chisinau: National Centre of Health Management, 2014 (<http://monitoring.mednet.md:8090>, accessed August 2014).

³ Moldovan lei, currency of the Republic of Moldova; 1 MDL = €0.047 (exchange rate at 20 August 2015)

regression) according to intention to treat, the provision of incentives was independently associated with an overall decrease in the rate of unsuccessful outcomes (relative risk, 0.5; 95% confidence interval, 0.45–0.62; $p < 0.001$) after adjustment for confounders such as sex, age, length of education, occupation, residence, homelessness status, type of TB and HIV status.

This retrospective study showed that the provision of incentives to TB patients significantly improves the treatment success rate and should be sustained. Treatment adherence increased, thus potentially preventing drug resistance among patients with TB.

Important factors for success

Strong aspects of this intervention were the collection of evidence to validate the results and collaboration among the stakeholders.

Ensuring sustainability

Since 2013, the provision of incentives to TB patients by local offices of the national health insurance company has increased significantly over that in 2011, from 9% to 38%.



NETHERLANDS

Costing treatment and control of TB and M/XDR-TB

Background

WHO requests annual data on total expenditure on TB control and a forecast of the budget required for the following year. NTPs in countries with a high incidence and a high burden of TB often have clear budget lines for TB control, and the WHO Planning and Budgeting Tool for Tuberculosis Control assists these countries in estimating the cost. In countries with a low incidence of TB, however, TB services are usually fully or partially integrated into general health services, with no specific budget line for TB control. Thus, the costs for TB and M/XDR-TB control are more difficult to assess, including the cost per patient.

In the Netherlands, clinical TB services are provided at general hospitals and two designated TB centres (modern sanatoria). The TB departments of municipal public health services are responsible for public health interventions for TB, such as patient support, contact investigation and screening of high-risk groups such as immigrants and asylum seekers from high-incidence countries, prisoners, homeless people and illicit drug users. Several organizations, including the KNCV Tuberculosis Foundation and the Centre for Infectious Disease Control, are involved in national coordination and support, such as guideline development, surveillance, national reference laboratory functions, including universal genotyping, and training.

Health system challenge

As the costs for TB and M/XDR-TB control, including the cost per patient, have been difficult to assess in the Netherlands, where TB services are fully or partially integrated into general services, a means of assessment was needed in order to direct the allocation of resources.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

A study was conducted by the KNCV Tuberculosis Foundation, the Centre for Infectious Disease Control at the National Institute for Public Health and the Environment, the Beatrixoord Tuberculosis Centre at the University Medical Centre in Groningen and the Dekkerswald Tuberculosis

Centre at Radboud Nijmegen University Medical Centre, all of which are involved in controlling TB.

Two approaches were used: a top-down approach with realized costs (e.g. the programme cost of the NTP) and a bottom-up approach in which the cost per actual item (e.g. medication, staffing) was calculated. Costs were calculated for 2009. In that year, 1158 patients were reported to have TB, 17 of whom had MDR-TB and three of whom had XDR-TB.

Outcomes

Cost of medication

We assumed that patients with non-M/XDR-TB were treated for 6 months. Detailed information was available on the drugs and the duration of treatment for all M/XDR-TB patients. We calculated drug consumption on the basis of an average weight of 60 kg. The costs of registered drugs were obtained from the National Health Care Institute and those of non-registered M/XDR-TB drugs from the hospital pharmacists at the two TB centres. The total cost of medication for the 1138 patients with non-M/XDR-TB was €528 000, and that for the 20 M/XDR-TB patients was €347 000. Thus, the medication cost for an M/XDR-TB patient in the Netherlands was 37 times higher than that for a patient with non-M/XDR-TB (€17 370 versus €467).

Cost of hospitalization

The National Hospital Register provided data on bed occupancy for TB in 2009: nearly 9000 bed days were used for patients admitted for TB diagnosis and treatment. The two TB centres admitted 262 patients (nearly 12 000 bed-days) in 2009; the 20 M/XDR-TB patients stayed for 2178 bed-days. The estimated cost of hospitalization for non-M/XDR-TB patients was €6.1 million (€5800 per patient) and that for M/XDR-TB patients was €740 000 (€37 000 per patient).

Cost of follow-up by medical specialists

The cost was estimated to be €719 000.

Cost of TB control

On the basis of the number of full-time equivalents of staff for TB control in the TB departments of 25 municipal public health services (175), we estimated the total cost of TB public health services at €17.9 million.

Cost of national coordination

The cost of coordinating the KNCV Tuberculosis Foundation, the Centre for Infectious Disease Control and the Association of Municipal Public Health Services was estimated to be €2.4 million.

The total cost of TB care and control in the Netherlands, a country with 16.4 million inhabitants, 1138 TB patients and 20 M/XDR-TB patients in 2009, calculated from the above, was €30 million. As some costs of primary health care and, e.g., the cost of drugs for the treatment of latent TB infection were not included, we assumed that the actual cost to the health system was 10% higher, i.e. €33 million. Patient costs, such as travel to clinics and loss of work, were not included.

TB has substantial financial implications. Our study shows that the public health expenditure on TB in the Netherlands represents 61% of the total cost. The public health focus of TB control in the country contributes to limiting hospitali-

zation (only 30% of TB patients are admitted for more than 1 week) and thus less cost for hospital care. Furthermore, the TB departments conduct active case-finding, which has contributed to the currently low incidence in the Netherlands, i.e. 4.9 per 100 000 persons in 2014.

The total cost of M/XDR-TB patients to the health system was 17 times higher than that for non-M/XDR-TB patients (€58 500 versus €7850 per patient), and the average cost of the three XDR-TB patients was €139 500 per patient (maximum, €207 400). The cost of M/XDR treatment could be reduced significantly if the drugs could be procured at a lower price (e.g. through the Global Drug Facility) and if the duration of hospitalization could be limited.

Important factors for success

Strong aspects of this intervention were the collection of evidence to validate the results and collaboration among the stakeholders.

Ensuring sustainability

The results of this study are useful for allocating resources for efficiency and impact. The study will be repeated every 5 years to provide accurate, up-to-date information for WHO and the Ministry of Health.



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AZERBAIJAN

Ensuring the continuity of TB treatment and care for ex-prisoners

Background

Azerbaijan is one of the 18 countries of the WHO European Region that is a high priority for TB and one of the world's 27 countries with a high burden of MDR-TB. In a national survey of resistance to TB drugs in 2013, 72 (13%) new and 66 (28%) previously treated patients had MDR-TB; of these, 38% of new and 46% of previously treated cases had XDR-TB or signs of XDR-TB.¹

According to WHO, TB is a major public health problem in many prisons, with infection rates often more than 10 times higher than in the general population. Every year, 120–140 TB patients are discharged from Azerbaijani prisons, of whom 20–25% have DR-TB. Until the end of 2010, these patients joined the civilian population, with no measures to ensure that they would continue their TB treatment. As a result, the majority of these patients were lost to follow up.

Health system challenge

Loss-to-follow up can lead to treatment failure, acquired MDR-TB and a higher risk for transmission of TB and MDR-TB to the general population. In Azerbaijan, as only 10–15% of prisoners with TB were reported as having continued their treatment after release, a method for follow-up care was needed.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In 2011, the Saglamliga Khidmat Public Union, a national NGO, collaborated with the Main Medical Department of the Ministry of Justice to launch a responsive, innovative initiative to assist prisoners with TB to adhere to treatment after their release from prison. This patient-centred initiative was funded by the Global Fund.

The project started by determining why people do not complete treatment. Thus, it was considered that, in order to



tackle problems of treatment interruption, the reasons should be identified and needs assessed.

The initiative has two phases; the first is carried out in prison and the second after release from prison.

Phase I, in prison

Patients are thoroughly briefed and informed about their treatment and continuation options by an adherence counsellor from the Public Union. During the sessions, patients are informed about the importance of completing treatment. All relevant information about patients and their treatment is collected, including address, phone numbers of relatives and family members, treatment cards, transfer forms and other medical and personal documents. This information is passed to the civilian DOTS centre that will receive the patients after their release, which is informed that the patient will be transferred to continue treatment.

Phase II, after release

When a patient arrives at the TB dispensary, a nurse is assigned to provide DOTS with the support of Public Union coordinators, who ensure that the treatment is well organized and that the patient adheres to treatment. The coordinators visit every ex-prisoner TB patient each month in every

¹ Alikhanova N, Akhundova I, Seyfadinova M, Mammadbayov E, Mirtskulava V, Rüsç-Gerdes S, et.al. First national survey of anti-tuberculosis drug resistance in Azerbaijan and risk factors analysis. Public Health Action 2014;4(Suppl 2):S17–23.

region of the country to increase their awareness in health education sessions and provide social support; patients can also air their grievances. Ex-prisoners often face many social and judicial barriers, such as lack of a national identity card, difficulty in initializing pension payments, finding a new place to live and unemployment. The Public Union helps ex-prisoners to overcome these obstacles, in collaboration with other local NGOs specialized in the relevant issues.

Once a month, the Public Union delivers food parcels and a transport allowance to serve as incentives for the patient to make daily visits to the DOTS centre. Union members also deliver a monthly stock of second-line TB medication to the DOTS centre and collect sputum specimens to take to the laboratory.

The Public Union has a database containing all the medical and non-medical information on ex-prisoners, which is referred to regularly.

Outcomes

Before this initiative, the rates of adherence of ex-prisoners to TB treatment were substantially lower than those of civilians. This difference is slowly narrowing, as the Public Union has managed to follow up 98% of TB patients released from

prison. As a result of this initiative, the number of patients lost-to-follow-up has decreased dramatically.

Important factors for success

The success of this initiative hinged on the collaboration of two sectors: the health and judicial sectors. By working together, with coordination through the Public Union, the transfer of ex-prisoners into civilian life has run smoothly, with limited interruption in TB treatment. The Public Union has been instrumental in bridging prison services with civilian TB facilities.

Ensuring sustainability

This practice has been shared with other national NGOs working on the control of TB.

Potential for scaling up the project and future areas of development

This initiative is in place in all regions of the country. The plan is to scale up the practice in 2016–2017 with the financial support of the Global Fund and with five other national NGOs, including a patient organization and four NGOs working with migrants, refugees, internally displaced people and people with TB/HIV co-infection.



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CZECH REPUBLIC

Establishing a central unit for treatment of MDR-TB in a department of respiratory medicine

Background

The Czech Republic has a low incidence of TB, which has been decreasing since the end of the 1990s, to a total incidence of 5.5 per 100 000 population in 2013. At the beginning of the 21st century, with the increasing threat of MDR-TB, efforts were made to centralize care of these patients in one, specialized unit. From the beginning, the unit was based in Thomayer Hospital in Prague, which underwent complex reconstruction to fulfil the rigorous infection control criteria for highly dangerous infections. Before centralization of MDR-TB patients in this unit, their care was fragmented, which led to treatment delays and inadequate regimens, for reasons including lack of experience in treating MDR-TB, lack of availability of some drugs (due e.g. to high cost) and loss-to-follow-up of a number of patients before they had completed the intensive phase of therapy. In addition, infection control measures for MDR-TB were not standardized in all hospitals.

Health system challenge

Means were required to ensure the provision of comprehensive, timely diagnosis and care for MDR-TB patients while also improving infection control.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In 2007, the Central Unit for MDR-TB Treatment was established in Thomayer Hospital, which provides care for all patients with MDR-TB, including asylum seekers but excluding prisoners, who are treated in a penitentiary facility. The Unit offers early diagnosis, fully controlled treatment based on drug sensitivity, modern equipment, all necessary infection control measures and highly experienced, trained staff in a one location. The Unit has 15 beds. All patients admitted to the Unit are routinely tested for HIV infection.

The Unit has two pneumologists, an emergency service attended by physicians from the Department of Respiratory Medicine, six nurses, one hospital attendant, one X-ray technician, one nutrition specialist and one social worker. Medications are procured by standard practice by the hospital pharmacy or are exceptionally imported. All the necessary equipment is available either directly in the Unit or in Thomayer Hospital, including an isolated intensive care bed for artificial lung ventilation and an operating theatre for chest surgery. Samples for testing mycobacteria for susceptibility are sent to the national reference laboratory in the National Institute for Public Health in Prague.

The ventilation system and general procedures used in the Unit reduce the risk of patients for TB infection and transmission from patients to staff to a minimum.

Outcomes

The Central Unit has treated 52 patients since 2007, of whom 37 were men with an average age of 41 years and 15 were women with an average age of 34 years; 36 patients (69%) were foreigners, mainly from countries of the former Soviet Union and Mongolia. Bacteriological sputum conversion was achieved in an average of 2.8 months for culture-negative patients and 3.4 months for culture-positive patients. Since 2007, three patients have been found to be HIV positive; they were subsequently managed and treated with antiretroviral therapy in addition to MDR-TB treatment. No deaths due to MDR-TB have been reported.

Ensuring sustainability

The sustainability of funding is ensured by Government legislation. The Central Unit for MDR TB Treatment has been granted funds from the general health insurance as a unique department supported by the Government.

GEORGIA

Transport of sputum samples via the Georgian post

Background

Georgia is a country in transition with a population of 4.4 million. TB re-emerged as an important public health issue after independence, and the disease burden remains high, with 4320 reported cases of TB in 2013, resulting in an incidence rate of 76 cases per 100 000 populations and an overall notification rate (prevalence) of 96 cases per 100 000.

The NTP has made significant progress in fully implementing DOTS since 1995, achieving the WHO case detection target ($\geq 70\%$ by 2015) and even exceeding it (78% in 2012). Substantial improvement has also been made in treatment results, with a treatment success rate in new cases of 84% in 2012, in establishing routine drug resistance surveillance since 2005 and providing universal access to DR-TB treatment since 2009. Serious challenges remain, however, to sustaining these fragile achievements and moving forward. As in the other republics of the former Soviet Union, resistance to TB drugs represents a serious obstacle to effective control of the TB epidemic. In 2013, MDR-TB was found in 11% of new cases and 38% of previously treated cases in Georgia.

The treatment success rate among confirmed MDR-TB cases was 50% in 2011.

Since 2012, the vertical organization of the Georgian NTP was made horizontal with integration of TB service delivery into primary health care, and the Ministry of Labour, Health and Social Affairs decided to reorganize the laboratory network as well. Currently, the network has three levels, consisting of the national reference laboratory in Tbilisi, a regional reference laboratory in Kutaisi, nine laboratories for sputum smear microscopy in the civilian sector and two in the penitentiary system. These 11 microscopy laboratories correspond to 0.3 per 100 000 population.

Transport of sputum samples from TB service providers to smear microscopy laboratories is fully subsidized by the State. One vehicle has been allocated to each region, which collects sputum samples at each district service delivery point two or three times a week and delivers them to the diagnostic laboratories. Consequently, patients receive their test result within 5–7 days.

Health system challenge

Diagnostic delays can result in delayed initiation of correct treatment or a change in the treatment of individual patients. In order to reduce the delay to reception of laboratory results and to reduce the burden on laboratories when many samples are delivered simultaneously, a more efficient method of sample transport was needed.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

From July 2013, the Georgian NTP began sending sputum samples through the Georgian post in three regions: Samegrelo-Zemo Svaneti, Racha-Lechkhumi and Imereti. The programme was initiated as a pilot project, with possible extension depending on the outcome.

The Georgian post provides universal postal service in the country and holds the leading position on the market. The company has been a member of the Universal Postal Union



since 1993. Recently, it underwent major reform, with a consequent noticeable improvement in service delivery.

Each region of Georgia consists of several districts, each of which has one TB service delivery point for sputum samples from patients with presumptive TB. Sputum samples are transported in cold boxes. They are placed in a triple pack consisting of a sputum container, a closed box with six sputum containers and a cold box that contains two closed boxes. Thus, a single cold box can contain up to 12 samples of sputum. The NTP purchased three cold boxes for each TB service delivery point. The cold box is fastened to the wall in a specific location in the vehicle. The Georgian post and TB service delivery personnel (postmen, physicians and nurses) were trained in biosafety.

At most service delivery points, the Georgian post provides a daily service, while in some districts the service is provided three or four times a week. Each delivery point is aware of the approximate timing of the post to the facility. If no samples are to be collected, a nurse or doctor informs the postman, who bypasses the facility.

Outcomes

Table 1 summarizes transport via the previous system and the pilot system via the Georgian post.

Table 1. Comparison of modes of sample transport

Georgian post	Transport with NTP vehicle
Service daily or three to four times a week in mountainous districts	Two to three times a week
Patient receives test results within 3 days	Patient receives test results within 5–7 days
20–25 sputum samples sent to the laboratory every day	50–60 sputum samples received at the laboratory simultaneously
Approximate cost per month (for three regions): US\$ 295	Approximate cost per month (for the same three regions): US\$ 2300

Ensuring sustainability

The Georgian postal service was purchased by the National Centre for Disease Control and Public Health and, in line with the agreement, pays a reduced price per parcel, which is approximately US\$ 1.5 for transportation of one cold box. The monthly cost of the post system is nearly eight times lower than that of vehicle transport.

Potential for scaling up and future areas of development

The Georgian NTP plans to extend the Georgian post service. Recently, the Adjara region was included in the contract. Negotiations are under way to agree on the routes in the eastern part of Georgia.



GEORGIA

Collaboration with the Georgian Orthodox Church for early detection of TB and adherence to treatment

Background

Despite universal access to TB care services and social support in Georgia, late diagnosis and a high level of loss-to-follow-up are seen, especially among M/XDR-TB patients. The rate of loss-to-follow-up of patients with DS-TB in 2012 was 6.1%, and that of MDR-TB patients reached 34% in 2011. International experience has demonstrated a significant role of faith communities in the provision of life-saving prevention, care and treatment, in addressing stigma and in educating communities about health. Their capacity to function in difficult-to-reach areas increases the programme coverage and creates an opportunity for early TB case detection and treatment adherence.

Health system challenge

Active case finding and innovative solutions to promoting adherence to treatment are needed to cover the most vulnerable and hard-to-reach populations of Georgia.

The good practice in health system strengthening to improve prevention and care of M/XDR-TB

The Georgian Orthodox Church is widely respected throughout the country, as both an authority and a support system. The unique advantages of faith-based organizations in TB control have been recognized by the NTP in Georgia; however, there was no functional model for systematic involvement of the Church in active TB case finding in long-term care. With the support of the Centre of Bioethics Studies and Culture, the USAID Tuberculosis Prevention Project formed a collaboration with the Georgian Orthodox Church to provide spiritual support to TB patients as well access to TB services in monasteries. This community is important for two reasons:

- » Nuns and monks themselves may be infected. Because of their unique lifestyle, strategies should be targeted to monks and nuns to inform them about TB.
- » As religious leaders who are well-respected by their communities, monks and nuns can play an active role in reducing the stigma of and in educating their parishioners about the spread of TB, its treatment and its prevention. As they have the trust of their parish, the behaviour they promote is readily accepted.

An anti-stigma campaign was run to increase awareness among the clergy (bishops, priests) and their parishes. The Centre of Bioethics Studies and Culture developed a comprehensive information package, which included materials on disease transmission, the importance of treatment adherence, supporting patients and decreasing stigma. The Centre of Bioethics Studies and Culture then conducted a country-wide advocacy, communication and social mobilization campaign for religious leaders and hard-to-reach groups such as monks, nuns and parishioners, including former prisoners.

The Church was engaged to help with early TB detection and treatment for hard-to-reach populations that sought refuge in nunneries and monasteries, by engaging nuns and monks to disseminate information about TB, help identify active cases and engage a network of peer educators to minimize lack of adherence and to support completion of treatment. The Centre of Bioethics Studies and Culture also arranged medical examinations in monasteries and nunneries.

Outcomes

To date, the project team has conducted 27 meetings and 16 medical examination sessions in monasteries. A total of 390 monks and 86 nuns were examined, of whom 17 were referred to health services for symptoms of presumptive TB. Twenty-four meetings were conducted in dioceses, which were attended by 1925 people. Medical examinations were also conducted. In total, 930 clerics and parishioners were examined during 14 sessions, of whom 23 were referred to health services for symptoms of TB. A total of 65 reverends and priests were selected and trained as peer educators to disseminate information during monthly workshops after the regular Sunday service.

Once people presumed to have TB are identified, they can be referred immediately to primary health care units for further medical examination.

Ensuring sustainability

The sustainability of this project has been demonstrated by the commitment of the religious peer educators and by the approval of the Metropolitan of the Georgian Orthodox Church.

KAZAKHSTAN

Comprehensive approach to the care of patients with MDR-TB

Background

In the 1990s, interrupted drug supplies and shortages of certain TB drugs, use of inadequate treatment regimens, lack of unified treatment standards, the low socio-economic status of patients and difficulties in ensuring treatment adherence created a huge pool of patients with MDR-TB. The prevalence of drug resistance in the country was further increased by suboptimal infection control in inpatient TB facilities at regional and district levels, where all TB patients (new cases, relapsed cases of DR-TB and cases of presumptive DR-TB) were kept together until their DST results became available. The sanitary norms did not reflect the latest approaches to airborne infection control, and patients on treatment in district and regional inpatient facilities had to wait an average of 2–3 months before receiving their DST results. Subsequent introduction of BACTEC, Hain and GeneXpert tests necessitated radical re-staffing of the laboratories. There were organizational issues in implementation of DOTS by health care workers, and not enough civil society organizations participated in TB activities. Additionally, the provision of TB services to internal and external migrants, who had limited access to diagnosis and care, was problematic.

Health system challenge

The factors that limited the TB response in Kazakhstan were the high DR-TB burden, poor TB infection control, lack of rapid diagnostics and insufficient capacity to provide DOTS and support to patients.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

These numerous challenges called for a comprehensive approach to TB and MDR-TB care based on optimization and restructuring of the bed capacity of the TB hospital and channelling the funds used for hospitalization to other service delivery areas.

Since 2009, BACTEC MGIT-960, a rapid diagnostic tool for detecting both DS and DR forms of TB, has been used in 20 regions of the Republic; the express Hain test has been used since 2010 in 12 regions; and the XpertMTB/Rif was intro-

duced in 2013 in 23 regions. With funding from the local budget and the Global Fund, the requirements for reagents and consumables for rapid diagnosis are now fully met.

During the past three years, Kazakhstan has optimized and restructured TB hospital bed capacity in order to reduce inefficiency, improve infection control and separate patients on the basis of the results of bacteriological tests. The funds thus economized are used to strengthen laboratory services, ensure full supplies of first- and second-line drugs for all patients, provide social support to outpatients and improve TB infection control. All regions have inpatient palliative care facilities. This comprehensive set of measures contributed to substantially improved treatment outcomes.

Outcomes

In 2014, Kazakhstan achieved 95–97% coverage with rapid MDR-TB diagnostic tools, ensuring timely diagnosis of DR-TB. Timely initiation of adequate treatment reduces the risk for further spread of infection. Since 2012, the standard for an uninterrupted supply of TB drugs for all TB and MDR-TB patients (86.9%) has been achieved, including in the penitentiary sector. By the end of 2014, second-line treatment coverage was 99% in the civil sector and 87% in the penitentiary sector. The coverage of XDR-TB patients is 93.2%.

Local executive authorities have increased annual funding for the provision of social support to TB patients. Thus, with the economies made from greater efficiency, spending on social assistance increased by 27.1% in 2014 over that in 2013, amounting to US\$ 2.9 million. The loss-to-follow-up rate among MDR-TB patients also decreased, to 7.3%. In 2014, the programme achieved a 86.4% cure rate among new DS-TB cases and 73.5% among MDR-TB cases.

The civilian and penitentiary sectors both use the comprehensive approach to MDR-TB. Training is given to the staff of TB services and primary health care institutions on MDR-TB management and infection control, and civil society organizations have become involved in various TB control activities.

Important factors for success

Many of the achievements are due to well-established inter-agency cooperation between the civil and the penitentiary sectors. Inter-sectoral cooperation between TB and primary health care services was indispensable for ensuring referral and high-quality outpatient treatment and care. The active involvement of Government specialists was a key element in the success of the reforms and improved service delivery.

These results would not have been accomplished without strong political commitment from the Ministry of Health

and Social Development, cooperation with international organizations (the Global Fund, KNCV and USAID) and support from representatives of WHO, namely Dr Masoud Dara, Dr Martin van der Boom and Dr Richard Zaleski.

Ensuring sustainability

This practice will be implemented in the Consolidated TB Control Plan, 2014–2020, approved by a decree on 31 May 2014, and will be funded from Government and local budgets.

KYRGYZSTAN

Palliative care for patients with DR-TB

Background

The efficacy of MDR-TB treatment in Kyrgyzstan in 2009 was only 42.4%: 38.5% of the patients interrupted treatment, the treatment was ineffective in 9%, and 10% of patients died. While most of the patients who interrupted treatment could eventually be returned to treatment, the risk of these patients for treatment failure was around 50%. In 2009, 49 MDR-TB patients experienced treatment failure. The technology available in 2009 did not permit testing for XDR-TB, as the Hain test was introduced only in 2013. DST on solid media was time-consuming, and the test results were not quality assured.

There was no policy for managing MDR-TB treatment failures, which were mainly cases of XDR-TB or totally DR-TB. Proper infection control measures were not in place, and TB patients received no social support from the State, except for a disability pension. In order to prove treatment failure and thus justify disability status, patients had to collect many supporting documents; however, there was no regulation that allowed a disability pension for patients who failed treatment. Doctors on the medical labour expert committee were not motivated to work with such patients because of their infectiousness.

Health system challenge

No palliative care was available for DR-TB patients who could no longer be helped by the health care system. The entire burden of care was borne by their relatives, who were not trained in infection control and therefore had a very high continuous risk for infection with highly resistant forms of *M. tuberculosis*.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

Initially, MDR-TB guidelines were prepared by the USAID project TBCARE I, implemented in Kyrgyzstan by KNCV in collaboration with an MDR-TB working group consisting of NTP and international experts. The guidelines were reviewed by the international experts and approved by the Ministry of Health within one year. Then, 27 local experts

from all MDR-TB departments were trained in use of the guidelines for diagnosis, treatment and management of MDR, decision-making, management of adverse events and other topics. This initiative addressed the problem of MDR-TB at least partly, but the problem of management of treatment failures (mainly XDR-TB) persisted. To address this situation, guidelines on palliative care were prepared in 2012–2013. According to these guidelines, such care could be provided at TB inpatient and outpatient facilities as well as at family medicine centres, including by family doctors and nurses.

In addition, in March 2013, the inpatient department of Kemin TB hospital received 7 million Soms (about €100 000) to reconstruct and repair an area to provide palliative care to 40 patients. Two training sessions on palliative care were provided to 12 staff members at the hospital and the NTP. The first course introduced the palliative care guidelines and provided detailed information of care provision. The second was targeting to doctors and nurses, including several nurses from religious orders, and provided detailed information on TB infection control, case management, psycho-emotional support, including addressing depression, improving communication skills and other aspects of psychological care and pain relief.

Outcomes

All patients with MDR-TB treatment failure who required hospitalization were admitted to the Kemin TB hospital from spring 2013. Initially, only 50% of the beds were filled, as the referral process was new. The NTP, Bishkek City TB hospital and the Kara-Balta MDR-TB hospital were among the first to refer treatment failures to the palliative care department. By the end of 2013, the number of patients had increased to 37, and in 2015 there were on average 27 patients.

In May 2015, several patients in the Kemin hospital were interviewed. One was a young woman who had interrupted her MDR-TB treatment several times for various reasons; when she was motivated to complete treatment, it was no longer effective. The hospital could no longer officially accept

her as a patient as her treatment had been stopped because of lack of efficacy, and her family refused to accept her at home. The palliative care facility was the only place in which she could receive proper care with a minimal risk of infecting other people. The other patients had similar stories; many did not have relatives or friends who could take care of them.

The physician in chief at Kemin Hospital reported that, for the first time, all patients in Kyrgyzstan have access to care and support. The life expectancy and the quality of life of such patients has been substantially improved by the introduction of palliative care, and the risk for spread of XDR-TB in the community has been reduced by the introduction of proper infection control for MDR-TB treatment failures.

The Open Society Foundation subsequently used the palliative care guideline as an example in other countries.

Important factors for success

The main factor for success was the development of the guideline, which laid the foundation for palliative care provision in Kyrgyzstan. Another important element was the initial training of health care workers. Finally, dissemination of information about the availability of palliative care to other health care professionals improved referral.

Ensuring sustainability

The trained staff and refurbished facility are now fully funded by the State, which guarantees the sustainability of this practice. The need for palliative care will decrease with the scaling up of proper MDR-TB management and access to new diagnostics and drugs. The success of treatment for MDR-TB increased from 42% in 2011–2012 to 62% in 2014, and even cases of treatment failure receive proper care to ensure the best possible quality of life and minimal risk for the spread of DR-TB in the community.

PORTUGAL

Outreach work on TB: a local experience of cooperation

Background

In 2012, Portugal was the only country in western Europe with an intermediate incidence of TB. The region under consideration, Porto, also has an intermediate incidence of TB, with the highest rate in the country (33 per 100 000) after Lisbon.

Since 2010, about 15% of TB patients have been found to be infected with HIV.¹ According to a WHO report on TB surveillance and monitoring in Europe (2015),² three of the countries that reported representative HIV testing (> 50% coverage) documented a significant overlap of the HIV and TB epidemics, exceeding 10% HIV prevalence among new and re-treated TB cases: Ukraine (19.6%), Portugal (14.5%) and Estonia (13.0%). TB/HIV co-infection is thus of concern in Portugal.

Certain types of illicit drug use have consistently been associated with infectious diseases, particularly viral hepatitis, HIV infection and TB. People who use and inject illicit drugs are at high risk for contracting TB, regardless of whether they are infected with HIV. Studies conducted before and after the emergence of HIV/AIDS show that this population has a higher risk not only for TB but also for developing active disease than the general population. Similarly, outbreaks of DS- and MDR-TB are common in this group.³

Although the incidence of TB among people who use drugs has been decreasing in Portugal,⁴ they still have a high risk

for infection due to their marginalized lifestyle and difficulty in adhering to treatment. In 2012, 12% of the 117 deaths from TB were in drug users.² A report of the Direção-Geral Saúde in 2014)² indicated that 30% of TB patients have social risk factors, including use of alcohol and/or illicit drugs (intravenous or inhaled).

Health system challenge

TB disproportionately affects people who use drugs, and the absence of appropriate TB care for these people results in incomplete TB diagnosis and treatment and the rapid spread of MDR-TB in this population (Eurasian Harm Reduction Network, 2015).⁵

To ensure specific strategies to address this issue, the NTP⁵ recommended:

- » strengthening the national plan for syringe exchange;
- » strengthening strategies for early diagnosis of HIV infection, especially among vulnerable populations;
- » universal access to primary health care;
- » equitable access to and high-quality treatment of HIV infection;
- » promotion of easy access to health care services and adherence to TB treatment; and
- » better detection of HIV infection in TB patients.

The project described here was an attempt to respond to these challenges by providing a proximal, integrated service for hard-to-reach people who use drugs in order to prevent, diagnose and treat TB.

As stated by Getahun and colleagues:³ the prevention, diagnosis and treatment of TB among people who use illicit drugs have been neglected and require immediate attention and effective models of integrated delivery of services for HIV infection, hepatitis and harm reduction that respect human rights. The model of integrated service delivery may depend on the setting, “ranging from the provision of multiple services in a single venue to service delivery at multiple venues through effective referral and coordination mechanisms.”

1 Direção-Geral de Saúde (2013). Plano Nacional de Luta Contra a Tuberculose. Ponto da situação epidemiológica e de desempenho. Relatório preliminar (<http://portal.arsnorte.minsaude.pt/portal/page/portal/ARSNorte/Conte%C3%BAdos/Sa%C3%BAde%20P%C3%BAblica%20Conteudos/PNT%20%20Ponto%20da%20Situac%C3%A7%C3%A3o%20Epidemiol%C3%B3gica%20e%20de%20Desempenh.pdf>, accessed 30 June 2015).

2 European Centre for Disease Prevention and Control and WHO Regional Office for Europe. Tuberculosis surveillance and monitoring in Europe 2015. Stockholm: European Centre for Disease Prevention and Control; 2015 (<http://ecdc.europa.eu/en/publications/Publications/tuberculosis-surveillance-monitoring-Europe-2015.pdf>, accessed 26 August 2015).

3 Getahun H, Baddeley A, Raviglione M (2013). Managing tuberculosis in people who use and inject illicit drugs. *Bull World Health Organ*; 91:154–156. doi: 10.2471/BLT.13.117267.

4 Direção-Geral de Saúde (2014). Portugal. Infecção VIH/SIDA e tuberculose em números—2013. Programa Nacional para a Infecção VIH/SIDA (<http://www.google.pt/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=4&ved=0CDAQFjAD&url=http%3A%2F%2Fpnvihsida.dgs.pt%2Festudos-e-estatisticas11111%2Frelatorios1%2Fportugal-infecao-vihsidaemnumeros2013pdf.aspx&ei=Qr2LVYTZNcmtU9ubgIAL&usq=AFQjCNG3VZlMq3EOYymgiEypnNjYDBPAqg>, accessed 30 June 2015).

5 Eurasian Harm Reduction Network (2015) (<http://www.harm-reduction.org/issues/drug-use-and-tuberculosis>, accessed 30 June 2015).

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In the city of Vila Nova de Gaia (Porto District), drug use is a particular challenge for the TB outpatient centre, a Government institution responsible for managing TB patients and screening at-risk populations in the region, and for GIRUGaia, an outreach team for people who use drugs, promoted by the Piaget Agency for Development (www.apdes.pt) and co-financed by the national Service for Intervention in Addictive Behaviour and Dependence. The two institutions have been working in partnership for several years to meet challenges such as the domestic, dispersed character of drug consumption, which makes users hard to reach.

The TB outpatient centre:

- » has defined an easy, rapid procedure for receiving and caring for GIRUGaia clients, avoiding bureaucratic contact between the patient and socio-sanitary services;
- » allows direct, informal contact with selected doctors to solve emerging problems;
- » lends the GIRUGaia outreach team an office in a strategic geographical location to use for psychological counselling and other important tasks; and
- » conducts training and discussion sessions with GIRUGaia professionals and clients on TB.

GIRUGaia:

- » prevents new cases of TB by increasing awareness and health literacy on TB and other topics;
- » promotes more hygienic drug use by distributing paraphernalia like tubes for individual oral use in order to avoid sharing and by education to prevent less risky rituals;
- » motivates clients to be screened for TB, takes them to the TB outpatient centre if necessary, stays with them during the consultation and takes them back to their environment after the consultation;
- » administers medication for TB in the field with methadone, ensuring better compliance of clients with treatment;
- » cooperates in searching for patients who have discontinued treatment in the TB outpatient centre;
- » takes medication to clients who cannot go to the TB outpatient centre for treatment (for example, when they are ill); and
- » uses the peer educator of the team to reach hidden consumers who might be infected or have abandoned treatment.

The two institutions discuss common cases in order to give each person the best treatment available and to overcome

emerging problems adaptively. For example, in a recent TB outbreak in an area of Vila Nova de Gaia, common efforts made it possible to screen and take treatment to every autochthonous drug user.

Most GIRUGaia clients have had no previous contact with treatment institutions and are reluctant to attend socio-sanitary services. Without the partnership, TB screening and treatment would be difficult to implement in this social universe. Furthermore, the prevention, diagnosis and treatment of infections associated with TB, such as with HIV, are addressed in the natural environment of clients. This is an effective way to overcome structural and organizational barriers to the delivery of integrated services.

Outcomes

The two institutions recognize the positive impact of their cooperation. For example:

- » in the recent TB outbreak in Vila Nova de Gaia, common efforts made it possible to screen and take treatment to every autochthonous drug user in the field;
- » about 90% of patients are screened for TB and HIV infection; and
- » all cases of TB detected have taken the full treatment, even though they are extremely marginalized and resistant to adhesion.

Important factors for success

This partnership between the TB outpatient centre and GIRUGaia has ensured a strong new connection between vulnerable excluded populations, such as some people who use drugs, and specialized services for TB. The results are promising. Of course, ethical questions in such interventions, like anonymity and confidentiality, must always be considered; however, there is stronger involvement in protecting the human rights of clients, such as ensuring access to the best treatment services, reducing stigma and discrimination and the active involvement of people who use drugs in needs assessment, the design of interventions and evaluation, by the inclusion of peer educators in the GIRUGaia team.

Ensuring sustainability

This type of mutual cooperation does not entail extra resources but only effective interaction between institutions. The Piaget Agency for Development is a founder and one of the leaders of the national and the European harm reduction networks; this kind of procedure and promising achievements can therefore be disseminated easily among partners.

REPUBLIC OF MOLDOVA

Provision of access to adequate TB diagnosis and treatment to homeless people

Background

TB remains a public health problem in the Republic of Moldova, which is among the 18 high TB burden countries in the WHO European Region and among 27 high MDR-TB burden countries in the world. The number of homeless people in Chisinau, the capital, with a population of 804 000, has been rising, as has the number of cases of TB among these people; however, no exact data were available about TB in this risk group. TB inpatient facilities and polyclinics found it difficult to diagnose, treat and follow up such patients.

Homeless people have a higher risk for becoming infected and developing TB, especially while in spontaneous temporary residences. The rate of loss-to-follow-up is high, and the treatment outcomes are worse among homeless people than in the general population. The awareness of homeless people about TB and where to turn for help was insufficient, and TB treatment was virtually inaccessible if they were not registered at a polyclinic. The lack of an unambiguous definition of who is “homeless” meant that these people generally had limited access to health and social services, including TB diagnosis and treatment.

Health system challenge

To improve access to TB diagnosis, treatment and adherence support of homeless people, an intensive, innovative approach was needed.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

International strategies to reduce the incidence of TB among homeless people include intensified TB detection, mandatory screening in temporary residences and material incentives to promote adherence to TB diagnosis and treatment. A project to identify and treat TB among the homeless population in Chisinau was therefore implemented.

A mobile team consisting of a physician, a nurse and a driver was created to go out each day to find homeless people and to interview them with a screening questionnaire. It took some time for trust to be built between the mobile team and

the homeless; the medical uniforms worn by the team made them easier to identify and remember. As recompense for participating in TB screening, the homeless people received an incentive of tinned meat or fish. The doctor in the mobile team established contacts with polyclinics, but the referrals of homeless people remained difficult, as changing attitudes and countering discrimination is a lengthy process. Therefore, the homeless patients had to be accompanied during their visits.

Homeless people with presumptive TB were taken to the nearest polyclinic for further examination and a consultation with a TB physician. If TB was confirmed, the mobile team took the patient to a TB hospital for inpatient treatment, where he or she was given information to increase adherence, included about what to do if their treatment was interrupted by the facility because they violated the hospital rules, such as consuming alcohol. The patients were given the phone numbers and other contact information of the mobile team. They filled in a questionnaire indicating the availability of documents, family members, addresses of temporary residences, a contact person, physical characteristics and other information. Focus groups were conducted to identify their particular challenges and needs. The most active project participants engaged in volunteer work to detect and direct homeless people who were coughing to the mobile team or to the nearest health care facility.

When the homeless patients were discharged from hospital, the mobile team facilitated their first contact with the TB physician in the polyclinic to ensure that they continued their treatment as outpatients. The physicians provided TB drugs, supervised the patients and carried out monitoring and case management in accordance with national protocols. The mobile team transported patients on outpatient treatment to health care facilities for planned examinations and consultations with the attending physician during treatment. In order to improve TB treatment adherence, patients received social support in the form of food parcels, reimbursement of transport costs, clothing and special needs, such as glasses or crutches. Then, an NGO contacted special-

ists directly or via an insurance scheme. As insurance could be accessed only if the patient had an identification card, the NGO helped some patients to re-establish their cards.

A plan was made for continuing DOTS, e.g. in an office or through a DOTS provider from an NGO at a location specified by the patient. Soon after the beginning of the project, 35 homeless patients had been identified; thus, assisting them was beyond the capacity of one DOTS supporter. Therefore, when possible, the plan specified an alternative location such as a polyclinic, where adherence was monitored once a week. The DOTS supporter visited patients who refused to go to a polyclinic at the places they frequented, spending half a day in the polyclinic and half doing DOTS outreach. On the questionnaires, the homeless people indicated two to five locations at which they could usually be found, such as markets, old churches or, in wintertime, abandoned buildings.

Material support was provided by the Global Fund, individual donations and a donation from the Church. To raise funds for warm meals for homeless people during the winter months, sales were organized, at which people could give a donation in symbolic exchange for an apple. The action was a success: people started bringing food and clothes to the NGO and, later, virtual donations online via Facebook.

By the end of 2014, TB case identification among homeless people had increased their access to rapid TB diagnostics with GenExpert. MDR-TB patients in this group are enrolled in treatment with second-line drugs. In 2014, 1147 homeless people were interviewed and informed about TB, and 299 (26%) with presumptive TB were tested. TB was confirmed in 58 cases (12 females and 46 males), representing 19.4% of those found positive by screening. Thus, the TB incidence rate among homeless people is 50 times higher than the average rate in the country (5056 per 100 000 homeless versus 99 per 100 000 in the general population). Of the 58 patients identified, 31 (53.4%) have completed their treatment, 7 were lost to follow up (12%), 3 died (5.2%), and the other 17 are still on treatment with second-line drugs (29.3%).

More than 120 social assistants were trained in case management of TB in homeless people and on international strategies in this area. One- to two-day training courses included general information on TB (signs, routes of transmission and referral), infection control, international recommendations for TB in the homeless and the local context in Chisinau. The courses included group work and case studies. The project improved social workers' awareness about

TB and engaged them in activities to increase treatment adherence by the provision of social support, such as a one-time allowance and help in obtaining disability status. A few homeless persons were reintegrated into their families with the help of the social services.

Outcomes

During the project, a sustainable dialogue was established between the municipal health services and the social services to prepare a specific action plan for the homeless. Homeless people received better access to TB diagnostics and treatment, including rapid diagnostic tools and second-line drugs. In the past, this category of patients was refused MDR-TB treatment because they could not continue ambulatory care.

The initiators of the project raised funds to initiate a small sociological study of homeless TB patients, including not only social determinants but also other infectious and non-infectious diseases. The preliminary results show a very high percentage of alcohol dependence and infection with HIV and other sexually transmitted diseases.

Important factors for success

The experience gained by the NGO during the project was the basis for proposals to the NTP for modifications to the national protocol on TB in adults (<http://old.ms.md/public/info/Ghid/protocols/pcn123/>). Hospitalization criteria were revised to include the status of homeless person and to allow discharge from the hospital only if the conditions for continuation of outpatient treatment are met. In the same protocol, homeless people are considered a priority for testing with GenExpert.

Ensuring sustainability

TB diagnosis and treatment for homeless people are free of charge; first-line drugs are covered by funds from the national insurance company and second-line drugs by the Global Fund. The new programme of the NTP should include a sustainability plan and full funding from the State budget after 2017.

Social problems faced by homeless people are barriers to successful TB treatment. Addressing them required effective dialogue with municipal health services and social services, which was established in this project and must be maintained. Regulations on living in a temporary residence for homeless people are meant to provide equal access and to prevent discrimination; these are under revision.



Potential for scaling up and future areas of development

The social workers suggested joint training with family doctors when funds become available.

There remains an urgent need to create proper conditions for the health and social support of homeless people with TB in

order to provide a comprehensive continuum of care. These include TB treatment in combination with substance abuse treatment programmes and programmes to strengthen treatment adherence and social reintegration.

REPUBLIC OF MOLDOVA

Outpatient treatment for MDR-TB

Background

The Republic of Moldova has very high burdens of TB and MDR-TB. MDR-TB represents 24% of new TB cases and 62% of those who have already been treated. The increasing number of cases of DR-TB is accompanied by high rates of treatment failure and mortality and represents a major public health problem for the country and the region. The increase in the number of MDR-TB cases is due to poor treatment compliance, TB/HIV co-infection, lack of drugs, inappropriate treatment leading to acquired resistance and nosocomial TB transmission.

While the current MDR-TB treatment model in the Republic of Moldova is hospital-based, the Moldovan NTP has shown interest in exploring the outpatient MDR-TB case management model.

Health system challenge

As TB care relies heavily on hospitalization, it is very costly and increases the risk for nosocomial TB transmission; however, there was no evidence for the effectiveness of the outpatient-based model of care.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

The revision of the model of care had to address the high costs of hospitalization, reduce nosocomial transmission and allow more patient-centred care. The aim of the study that accompanied the project was to collect evidence about the outpatient-based model of care and to evaluate the innovative MDR-TB management model combining rapid diagnostics with outpatient MDR-TB treatment and intensified patient support between 2012 and 2014.

Initially, the new approach was met with considerable resistance by the staff and management of inpatient facilities and the public health service, which continued to insist on hospitalization and isolation of TB patients. Many outpatients had to be hospitalized because, under the rules of the mandatory health insurance, they could access drugs for adverse reactions only in hospitals; otherwise, outpatients had to

buy these drugs themselves. Alcohol consumption by TB patients was another challenge to the project, which had to be addressed by providing additional psychological support to patients with alcohol dependence.

To sensitize the stakeholders, including the public health service, round-table discussions were held, at which the project was introduced in the context of the need for change: to reduce costs, nosocomial transmission and stigma related to (DR-)TB.

Two regions with a high TB incidence and large numbers of MDR-TB patients (Orhei and Cahul) were selected for the project. Between January 2012 and December 2014, 107 MDR-TB cases were detected in Orhei and 63 in Cahul. A specific diagnostic algorithm comprising GeneXpert, smear microscopy, line probe assay, solid and liquid culture and a conventional DST (MGIT) were used to rapidly identify and manage MDR-TB patients. Of the 170 patients, 38 started outpatient treatment with a standardized MDR-TB regimen provided by the district TB clinic and primary health care facility, and 43 cases were managed as inpatients with the standard approach. Community TB centres currently funded by the Global Fund in 10 regions assisted the patients psychologically and legally and provided adherence support.

No major differences were found between inpatients and outpatients with regard to risk factors or clinical characteristics (new cases: 53.5% vs 68.4%; first- and second-line DR pattern: all MDR-TB with two XDR-TB cases among outpatients).

The median time to initiation of MDR-TB treatment after Xpert results was 10 days for inpatients and 6 days for outpatients. The proportions of sputum smear conversion (inpatients vs outpatients) was as follows: 38.7% vs 71.4% at 2 weeks, 96.7% vs 63.6% at 2 months and 86.7% vs 77.2% at 5 months. The median time to smear conversion was 28 vs 42 days; culture conversion was 59.0% vs 55.8% at month 1 and 94.7% vs 77.4% at month 5, with a median time to culture conversion of 56 vs 56 days. The treatment outcomes were:

cured 11/43 (25.6%) vs 9/38 (24%); failed 0 vs 2; died 1 vs 1; lost-to-follow-up 3 vs 3; still on treatment 28 vs 23 ($p = 0.67$).

The treatment outcomes of the outpatients who finished treatment (15 people at the time of this report) are: treatment success rate: 60.0% (9/15), loss-to-follow-up rate: 20% (3/15), failure: 13.3 (2/15) and mortality rate: 6.7% (1/15). In comparison, the national treatment success rate among MDR-TB patients in 2012 was 50.0%, while the loss-to-follow-up rate was 26.0%.

Outcomes

The results obtained formed the basis for a new strategy of ambulatory MDR-TB treatment. They show that outpatient treatment is not inferior to inpatient treatment and is feasible, well tolerated by most patients and manageable. Although the interim treatment response represents a very limited number of patients, all patients achieved smear conversion within the first 5 months, and most patients achieved culture conversion within the first 3 months of treatment.

The project changed the attitude of TB doctors towards outpatient management and towards acceptance of rapid diagnostics as a readily available, more sensitive test that allows rapid initiation of effective treatment. Primary health care workers, who already practised outpatient management, became more involved in outpatient care for DR-TB patients in the intensive phase; they were monitored during the project and received supportive supervision and recommendations from project staff.

The outpatient strategy reduced the stigma towards DR-TB. The patients were accepted by their families and received family support and could also continue to participate in economic activities, such as maintaining land plots.

Important factors for success

A crucial factor for success was the availability of rapid diagnostic methods. NGOs and community TB centres played an important role.

Ensuring sustainability

The national criteria for hospitalization were reviewed, revised and approved in May 2015 by an order of the Ministry of Health. This protocol increases access to outpatient care. An important factor in ensuring the sustainability of the outpatient model at facility level is changing the mentality of health care staff. Treatment outcomes are expected to be further improved as primary health care staff become more involved and experienced.

Potential for scaling up the project and future areas of development

Restructuring hospital funding is an important next step, in order to optimize the number of beds, prevent unnecessary hospitalization and allow the facilities to use the funds for motivating staff or providing treatment support and incentives to patients. The problem of access of outpatients to adequate treatment of adverse drug reactions should be addressed at national level. Some problems in clinical management could be reduced by refresher training and supportive supervision of district TB doctors.

RUSSIAN FEDERATION

Comprehensive reform of the diagnosis, care and management of M/XDR-TB in Arkhangelsk region

Background

In late 1990s, the Arkhangelsk region saw increasing TB incidence and mortality. By 2000, the rate of new TB cases was 104 per 100 000 and the mortality rate of 16.5 per 100 000 was higher than the country's average. The worsening of the epidemiological situation was associated with inefficient TB programme management, lack of good-quality bacteriological TB diagnosis, irregular use of DSTs for selecting the appropriate chemotherapy regimen, interrupted supplies of TB drugs, the absence of DOTs, lack of cohort reporting and recording, including an electronic information system, lack of infection control and rapid spread of MDR-TB in the penitentiary community and inpatient TB facilities.

Health system problem statement

The region was in dire need of reformed TB control activities for effective diagnosis and treatment of MDR-TB, particularly with regard to laboratory diagnostics, outpatient treatment and monitoring and screening among high-risk groups.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

Improving laboratory diagnostics

One of the first steps to improving TB control was to strengthen peripheral laboratories for the diagnosis of TB. Modernization of laboratories, training of staff and closer supervision of the quality of laboratory diagnosis initially improved the quality of microscopic confirmation of TB and increased the rate to 50% of all new TB cases in peripheral laboratories.

High-quality microscopic diagnosis permitted outpatient treatment of all smear-negative TB cases. Smear-positive TB cases were admitted to the Arkhangelsk TB dispensary. All the TB inpatient facilities in the region were closed except for the TB dispensary, where infection control was introduced in all departments, an MDR-TB department was opened, and a reference laboratory for bacteriological testing of patients in both prison and civil communities was established. In 2005,

TB liquid culture was introduced in the reference laboratory, in addition to solid culture; in 2009, use of molecular genetic tests before initiation of TB treatment was introduced for all patients. At present, all outpatients and inpatients with bacteriologically confirmed TB start their treatment with a known rapid DST. All TB patients, including those who are socially vulnerable, have free access to all bacteriological diagnostic tests.

Treatment as outpatients with strengthened monitoring

The second and perhaps one of the most important components of the programme was the introduction of direct observation of TB and MDR-TB treatment in outpatient and inpatient settings. This was accompanied by more intensive monitoring and management of the side-effects of TB drugs in MDR-TB patients. All priority activities were introduced in both civil and penitentiary communities. A unified medical consilium and a physicians' commission for monitoring patient management were introduced to improve TB programme management and monitoring.

The monitoring department also conducted computer-based cohort analyses with a case-based database in all the districts of the region and in the penitentiary administration. Monitoring is based on TB case categories, bacteriological confirmation of the diagnosis, the results of DSTs and cohort treatment outcomes in all categories.

Screening and treatment of high-risk groups

The TB programme introduced a patient-oriented approach to TB treatment and preventive isoniazid therapy in patients with HIV infection. Active radiological screening for TB in high-risk groups has been conducted twice a year since the 1990s, for populations including prisoners, people living with HIV, homeless people and migrants. The general population is screened once a year.

Outcomes

In 2012, an uninterrupted drug supply and social support during treatment helped to increase the success rates to

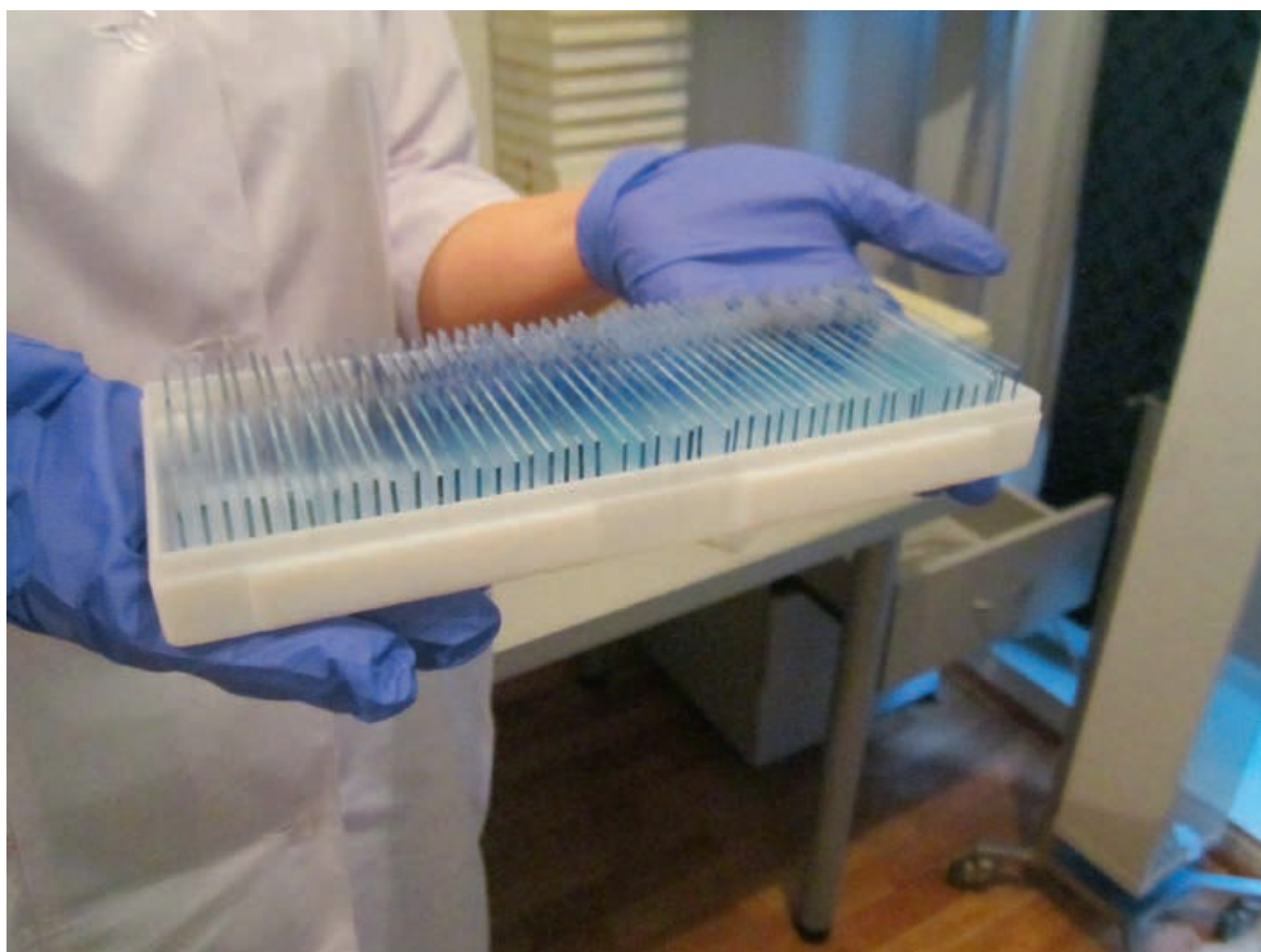
81% among DS-TB patients and 68% in MDR-TB patients. Approximately 70.5% of new TB cases and 84% of relapses have been bacteriologically confirmed. In 2014, 98.9% of TB patients have had rapid DSTs before treatment initiation.

The treatment success rates increased to 81% for DS-TB cases and 68% for MDR-TB cases in 2012. All MDR-TB patients now receive the appropriate treatment with second-line drugs. Only a few isolated cases of refusal to treat and loss-to-follow-up were recorded. In 2014, the incidence of new and relapsed TB cases was 43.9, and the mortality rate was 4.4 per 100 000.

Since 2006, the number of MDR-TB patients on treatment has been decreasing continuously, from 536 in 2006 to 250 in 2014. The number of new MDR-TB cases has also significantly decreased, from 208 in 2007 to 115 in 2014. Consequently, 360 beds for TB cases were eliminated in the civil community, and a TB prison colony of 400 beds was closed.

Ensuring the sustainability of the project

The reforms in Arkhangelsk region have now been in place for many years with funding from the regional budget. The system for provision of TB care is well established and does not require major changes except for finalization and improvement of current practices, especially for XDR-TB care.



TAJIKISTAN

Improving detection of TB among women in community structures

Background

Despite recent achievements, the NTP in Tajikistan continues to face serious challenges that must be addressed to ensure optimal patient outcomes and control of the disease. TB is a serious problem for the country and for communities in Tajikistan, with about 8000 cases detected annually; in 2013, the incidence rate reached 100 per 100 000. Serious challenges to the NTP are the high rate of MDR-TB – 13% among new cases and 56% among previously treated cases – and a growing trend of TB/HIV co-infection. Universal access to proper diagnosis remains a distant goal. Given the country's geography and difficult physical access to health facilities in many areas, the current system for TB diagnosis is generally not reliable for collecting and transporting sputum specimens from primary health care to microscopy centres and further to reference laboratories. Diagnostic delays are common and result in continuing transmission of TB in the community and to more advanced forms of disease.

Health system challenge

Women with TB are stigmatized and have resource constraints, creating gender inequity in access to care and treatment. Treatment of MDR-TB in women thus poses particular challenges, as they may face barriers to accessing health services and abandonment or eviction from their household, pushing them to high-risk situations. A survey of knowledge, attitudes and practice in the general population in 2008, revealed that stigma due to a TB diagnosis affected marital status, especially among women.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

To address gaps and reduce stigma and discrimination with regard to women with TB, Project HOPE (with financial support from the Global Fund) provided a grant to a local NGO to conduct a pilot project in a remote area of Tajikistan. The Matcha *raion* is located north of Khujand along the main road between Dushanbe and Chanak, 50–70 km from the regional centre and is divided administratively into Matcha district centre and five remote areas (*jamoats*). The current population is around 100 000, of whom 83% are rural residents.

Microscopy laboratories are located in the district centres, which are 10–25 km from most villages, making it difficult to provide a sputum examination and to consult a medical doctor or a TB specialist. The situation is further complicated by the fact that not all villages have public transport to a district centre. These barriers particularly affect the access of vulnerable groups such as women to services.

In 2013, 128 TB cases were detected, of which 99 were new smear-positive cases and 15 extra-pulmonary TB. Of these patients, 67 were men and 61 were women. All the patients were enrolled in TB treatment in 2013; 71.5% completed treatment, 12.1% were lost-to-follow-up, 9.4% failed treatment, and 7% died. Analysis of the treatment outcomes showed that women represented 67% of those lost-to-follow-up, 56% of those in whom treatment failed and 43% of those who died.

The women had poor awareness of the symptoms of TB in a general context of low literacy. They depended on their husbands and in-laws for making decisions on medical treatment. In combination with stigma, these factors resulted in delayed treatment, advanced cases and a high probability of mortality among women.

An agreement was signed with the Women's Committee, a Government structure with a nationwide network, to improve women's access to TB diagnosis and treatment. Representatives of the Women's Committee were trained to recognize TB symptoms and in referral, including communication skills and stigma reduction.

Meetings were held in communities to identify family decision-makers, and focus groups were conducted to determine the factors that influence timely access to health facilities and the cause of stigma. Training materials were prepared on the basis of qualitative data collected during these meetings and focus groups. The results helped to assess the relative severity of stigma and discrimination and to strengthen community involvement to reduce social exclusion of (female) TB patients and their families. Health education

sessions were provided to mothers-in-law and men, who were the main influencers and decision-makers in families.

A questionnaire for TB screening was prepared jointly with TB and primary health care workers, and a pool of volunteers were trained in proper use of the questionnaire. The volunteers screened the population to identify groups at risk, as an innovative approach to the early detection of TB, with simultaneous educational sessions. People with TB symptoms were referred to TB diagnostic centres with a voucher, and their transport costs were covered by the project. An advisory hotline was set up to address TB-related questions. An optimal map showing the route from each remote area to health facilities for TB testing was prepared to reduce the travel time of community members and further facilitate access.

Outcomes

Of the 1237 people screened for TB, 13 were referred for testing, and 6 cases were confirmed. Of these, four were new cases (three in women) and two were previously treated cases (both women).

This project strengthened the prevention and early detection of TB by identifying people with TB symptoms from a specially designed questionnaire. Although the questionnaire was not gender-specific, attention to the issues of TB in women during the situation assessment, working with a women's organization and advocacy and educational activities for women yielded good results. Application of new methods to reduce the spread of TB, such as mapping and

questionnaire screening, increased the arsenal of medical and non-medical stakeholders in the detection of TB in the community.

Important factors for success

Informing the public about the main features of TB increased attention to specific TB symptoms, and the involvement of the Women's Committee, volunteers, primary health care workers, community activists and the authorities reinforced the principle of community participation in TB control.

Ensuring the sustainability of the project

Better coordination of Government agencies and NGOs and the use of low-cost methods for early diagnosis developed during the project will enhance its sustainability. It is expected that evidence of the effectiveness of the screening questionnaire method and work with risk groups will result in recommendation of this approach to primary health care and community organizations involved in TB control in communities outside the pilot area. For more targeted early detection of TB, use of the maps to design and coordinate work will ensure consideration of the specifics of localities. The maps of the area will lead to better use of the available resources.

Potential for scaling up project and future areas of development

Establishment and optimal use of funds from *mahallas*, urban divisions in Tajik communities, will ensure financial support for the transport of patients and the sustainability of this approach.



UKRAINE

Support for patients with MDR-TB at the outpatient stage of treatment

Background

A cohort analysis of patients with MDR-TB in 2010 and 2011 in Ukraine revealed a high percentage of treatment interruptions in 2010: 12.3% among newly diagnosed cases and 18.8% among cases re-treated after treatment interruption. Patients with a history of treatment interruptions and patients in high-risk groups, such as alcohol users, people who use drugs, homeless people and ex-prisoners, are in particular need of support for adherence.

Health system challenge

Treatment interruptions decrease the efficacy of MDR-TB treatment and create an additional financial and resource burden for the NTP. The health care system alone cannot ensure good adherence to treatment among patients with MDR-TB.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

To promote treatment adherence, follow-up care is offered and delivered to all patients with MDR-TB treated with second-line drugs procured with support from the Global Fund. Such care is offered to all patients with a high risk for treatment interruption, and most of the patients accept it. Care is delivered by nurses of the Ukrainian Red Cross Society, the only organization with a wide network of health care workers throughout Ukraine.

Follow-up care consists of daily visits at home or at work to patients who are unable to attend DOTS rooms, who include those living in remote locations, working patients in large cities where there is a shortage of DOTS rooms and patients with reduced mobility. Follow-up care includes delivery of drugs, supervision of drug administration and distribution of food packages twice a month to all patients who adhere to treatment.

All patients receive medical, psychological and social support throughout treatment. To prevent treatment interruption during the transition from inpatient to outpatient care, interaction has been established with the staff of inpatient departments. Two weeks before discharge of patients in

high-risk groups or whose treatment is funded by the Global Fund, the TB doctor informs the Red Cross, which prepares an established outpatient follow-up plan based on the characteristics of the patient (e.g. remote residence). As part of this programme, the nurse who will be in charge of follow-up is identified. If the patient lives in an area where there is no visiting Red Cross nurse, nearby medical staff are identified and contracted by the Red Cross to provide follow-up care. A mechanism for drug delivery is discussed and organized in advance in order to avoid any interruption. Patients are then informed of their outpatient follow-up plan; the suitability of the plan is discussed, and changes are made if required.

The follow-up care initiative started in April 2013. Training was conducted to build the capacity of the visiting Red Cross nurses, who at that time did not have sufficient experience with TB patients. The training included information about DR-TB treatment, adherence motivation and TB infection control.

Outcomes

MDR-TB patients were enrolled in the project starting from the second cohort in 2013. Thus, the first results of the cohort analysis are expected in the third quarter of 2015. There has, however, been a significant reduction in the treatment interruption rate among the patients with DS-TB who started treatment at approximately the same time.

In 2012, the treatment interruption rate among people who receive follow-up care was 1.5%, as compared with 7.2% among all categories of patients with DS-TB.

Important factors for success

The initiative started during round 9 of implementation of the Global Fund grant. By that time, all stakeholders were aware that social support for TB patients (including those with MDR-TB) is as necessary for treatment success as the availability of TB drugs. The initiative was successful, and most MDR-TB patients and TB doctors reported satisfaction with the follow-up support. Therefore, this initiative was included by the NTP in the new Global Fund grant.

Ensuring the sustainability of the project

It is expected that the reform of TB services in the context of general health care system reform, including a transition to the outpatient TB treatment model, will lead to re-allocation of funding to outpatient services. Funding per service and per completed case are the alternatives used to finance follow-up care from the State budget. Currently, Alliance Ukraine and the Red Cross use per service funding, in which nurses receive payment for every visit to a patient. In funding per completed case, a nurse's salary is increased after completion of treatment by a patient. Currently, Alliance Ukraine is preparing a discussion of these funding mod-

els with State decision-makers. Advocacy initiated by civil society will also facilitate allocation of funding from local (oblast, city and district) budgets.

Potential for scaling up the project and future areas of development

One of the goals of this project is to involve the staff of NGOs in the support and treatment of TB patients, to shift tasks from the health care system and to bring health care closer to patients. Social contracting may also be introduced for these follow-up care services.

UKRAINE

Early detection of TB among vulnerable groups

Background

The incidence of TB in the general population of Ukraine has decreased by an average of 3.3% during the past few years; however, the number of TB cases among HIV-infected patients remains high. A marked increase in the incidence of co-infection (19.6%) reflects the growing HIV epidemic in the country. Another serious problem for eliminating TB is the increase in the number of cases of MDR-TB, which underlines the importance of early detection and proper treatment. Early detection of TB increases the likelihood of proper treatment and cure and helps combat the spread of MDR-TB. In Ukraine, the incidence of MDR-TB is very high: the estimated proportion of MDR-TB among new TB cases is 14%. Drug resistance adversely affects not only the results of treatment but also increases the economic cost of treating these forms of TB.

The incidence of TB in vulnerable groups was found to be 10 times higher than the estimated incidence in the general population. People living with HIV/AIDS are particularly vulnerable to TB because they often have a lower standard of living and limited access to prevention and treatment of TB. According to estimates for 2014, 7% of newly registered TB patients injected drugs. Early detection of TB among vulnerable groups has therefore been adopted to respond to the current situation in the country, on the basis of recommendations by WHO.

Health system challenge

Programmes are required to support early detection of TB among vulnerable groups.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

During 2013 and 2014, Alliance Ukraine introduced services for early detection of TB among risk groups in the HIV harm reduction programme as a pilot project. The project

was implemented by Alliance Ukraine in partnership with regional NGOs to provide TB detection and diagnostic services to the most vulnerable groups. TB symptom screening questionnaires for clients at risk for TB were introduced, and referral systems were developed to help patients navigate the complicated health care system. In 2014, 39 NGOs were involved in the programme, providing support for patients in all phases, from the screening questionnaire to laboratory confirmation of TB and initiation of treatment.

In 2014, more than 46 000 clients were actively questioned about TB symptoms. Of these, 6905 individuals in vulnerable groups were found to have TB symptoms, of whom 5862 (85%) had previously received a diagnosis of TB. Active TB was diagnosed in 555 individuals, of whom 535 (96%) started treatment in TB facilities.

Evidence of impact and efficacy

On the basis of the experience of 2013–2014, Alliance Ukraine continued to implement this practice in 2015, within the new Global Fund funding mechanism. According to preliminary data for the past 6 months, more than 87 000 clients have responded to the screening questionnaire, exceeding the rate in 2014 by 349%.

Sustainability of the practice

The practice of early detection by screening vulnerable groups is relatively inexpensive. It is expected that reform of the TB service in the context of general health care system reform, with transition to the outpatient TB treatment model, will lead to reallocation of funding. Funding per service and per completed case will provide resources for the follow-up care services delivered to such patients from the State budget. Advocacy initiated by civil society will also facilitate allocation of funding from local budgets (oblast, city and district).

UKRAINE

Treatment of TB concomitantly with opioid substitution therapy¹

Background

Several epidemics adversely affect the demographic situation in Ukraine: HIV/AIDS, TB and drug addiction. People who inject drugs are vulnerable to both HIV infection and TB. It is estimated that more than 250 000 people in Ukraine inject opiate drugs, of whom only a little more than 50 000 are officially registered. In 2004, Ukraine introduced opioid substitution therapy, which was available only in some regions of Ukraine for a limited number of patients in 2004–2005; as of July 2015, however, 8264 patients receive opioid substitution therapy at 170 medical institutions in all regions of Ukraine.

Health system challenge

More than 40% (3428) of patients on opioid substitution therapy are co-infected with HIV, of whom 2043 receive antiretroviral therapy, 138 are preparing for antiretroviral therapy, 1303 have TB, 1399 are infected with hepatitis B virus and 4458 with hepatitis C virus. A significant number of patients are co-infected simultaneously with two or three infectious diseases.

Thus, people who inject drugs require a special approach to treatment of TB, particularly MDR-TB; however, sites for these patients were not available in all TB institutions in Ukraine.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

Sites of substitution treatment were opened in TB dispensaries in order to improve the access of people who inject drugs to medical services, drug treatment and HIV and TB treatment. The advantage of this approach is that it leads to mutually beneficial cooperation between TB and drug services, which in turn allows services to be provided to patients on the principle of an integrated approach (“services under one roof” or “one-stop shop”).

The Ukrainian Institute on Public Health Policy conducted a study at six opioid substitution therapy sites over 90 days to assess the services available in TB dispensaries. The purpose of the study was to evaluate the effectiveness of integrating methadone treatment with TB treatment in increasing adherence to TB treatment.

Outcomes

All the primary outcomes were significantly better in the groups on opioid substitution therapy, including 90-day TB treatment completion (89.5% versus 73.6%), time to TB treatment discontinuation and TB medication adherence (97.1% versus 86.2%), after control for death. The main reasons for not completing treatment in the control group were death, discharge from the clinic, loss-to-follow-up and arrest. Overall, 90-day mortality was high (8.2%). After control for covariates that differed between the two groups at baseline, the only independent predictor of completing 90 days of TB treatment was receipt of methadone treatment in an integrated treatment setting (adjusted odds ratio, 3.05; 95% confidence interval, 1.08–8.66). Integration of opioid substitution therapy into inpatient TB treatment significantly improved retention in TB treatment and treatment adherence among people who inject drugs.

As of July 2015, the retention of patients on TB treatment at sites in which opioid substitution therapy was integrated was 75%.

Important factors for success

An important factor for adherence to treatment for TB, including MDR-TB, was a well-established system of integrated care with narcotics, TB and AIDS services. Regional NGOs that provide psychosocial support for patients on opioid substitution therapy also played an important role in treatment retention; additionally, at some sites, case managers accompanied patients to receive medical services, thereby ensuring that they received the necessary care.

Ensuring the sustainability of the project

Given the positive results of treating people who inject drugs with opioid substitution therapy, especially in combination

¹ Adapted from the original article: Morozova O, Dvoryak S, Altice FL. Methadone treatment improves tuberculosis treatment among hospitalized opioid dependent patients in Ukraine. *Int J Drug Policy* 2013;24:e91–8.

with treatment for HIV/AIDS and TB, this therapy is supported by the State programme on HIV/AIDS for 2014–2018.

Guidelines (methodological recommendations, instructions and manuals) on medical treatment and psychosocial support for integrated opioid substitution therapy–TB treatment were issued, helping to ensure consistent treatment.

Potential for scaling up and future areas of development

This model of integrated care is especially important for people who inject drugs who have MDR-TB, as they frequently interrupt their treatment. Advocacy is being undertaken for the opening of new opioid substitution therapy sites in TB facilities.



UNITED KINGDOM

London TB extended contact tracing team¹

Background

TB remains a significant public health issue in the United Kingdom, even though it can be controlled through early detection and treatment of new cases or can be prevented through effective tracing of people who have been exposed. An important challenge of managing TB is that it does not respect jurisdictional boundaries, especially in busy cities like London, where populations are particularly mobile, working in one part and living in another. As a result, the likelihood of infection across boundaries is increased. Moreover, this airborne infectious disease is strongly associated with poverty and health inequality. It is most commonly found among marginalized groups with poor access to health care and often with other health or social issues, such as unstable housing, vulnerable employment and addiction. London has an especially high rate of TB – higher than in any other comparable city in Europe – and it accounts for more than one third of national cases.

Before this intervention, TB patients were managed by four health protection teams and in approximately 30 TB clinics. An audit found that the services were overstretched and were usually unable to track patients who moved from one area to another or to screen at-risk populations. This resulted in a low uptake of screening and inaccurate data collection on the extent of TB in London. Moreover, referral systems were complicated.

Health system challenge

A cross-area service was necessary to help detect and manage TB, regardless of patients' movements.

Good practice in health systems strengthening to improve prevention and care of M/XDR-TB

A team of public health specialists and clinical TB nurses was set up to treat the city as a whole rather than by area. The London TB extended contact-tracing team is the first dedicated team in which public health specialists and clinical TB

nurses work together. The team conducts on-site screening in the community to find people who have been exposed to TB. The team screens at schools, colleges, workplaces, detention centres and hostels. The nurses on the team also assess contacts clinically, perform tuberculin skin tests and phlebotomy and enter the data into a centralized database. On-site screening is particularly important for children and young people, as it allows them to be screened in a familiar environment with support from friends, family and staff who they know and trust. Providing care in their own environment is particularly advantageous for screening vulnerable populations. The team also provides health promotion through a TB awareness session for parents and at school assemblies. Furthermore, the team provides essential skills and capacity to fellow health professionals who manage TB patients in the capital.

Outcomes

The team was to be formally evaluated by an independent body, but preliminary observations and feedback from colleagues and patients showed that the programme has been beneficial. The team has identified cases of active and latent TB and managed to initiate treatment. This not only improves individual outcomes but also prevents onward transmission. The programme has eliminated several of the barriers that usually prevent patients from accessing services, such as stigma, language barrier, having to negotiate time off work or school, fear of hospitals or not being able to afford transport.

The team has also created the first pan-London TB contact-screening database to ensure that comprehensive, appropriate public health action is taken. These data can be used as a basis for evidence-based recommendations and to inform fellow health professionals of the importance of contact tracing. The team has also increased the capacity of other health professionals in London.

The London TB extended contact tracing team was a finalist in the Public Health Nursing category of the Nursing Standard sponsored by Public Health England.

¹ Adapted from the original article: Cole E. Turning the tide on tuberculosis. London: RCNi; 2015 (<http://rcni.com/newsroom/nurseawards/turning-tide-tuberculosis-26656>).

Important factors for success

The team had to overcome clinical governance structures, commissioning boundaries and entrenched attitudes; but, with commitment of staff and close collaboration with more than 30 TB clinics, the team was able to gain sustained, sector-wide support. Positive feedback from both TB services and service users has helped perpetuate the programme, which has been effectively integrated into existing national health services.

Ensuring the sustainability of the project

Funding was extended after positive feedback from stakeholders and positive provisional data.

Potential for scaling up the project and future areas of development

The team hoped to scale up the project to other cities by sharing its experience at conferences and through expert testimony to the National Institute for Health and Care Excellence.





AZERBAIJAN

Training centre on prevention and control of TB in prisons

Background

The Main Medical Department of the Ministry of Justice of Azerbaijan has provided health care to prison inmates for many years and is an internationally recognized centre for the control of TB and MDR-TB. The Department received the 2013 Correctional Health Care Award from the International Corrections and Prisons Association for its innovative implementation of best practices in the diagnosis, treatment and care of TB and MDR-TB. Programme sites have been used for demonstrations for representatives of many countries in and beyond the European Region.

Health system challenge

An effective TB control programme in prisons requires a well-organized team of health care providers and non-medical penitentiary staff. Special measures are needed to tackle the problem of high staff turnover in the penitentiary system, including continuing professional development to raise their awareness and knowledge of TB control and their role in managing and controlling the spread of the disease.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In 2012, the Main Medical Department founded a training centre for TB in prisons at the specialized treatment institution. The faculty of the centre share evidence-based theoretical modules and first-hand experience in TB case detection in prisons, effective infection control and treatment. Their evidence was based on their work in 24 prisons including the specialized treatment institution, which consists of eight departments, 23 sub-departments and a central level-3 biosafety laboratory in which the whole range of phenotypic and genotypic TB diagnostic methods are used.

The main lecturers at the training centre are physicians working directly in the specialized treatment institution, public health managers with wide experience in international organizations and WHO experts. The target audience includes doctors and mid-level medical staff in primary, secondary and tertiary medical institutions of the penitentiary system. The centre provides high-quality evidence-based

education on TB control in prisons based on WHO strategies and guidelines on TB control.

In 2015, the training centre and the WHO Regional Office for Europe conducted a 5-day international training course for policy-makers and health care providers involved in planning and providing TB services in penitentiary institutions in eastern Europe and central Asia. The course took place in Baku, Azerbaijan, and comprised lectures and visits to prisons for hands-on classes. Evaluation of the course by the participants indicated high-quality organization and delivery of the programme and good retention of the course material.

Outcomes

Since 2012, the centre has conducted 60 training courses for 344 doctors, 118 mid-level medical staff, 70 laboratory technicians, 245 non-medical workers in the penitentiary system and 25 officers in other agencies. In the past 3 years, people from Belarus, central Asia, China, Georgia, Iraq, Italy, the Philippines, the Republic of Moldova, Mongolia and South Africa have used the resources of the training centre and participated in courses. High-level officials and public health managers in the penitentiary system and TB physicians from several countries have been trained several times in the centre. In general, the initiative for the courses came from ministries of health and WHO offices, the European Union and the International Committee of the Red Cross.

In view of the vast, successful experience in implementing the WHO-recommended TB control strategy in the Azerbaijan penitentiary system in 1995, the training centre was approved as a WHO collaborating centre on prevention and control of TB in prisons in 2014.

Important factors for success

Training and refresher training for medical and non-medical staff of penitentiary systems must continue to be an integral part of the TB control programme in prisons. It is important for the joint work of medical staff and security officers providing modern TB diagnostics and treatment for prison

inmates. The Government's support was key to establishing the centre, and intersectoral collaboration between the Ministry of Justice and the Ministry of Health in ensuring continuing professional development of staff was instrumental to the success of the project.

As a result of continuous training and advocacy, the TB incidence has been significantly reduced and treatment success

rates for TB and rifampicin-resistant TB in the penitentiary system of Azerbaijan have reached 91% and 80%, respectively.

Ensuring the sustainability of the project

Although the training centre was organized under a Global Fund grant, its work to serve domestic needs is supported by State funds. International training courses are conducted at the request and with the support of donors.

AZERBAIJAN

Home treatment and support on adherence for patients with DR-TB

Background

In 2009–2010, a large number of TB patients, including patients with DR-TB, was a major health problem in Azerbaijan. WHO estimated that the prevalence of new and previously treated DR-TB cases in 2009–2010 was 2800 cases per year.

The DOTS Plus project began in 2008; however, access to treatment was insufficient, and there was a waiting list of DR-TB patients, most of whom had a long history of TB, destruction of the lungs, accompanying diseases and, often, disability.

Health system challenge

One of the main challenges was the provision of DOTS and support for adherence to a group of long-term patients, who were unable, due to their physical state, reduced mobility, disability or other conditions, to attend the DOTS clinic.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In order to assist patients, the International Federation of Red Cross and Red Crescent Societies, actively supported by the Azerbaijan Red Crescent Society, initiated a pilot project in Baku and Sumgait to provide DOTS at home and to support adherence. Each year, 20–25 DR-TB patients were enrolled in a pilot project to provide outpatient care to those who were unable to attend a DOTS clinic. Care was extended throughout treatment (18–24 months) or until the patient was able to visit the DOTS clinic alone.

The staff of the NTP provided training for Red Crescent Society nurses and social workers and information about DR-TB drugs, possible adverse drug reactions and how to handle them. Particular attention was paid to infection control measures while working with DR-TB patients. A psychologist participated in the training to improve the communication skills of the health care workers, especially in assisting people with long-term TB. After training, Azerbaijan Red Crescent Society staff were able to educate family members of DR-TB patients in supporting the patients and taking precautions to reduce transmission of TB in the community.

DR-TB patients were visited six times a week. The responsibilities of the Red Crescent Society staff included DOTS at home, monitoring and treating side-effects, working with family members and providing psychological and social support to patients. The nurses collected sputum samples every month and transported them for monitoring of treatment adherence to nearby TB facilities. Nurses at the TB dispensaries supplied TB drugs to the Red Crescent Society nurses according to the list of patients in the catchment area. The psychologist gave additional consultations to patients, and the nurses offered social support and additional humanitarian aid to patients in more remote areas via the organization's district sections.

None of the 70 patients in the pilot project interrupted their treatment, due to the assistance of the nurses and social workers who increased their awareness about DR-TB and the importance of adherence, rapidly identified and managed side-effects and supported the patients psychologically. The patients became more aware of DR-TB and were more willing to complete their treatment. This helped combat the stigma associated with having DR-TB.

Outcomes

The project strengthened the links between the State institutions and NGOs and demonstrated that such organizations are fully capable of providing DOTS at home. Red Crescent Society staff not only provided TB-related information but also informed the nurses, patients and their families (a total of 100 people) about the rules and eligibility for receiving humanitarian aid, how to provide first aid, a healthy life style and co-infection with HIV and hepatitis viruses.

During interviews, the patients and their families recognized the importance of a patient-centred approach and expressed their appreciation for the personal attention and care provided. The psychosocial support the patients received inspired them to share their experiences of overcoming the challenges of DR-TB treatment with other TB patients to support and motivate them to complete their treatment.

The Azerbaijan Red Crescent Society became a member of the country TB working group of the NGO constituency.

Important factors for success

An important factor was use of the network of trained NGO staff – nurses, psychologist, social workers – to reach out to patients who would otherwise not have access to DOTS and treatment support. Nurses at TB dispensaries were able to transfer their excess workload to the visiting nurses, who were specially trained to address the needs of long-term DR-TB patients. This improved the quality of care.

Ensuring sustainability

The project was effective and relatively low cost: it improved the quality of treatment and, by supporting adherence, prevented the development of more serious forms of drug resistance. The Red Crescent Society is planning to continue cooperation with international donors and with State structures. It conducts fund-raising and is a sub-recipient of Global Fund grants.

TB patients are still stigmatized, and there are few TB NGOs; therefore, until now, the country's Supreme Council, which allocates State grants to NGOs, have not allocated funds for their participation in the TB response. Best practice shows that stigma can be overcome. The success of the project is being used by the recently created NGO coalition to advocate for the interests of TB and DR-TB patients.

Acknowledging the project as best practice will draw the attention of decision-makers and stakeholders responsible for TB control in Azerbaijan to the remaining problems and effective ways to solve them.

Potential for scale-up and future areas of development

The Azerbaijan Red Crescent Society has the necessary infrastructure (83 district committees and seven regional centres), the human resources (staff and volunteers, including in remote areas) and collaboration mechanisms at local and international levels to continue collaboration with State structures to combat TB and DR-TB in Azerbaijan.

BELARUS

DR-TB consilium

Background

In 2010 in Belarus, M/XDR-TB represented an emergency situation, with a rate of MDR-TB of 32.7% among new cases and 76.6% among previously treated cases and a rate of XDR-TB of 1.7% among new cases and 16.5% among previously treated cases. The proportion of MDR-TB was consistently higher both among new (51.1%) and previously treated cases (100%) in TB/HIV co-infected patients. The MDR-TB treatment success rate was low and mortality dramatically high. Routine monitoring in 2009–2010 showed that the WHO-recommended treatment regimens were not always correctly prescribed.

In these conditions, the role of the DR-TB consilium was to expedite diagnosis and ensure that individual treatment schemes were correct. The DR-TB consilium is a platform for the input of a broader range of specialists to the discussion of cases in order to find optimal treatment solutions.

Health system challenge

An urgent task of the DR-TB consilium was to train specialists to participate in multidisciplinary consilia at a decentralized level in order to improve the quality of diagnosis and care and to reduce the time to initiation of effective DR-TB treatment throughout the country.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

The aim of the MDR-TB consilium is to improve MDR-TB treatment outcomes by a multidisciplinary approach to patient management. Although it was initially centralized, the approach was gradually to build capacity in the oblasts to allow decentralized decision-making and to reduce the time to effective treatment initiation.

The MDR-TB consilium has the following functions: registration of new MDR-TB cases, making decisions on treatment initiation, changing treatment regimens, treatment management, transfer of patients to palliative care, evaluation of the severity of side-effects and their management, deciding on indications for surgery, managing treatment loss-to-

follow-up, cohort analysis and ensuring an uninterrupted supply of TB and supportive medications. The MDR-TB consilium consists of a chairperson, a secretary, specialists in drug management, monitoring and evaluation and laboratory work, a radiologist, a surgeon and a TB physician or pulmonologist. Other specialists are sometimes invited (e.g. a neurologist for a case of central nervous system TB). All MDR-TB cases are reviewed by the consilium before treatment initiation and thereafter every 3 months.

The consilium has always been a platform for training district and provincial specialists. The oblasts provided transport for their specialists to attend consilium meetings at least once a month, where the doctors and the heads of oblast consilia presented their cases, accompanied by supporting documentation, and proposed treatment regimens, which were subsequently discussed by the consilium. At least two courses were organized each year for specialists from oblasts and districts, in training facilities well equipped with a negatoscope and computers for viewing tomograms. The monitoring and evaluation specialist checked the correctness of patient registration online. At the central consilium meetings, the specialists could network regularly in an informal atmosphere, which also improved collaboration.

Outcomes

As knowledge built up at decentralized level and the professionalism of district staff grew, the input required from the central consilium decreased. From 2013, based on recommendations of the Green Light Committee, the oblast consilia started to work independently, as their training enabled them to make decisions on DR-TB treatment; only more difficult cases were referred to the central level. Initially, central consilia were held for 3 days; they now take only 1.5 days, as they discuss primarily cases in which new drugs, such as bedaquilin and clofazimine, are required. Decisions on treatment with new drugs are taken by a quorum of specialists.

From the start of practice in 2010, consilia at the central and oblast levels have reviewed > 10 000 cases. Largely as

a result of these consilia, as noted by Green Light Committee consultants in 2011 and 2013, treatment is prescribed correctly throughout Belarus. According to a countrywide cohort analysis, the treatment success rate increased from 37.2% in 2010 to 54.1% in 2012.

Every TB doctor in the country (at least 100 people) has attended a central consilium and received on-the-job training by presenting, analysing and receiving feedback on their cases. In addition, two training seminars were held for oblast consilium members. They can now successfully function as oblast-level consilia. There is one consilium for penitentiaries.

Important factors for success

The MDR-TB consilium was established at the Republican Research and Practical Centre. Its experience was shared,

and oblast representatives received on-the-job training, enabling them to establish similar structures at oblast level. Now MDR-TB consilia exist in every oblast of the country.

Ensuring sustainability

Consilium activities were initially funded by the Global Fund. In view of their acknowledged usefulness and the motivation of oblasts and districts to continue this practice, the sustainability of the oblast consilia is backed by an order of the Minister of Health, which states that districts must provide transport and per diem for doctors to travel to oblast and central consilia. To maintain their skills, two courses a year will be covered from the NTP budget.

ESTONIA

TUBIDU project: empowering public health systems and civil society to fight the TB epidemic among vulnerable groups: addressing the needs of people who inject drugs

Background

The TUBIDU project was proposed jointly by various organizations in different countries and was led by the Estonian National Institute for Health Development. The project focused on preventing injecting drug use and the HIV-related TB epidemic in participating countries by empowering civil society organizations (including harm-reduction service providers) and public health professionals. The main targets of the project were people who inject drugs, who are at high risk for HIV infection and TB, especially M/XDR-TB, as they have many social and demographic risk factors that put them in a vulnerable social position (e.g. poverty, unemployment, homelessness, imprisonment, malnutrition and limited access to health care).

The TUBIDU project was implemented by seven associates in six European Union countries: the NGO Dose of Love Association in Bulgaria, the Estonian National Institute for Health Development (the lead partner) and the Estonian Network of People Living with HIV, the Finnish Lung Health Association, the Tuberculosis Foundation of Latvia, the Institute of Hygiene in Lithuania and the Romanian NGO Angel Appeal; and also five collaborating partners in non-European Union countries: World Vision Albania, World Vision Bosnia-Herzegovina, the National Centre for Tuberculosis and Lung Diseases in Georgia, the Leningrad Region AIDS Centre in the Russian Federation and the International HIV/AIDS Alliance in Ukraine. The project was co-funded by the Consumers, Health and Food Executive Agency of the European Commission in the framework of Programme of community action in the field of health (2008–2013).

All the participating countries face the challenges of M/XDR-TB, TB/HIV co-infection and high incidences of TB in vulnerable groups. Six of the countries – Bulgaria, Estonia, Latvia, Lithuania, the Russian Federation and Ukraine – are high-burden M/XDR-TB countries of the WHO European Region.

Health system challenge

Treatment barriers, including poor adherence and limited access to health care, pose challenges to early testing and access to treatment for TB and M/XDR-TB among people who inject drugs.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

Professionals working in health services and at the policy level (including health specialists in government organizations and NGOs, local municipalities, research institutions and community organizations) have been engaged in efforts to reduce the burden of TB among people who inject drugs and people living with HIV through local and international training, international and country-specific meetings, exchange of good practices during internships, study visits and networking.

Target groups were given intensified training, including study materials and guidelines on TB infection control, case finding and TB/HIV-related health care systems and services. Guidance was prepared for TB prevention activities in the community by organizations working with people who inject drugs and people living with HIV. Recommendations for policy-makers on future action in the field were prepared and disseminated.

Specific materials were prepared for the project, including guidance documents, handbooks and training outlines for community-based organizations, and policy briefs for policy-makers. These materials were used to raise awareness, provide information, recommendations and guidance for community organizations on inclusion of TB prevention, control and treatment activities in their work with people who inject drugs (including intensified and active TB case finding, contact tracing, informing, educating, counselling and supporting their clients during TB treatment.)

TUBIDU materials are available in seven languages (Bulgarian, English, Estonian, Latvian, Lithuanian, Romanian and Russian) on the website of the project and can be downloaded at <http://www.tai.ee/en/tubidu/publications>.

Outcomes

A final evaluation confirmed that the TUBIDU project had addressed many important issues in the field of TB prevention and harm reduction, within and beyond the project area. The TUBIDU partners and other specialists involved expressed satisfaction with the project, confirming that the outcomes (i.e. training, network meetings, information and training materials) had met their professional needs and had already improved and facilitated work in their organization or facility. The feedback indicated that TUBIDU deliverables were well received and in some cases had already been used successfully in harm reduction or in the work of other relevant sites. The online feedback also revealed that TUBIDU events, internships and training were highly valued by the participants, both for the theory of TB in vulnerable groups and for practical knowledge and skills.

The project enhanced horizontal and vertical country-specific and cross-border collaboration of various stakeholders to tackle TB. All the TUBIDU collaborators emphasized the importance of the project's multilateral bridging nature, therewith also initiating new and strengthening existing collaboration between community-based and government organizations as well as social, harm reduction and medical institutions. The project has therefore had an important impact on the partners in creating, strengthening and broadening international and national partnerships in the response to TB and injecting drug use at national and international levels.

The project contributed to more active communication and collaboration among specialists in different fields, such as between medical (e.g. HIV and TB doctors and nurses) and harm reduction specialists. The contribution of the TUBIDU project to improving collaboration with other national stakeholders and organizations was considered to be significant by 73% of the online feedback respondents.

Ensuring sustainability

The greatest challenge remains the sustainability of the activities. At the end of the project, some partners found difficulty in obtaining resources for continuing their work.

In Estonia, some of the activities will be integrated into the National Health Plan. Furthermore, the Estonian Ministry of Social Affairs has showed interest in sharing the TUBIDU project outcomes, experience and recommendations at international level to keep the topic of TB in vulnerable groups high on the international agenda.

In Latvia, the Ministry of Health has supported the development of collaboration algorithms and mechanisms between community-based organizations and health care providers (e.g. TB/HIV services) in policy documents and has expressed willingness to use the project results in future policy planning.

TUBIDU partners emphasized the importance and benefit of maintaining the national and international network that was established during the project. Project partners will continue to advocate for sustainable implementation of TUBIDU policy recommendations through international networks and new projects in the same field. Thus, in Romania, some of the TUBIDU project activities have been integrated into the new Global Fund project.

HUNGARY

Forming an expert team for active TB surveillance

Background

The incidence of TB in Hungary is decreasing steadily. In 2014, it had decreased to 8.4%, with nine cases of MDR-TB. Despite the decrease, some regions still have a higher-than-average incidence of TB, particularly counties bordering Romania and Ukraine, where poverty, unemployment and cross-border trafficking are prevalent.

Hungary has a vertical TB surveillance system, with statutory case-based notification directly to the national level. Surveillance involves obtaining data from treatment sites (i.e. pulmonary dispensaries responsible for TB treatment and screening, pulmonology departments) and from laboratories handling mycobacterial samples. As of 2010, these data have been registered online.

Health system challenge

The national surveillance unit required a team with special expertise in TB to increase efforts to decrease the rates of TB in Hungary.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

The national surveillance team has set up an online system to register TB cases and has formed a TB expert team within the surveillance unit to manage and monitor cases. The expert team includes pulmonologists, an M/XDR-TB treatment specialist, a microbiologist, a statistician, the head of the National Mycobacterium Reference Laboratory and the NTP manager; its work is supported by an information technology expert. The aim of the team is to monitor TB status and to provide support to treatment facilities, health professionals, mycobacterial diagnosticians, laboratories and screening facilities to ensure adherence to the proper clinical pathways.

Although there remains room for improvement in the timely reporting of cases, the online system has led to faster identification of possible discrepancies in data from different sources on the same TB patient or patients who may have been seen in only one or another setting (laboratory or

treatment facility). For example, when cases are detected in a laboratory, the national surveillance unit can help ensure that they are also found and referred to the geographically appropriate pulmonary dispensary or pulmonology department to initiate treatment as quickly as possible.

When discrepancies and potential errors are found in diagnosis and treatment, the expert team can contact the health professional in question to provide guidance and feedback for re-assessing the treatment plan or explain how to use the online system, should this be an issue. The expert team is also responsible for assessing and investigating all treatments still registered at 10 months to find the reason for the prolonged treatment and, if necessary, provide guidance to improve the treatment.

The expert team has also helped to address problems in regions of Hungary with a high TB incidence. For example, in 2010, the northeastern counties of Borsod-Abaúj-Zemplén, Szabolcs-Szatmár-Bereg and Hajdú-Bihar, had higher rates of poverty, unemployment and local border traffic and therefore experienced incidence rates that were higher than the average rate in Hungary.

In 2011, discussions between the expert group and the main stakeholders in TB control in Borsod-Abaúj-Zemplén county resulted in a reduction in the incidence rate and led to intensified mandatory screening of the local population and increased awareness about proper diagnosis and treatment. In 2013, although screening programmes were in place, no significant decrease in the incidence rates of TB was observed in Szabolcs-Szatmár-Bereg county. The expert team therefore organized site visits to hold advisory forums for local practitioners, mycobacteriologists and public health officers on various aspects of TB care and control. Medical charts were revised.

Outcomes

This scaled-up, concerted approach resulted in a marked improvement in data quality, and 30–40 cases of infection with non-tuberculous mycobacteria are de-notified. In addi-

tion, there is more rapid de-notification in cases of misdiagnosis (Fig. 1) and adoption of the recommended interval for treating DS pulmonary TB treatment (Fig. 2).

The expert group and online registration system also contributed to better control and management of TB in the target counties of Borsod-Abaúj-Zemplén, Szabolcs-Szatmár-Bereg and Hajdú-Bihar. Fig. 3 shows the observed decreases in incidence between 2010 and 2014.

As a result Hungary has been able to maintain a low proportion of MDR-TB cases: in 2014, only 1.5% of new culture-positive pulmonary TB cases and 11.8% of re-treated cases were MDR-TB. In 2010, 14 new and no re-treatment cases were detected in the northeastern counties (out of all 22 Hungarian MDR-TB cases), whereas by 2014, not a single case of MDR-TB was registered, and only five cases of MDR-TB in re-treatment patients appeared in that region.

These results underline the importance of ensuring compliance and treatment completion among patients with new TB to prevent acquired MDR-TB.

Fig. 1. Time to de-notification in cases of misdiagnosis, 2010–2014 (relative frequency)

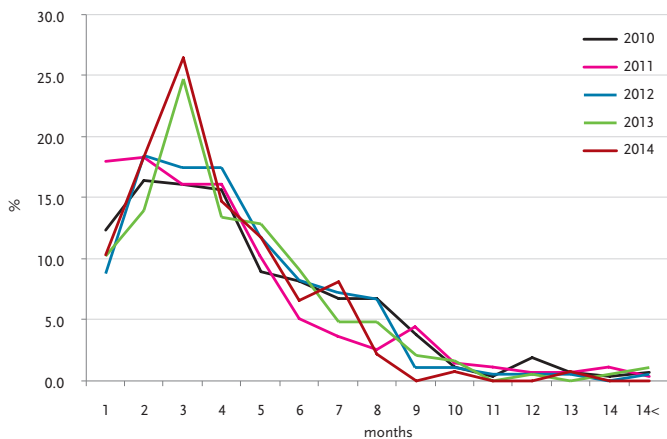


Fig. 2. Interval before treatment of pulmonary DS-TB, 2010–2014 (relative frequency)

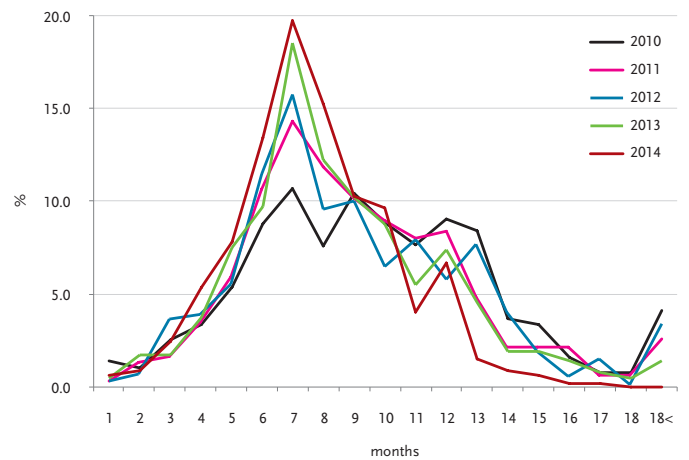
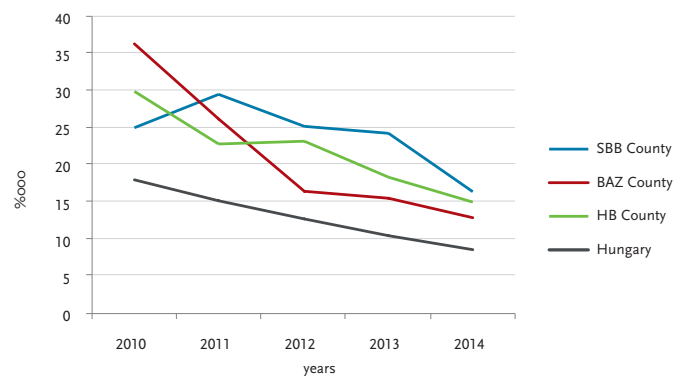


Fig. 3. Incidence of TB per 100 000 in high-risk counties, 2010–2014



BAZ, Borsod-Abaúj-Zemplén; SSB, Szabolcs-Szatmár-Bereg; HB, Hajdú-Bihar

SERBIA

Building human resource capacity for ambulatory care of patients with M/XDR-TB

Background

Serbia has a well-organized TB programme, which in the past 5–6 years has stabilized the MDR-TB situation in the country. The incidence of all TB fell from 37/100 000 in 2003 to 17/100 000 in 2013. The success rates of treatment for DS TB were good until 2011, when the rate was 85%. In 2012, the rate was 82% for new cases, with increasing death rates due to population ageing.

MDR-TB treatment in the country started with a Global Fund grant in 2009, and during the first 2 years treatment was given mainly for chronic and difficult-to-treat MDR-TB cases. Although many patients died during treatment, most (60%) were successfully treated in 2009; subsequently, they treatment success rate has been increasing (71% in 2010 and 76% in 2011). The number of new MDR-TB cases appears to have stabilized at 10 patients a year, and mortality among these patients has fallen.

Since December 2004, Serbia has had external funding from the Global Fund of a total of US\$ 10 million. The Serbian Government has shown political will to support the NTP and the Global Fund Project Implementation Unit to make best use of the external resources. The money was invested in training health staff in hospitals and in the primary sector in introducing the DOTS strategy, for MDR-TB treatment, use of a new information and registration system, upgrading the national reference laboratory and supplying laboratory equipment and consumables for TB drugs. In 2008–2009, guidelines for MDR-TB management were published, staff were trained in use of the guidelines, second-line TB drugs were procured through the Green Light Committee mechanism, and treatment of MDR-TB was started. Until then, there had been no organized treatment of MDR-TB in Serbia, and there was a considerable backlog of patients with (chronic) MDR-TB when treatment was first offered in 2009.

The health institution with longest tradition in treating TB patients in Serbia is the Ozren-Sokobanja Specialized Hospital for Pulmonary Diseases, which opened in 1942 in a beautiful mountainous area. The MDR-TB department has

been newly refurbished, and 10 beds are available for these patients. The rooms are large and pleasant, and all face a wide balcony to which patients have access under proper infection control measures. The central store of second-line TB drugs for the country is located in this hospital. Medical staff in the hospital were trained in the WHO Collaborating Centre for M/XDR TB in Riga, Latvia.

Health system challenge

Despite good hospital capacity for MDR-TB patients in Serbia, measures were needed to improve ambulatory care services once patients with MDR-TB were discharged from hospital, with a focus on improving adherence to treatment.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In order to increase adherence to treatment by M/XDR TB patients and improve the treatment success rate, the NTP, with financial support from the Global Fund, introduced practical training for ambulatory teams (doctors and nurses) to conduct outpatient treatment of MDR-TB. The first course, in 2010, was organized by Ozren Hospital with technical assistance from the Global Fund unit of the Ministry of Health; from 2012, training was fully organized by the hospital itself.

The courses covered the organization of treatment and follow-up, disease management, storage of second-line TB drugs, case reports of treated patients, management of patients to be discharged with continuation of treatment, principles of continuous health education of patients and their families and the patient-centred approach to medical care. Trainees also visited an M/XDR-TB ward and held health education sessions with the patients, using a brochure and a PowerPoint presentation on the most interesting topics for patients, prepared by national TB experts. Each patient received a brochure, and trainees and patients got to know one another. Patients were encouraged to ask questions and to participate actively in their treatment, thus initiating a trusting relationship, which is important for the continuation of long-term treatment. The ambulatory teams

are encouraged to stay in touch with physicians at the hospital and to ask for advice on M/XDR-TB treatment.

At the end of the courses, ambulatory teams give the patients all the second-line TB drugs necessary for 3 months. After three months, the TB Expert Consilium in the hospital reviews the health status of the patient and decides on further treatment.

Outcomes

With other aspects of the M/XDR-TB programme, this practice resulted in a good treatment success rate in MDR-TB patients, keeping in mind the fact that there was a considerable backlog of patients with (chronic) MDR-TB when treatment was first offered in 2009. The latest data show a treatment success rate among MDR-TB patients of 76%, with a low rate of treatment interruption.

This practice improved the ability of ambulatory care providers to support patients in coping with their illness. The training programme was considered to have increased the capacity of health workers in M/XDR-TB management significantly and improved the quality of services provided.

Ensuring the sustainability of the project

While the intervention increased health system costs for treating and managing M/XDR-TB in the short term, it has helped the country to reduce the costs that would be incurred by having to treat patients more intensively due to non-adherence, treatment failure and continued spread of TB. This good practice has been recognized by decision-makers and is now part of the draft national strategic document and annual plans for Ozren Hospital. It will therefore be continued after the end of the Global Fund project.

Potential for scaling up project the and future areas of development

Ozren Hospital has a long tradition of TB treatment in the Balkan region, and it has now become a centre of excellence for M/XDR-TB by organizing and coordinating activities in the country. With potential further development, it could become a centre of excellence for the Balkan region.

The authors wish to thank the Ministry of Health for setting up the project “Control of tuberculosis in Serbia”, supported financially by the Global Fund, through which this practice was introduced in Serbia.

SLOVAKIA

Addressing the needs of the most vulnerable and hard-to-reach groups: the case of the Roma community

Background

The fight against TB has made significant gains during the past 25 years. Prioritizing TB control has been included as a separate provision of the national Act on Protection, Promotion and Development of Public Health (Act 355/2007). Sectors involved in TB control, whether public–private or public–public, collaborate at various levels of the health system. Patient referral and counter-referral practices between general practitioners, TB specialists and in- and outpatient facilities are comprehensive and systematically organized. Medical and public health education about TB is up to date. Conferences, meetings, workshops and case studies targeting general practitioners and nurses as well as specialized pulmonologists are organized jointly each month by the TB centre, the Slovak Society of Respiratory Diseases and other academic institutions. Up-to-date national textbooks, guidelines on TB treatment, care and management targeting various health professionals and information about TB control accessible to different audiences in various settings all reflect the country’s commitment to tackling TB.

Nevertheless, several concerns persist. TB remains a particular concern in the Roma population, which is one of the most marginalized communities in Slovakia. Roma comprise 7%

of the country’s 5.4 million population, and unemployment in their communities often reaches 90–95%. According to the country’s health statistics, there is still a large discrepancy between the health status of the Roma population in Slovakia and the rest of the population. This is exacerbated by poor socioeconomic status, segregation, unhealthy living environments, unhealthy life styles and lack of integration into society. The rates of TB are higher in this population than in the general population, particularly among children (Table 1).

Health system challenge

Innovative, tailored ways of reaching this hard-to-reach population were needed, particularly in the most affected regions of Presov and Kosice in eastern Slovakia.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In 2003, with technical and financial assistance from the State, Slovakia introduced a system of Roma health mediators to target TB in Roma communities. The mediators were recruited from within the Roma communities on the understanding that they are best placed to overcome language and cultural barriers. The mediators are trained in implement-

Table 1. TB cases among children in Slovakia

Year	No. of TB cases	TB in all children	Rate per 100 000 children	TB in Roma children	Percentage of child TB
2006	732	23	2.6	13	56.5
2007	708	16	1.9	9	56.3
2008	652	14	1.7	13	92.9
2009	513	11	1.3	9	81.8
2010	443	11	1.3	10	90.9
2011	399	17	2.5	14	82.4
2012	345	19	2.3	19	100.0
2013	401	38	4.6	33	86.8
2014	336	46	5.5	39	84.8

ing DOTS and in management guidelines. By regularly visiting presumptive and confirmed cases, these mediators help general practitioners to ensure that presumptive cases are referred in a timely manner and that confirmed cases adhere to treatment. The mediators help monitor the contacts and families of confirmed cases for emerging symptoms. To facilitate decision-making, each health mediator is also linked with pneumologists and TB nurses in their respective catchment area. Mediators also help to administer BCG vaccine, which, on the basis of the findings of a mission by WHO and the European Centre for Disease Prevention and Control in early 2013, was deemed by the Government of Slovakia as necessary and compulsory for newborns aged from four days to six weeks in three municipalities (Výborná, Krížová Ves, Hranovnica). Mediators also play a vital role in raising awareness about TB among both patients and the larger

Roma community, using information materials translated into the Roma language.

Outcomes

The health of the Roma population continues to pose an important public health challenge in Slovakia. Awareness of TB in this population and continuing information on the population's health status through the Roma health mediators are, however, important steps in improving the situation. One community in particular has seen significant improvements. At the time that health mediators were introduced in Spisske Bystre in the Presov region of northeastern Slovakia, 84 cases of TB were concentrated in three families (with 27, 24 and 20 cases), with one case of MDR-TB. In the past five years, the occurrence of TB in these three families decreased to 0.

UZBEKISTAN

Improving educational processes in TB services

Background

Staff training requires substantial funding; one of the challenges of training is measuring its output in terms of the knowledge and skills acquired and its impact on staff performance and programme functioning. Training and educational activities in TB services are generally organized for senior medical staff, rarely for mid-level staff and almost never for the clients of TB services (patients and their household members).

In the past, it was difficult to conduct a comprehensive, objective evaluation of educational activities for TB workers, as every provider used different evaluation tools or did not conduct relevant, direct evaluations. Thus, these evaluations did not question the objectivity, specific purpose, method, completeness or topicality of the courses and did not allow comparison of various activities.

In most cases, the effectiveness of interventions in educational institutions is evaluated by their providers, which can bias data collection, the accuracy of baseline documentation and the analysis. There was no platform for targeted assessment of the sustainability of participants' knowledge; the rare assessments of the sustainability of acquired knowledge were indirect. There were no conditions for selecting candidates to participate in educational activities, and they were often nominated directly by high-level authorities rather than through comprehensive human resource development planning or individual training needs.

Health system challenge

As in many other countries, large proportions of the annual budget in Uzbekistan and of donor funding were used for training. However, there was no uniform system for evaluating the effect of training and education activities. This challenge is not unique to Uzbekistan; internationally, in the framework of results-based financing, the added value of training activities requires a more systematized approach, beyond a few quantitative indicators such as the number of courses held and the number of participants.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In 2014, in collaboration with the WHO Country Office in Uzbekistan and USAID, the nongovernmental, non-profit organization of the Republican Educational Resources Information Centre, INTILISH, formulated a system to assess the effectiveness of training comprehensively and not only on the number of courses and the numbers of people trained.

In-service TB education in Uzbekistan consists mainly of formal training provided by the State and short courses offered by donors and international organizations. Uniform methods were used in training offered by donors. Therefore, 14 TB doctors were trained as trainers, learning basic training skills, the components of training courses and the preparation and delivery of a session. The purpose was to form a pool of consultant trainers who are also acquainted with evaluating training. With the assistance of INTILISH, five TB doctors with relevant experience, skills and knowledge were involved in preparing standardized modules, with part of the evaluation integrated in the design. Further activities were implemented over 14 months, including standardization of the training materials, adult and paediatric TB MDR-TB case management and provision of psychosocial support to TB patients. The materials were evaluated by a standard system for assessing participants' knowledge. Several courses were conducted for senior and mid-level medical staff, accompanied by external assessment with the standardized tools. The educational materials and assessment tools were revised several times.

Software created by INTILISH for data storage and processing allows monitoring of off-line classroom courses. A trained evaluator present in the training room operates the software and enters the necessary data online. Donors, trainers and the participants of a course can use the information system. It gives donors real-time access to the attendance and academic performance of the participants, the participation of the trainers and statistics on the performance of individual participants or groups. The system provides information about the effectiveness of individual trainers

or teams of trainers and of individual training activities or sets of activities. On the website of INTILISH, trainers can identify how many participants attended the course, for how long, pre- and post-test results, assessment of the training session by participants and the final evaluation of the course by a focus group. Trainers can use this information to improve their delivery and for retrospective revisions, e.g. to determine whether the duration of the course was appropriate on the basis of evidence and correlations. The information system gives participants timely access to their personal results, their baseline knowledge and progressive improvement and allows them to take part in preliminary selection of prospective training and educational activities.

Outcomes

The training evaluation system substantially increased attendance (average participation rate in 10 TB courses, 96%), as it shows how many hours each participant actually spent in the classroom. During the sessions, participants were more engaged and asked more targeted questions because of pre- and post-testing than in courses without such testing. Objective information is available on the performance of each trainer. A total of 188 TB doctors took part in the courses.

The database has information on 10 TB training courses and allows assessments of the sustainability of the knowledge of participants who took part in educational activities and their performance. A platform for accessing their assessment results promoted self-study to correct the mistakes: most participants regularly access the information system, study their results and try to improve them. All results are stored in the system, and trainers can monitor improvements in the knowledge of participants.

The fact that educational activities were evaluated externally significantly affected the participants. Baseline and final knowledge assessment was an additional motivating factor for participants to accumulate knowledge more efficiently. Participants, trainers and facilitators more clearly understood the importance of proper selection of participants for future educational activities based on the criteria of a high level of prerequisite knowledge for adequate acquisition of

training materials and a low level of knowledge in the area of the educational activity.

The educational materials and evaluation tools could be used to assess unstructured educational events. Currently, the evaluation system is designed for small groups and would have to be upgraded to handle large numbers of participants.

Important factors for success

Through its effect on human resources development and health care information systems, the evaluation system will contribute to the quality of the services provided by TB control programmes. Collaboration between the NGO, the TB services and information technology specialists led to strong methodology, up-to-date TB content and user-friendly solutions that can readily be translated into information for decision-making.

Ensuring sustainability

Application of this practice to future educational activities will require one-time preparation or adaptation of educational materials and the participation of an external evaluator who can provide an impartial evaluation of all the educational activities.

All expenses related to preparation of the system were covered in the pilot project. The total costs for use of the system correspond roughly to a doubling of the time of the trainers, as each new course has to be standardized to include the evaluation indicators, the pre- and post-tests and other information. For instance, about 40 person-days would be required to standardize a new 4–5-day module. A further expense would be hiring staff from INTILISH or, in the future, from the pool of training evaluators.

For State clients, such as the TB department of the medical university, INTILISH will offer lower-cost modalities.

Potential for scaling up the project and future areas of development

The current system can be used for all TB-related training and education. A multi-language format is planned.



GEORGIA

Introduction of new drugs for the treatment of DR-TB as part of programme management of M/XDR-TB

Background

Georgia is one of the 27 countries with a high burden of MDR-TB identified in the WHO Drug Resistance Survey (conducted in 2005–2006), and, according to the Global TB report 2014 ranked 10th for MDR-TB rates, with 11.6% among new cases and 39.2% among re-treated cases. Georgia first introduced second-line drugs for TB treatment in a pilot project in Samegrelo region in 2006, supported by Médecins Sans Frontières France (MSF-France). On the basis of this experience, universal access to second-line drugs for DR-TB patients was achieved in 2008 with the support of the Global Fund.

Laboratory capacity to diagnose DR-TB increased between 2009 and 2015, with the financial and technical support of the Global Fund and other partners, such as WHO-FIND through the Expand TB Project and Global Laboratory Initiative. Thus, since 2009, all diagnosed cases of TB have access to first- and second-line DST, including rapid molecular tests (Hain MTBDRPlus/sl and Xpert-MTB/RIF), and to high-quality, WHO prequalified first- and second-line TB drugs procured through the Stop-TB Partnership Global Drug Facility and administered in compliance WHO-recommended treatment regimens.

Since 2008, more than 4000 DR-TB patients have been enrolled in WHO-recommended second-line TB treatment in Georgia. Nevertheless, the treatment success rate for DR-TB remains low, as it is globally, comprising 46% for the 2012 patient cohort. Georgia has one of the highest loss-to-follow-up rates, at 34% for patients enrolled in 2011 and dropping slightly to 32% for those enrolled in 2012. Many factors contribute to this high loss-to-follow-up rate among M/XDR-TB patients in Georgia; most of the problem is attributed to poorly managed side-effects and lack of trust and confidence in the effectiveness of the TB drugs and treatment regimens used before the new drugs became widely available. Not only TB patients but also, most alarmingly, TB doctors and those dealing with hard-to-manage M/XDR-TB cases expressed lack of confidence in TB drugs. Unfavourable treatment outcomes were also found to be due

to suboptimal treatment because of amplified resistance and intolerable, severe, serious side-effects; these factors unintentionally led to regimen failure, with no drug available to substitute or add to the regimen.

As the number of DR-TB patients with poor treatment outcomes has increased dramatically in Georgia, increased resistance to second-line drugs (XDR-TB) has been observed, XDR-TB comprising almost 20% of all MDR cases in 2013. In that year, the rates of resistance to second-line drugs were: 90% to ethionamide, 43.3% to kanamycin, 13.4% to capreomycin and 28.4% to ofloxacin. The national reference laboratory currently tests resistance to second-line drugs only by the solid Lowenstein-Jensen method. In summer 2015, it will use the Hain MTBDRsl test, procured through the Global Fund.

Health system challenge

The good practices described below are designed to address the challenges of programme management of DR-TB in Georgia by streamlining the introduction of new treatment regimens and drugs.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

Compassionate use of new TB drugs and MSF-France project

In September 2014, a memorandum of understanding was signed between the Ministry of Labour, Health and Social Affairs of Georgia, the National Centre for Tuberculosis and Lung Diseases and MSF-France to offer high-quality treatment to DR-TB patients with the introduction of two new drugs, bedaquiline and delamanid. Within the MSF-France project, several training sessions were delivered to a select committee of TB doctors, nurses, treatment adherence consultants and surgeons at the National Centre for Tuberculosis and Lung Diseases on the new treatment regimens, monitoring and treatment of side-effects, pharmacovigilance and implantation of venous access devices for administration of imipenem plus cilastatin.

To date, 28 patients have been approved by the committee for treatment of DR-TB with new medications. Before the start of treatment, four died, 20 patients were approved to receive bedaquiline, and three cases were requested to receive Delamanid, two of whom have been approved by the drug manufacturer and are in treatment. Four patients are already treated as outpatients.

Global Fund and USAID programme to support new drugs for Georgia

In July 2014, the Green Light Committee mission recommended the introduction of new drugs and treatment regimens for M/XDR-TB patients that were in line with the recommendations in the *Companion handbook to the WHO guidelines for the programmatic management of drug-resistant tuberculosis* (2014). The National Centre for Tuberculosis and Lung Diseases and the National Centre for Disease Control and Public Health (Global Fund principal recipient in Georgia) therefore prepared a drug order for the Global Drug Facility to introduce new and re-purposed drugs (linezolid and imipenem plus cilastatin) as part of management of DR-TB countrywide. The Global Fund responded to the new recommendations positively and approved the order.

When USAID and Janssen Therapeutics launched the bedaquiline donation programme on 1 April 2015, Georgia became the first country to benefit, the first patients receiving bedaquiline at the end of July 2015. Overall, the country plans to enrol 166 patients on regimens including bedaquiline annually.

Milestones for effective introduction of programme-wide use of new drugs as part of combination therapy, including in the penitentiary sector

In addition to the two initiatives described above, four mechanisms have been introduced in Georgia as part of a multi-pronged strategy to address drug resistance:

- » a national bedaquiline implementation plan and technical working group;
- » pharmacovigilance;
- » national TB treatment guidelines;
- » training in new MDR-TB treatment schemes; and
- » a mobile consilium.

On the basis of WHO recommendations and pre-conditions set by the Global Fund, Georgia prepared a national bedaquiline implementation plan that has been approved by the National TB Committee under the Ministry of Health. The Minister of Health ordered creation of a technical working group to coordinate all aspects of the plan.

The technical working group for pharmacovigilance is led by the Director of the National Centre for Tuberculosis and Lung Diseases, where a pharmacovigilance committee has been established, which collaborates with the penitentiary sector and the Pharmaceutical Activities Department of the Ministry of Health. This Department is building capacity for pharmacovigilance, with the TB programme and new drugs being the main triggers. A person responsible for pharmacovigilance activities at the Ministry has been designated and trained at the Uppsala Monitoring Centre with the support of the Global Fund TB programme. The pharmacovigilance committee at the National Centre for Tuberculosis and Lung Diseases has created a scheme and reporting forms for monitoring adverse drug reactions, is drawing up a pharmacovigilance plan and protocols, and will train TB doctors, data abstractors and pharmacovigilance coordinators in grading severity and in the clinical management of adverse drug reactions and severe adverse events by special (Medra/WHO-art) coding and assessing causality. As part of the donation programme, USAID is providing specific technical assistance to the pharmacovigilance committee.

The national TB treatment guidelines and protocols were updated according to the latest (spring 2015) recommendations in the WHO *Companion handbook* and approved by decree of the Ministry of Health.

In order to support the NTP in introducing new MDR-TB treatment schemes, the USAID Georgia Tuberculosis Prevention Project conducted training for TB specialists to ensure their adherence to best practices in treatment delivery, for optimal drug effectiveness and safety. A team comprising leading local specialists and an international expert trained 63 TB specialists from all regions of the country and from the prison sector. The course was perhaps the largest in the world for MDR-TB providers.

In the current system for TB service delivery, whereby M/XDR treatment is administered only after a decision of the MDR-TB Committee of the National Centre for Tuberculosis and Lung Diseases, the pace of enrolment of patients would be too slow. To avoid delays in using the new regimens, the Centre proposed creation of a “mobile consilium” under the current Global Fund TB grant, by adding the extra activity to enhancing coverage of M/XDR patients. The Global Fund approved the action plan, and, starting in July 2015, the Georgian TB programme has stepped into a new era of decentralized enrolment of M/XDR-TB patients into the new treatment regimens. During the first round, the mobile consilium will conduct initial visits throughout the country, including the penitentiary sector, and their decision to enrol

a patient will be based on analysis of clinical and diagnostic characteristics and an on-site risk assessment. The health professionals in charge will be given guidance and precise instructions on mandatory treatment and on monitoring and supervising the safety of patients under treatment. Each round will be repeated four times a year at each location and will retain a supportive supervision component.

Outcomes

It is still too soon to discern the epidemiological impact of the new drugs as part of programme management of

M/XDR-TB in Georgia. Use of new TB drugs has nevertheless put TB high on the agenda of the Ministry of Health and increased its willingness to pay for TB services.

Ensuring the sustainability

Although most the activities in this practice are currently supported by the Global Fund, they have also been included in the recent National TB Strategic Plan 2016–2020 and accompanying sustainability plan. It is therefore expected that these activities will continue after the country no longer has Global Fund support.

LATVIA

Rapid diagnostics and new drugs: delamanid and bedaquiline for treatment of MDR-TB

Background

Latvia, with a population of 2 million, is one of the 27 countries in the world with a high burden of MDR-TB: 8.8% of new and 26% of re-treatment cases were MDR-TB in 2013. In 2014, 637 new TB cases and 124 re-treatment cases were registered, including 63 cases of MDR-TB, with an overall proportion of XDR of 16.0%. The average time to diagnosis of MDR-TB is 23 days in liquid media and 68 days on solid media. Although the overall treatment results since 2008 are favourable, with a 62–72% treatment success rate, the proportion of TB/HIV co-infected patients, especially M/XDR-TB patients, has been rising in the past decade.

Health system challenge

Treatment options for XDR-TB patients were limited due to wide resistance to second-line drugs. Rapid diagnostics and the inclusion of new drugs in the treatment regimen in Latvia were therefore essential.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

The line probe assay was used from 2003 to screen people at high risk for MDR-TB, such as contacts of MDR-TB patients and previously treated TB cases. From 2010, the national reference laboratory started examining sputum samples with a rapid molecular diagnostic test (Xpert MTB/RIF). The recommended regimen for MDR-TB patients is treatment for 20 months, including an intensive phase of 8 months, with at least four second-line drugs that are likely to be effective in the intensive phase. From 2012, more general use of GeneXpert was promoted, and the results determined whether a patient was initially placed on MDR-TB treatment; in its absence, patients were initially started on first-line drug regimens.

In Latvia, rifampicin resistance is considered a good predictor of MDR-TB. The Latvian experience suggests that using GeneXpert for early diagnosis allows rapid treatment decisions and reduces the time to initiation of treatment. To meet the demand for treatment of M/XDR-TB, the new drugs delamanid and bedaquiline have been made available

in Latvia since 2008, after clinical trials, and they have been approved for compassionate use since 2013. A total of 95 patients were enrolled in the clinical trial of delamanid and 26 in the clinical trial of bedaquiline. Within the compassionate use programme, delamanid was prescribed for two more patients and bedaquiline for 35 patients. Delamanid was donated for a further 15 patients.

Outcomes

The results of the clinical trials of delamanid and bedaquiline have been published and show a reduction in the time to culture conversion, improved treatment outcomes and reduced mortality among M/XDR-TB patients. Early results of the bedaquiline compassionate use programme indicate a median culture conversion time of 26.5 days; to date, 18 patients have completed treatment and are cured, one died, one was lost-to-follow-up, and 15 are continuing treatment. In the delamanid compassionate use programme, one patient has completed treatment; all 15 patients that received delamanid in this programme are still on treatment.

Use of the Xpert MTB/RIF test decreased the average time to diagnosis of MDR-TB to 4 days; the time to initiation of treatment was therefore shorter in individuals who received such testing. Reducing the delay to appropriate treatment is likely to benefit MDR-TB patients and reduce transmission, both nosocomially and in the community.

After registration of delamanid and bedaquiline by the European Medicines Agency, negotiations were started with the Ministry of Health, the National Health Service and the Latvian Centre for Disease Control. In early 2015, both drugs were included on the essential TB drugs list in Latvia. The process required approximately 1 year to complete.

The National Health Service approved funding for the procurement of delamanid and bedaquiline from 2015 for the treatment of 20 patients. Unfortunately, due to the lengthy drug procurement process, it was almost 6 months before the patients could receive the drugs. The NTP expects to continue facing the challenge of budget availability and may

have to struggle to ensure that treatment with delamanid and bedaquiline is available to all the patients who need it.

Important factors for success

Since 1995, the Latvian NTP has been stable and has addressed all the components of the Stop TB strategy, including the availability of postgraduate education. Political commitment has ensured an adequate budget for TB bacteriological diagnosis and for most TB drugs. All these factors help Latvia to implement an effective TB control strategy.

Ensuring the sustainability of the project

Although the Xpert MTB/RIF test represents additional initial costs, rapid testing has made it possible to reduce the

expense of unnecessary tests with conventional methods. Cost savings can also be expected due to treatment optimization and patient management, as these interventions are expected to reduce the overall burden of TB disease.

More comprehensive information and a more careful analysis will be necessary to determine the impact of the use of the Xpert MTB/RIF test and the introduction of the new TB drugs. Nonetheless, Latvians forecast improved treatment outcomes, shorter treatment and less nosocomial TB transmission.

UZBEKISTAN

Surgical treatment of pulmonary and pleural MDR-TB

Background

The number of cases of pulmonary DR-TB has increased markedly over the past few years, and in Uzbekistan, as well as all over the world, current TB chemotherapy is ineffective: the cavity closure rate is 53.3% in TB cases resistant to isoniazid and rifampicin and 40.9% in those resistant to isoniazid, rifampicin and streptomycin.

Health system problem statement

Current thoracic surgery, use of novel surgical techniques and efficient TB drugs extend the possibilities for surgical care of patients with pulmonary and pleural MDR-TB. Before instituting surgical treatment for pulmonary and pleural MDR-TB in Uzbekistan, we assessed its clinical and cost-effectiveness.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

We analysed the surgical treatment outcomes in 196 patients with pulmonary and pleural MDR-TB treated at the surgical department of the Republican Specialized Scientific-Practical Medical Centre of Phthisiology and Pulmonology of the Ministry of Health of Uzbekistan during 2013–2015. The majority of the patients (52.5%, 103) were male and 47.5% (93) were female, with an age range of 15–61 years (average, 31.4 years). Ten (5.1%) patients had primary MDR-TB, and the remaining 186 (94.9%) patients had been previously treated. Thirty-three (16.8%) patients had bilateral TB, 78 (39.8%) had unilateral left-sided TB and 85 (43.4%) patients had unilateral right-sided TB. In 67 (35.8%) patients with pulmonary TB, the disease was considered to be localized, while the remaining 120 (64.2%) patients had generalized TB (with more than three segments of the lung involved). On admission, 13 (6.6%) patients were smear negative, and the remaining 183 (93.4%) were smear positive. Infiltrative TB was diagnosed in one (0.5%) patient, cavitary TB in two (1%), caseous pneumonia in three (1.5%) and cirrhotic TB in three (1.5%) patients; tuberculomas were observed in 22 (11.2%) patients, fibro-cavitary TB was detected in 156 (79.6%) patients, and nine (4.6%) patients had TB pleurisy or empyema. Thirty-five (17.9%) patients had various pre-

operative complications of the main TB process (including lung haemorrhage, haemoptysis, spontaneous pneumothorax, pyopneumothorax, hydrothorax, pleural empyema, cavity burst into bronchi). Fifty-one (26%) patients had severe cardiovascular, respiratory, nervous, gastrointestinal or endocrine co-morbid conditions and other communicable diseases. Four (2%) patients who had been operated on in non-TB facilities, developed postoperative complications, and three required resuscitation.

Owing to the extent and complicated course of TB and its severe initial clinical presentation, preparation for surgery was multidimensional. All patients received preoperative DOTS and chemotherapy (capreomycin, levofloxacin, pyrazinamide, protionamide, cycloserine, ethambutol and PASK); new TB cases received chemotherapy for 3–4 months, and previously treated cases were treated until perifocal inflammation was resolved. To minimize side-effects and to accelerate stabilization of TB, additional transfusions of normal saline, protein solutions and various blood substitutes were prescribed. Clinical and radiological stabilization of pulmonary and pleural TB, with sputum smear conversion, was observed after preoperative preparation in 157 (80.1%) patients.

The 248 operations performed on 196 patients included 44 (22.4%) staged surgeries: 8 (18.2%) patients had three-stage surgery and 36 (81.9%) had two-stage surgery. Various atypical resection procedures were performed in 30 cases: anatomical resection in 8 cases, lobectomy or bilobectomy in 53 cases, combined resection in 30 cases, pneumonectomy and extrapleural pneumonectomy in 66 cases, therapeutic thoracoplasty in 17 cases, postponed thoracoplasty in 19 cases, trans-sternal occlusion of the main bronchus in three cases, transthoracic removal of the stump of the main bronchus in two cases, thoracomyoplasty with the latissimus dorsi muscle on a vascular pedicle in six cases, pleurectomy with decortication with or without lung resection in six cases, re-thoracotomy in seven cases and tracheostomy in one case.

Postoperative complications occurred in 27 patients (13.8%): bronchoesophageal fistula with empyema was detected in

one patient, bronchial fistula in 13 patients, residual cavity without empyema in one patient, blood clotting in the pleural cavity in one patient, post-surgery pneumonia in four patients, early exacerbation of the specific process in three patients and pulmonary–cardiac and respiratory failure in four patients. Surgical complications were observed in 16 patients, constituting 59.3% of the total number of complications, and therapeutic complications occurred in 11 (40.7%) patients. Complications following atypical resections occurred in two (7.4%) patients, after lobectomy/bilobectomy in six (22.2%) patients, after combined resections in five (18.5%) patients, after pneumonectomy or extrapleural pneumonectomy in nine (33.3%) patients, after thoracoplasty in one (3.7%) patient and after trans-sternal occlusion in one (3.7%) patient. In 20 patients, the postoperative complications were managed conservatively or by repeat surgery.

Good early postoperative clinical outcomes were observed in 186 patients (94.9%), including 65 (97.0%) with localized pulmonary TB, 113 (94.2%) with generalized forms of TB and 8 (88.9%) with TB pleurisy. Poor surgical outcomes were observed in 10 patients (5.1%): 4 patients after pneumonectomy or extrapleural pneumonectomy due to bronchial fistula and pleural empyema and 6 patients after thoracoplasty, due to the presence of a deformed cavity and persistent bacilli excretion. Three patients died postoperatively (1.5%), all of whom had undergone pneumonectomy or extrapleural pneumonectomy. The causes of death were multiple organ dysfunction secondary to bronchoesophageal fistula and empyema in one case, progressive toxic myopathy and aspiration pneumonia of the only lung in one female patient and progressive respiratory failure secondary to pneumonia of the only lung in the third case. There was no valid difference in surgical outcome according to the chemotherapy regimen.

Postoperative chemotherapy in a DOTS Plus programme for 4–8 months was prescribed according to smear conversion at the time and postoperatively, the extent of the TB process and the postoperative course of TB. After surgery, the patients continued the intensive phase of treatment for 2–4 months, with another 2–4 months of treatment in the continuation phase.

Outcomes

Radical anatomical operative procedures should be recognized as the best tactic in surgical treatment of pulmonary and pleural MDR-TB. Our experience in surgical treatment leads to the conclusion that resection is a highly effective treatment, with limited, localized processes in the lungs, providing a 97% cure rate.

To assess cost–efficiency, the average costs of pre- and postoperative chemotherapy and surgical treatment were calculated and analysed. The cost–efficiency of surgery was significantly higher than in the group with no surgical treatment.

Important factors for success

The combination of resection procedures with postponed correcting extrapleural pneumonectomy significantly improves treatment outcomes in patients with generalized TB, including a reduced risk for postoperative pleuropulmonary complications.

Ensuring sustainability

To tackle the problem of M/XDR-TB in Uzbekistan, surgical methods of treatment were proposed in the State programme adopted by a statute of the Cabinet of Ministers (No. 62) on additional measures to reduce the TB incidence in Uzbekistan, 2011–2015.

Our experience with therapeutic thoracoplasty leads us to recommend it as a method for TB stabilization. Early surgical treatment saves the direct costs of chemotherapy.

Potential for scaling up the project and future areas of development

The data show that investigation and rationalization of resection procedures and thoracoplasty, in particular selection of the most feasible lung resection and thoracoplasty procedure, increases their efficiency. Wider use of surgery in patients with generalized MDR-TB has important scientific–practical and epidemiological value.

UZBEKISTAN

Use of rapid diagnostic tests for TB

Background

Despite a steady downward trend in the incidence of TB overall in the European Region and in Uzbekistan in particular, TB is still on the agenda of the Government. The current epidemiological situation, which is characterized by the spread of M/XDR-TB, is under close scrutiny by the Government.

Before adoption in March 2011 of statute No. 62 on additional measures to decrease the TB incidence in Uzbekistan, 2011–2015, by the Cabinet of Ministers and endorsement of the State programme for TB control for 2011–2015, TB was diagnosed solely by sputum smear microscopy in district and regional laboratories and three culture laboratories equipped with five BBL MGIT systems and 2 Hain test systems, providing only 30% access to DSTs for TB patients.

Health system problem statement

The quality of sputum smear microscopy was poor, aggravated by logistic issues that resulted in contamination of sputum samples during transport. About 70% of TB patients had no access to DSTs; all new TB cases started treatment with first-line drugs, and a proper TB regimen was initiated only after 2–3 months of treatment, when DST results became available. Until then, patients were not separated or isolated, leading to a high risk for nosocomial DR-TB infection.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In March 2011, the Cabinet of Ministers adopted Resolution No. 62, which provided for improvement of the regulatory framework, optimization of the structure and network of TB facilities, capital repairs and reconstruction to meet infection control standards, refurbishment with modern medical equipment, improved provision of TB care, training of a highly skilled workforce and building cooperation and coordination of work between State and international organizations involved in TB control.

State funding was used to fully repair and upgrade district microscopy laboratories and five inter-regional culture laboratories

with modern equipment, to solve transport issues and to train laboratory staff. A task force on laboratory diagnosis, initiated with the technical support of WHO and with the participation of international partners, prepared guidelines on laboratory quality management. A nationwide network of bacteriological laboratories was established on the basis of a five-tier system of laboratory diagnosis.

On tier I, TB is diagnosed at central microscopy laboratories located in district health facilities and in district and city TB dispensaries, with one laboratory per 100 000 population. These facilities are equipped with binocular microscopes; consumables and reagents are purchased with grants from the KfW German development bank, Project HOPE, MSF and the Global Fund TB programme.

On tier II, TB is diagnosed at regional TB dispensaries, which conduct microscopy examinations and control the quality of smear microscopy tests performed in first-level laboratories.

On tier III, TB is diagnosed in five inter-regional laboratories that culture samples, isolate and identify *M. tuberculosis* and transport isolates to the national reference laboratory for DST.

On tier IV, TB diagnosis is organized at the regional TB dispensary of Samarkand Region and the Republican TB dispensary in Kulus in Karakalpakstan.

On tier V, TB diagnosis is organized at the national reference laboratory of the Republican Specialized Scientific–Practical Medical Centre of Phthisiology and Pulmonology.

At present, there are 12 Xpert MTB/RIF rapid TB test systems at the first level of the TB diagnosis system: two in Samarkand region, two in Tashkent Region, two in Surkhandaryinsk Region and six in Fergansk Region. At the second level of the system, there are four new Xpert MTB/RIF systems: one in Bukhara Region, one in Kashkadaryinsk Region, one in Khorezm Region and one in Novoinnsk Region. The rapid molecular genetic diagnostic Hain test system is

installed at the regional TB dispensary in Samarkand. Both tier-IV laboratories conduct microscopy and bacteriological examination (cultures, specific identification of *M. tuberculosis*) of material at all levels of diagnosis and treatment of patients with presumptive and/or confirmed TB, conduct DSTs to determine resistance to first- and second-line drugs and monitor the performance of tiers II and III laboratories. The national reference laboratory performs the full range of TB diagnostic tests, depending on the available resources (smear microscopy, culture, DSTs, specific identification of *M. tuberculosis* and the rapid genetic methods Hain and G-Xpert) and also performs DSTs on all TB isolates delivered from inter-regional laboratories. The fifth tier of the TB laboratory diagnosis system collaborates with the network of supra-national reference laboratories and other international partners and participates in external international quality control of TB diagnostic tests. The national reference laboratory trains the staff of laboratory services and organizes and hosts workshops, meetings and scientific conferences for specialists in the services. The national reference laboratory is responsible for controlling and monitoring the laboratory diagnosis of TB at all levels.

Outcomes

Establishment of a five-tier bacteriological laboratory network with modern rapid diagnostic tools provides universal access of the population to TB diagnosis, including M/XDR-TB. At present, for rapid M/XDR-TB diagnosis in Uzbekistan, there are nine MGIT systems, five Hain test systems and 27 Xpert MTB/RIF devices (three in the AIDS service), ensuring diagnosis of more than 70% of all TB cases.

Use of the five-tier bacteriological laboratory network and provision of additional equipment for rapid diagnosis of MDR-TB:

- » ensured 100% coverage of re-treatment TB cases with DSTs to first-line drugs and more than 70% coverage of new TB cases with DSTs to first-line drugs;
- » reduced the delay to diagnosis, especially for M/XDR-TB, so that adequate TB treatment that meets current standards could be initiated earlier;

- » significantly improved the treatment success rate, accelerated sputum conversion and reduced the spread of the infection; and
- » improved TB infection control by administrative separation of the patient flows in TB facilities.

Important factors for success

Under the State programme, the Uniform Order on improving TB control, an updated code of regulations, defines the legislative framework and regulates the diagnostic and treatment work of the TB service. The Uniform Order was a key factor in the provision of universal access to M/XDR-TB diagnosis.

Ensuring sustainability

Having studied best practices in the use of scarce rapid TB diagnostic tools, the Ministry of Health drew up a regulatory framework that provides for:

- » optimized distribution of diagnostic equipment, such as GeneXpert, Hain test systems and MGIT, around the country, taking into account logistical issues of transporting sputum samples, to ensure 100% coverage with DSTs to first-line drugs for re-treatment TB cases and more than 70% coverage with DSTs to first-line drugs for new TB cases;
- » external quality assurance in accordance with international standards in all culture laboratories;
- » use of the revised diagnostic algorithm for *M. tuberculosis*, including M/XDR-TB, which allows rapid detection of mycobacteria and their drug resistance pattern, separation of patients in accordance with the infection control requirements and prompt initiation of adequate therapy;
- » prioritization of patients for testing with XpertMTB/RIF; and
- » convincing all primary health care physicians to follow the TB diagnostic algorithm strictly, with a focus on laboratory diagnosis from sputum samples.

Achieving universal access to diagnosis of TB in smear-positive cases, including those with DR-TB, will prevent further spread of TB and M/XDR-TB in Uzbekistan.

BELARUS

Introduction of a public electronic register for TB

Background

The first steps in establishing an electronic register for TB cases in Belarus were taken in 2006. In 2009, with support from the Global Fund, a Belarussian information technology company developed a module for electronic registration of DS-TB cases and introduced it on the MIS Lekar platform. It allows data reporting in accordance with WHO reporting requirements. The work was continued, and, in 2012, a module for MDR-TB was added. In 2013, a laboratory module for the electronic TB register was disseminated across the country, and a drug management module has been available since 2014.

Health system challenge

TB surveillance strengthening and operational research were impossible without case-based electronic registration of all TB patients and their drug susceptibility.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

The electronic register is accessed through a designated server; it has more than 60 secure data access entry points and covers all cases of TB and MDR-TB registered in Belarus. In 2013, with the support of the Global Fund, a laboratory module was added; since then, all TB laboratories have been connected to the register to enter the results of DSTs into the system.

The data in the register are used to analyse indicators of the TB programme, and laboratory module data are used to inform the consilium on MDR-TB. The register is also used for reporting the number of notified cases and the drug resistance spectrum and for following up patient outcomes and quantifying drug requirements.

Since the start of the register in 2009, 28 000 cases of TB have been registered, including more than 10 000 cases of MDR-TB. Since 2013, the laboratory module has held diagnostic and treatment monitoring results for each registered TB patients. The database is used for operational research, analysis of key socio-demographic and clinical characteris-

tics of patients, surveillance of drug resistance and assessment of treatment outcomes at all levels. These functions lead to improved TB control interventions in targeted groups. At present, the register holds about 80 variables on each registered case. It has a patient search function at national level, and any file can be downloaded for further analyses with application programs.

The data in the register are used to analyse the key indicators of the TB programme, and DST results are verified during consilium meetings on MDR-TB cases. The number of registered TB patients and the spectrum of drug resistance are reported, TB treatment outcomes are followed up, and drug requirements are quantified from register data.

Outcomes

The electronic register allows in-depth analysis of programme performance at district, regional and country levels. The results of the analyses allow goal-oriented planning of activities to improve the quality of health services. The TB programme can be analysed in depth, in accordance with WHO requirements. The data are used to assess the performance of TB services and are incorporated into the State statistical reporting system.

Since 2014, it has been possible to identify the use of rapid TB diagnostic methods and to analyse the time required to diagnose TB and MDR-TB. In the past, use of paper forms delayed DST results by up to 2 weeks. At present, as soon as a test is performed, the results are immediately available to the attending physician. Thus, the time between a patient's attendance for medical help and diagnosis has been reduced by 7–8 days. All consilia also have access to the electronic register, which not only provides statistical information but also holds medical records and data on social determinants that could affect the course of treatment and patient adherence.

Case-based recording has improved quantification of TB drug requirements and stock management in the region. Introduction of the laboratory component of the register

and the possibility of verifying all laboratory diagnostic tests results has increased the use of register data by TB physicians.

Important factors for success

An important factor in the success of the register is that it allows automated generation of reports on indicators to be submitted to State bodies and international organizations.

Ensuring sustainability

Since 2012, State statistical reports have been based on data from the electronic TB register. In 2016, with financial support from the Global Fund, a pharmacovigilance component will be introduced. Since 2014, the maintenance of the register has been paid from local budgets.



BELARUS

Cohort event monitoring of the safety and effectiveness of linezolid in combination TB therapy

Background

In 2010–2011, Belarus had one of the highest burdens of MDR-TB in the world, comprising 32.3% of newly diagnosed cases of TB and 75.6% of previously treated patients. New drugs and technologies are urgently needed to stop the spread of M/XDR-TB. Despite the benefits of complex TB regimens, they are accompanied by attributable risks such as drug-induced adverse reactions, which make a significant contribution to avoidable morbidity, treatment failure, reduced quality of life and death. The administration of new TB regimen components should be closely monitored to ensure optimal drug effectiveness and safety and to obtain new, relevant data.

The national TB treatment policy in Belarus is based on WHO recommendations, and the national treatment guidelines have been standardized since 2005. The National Pharmacovigilance Centre operates under a regulatory body, the Centre of Examinations and Tests in Health Service of the Ministry of Health. Legislation on pharmacovigilance has been in place since 2006 and is continuously updated. The National Pharmacovigilance Centre has designated staff, technical and material resources and standard operating procedures for pharmacovigilance, including safety data management, signal detection, evaluation, risk minimization measures and communication. Active pharmacovigilance has been used with the support of WHO in the HIV programme since 2012, and currently 620 patients with HIV infection are monitored. Every year, more than 30 drug profiles are re-evaluated for safety and effectiveness by local and foreign safety monitoring. The results are used to modify recommendations, impose various types of restriction, withdraw drugs from the market and conduct quality control and technological and biopharmaceutical investigations and changes. Starting in 2015, Good Pharmacovigilance Practice will be instituted in national legislation, and the national pharmacovigilance system and those of all manufacturers operating in the market in Belarus will be required to adhere to it.

Health system challenge

The introduction of repurposed and new TB drugs for which there are limited data about safety and effectiveness into

intensive DR-TB therapy requires additional pharmacovigilance by the NTP in order to ensure that patients have optimal care and proper risk management.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

“Cohort event monitoring” is used for monitoring adverse drug reactions. In Belarus, this procedure provides new data on safety and a mechanism for drug administration under close monitoring. It allows the detection, evaluation, prevention or minimization of risk and safe, rational, effective use of medicines, which are important for both patients and public health and safety.

The goals of the pharmacovigilance plan for TB drugs are:

- » to introduce an effective pharmacovigilance system into the TB programme, with continuous monitoring of the safety and efficacy of TB treatment to ensure the safety of TB patients; and
- » to improve the effectiveness and safety of pharmacotherapy for TB and M/XDR-TB patients.

The specific objectives of the plan include:

- » increasing reporting and professional skills among TB health care professionals;
- » introducing effective early warning of problems related to the use of TB drugs and concomitant medicines;
- » finding approaches for further optimizing TB patient management and monitoring and minimizing unfavourable consequences of pharmacotherapy of patients with M/XDR-TB;
- » encouraging safe, rational, more effective use of TB drugs;
- » contributing to the assessment of benefits, harm, effectiveness and risks associated with the medicines used in M/XDR-TB patients, leading to maximization of benefits; and
- » promoting understanding, education and training in pharmacovigilance and its effective communication to the public.

The components of the project include:

- » establishing, by an order of the Ministry of Health, a collaborative TB pharmacovigilance working group consisting of representatives of the Republican Research and Practical Centre for Pulmonology and TB and the Centre of Examinations and Tests in Health Service;
- » an intensive basic training programme for health care professionals in the TB programme and visits to sentinel sites, followed by an advanced training programme based on the national guidelines, with modules that include detection of adverse drug reactions, verification and reporting, cohort event monitoring, monitoring the safety of TB drugs and TB and MDR-TB management;
- » a preparatory phase to obtain ethical approval, development of a cohort event monitoring programme, data collection forms and a cohort event monitoring manual; and
- » cohort event monitoring of linezolid.

Belarus developed a comprehensive plan for national cohort event monitoring of the safety and effectiveness of linezolid in combination TB therapy. The pilot phase of the programme was evaluated in August 2014 and was followed by implementation in all sentinel sites, which are currently monitored quarterly.

The first patients were enrolled in December 2014; 87 M/XDR-TB patients have now been enrolled. The preliminary results show 215 adverse drug reactions registered in 70 (80%) patients. The reactions were in the blood, lymphatic, hepatobiliary, renal, urinary, gastrointestinal and nervous systems; psychiatric and metabolic reactions were observed as well as in the ear and labyrinth. A total of 341 M/XDR-TB patients will be enrolled into the cohort. The final analysis will be performed in January 2017 after cohort completion.

The inclusion criteria are: M/XDR-TB confirmed by a DST, indications for linezolid and age 25–65 years. The exclusion criteria are known hypersensitivity to linezolid, monoamine oxidase inhibitors, serotonin re-uptake inhibitors, tricyclic antidepressants, 5-hydroxytryptamine 1 antagonists, buspiron, uncontrolled arterial hypertension, pheochromocytoma, hyperthyroidism and malignancy. Health care professionals use the national adverse drug reaction reporting form in routine clinical practice and in intensive monitoring programmes to submit information about observed complications of pharmacotherapy. Adverse drug reactions reported in the cohort are first evaluated and causality assessed by a clinical review team established to select patients appropriately, make a detailed assessment of safety and effectiveness and prepare recommendations for

risk management. As a result of training and use of cohort event monitoring, health care professionals are expected to be more aware of and to use the risk minimization approach and active surveillance proactively.

Outcomes

Health services delivery has been improved by monitoring adverse reactions to the new TB drugs, and the surveillance system has also been strengthened so that it can be used for reporting other diseases. A functional cohort event monitoring system has been established and incorporated into the electronic TB register, where adverse drug reactions are reported from all sentinel sites in Belarus.

Important factors for success

Establishment of the collaborative TB and pharmacovigilance working group by an order of the Ministry of Health and State funding to maintain the electronic register have been essential for establishment of the cohort event monitoring system.

Ensuring the sustainability of the project

International experience shows that cohort event monitoring is one of the most effective tools for monitoring and reporting adverse drug reactions. Although it required initial investment and political commitment, integration of the pharmacovigilance component into the routine electronic TB register and increased skills among TB health care professionals based on national guidelines for adverse drug reactions will allow for sustainability.

Potential for scaling up the project and future areas of development

The main expected deliverables of this project include data on the safety and effectiveness of linezolid-containing TB treatment regimens. The project is expected to improve patient adherence and contribute to optimizing the monitoring and management of safety in M/XDR patients. Professional skills such as adverse drug reaction detection, verification and reporting will also be improved.

Completion of the linezolid cohort event monitoring project is planned for December 2016, and it will be evaluated in January 2017 as a basis for risk-minimization measures and recommendations on the continuation of cohort event monitoring.

Cohort event monitoring of the safety and effectiveness of bedaquiline is under way, and patients are being enrolled. The system will continue to be developed and used for other new TB drugs (e.g. delamanid), with the goal of conducting event monitoring for all patients receiving TB treatment.

FINLAND

Creating an online database of TB medications

Background

M/XDR-TB is rare in Finland, although these forms of TB are distributed throughout the country. Patients are therefore seen by doctors who do not necessarily see such cases frequently enough to have up-to-date knowledge on treating DR-TB.

Health system challenge

Owing to the low incidence of TB in Finland, physicians treating TB patients may not have the necessary knowledge, particularly for treating DR-TB. It was also necessary to standardize the treatment and care of DR-TB patients throughout the country in order to give consistent, practical guidance to doctors overseeing treatment.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

A web-based database of first- and second-line TB medications was created under the supervision and funding of the Finnish Ministry of Social Affairs and Health. The database is designed to be used by doctors and nurses treating cases of TB, especially M/XDR-TB. Treating physicians can access the database online and choose the appropriate medication by using a web-based decision-making tool. The database generates a monitoring scheme for the duration of treatment and provides guidance on which laboratory tests should be

performed weekly or monthly in a form that is easy to understand for patients, who are responsible for having the tests. The database also provides information on possible side-effects and precautions to be taken with the selected treatment combinations. The web tool is currently available only in Finnish (at <http://tuberkuloosi.fi/tb-apuri/#/>) but will be translated into English to make it accessible in other countries and to non-Finnish speakers. It is available at no cost to the health provider or individual accessing the database.

Outcomes

The primary beneficiaries of this database are health care personnel and patients. It provides standardized, easy-to-follow guidance for TB treatment, and it helps patients to participate in their care and understand the follow-up of treatment of M/XDR-TB. So far, feedback from physicians using this tool indicates that it is a helpful for clinicians who do not see M/XDR-TB cases regularly. While the database targets treatment of M/XDR-TB, it can be adjusted for use in cases of DS-TB.

Ensuring sustainability

The project has been deemed sustainable and manageable. It can be found on the Finnish Lung Health Association webpage and will easily be updated as new evidence and developments in TB management emerge.

GEORGIA

Introducing an electronic health information system to strengthen TB surveillance

Background

Although Georgia has experienced a decreasing trend in the absolute number of TB cases over the past several years, WHO estimated that the incidence of TB in 2013 was still 116 per 100 000 population, which is the fourth highest level in the 53 countries of the WHO European Region. According to NTP notification data, 3850 cases of all forms of TB were registered in the country in 2014 (including the penitentiary sector), and, of these, 2807 were new cases. The high burden of MDR-TB is the main challenge for the NTP and the main obstacle for effective TB control in the country. Preliminary data for 2014 showed that the prevalence of MDR TB was 11.2% in new cases and 38.6% in previously treated cases. In response to these challenges, the country developed a national strategy to stop the spread of TB and reduce the burden of MDR- and especially XDR-TB. Effective governance and monitoring of Georgia's TB response have been identified as strategic priorities, including a well-designed health management information system, which is critical for effective programme monitoring, and evidence-based policy-making.

Health system challenge

Georgia needs a health management information system to provide real-time, reliable, comprehensive data to support TB patient management, health planning and resource allocation.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

The Government of Georgia has prioritized the use of information technology to streamline data systems, including those for TB. The USAID Georgia Tuberculosis Prevention Project responded by assisting in the introduction of an innovative range of m-health tools, such as mobile phones, tablets and web-based learning systems to optimize communication and exchange of information, images and data among health care professionals and with patients, wherever they are located. After a successful pilot study, a Government decree mandated electronic recording and reporting of TB-related data from 1 May 2015.

To support the m-health approach as broadly as possible, the Tuberculosis Prevention Project collaborated with the USAID Health Systems Strengthening project to integrate a TB health management information system into the national system. The system consists of TB case registration, laboratory test results and prescription and treatment monitoring components. All indicators and data collection tools are aligned to the latest WHO standards.

The TB health management information system allows providers rapidly to upload data on each patient with TB or presumptive TB to the national system. The module can be accessed through a computer or mobile devices such as smart phones and tablets. The Ministry of Labour, Health and Social Affairs uses the module for generating case-based financial reports and simplifying billing and financial transactions through electronic reporting within the State TB programme.

As most primary care providers lack computers but have access to cell phones, the electronic module accepts SMS on DOTS attendance and links the information to the DOTS monitoring component. This system will allow district providers and epidemiologists at the National Centre for Disease Control and Public Health to track DOTS in real time.

Epidemiologists at local public health centres under contract with the National Centre for Disease Control and Public Health are mandated to conduct intensive contact tracing and to support non-adherent patients in completing treatment. For this purpose, field epidemiologists visit households and close contacts of patients with newly diagnosed TB and refer them to the nearest TB facility. A tablet application for epidemiologists has been developed to track visits and results, and all epidemiologists were trained and equipped with tablets to support their activities and to help them provide high-quality patient education and counselling. Laptops were provided with donor assistance, and TB specialists and nurses were trained in follow-up with on-site support as long as needed.

Improved use of data for decision-making

Before introduction of the TB health management information system, information on patients was registered in TB facility logs, and, once every quarter, the paper-based data were transferred to the regional centre and then entered into the national database. Patient data were thus accessible only after a delay of at least three months. The new module enables immediate electronic registration of patients by facilities as soon as they are presumed to have TB.

Patient management

The m-health and health management information systems give TB care providers access to patient data from the time patients are referred to the time they complete treatment or otherwise leave the system. This allows health care workers to provide appropriate support to those patients who are at greatest risk for not completing treatment, through a built-in system for monitoring DOTS and side-effects. The system contains data on 2947 TB cases currently on treatment, and data on daily DOTS attendance are available for 92% of cases.

Monitoring social support services

One method of ensuring adherence to treatment is to give cash incentives to patients who continue to take medications, which often gives them support for critical needs such as access to transport and healthy food. It can be difficult to monitor who has received social support in rural areas, but the health management information system gives both health care workers and policy-makers data on who receives these incentives and how effective they are.

Supervision and follow-up

The health management information system in Georgia allows appropriate monitoring of health care workers and targeting supervision where it is needed. A DOTS provider who does not meet TB patients regularly can be identified for additional supervision and support. Android-based applications for epidemiologists are time- and Geo-tagged for quality monitoring. Data on the frequency and duration of counselling sessions can be generated and analysed for TB patients with poor adherence and can be linked to their performance at DOTS sessions to assess the effectiveness of educational interventions.

Outcomes

The TB health management information system allows health professionals to collect and analyse data to inform national programme planning and policy-making. The real-time data enable epidemiologists, health care providers and

policy-makers to target resources quickly, while traditional methods of data collection led to delays in resource provision. Additionally, policy-makers can prepare effective communication strategies to target high-risk populations. The module is also used for administration of the cash incentive scheme to promote treatment adherence. The Government is increasingly taking over the cash incentives for MDR-TB patients and has committed itself to increasing the provision of monetary incentives to these patients: 225 cases in 2016, 300 cases in 2017 and 375 cases (about 75% of all needs) in 2018. Although this practice is relatively recent and it is too early to document patient outcomes, it has already proved to be efficient and well accepted by the beneficiaries.

Important factors for success

High-level political commitment, donor support and private sector involvement have been critical in ensuring county-wide implementation of the new TB health management information system module. The module is a uniform, integral part of the general information system. Module users were involved from the design phase, and their needs and requirements were taken into consideration at every stage. The interface is consistent and easy to operate, even for inexperienced people. The responsive implementation team, continuous training, technical assistance and executive management support have ensured engagement of physicians, nurses and epidemiologists.

Ensuring sustainability

The political will and collaboration of many stakeholders ensured the system's sustainability by overcoming initial barriers, such as low computer literacy and lack of access to the Internet. The Ministry of Labour, Health and Social Affairs agreed to take over programme support of the system, including the TB module, and to provide a State budget allocation to ensure seamless functioning.

Potential for scaling up the project and future areas of development

The national TB information system will be further strengthened by integration of diagnostic and laboratory data, including the results of Xpert MTB/RIF; data on TB and HIV collaborative activities and drug management data (including those on adverse drug reactions and pharmacovigilance) will be included by the end of 2016. Integration of health service performance data (such as hospital activity indicators, data on contact investigations and delays in service provision) and links to expenditures will be completed by the end of 2018.



TAJIKISTAN

Improving case notification through screening and innovative approaches

Background

Tajikistan has a high burden of TB and a case detection rate of only 47% (6000–8000 patients annually), as reported in the WHO *Global tuberculosis report 2011*. The levels of M/XDR-TB are very high: according to a survey of drug resistance, 12.5% of new and 53.6% of previously treated patients have MDR-TB. In light of these findings, it is important to introduce new approaches that can rapidly detect drug resistant TB.

Health system challenge

Recently in Tajikistan, there has been an increase in the prevalence of diabetes; however, the rate of detection of cases of TB in this risk group was low. Ex-prisoners also constitute a risk group for late diagnosis of TB and low treatment adherence.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

A study was carried out in the framework of the project TB REACH/Stop TB Partnership “Innovative approaches to improving case notification through mass screening and Xpert MTB/RIF usage” in three pilot regions of the country – the capital city Dushanbe, Tursunzade and Rudaki district – covering a population of over 1 million. The objectives were to increase early case detection, improve reporting and provide correct, complete treatment of TB at primary health care facilities. A pilot project in Dushanbe involved screening for TB in two high-risk populations: patients attending diabetes centres and inmates of a pre-detention facility.

The objectives were to improve case detection and case holding by screening at polyclinics, improve case detection in high-risk populations by screening, provide incentives for increasing case detection and case holding and conducting a mass communication campaign.

Active screening was introduced to improve case detection at 17 multidisciplinary polyclinics: 14 in Dushanbe, two in Tursunzade and one in Rudaki. At each facility, two people conducted screening. The mobile phone-based screening

questionnaire, in line with the active case detection protocol, was designed to identify cases of presumptive TB on the basis of symptoms such as cough for over two weeks, low-grade fever, blood in sputum, weight loss and night sweating; the questionnaire also elicited general information such as age and gender. The questionnaire was installed on smartphones provided by the project and was used by health workers and non-medical personnel to screen people visiting the facilities. Completed questionnaires help identify people with presumptive TB, and information on potential cases is transferred to a database. Training and cash incentives were given to the 60 nurses and non-medical personnel who conducted screening.

Meetings with family doctors helped increase their awareness of TB, and now, guided by symptoms, family doctors refer patients with presumptive TB for sputum testing. Previously, the solutions had been limited to administering broad-spectrum antibiotic therapy.

In order to help patients adhere to treatment, the NTP contracted several NGOs working on TB/HIV in migrants and other vulnerable groups. The NGOs selected 20 volunteers, who attended a 3-day course provided by the NTP on topics including the epidemiological situation, general information on TB, communication skills, how TB is transmitted and counteracting stigma and discrimination. The volunteers are now involved in daily provision of DOTS.

A mass communication campaign conducted by NTP and the NGOs in the intervention area involved TV and radio announcements highlighting TB signs and symptoms and banners posted in several locations in the city urging people who had a productive cough for over two weeks to seek free testing at a polyclinic. Advertisements also addressed the stigma associated with TB.

Outcomes

During one year, over 870 000 people were screened verbally, resulting in the identification of 10 296 presumptive cases and detection of 1975 cases of all forms of TB. Of the

more than 1400 sputum smear- and bacteriological-positive patients detected, 353 (25%) were resistant to rifampicin; 91% of these patients were started on MDR-TB treatment before culture results were available to individualize their regimens. Screening and testing resulted in a 77% increase in the number of MDR-TB patients put on treatment in comparison with the previous year.

With use of the Xpert MTB/RIF assay, many cases were confirmed bacteriologically. In the baseline period, an average of 68% of all new cases were sputum smear-negative and extra-pulmonary TB. During the implementation period, the percentage of extra-pulmonary TB was 45%, a 23% decrease.

The treatment success rate among new sputum smear-positive patients between August 2013 and March 2014 was 87%. Of the 1400 new sputum smear-positive cases found, 775 were cured, 237 treatments were completed, 21 people interrupted treatment, 10 died during treatment, and the remainder are still on treatment.

Early case detection, early initiation of M/XDR-TB treatment, fewer patients lost to treatment follow-up and strengthening of DOTS increase the effectiveness of treatment.

Important factors for success

Meetings with the Ministry of Health to ensure its support for the project were of particular importance. Ministry of Health staff were made aware that increased numbers of TB cases may be the result of better case finding rather than a sign of a worsening epidemic; this prevented any misunderstanding or reproaches from the Ministry. Frequent monitoring of project sites helped improve all aspects of implementation.

Ensuring sustainability

In the second year, the NTP extended the approach to five more regions in Sogd Oblast and, with KNCV, started the innovative activities in 11 more regions of Khatlon Oblast. The next step for ensuring sustainability is to build capacity by including the new approaches to active case detection and support for treatment adherence in the concept note to the Global Fund for the 2016–2017 period.

Potential scaling up of the project and future areas of development

The next step will be to discuss transfer to State support for the interventions.



UNITED KINGDOM

British Thoracic Society Multidrug-resistant Tuberculosis Advice Service

Background

In the United Kingdom, about 80 cases of MDR-TB are diagnosed each year. Most patients are located in London, but small numbers are reported in all parts of the country. Individual clinicians rarely see more than a few cases per year, and management of these cases has been based either on individual experience or dependent on clinicians' personal resources and access to advice from colleagues.

Health system challenge

A system was needed to guide clinicians in up-to-date practice for managing TB and MDR-TB when experience with this patient population is limited.

Good practice in health system strengthening to improve prevention and care of M/XDR-TB

In 2008, Professor Peter Davis in Liverpool set up a national service offering advice to all MDR-TB patients in the United Kingdom via a web-based system. In 2011, this service was taken over by the British Thoracic Society. The aim of the service is to make available evidence-based expert advice to all patients with MDR-TB diagnosed in the United Kingdom. The service has brought together a panel of experts throughout the country to provide advice on a case-by-case basis. The experts comprise specialists with experience in managing MDR-TB cases in various disciplines, including respiratory medicine, infectious diseases, HIV, pharmacy, paediatrics, public health, microbiology and thoracic surgery.

When a case of MDR-TB is diagnosed from a sputum sample, the laboratory that processes the sample notifies the managing clinician, who registers the case with the advice service. Clinicians can also register a case of proven or presumed MDR-TB independently. The web-based service includes anonymous details of the case, including the sensitivity pattern and treatment used to date. Images can also be uploaded. The clinician posting the case can ask a set of

questions, and an alert is sent to the panel of experts to address the questions. An administrator oversees the forum to ensure that each question is answered by the appropriate expert.

Patient management is monitored by follow-up reminders from the administrator, and outcomes are sought at various intervals. The clinicians managing the case are also encouraged to post updates on progress.

Outcomes

The advice given has led to changes in medication (often when inappropriate medication had been prescribed), changes in practice and changes in isolation procedures and screening and has helped discontinuation of inappropriate drug combinations. A user survey showed a high level of satisfaction with the service. Many users commented on the quality of the advice. Approval of new MDR-TB medications has also been facilitated by the service.

The service has improved networking among MDR-TB specialists and clinicians throughout the United Kingdom. The British Thoracic Society has prepared monographs on commonly used MDR-TB medications. The advice service acts as part of the mechanism for approval of appropriate use of new, expensive MDR-TB drugs.

Ensuring sustainability

The MDR-TB advice service is currently funded by the British Thoracic Society, which effectively funds only one administrator for 4 h a week. A modest investment should be made to develop this service further so that more clinical data can be entered and so that an interactive drug monograph and a registry function could be incorporated. The service should be reviewed for continued central funding as an integral part of the national strategy.



The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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