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BEST PRACTICES IN PREVENTION, CONTROL AND CARE FOR DRUG- RESISTANT TUBERCULOSIS

A resource for the continued implementation of the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011–2015

Abstract

The WHO European Region has the highest proportion of multidrug- and extensively drug-resistant tuberculosis (M/XDR-TB) patients in the world. In response to this alarming problem, the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011–2015, was developed for all 53 Member States and endorsed at the sixty-first session of the WHO Regional Committee on 15 September 2011. In the two years since the implementation of the plan, much progress has been made, however critical challenges also remain. In order to improve the transfer of knowledge and experiences between countries, and help in improving the health system approach, the TB and M/XDR-TB Control Programme of the WHO Regional Office for Europe launched an initiative to collect examples of best practices in M/XDR-TB prevention, control and care. Submission of best practices was open to all stakeholders in the Region, and examples were collected from May to August 2013. In total, 82 best practices were submitted from 30 countries. All practices, for which there was enough information (76 practices), were evaluated against defined selection criteria by an expert committee. The selected best practices were compiled to form this compendium. This compendium is intended to be a resource for stakeholders at all levels of health systems for the continued implementation of the Consolidated Action Plan in the Region.

Keywords

BEST PRACTICES
CONTROL, INFECTION
DELIVERY OF HEALTH CARE – organization and administration
EXTREMELY DRUG-RESISTANT TUBERCULOSIS
SURVEILLANCE
TUBERCULOSIS, MULTI-DRUG RESISTANT

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From the TB and M/XDR-TB programme Dr Pierpaolo de Colombani and Dr Andrei Dadu provided expert input. Ms Nonna Turusbekova, WHO temporary adviser, assisted us with the work.

Abbreviations

AFI	Act For Involvement
ART	antiretroviral therapy
BSC	biological safety cabinet
CIS	Commonwealth of Independent States
CSO	civil society organization
CXR	chest X-ray
DOT	directly observed treatment
DOTS	directly observed treatment, short-course
DST	drug susceptibility testing
ECDC	European Centre for Disease Prevention and Control
ECG	electrocardiogram
EQA	external quality assessment
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GHA	Global Health Advocates
HIV	human immunodeficiency virus
IDU	injecting drug user
M&E	monitoring and evaluation
MDR-TB	multidrug-resistant tuberculosis – resistant to isoniazid and rifampicin
MSF	Médecins Sans Frontières
NHIFA	National Health Insurance Fund Administration
NGO	nongovernmental organization
NTP	National TB Programme
PCR	polymerase chain reaction
PIH	Partners In Health
PSG	patient support group
TB	tuberculosis
TB-IC	tuberculosis infection control
USAID	United States Agency for International Development
UVGI	ultraviolet germicidal irradiation
XDR-TB	extensively drug-resistant tuberculosis – resistant to isoniazid and rifampicin and to any one of the fluoroquinolone drugs and to at least one of the three injectable second-line drugs (amikacin, capreomycin or kanamycin)



FOREWORD

Countries of the WHO European Region have been at the forefront of tuberculosis (TB) prevention and control for centuries; however, the emergence of multidrug-resistant and extensively drug-resistant TB (M/XDR-TB) in the Region has seriously complicated the efforts to achieve the Millennium Development Goals. Despite the steady decline of TB incidence, our Region has faced the largest proportion of M/XDR-TB among individuals diagnosed with TB, requiring a stronger link between health system strengthening and M/XDR-TB control to adequately prevent and treat this deadly disease.

In response to this alarming problem, I established a special project in 2011 to prevent and combat M/XDR-TB with a health systems focus for better health outcomes. In consultation with the Member States, civil society organizations, communities and partners, a Consolidated Action Plan was developed as a roadmap for Member States, the WHO Regional Office for Europe and partners to scale up the comprehensive response and to work towards the prevention and control of M/XDR-TB. In September 2011, with unprecedented support and commitment from all 53 Member States, the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011–2015 and its accompanying resolution EUR/RC61/R7 were endorsed at the sixty-first session of the WHO Regional Committee for Europe in Baku, Azerbaijan.

This plan, with technical support from my office, takes account of new diagnostic techniques, patient-centred models of care and tailored services for vulnerable populations. Full implementation of the plan is projected to avert the emergence of 250 000 new MDR-TB cases and 13 000 XDR-TB cases and save US\$ 7 billion.

As we mark two years since the implementation of the Consolidated Action Plan, much progress has been made. The MDR-TB detection rate, the proportion of TB notification among health-care workers and the default rate among new laboratory-confirmed TB patients have all been improved. The percentage of M/XDR-TB patients enrolled in treatment has significantly improved from 63% to 96%. However, critical challenges also remain. The percentage of MDR-TB among re-treated cases, coverage of first-line drug susceptibility testing and the treatment success rate of MDR-TB patients still remain below their targets.

Several countries have made strides in their progress and response to M/XDR-TB. These successes are a product of outstanding work by Member State national TB control programmes, nongovernmental and partner organizations. It is this work that is exemplified by the best practices presented in this compendium. The successes of the Consolidated Action Plan thus far and the work of partner organizations serve as a foundation for TB prevention, control and care as we move towards the framework of the new European health policy, Health 2020.

Many lives depend on the targets yet to be met to prevent and combat M/XDR-TB. These targets are achievable; however, continued commitment and sustained funding are imperative. At all levels of Member State health systems, sharing of knowledge and experiences between countries is a critical tool in formulating and improving health strategies. Therefore, I encourage all stakeholders to look to this compendium as a resource in the further implementation of the Consolidated Action Plan and our efforts to beat this insidious disease.

Zsuzsanna Jakab

WHO Regional Director for Europe

PREFACE

In line with the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011–2015, the WHO Regional Office for Europe, in collaboration and coordination with WHO country offices and partners, has provided guidance and technical assistance to Member States to improve prevention, control and care for TB, M/XDR-TB and TB/human immunodeficiency virus (HIV) coinfection. These efforts are closely linked to health system strengthening efforts in the Region. The work has been guided by the WHO Regional Director for Europe's Special Project to Prevent and Combat M/XDR-TB through a close collaboration between the Division of Communicable Diseases, Health Security and Environment and the Division of Health Systems and Public Health.

Areas of assistance have included governance; planning and programme management; technical assistance in diverse areas including airborne infection control, surveillance, monitoring and evaluation, health financing, development of human resources capacity, quality-assured laboratory diagnosis guidelines and policy development; provision of high-quality medicines through the Global Drug Facility; state-of-the-art clinical and programmatic guidance by the Green Light Committee (Europe); and advocacy, communication and social mobilization.

Specifically, the Regional Office has also assisted 18 high-priority countries (15 high burden MDR-TB countries, plus Romania, Turkey and Turkmenistan) to develop national M/XDR-TB response plans based on their TB drug-resistance data, resource availability, HIV burden and other national specificities. In addition, the European TB Laboratory Initiative was launched in 2012 to scale up quality diagnosis, and task forces have been established to improve prevention and control of childhood TB, develop the role of surgery in TB treatment, draft a consensus document on cross-border TB control and care, and assess and address health systems and social determinants of TB in line with Health 2020.

Treatment coverage for MDR-TB has increased from 63% of estimated MDR-TB patients in 2009 to 96% in 2011, although the treatment success for MDR-TB is as low as 48.5% and below the 75% target due to a lack of efficient medicines, suboptimal programme performance, an increase in the proportion of TB cases with HIV coinfection, high prevalence of XDR-TB in some settings, inadequate patient-centred approaches and lack of a functioning mechanism for cross-border care. Of the 15 countries with high MDR-TB burdens, 9 had achieved universal access to MDR-TB treatment and care by September 2013. Six other Member States are progressing towards the provision of treatment for all patients.

We hope that this compendium of best practices in M/XDR-TB prevention, control and care will inspire Member States through sharing of successful policy directions and concrete country experiences and, above all, by demonstrating that it is possible to turn the tide against the M/XDR-TB epidemic through a strong and sustained political commitment towards evidence-based prevention and treatment practices.

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EXECUTIVE SUMMARY

The WHO European Region has the highest proportion of M/XDR-TB patients in the world.

In order to address this alarming problem, in September 2011, with support from all 53 Member States of the WHO European Region, the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011–2015 and its accompanying resolution EUR/RC61/R7 were endorsed at the sixty-first session of the WHO Regional Committee for Europe in Baku, Azerbaijan.

The plan, which has six strategic directions and seven areas of intervention, is aligned with the Global Plan to Stop TB 2011–2015, and has the following specific targets to be met by the end of 2015: decrease by 20% the proportion of MDR-TB among re-treatment patients, diagnose at least 85% of all estimated MDR-TB patients, and successfully treat at least 75% of all patients notified as having MDR-TB.

As we approach two years since endorsement of the Consolidated Action Plan, much progress has been made. However, critical challenges also remain. For example, the treatment success rate of MDR-TB is still below its target.

In order to improve the transfer of knowledge and experiences between countries, and help in improving the health system approach, in May 2013 the TB and M/XDR-TB Control Programme of the WHO Regional Office for Europe, launched an initiative to collect examples of best practices in M/XDR-TB prevention, control and care in the Region. Submission of best practices was open to all stakeholders (ministries of health, national TB control programmes, partners and nongovernmental organizations working to combat tuberculosis and M/XDR-TB in the Region), and examples were collected over a 4-month period, from May to August 2013.

In total, 82 best practices were submitted from 30 countries. All practices, for which there was enough information (76 practices), were evaluated against defined selection criteria by an expert committee. The selected best practices were compiled to form this compendium.

This compendium is intended to be a resource for stakeholders at all levels of health systems for the continued implementation of the Consolidated Action Plan in the Region. Descriptions of the best practices are the work of the authors and institutions listed. Best practices will continue to be collected after publication of this compendium, and shared on an online platform linked to the Regional Office web site (<http://www.euro.who.int>).



INTRODUCTION AND BACKGROUND

Tuberculosis in the world and the WHO European Region

TB ranks as the second leading cause of death from infectious diseases worldwide, after HIV. It kills nearly 1.4 million people per year, and causes severe illness in nearly 8.7 million people per year worldwide.¹ In addition, TB accounts for over 40% of all mortality from communicable diseases in the WHO European Region, which represents about 44 000 deaths; this is largely due to the prevalence of multidrug- and extensively drug-resistant TB (M/XDR-TB). Although the rates of new TB cases have been falling since 2005 in line with Millennium Development Goal targets, the global burden remains enormous. In the Region, the burden of TB is geographically and socioeconomically disparate; the incidence ranges from less than 1 TB case per 100 000 population in some Member States to over 200 TB cases per 100 000 in others.

M/XDR-TB is of urgent concern in the Region

The increasing proportion of M/XDR-TB, particularly in former Soviet Union countries, has dramatically complicated diagnosis, treatment and prevention efforts, leading to higher mortality rates among patients with M/XDR-TB. Among all new and re-treated cases of TB worldwide, the proportion of M/XDR-TB is the highest in the WHO European Region. Of the 310 000 cases of MDR-TB estimated to exist globally, 78 000 (25%) are in the WHO European Region,^{1,2} which also has 15 of the world's 27 high M/XDR-TB burden countries; 99% of the regional MDR-TB burden occurs in these countries. The proportion of MDR-TB among newly detected TB cases in the Region was estimated as 13%, and among previously treated cases it was 44%.² XDR-TB was estimated to account for 10% of all MDR-TB cases in the Region.³

Table 1 shows the estimated annual incidence of MDR-TB and

the estimated proportion of new and previously treated TB cases with MDR-TB among the 15 high MDR-TB countries in the WHO European Region, compared to the top three high MDR-TB countries in other WHO regions.

Fig. 1 illustrates the percentage of new TB cases with MDR-TB worldwide, whereas Fig. 2 shows the percentage of previously treated TB cases with MDR-TB.

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 of the WHO European Region, who committed to respond urgently to the re-emergence of TB in the Region. Adequate interventions addressing drug-resistant TB require effective national planning and implementation, comprehensive approaches in and across countries and strong support from national and international partners. These interventions therefore depend on strong institutional capacity at national, subnational and transnational levels. In April 2009, ministers from the 27 countries of the world with a high M/XDR-TB burden met in Beijing, China to urgently address this alarming threat. This was reflected in a call for action on M/XDR-TB, to help strengthen health agendas and ensure that urgent and necessary commitments to action and funding are made in order to prevent this impending epidemic. In May 2009, the sixty-second World Health Assembly in its resolution 62.15 urged all Member States to achieve universal access by 2015 to diagnosis and treatment of M/XDR-TB as part of the transition to universal health coverage, thereby saving lives and protecting communities.

In addition, the WHO Regional Director for Europe confirmed WHO's commitment to the fight against TB and M/XDR-TB as a regional priority and to developing an action plan to prevent and combat M/XDR-TB in the Region. This position was endorsed by the WHO Regional Committee for Europe at its sixtieth session in Moscow, the Russian Federation in September 2010. In order to scale up a comprehensive response and to prevent and control M/XDR-TB, the Consolidated Action Plan to Prevent and Combat M/XDR-TB

- 1 *Global tuberculosis report 2012*. Geneva, World Health Organization, 2012 (http://www.who.int/tb/publications/global_report/en/, accessed 20 August 2012).
- 2 European Centre for Disease Prevention and Control and WHO Regional Office for Europe. *Tuberculosis surveillance and monitoring in Europe 2013*. Stockholm, European Centre for Disease Prevention and Control, 2013 (http://www.euro.who.int/__data/assets/pdf_file/0004/185800/Tuberculosis-surveillance-and-monitoring-in-Europe-2013.pdf, accessed 20 August 2013).
- 3 *Roadmap to prevent and combat drug-resistant tuberculosis*. Copenhagen, WHO Regional Office for Europe, 2012 (http://www.euro.who.int/__data/assets/pdf_file/0014/152015/e95786.pdf, accessed 20 August 2013).

Table 1. Estimated annual incidence of MDR-TB

	ESTIMATED ANNUAL INCIDENCE OF MDR-TB		
	ESTIMATED % OF TB CASES WITH MDR-TB OUT OF THE TOTAL NOTIFIED		
	CASES (95% CONFIDENCE INTERVAL)	NEWLY TREATED (95% CONFIDENCE INTERVAL)	PREVIOUSLY TREATED (95% CONFIDENCE INTERVAL)
High MDR-TB burden countries in the WHO European Region			
Armenia	250 (220–280)	9 (7–12)	43 (38–49)
Azerbaijan	3 400 (3 200–3 700)	22 (19–26)	55 (52–60)
Belarus	2 000 (1 900–2 100)	32 (30–35)	76 (72–79)
Bulgaria	120 (90–150)	2 (1–3)	26 (19–33)
Estonia	100 (83–120)	23 (17–29)	58 (43–71)
Georgia	760 (700–820)	11 (10–12)	32 (28–35)
Kazakhstan	8 200 (8 000–8 400)	30 (29–32)	51 (50–53)
Kyrgyzstan	1 500 (1 400–1 700)	26 (23–31)	52 (45–58)
Latvia	120 (96–140)	13 (10–16)	29 (20–40)
Lithuania	360 (320–390)	11 (9–13)	49 (44–54)
Republic of Moldova	1 600 (1 500–1 700)	19 (17–22)	64 (60–67)
Russian Federation	44 000 (40 000–48 000)	20 (18–22)	46 (41–52)
Tajikistan	1 000 (910–1 200)	13 (10–16)	54 (48–59)
Ukraine	9 300 (8 500–10 000)	16 (14–18)	44 (40–49)
Uzbekistan	3 000 (2 700–3 400)	23 (18–30)	62 (53–71)
High MDR-TB burden countries in other WHO regions (top 3)			
India	66 000 (58 000–73 000)	2 (1–3)	15 (13–17)
China	61 000 (54 000–68 000)	6 (5–7)	26 (22–30)
Philippines	11 000 (8 000–13 000)	4 (3–6)	21 (14–29)

Sources: *Global tuberculosis report 2012*. Geneva, World Health Organization, 2012; and European Centre for Disease Prevention and Control and WHO Regional Office for Europe. *Tuberculosis surveillance and monitoring in Europe 2013*. Stockholm, European Centre for Disease Prevention and Control, 2013.

Fig. 1. Percentage of new TB cases with MDR-TB*

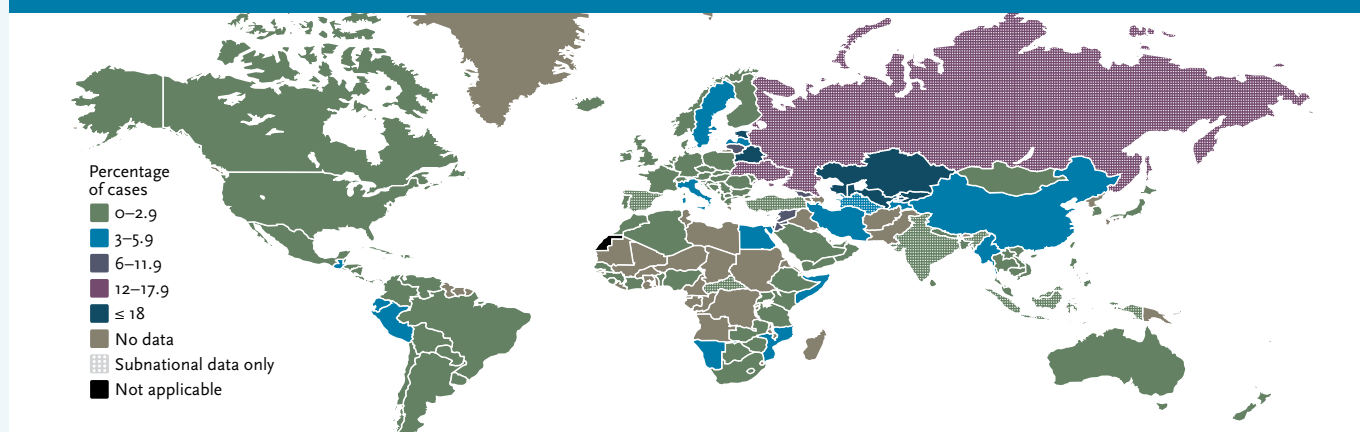
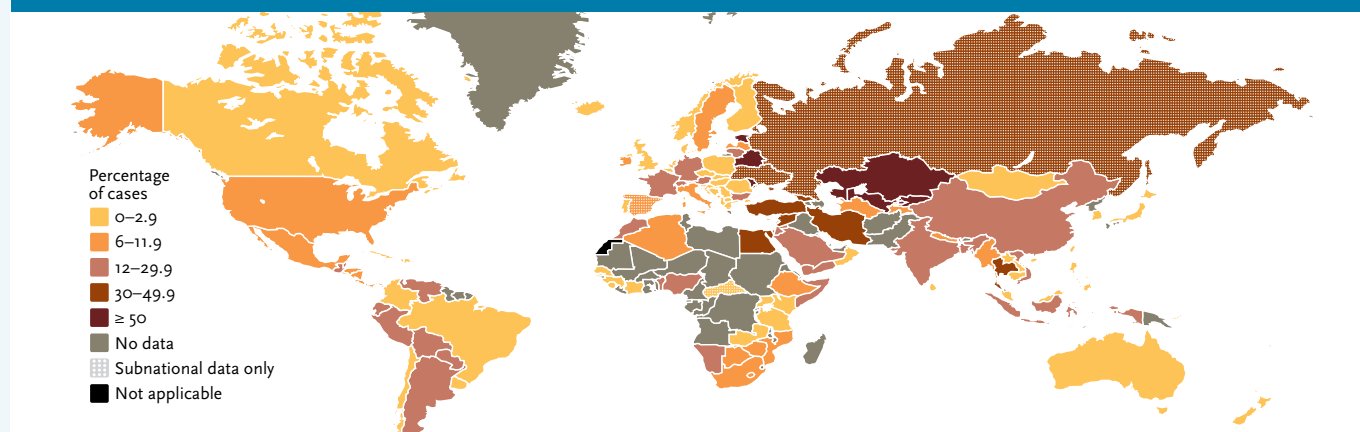


Fig. 2. Percentage of previously treated TB cases with MDR-TB*



Source: *Global tuberculosis report 2012*. Geneva, World Health Organization, 2012.

* Figs. 1 and 2 are based on the most recent year for which data have been reported, which varies among countries.

in the WHO European Region, 2011–2015⁴ was developed for the 53 Member States, the WHO Regional Office for Europe and partners. This plan has six strategic directions and seven areas of intervention. The strategic directions are cross-cutting and are designed to safeguard the values of the Health 2020⁵ strategy and highlight the corporate priorities of the Region. The areas of intervention are aligned with the Global Plan to Stop TB 2011–2015 and include the same targets as set by the Global Plan and World Health Assembly resolution WHA62.15, namely to provide universal access to diagnosis and treatment of MDR-TB by 2015. While the current epidemiological picture of drug-resistant TB in Europe appears daunting, this ambitious plan must be implemented if we are to stem this tide.⁶

Outline of the Consolidated Action Plan

Goal

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

Targets

The Consolidated Action Plan aims:

- » to decrease by 20 percentage points the proportion of MDR-TB among previously treated patients by the end of 2015;
- » to diagnose at least 85% of all estimated MDR-TB patients by the end of 2015; and
- » to treat successfully at least 75% of all patients notified as having MDR-TB by the end of 2015.

Strategic directions

The six strategic directions of the Consolidated Action Plan are:

1. to identify and address the determinants and underlying risk factors contributing to the emergence and spread of drug-resistant TB (areas of intervention 1, 4, 6 and 7);
2. to strengthen the response of health systems in providing accessible, affordable and acceptable services with patient-centred approaches: in order to reach the most vulnerable populations, all barriers to access must be addressed and treatment must remain truly free of charge for patients; innovative mechanisms are to

be introduced to remove barriers to equitable access to diagnosis and treatment of drug-resistant 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. to work in national, regional and international partnerships in TB prevention, control and care (area of intervention 6);
4. to 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. to promote the rational use of existing resources, identify gaps and mobilize additional resources to fill the gaps (area of intervention 6); and
6. to monitor the trends of M/XDR-TB in the Region and measure the impact of interventions (area of intervention 5).

Areas of intervention

Based on the objectives in the Global Plan to Stop TB 2011–2015 to achieve a reduction in the burden of drug-resistant TB, the seven areas of intervention of the Consolidated Action Plan are to:

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

Best practices in M/XDR-TB prevention, control and care

In order to improve the transfer of knowledge and experiences between countries, and help in improving the health system approach, in May 2013 the TB and M/XDR-TB Control Programme of the WHO Regional Office for Europe launched an initiative to collect examples of best practices in M/XDR-TB prevention, control and care in the Region.

A best practice was defined as any practice that works to achieve the targets of the Consolidated Action Plan or is otherwise working to prevent and control M/XDR-TB that can be useful in providing lessons learnt to other countries, partners and organizations. In addition, a best practice

4 Roadmap to prevent and combat drug-resistant tuberculosis. Copenhagen, WHO Regional Office for Europe, 2012 (http://www.euro.who.int/__data/assets/pdf_file/0014/152015/e95786.pdf, accessed 20 August 2013).

5 Health 2020 is a European policy framework supporting action across government and society for health and well-being (<http://www.euro.who.int/en/what-we-do/health-topics/health-policy/health-2020-the-european-policy-for-health-and-well-being>, accessed 24 August 2013).

6 Abubakar I et al. Tackling the spread of drug-resistant tuberculosis in Europe. *Lancet* 2012, 379(9813):e21–23.

should be relevant, effective, efficient and ethical, plus any one or more of the additional criteria detailed in Table 2.

Best practices could include implementation strategies; interventions; services provided; models of care, policy or governance; fundraising or financial allocation; partnerships established; awareness or advocacy activities; capacity building, etc.

Ministries of health, national TB programmes (NTPs), partners and nongovernmental organizations (NGOs) working to combat TB and M/XDR-TB in the Region were invited to submit examples of best practices via an online submission form, available in all four official languages of the Regional Office (English, French, German and Russian). In addition, the call for best practices was announced on the web site and through social media and was open to all stakeholders and partners for submission. Examples were collected over a four-month period, from May to August 2013.

At the end of the collection period, all practices were compiled and evaluated against the selection criteria detailed in Table 2 by an expert committee. The committee included members from the Regional Collaborating Committee on Tuberculosis Control and Care, the Technical Advisory Group on Tuberculosis Control, the TB Europe Coalition and the Regional Office.

Results and best practices presented in this compendium

Over the collection period, 82 best practices were submitted from 30 countries. Practices were received from 13 of the 15 high-M/XDR-TB burden countries and 14 of the 18 high-

priority countries. Of the 82 best practices submitted, 6 practices did not have enough information to be evaluated by the selection committee. Out of the 76 remaining practices, 40 were found to meet the selection criteria for a best practice and are presented in this compendium. The practices are organized according to the seven areas of intervention of the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis, 2011–2015. However, it is important to note that many practices address multiple areas of intervention, but have been categorized under one area only, in order to avoid replication.

All practices submitted for this initiative represent good and commendable examples of outstanding work being done by national programmes, partners and NGOs for the prevention, control and care of M/XDR-TB, and are available on the European Region TB Programme share-point, linked to the WHO Regional Office web site (www.euro.who.int/tuberculosis). It is also important to note that some of the practices not selected for this compendium may meet other criteria for best practices. Lastly, this compendium is not intended to be a comprehensive guide to all of the excellent and indispensable work currently being carried out in M/XDR-TB prevention, control and care in the Region, but rather represents best practices out of the submissions that were made during the four-month collection period. Many other programmes, partners and organizations may not have been aware of the best practices initiative or may not have been able to make a submission due to time constraints or other logistical limitations. The Regional Office encourages continuous submission of best practices, which will be shared on the aforementioned share-point.

Table 2. Selection criteria for best practices of M/XDR-TB prevention, control and care

Relevant*	Must address one of the targets or areas of intervention of the Consolidated Action Plan to Prevent and Combat Multi-drug- and Extensively Drug-Resistant Tuberculosis, 2011–2015, or otherwise addresses the control of MDR-TB
Effective*	Must work and achieve results that have been measured
Efficient*	Must produce results with a reasonable level of resources and time
Ethical*	Must respect the current rules of ethics for dealing with human populations
Equitable	Addresses the needs of vulnerable populations in an equitable manner
Sustainable	Implementable or able to be maintained over a long period of time (including policy decisions) without any massive injection of additional resources
Possibility of scale-up	Can be scaled-up to a larger population
Partnership	Involves satisfactory collaboration between several stakeholders
Community involvement	Involves participation from the affected communities
Political commitment	Has support from the relevant national or local authorities

* Required



BEST PRACTICES

PREVENT THE DEVELOPMENT OF M/XDR-TB CASES

HUNGARY

Reform of mandatory TB screening

At the request of the Ministry of Human Resources, a joint team from the WHO Regional Office for Europe and the European Centre for Disease Prevention and Control (ECDC) evaluated the National TB Programme (NTP) in Hungary. This also included a brief assessment of the efficiency of the mandatory chest X-ray (CXR) screening programme for the general population, practiced since the beginning of 1960s.

The last four decades have seen a steady decrease in the incidence of TB in Hungary. According to the latest statistics from the National Korányi Institute for TB and Pulmonology, the incidence rate in 2012 was 12.8 per 100 000 population, down from 96 per 100 000 in 1970. This makes Hungary one of the low-incidence countries. Nevertheless, the WHO/ECDC evaluation identified potential challenges: the relatively low bacteriological confirmation of cases (51%); the fairly modest treatment success rate (57%), and the high-level of geographical inequality in the incidence rate, reaching 48 per 100 000 in Záhony, the most disadvantaged part of the country.

CXR screening has been mandatory for the general population since the late 1990s in those parts of the country where the incidence rate is higher than 25 per 100 000. However, in one location, Nyíregyháza, the WHO/ECDC evaluation team found that the routine screening detection rate might be no better than detection through individuals visiting the dispensary because of their symptoms.

The evaluation findings also showed that although there was a comprehensive financial data collection system managed by the National Health Insurance Fund Administration (NHIFA) and the Central Statistical Office, there was no widespread and up-to-date review or follow-up of the budget for TB control. The evaluation mission therefore focused on collecting comprehensive data on TB control from NHIFA and the National Korányi Institute for TB and Pulmonology, in order to assess the pattern of finance allocation.

According to financing estimates prepared by the evaluation mission, screening clearly dominated TB expenditure, accounting for up to 65% of the total budget for TB services.

In 2011, only 35% was spent on other aspects of TB control. Although it is very difficult to define an appropriate division between screening and other treatments and services, the current allocation of resources suggests that the expenditure for screening has crowded out other expenditure for TB control. In particular, spending on outpatient care (excluding expenditures for pharmaceuticals) appears to be very low, accounting for only 3% of the total budget.

The Hungarian Central Statistical Office reported that, in 2010, 2.3 TB cases were found per 100 000 screenings by the dispensaries. This slightly overestimates the necessary number of screenings, as this number was calculated by dividing the identified pulmonary TB patients (508) by the total number of pulmonary screenings (2 172 685), whereas NHIFA reported that screenings with a TB indication were less (1 550 590) in 2011. If each screening costs US\$ 3.2 (source: NHIFA), finding one pulmonary TB patient through CXR screening of the general population costs more than US\$ 10 000. This compares to a treatment cost in hospital of US\$ 1000 per patient (source: NHIFA). This means that the cost of screening is 10 times higher than the cost of treatment per patient. Of course, this ratio can show high variation depending on the given epidemiological context in different parts in the country.

In January 2013, the ministry responsible for health (the State Secretariat for Health of the Ministry of Human Resources) announced in a press-conference that it is going to stop the routine screening practice for TB, following the recommendation of the WHO/ECDC evaluation team. Rather than continuing mandatory CXR screening for the general population, the Ministry of Human Resources is going to focus on risk-group screening, including people living with HIV, prisoners, socially disadvantaged groups and TB contacts, among others. In particular, it aims to intensify the cooperation with social service providers in order to better reach homeless people. As a result, this measure should make it possible to transfer a large share of resources within the TB budget to improving outpatient services, especially provision of pharmaceuticals.

In light of other identified weaknesses and various recommendations made by the WHO/ECDC evaluation, the Ministry of Human Resources decided to initiate a new National Action Plan on TB, which includes the prioritized screening of high-risk groups. The draft plan was prepared and circulated to key public and professional stakeholders for comments in May 2013, and is planned to be approved in the

second half of 2013. Thus, the true impact of the new policy approach remains to be seen, and largely depends on factors such as how the government reallocates the resources from CXR screening to other services within the TB control budget, and how the Ministry of Human Resources implements the new action plan.

NETHERLANDS AND UNITED KINGDOM

A case study of intercountry collaboration on migration and cross-border TB control

Background

The Amsterdam Municipal Public Health Service notified 151 new TB cases in 2011, of which 11 were detected through contact investigations. Immigrants from Somalia have the highest TB incidence and approximately 1% of TB cases in the Netherlands are MDR-TB.

In August 2011, "A", a 13-year old Somali girl was notified with smear-positive pulmonary TB. She had arrived in the Netherlands with a normal chest X-ray 17 months earlier. Subsequent culture grew *M. tuberculosis* resistant to isoniazid, rifampicin, pyrazinamide, ethambutol, streptomycin, protionamide and clarithromycin. She was immediately referred for isolation and treatment to the specialized National TB Care Centre in Beatrixoord, Haren.

Contact investigations

Amsterdam

All five close contacts in Amsterdam had latent TB infection, three of them developed active culture-confirmed TB within six months of A's diagnosis and strains proved identical in variable number tandem repeat and multidrug resistance pattern. After consultation with the national MDR-TB committee they were all referred to the National TB Care Centre. The index patient recovered; however, she needed resection of her left lung. All subsequent cases are also recovering well. The two multidrug-resistant latent TB infection cases in Amsterdam are being closely followed up.

London

In October 2011, another Somali girl "B", a 22-year old, was diagnosed with MDR-TB in a London hospital. Careful history taking proved that B was with her family in Limburg, a province in the south of the Netherlands, in the summer of 2011. A stayed there for a month in the same room. The information on time and exact place of transmission was rapidly communicated to the Amsterdam Public Health

Service. A was not aware of the address where she had stayed in the summer of 2011, her mother had left her with friends in Limburg while she went to Somalia. Further intercountry laboratory collaboration proved that the VNTRs of the two girls, A and B, were identical.

Later in 2012, a boy "C", with MDR-TB in this cluster was found in London. In retrospect, he turned out to have stayed with A and B in the summer of 2011 in the Limburg house. Further contact investigation was carried out in London.

Limburg

In the Limburg family, eight of nine contacts proved tuberculin skin test - and interferon-gamma release assay-positive and were put on close follow-up. Later in 2012, an adult man, a friend of the Limburg family developed spinal TB of the same VNTR cluster.

Conclusions

During the summer of 2011, a Somali girl with MDR-TB infected at least 16 close contacts from Amsterdam, London and Limburg. Six of them developed MDR-TB of the same cluster within twelve months. This MDR-TB outbreak with international transmission sites illustrates that mutant MDR-TB strains can be highly infectious and virulent. Information about the transmission site in Limburg only became available from a secondary case that occurred in London and was investigated through good international surveillance and cooperation. Special attention is needed when collecting information for contact investigations among refugees, who travel frequently in Western Europe and carry a high TB risk.

From our perspective, the best practice in intercountry collaboration started in London with the careful history taking and rapid communication of contact details (time and place of transmission in Limburg) to the Dutch Public Health Service.

SCALE UP ACCESS TO TESTING FOR
RESISTANCE TO FIRST- AND SECOND-LINE
ANTI-TB DRUGS AND TO HIV TESTING
AMONG TB PATIENTS

KAZAKHSTAN

Implementation of GeneXpert

Background

Kazakhstan is one of the 27 high MDR-TB burden countries. According to the WHO Global tuberculosis report 2012,¹ Kazakhstan had 28 550 notified TB cases in 2010, 19 703 of which were new and relapsed cases. According to the NTP review 2011, the rate of MDR-TB among new TB cases was 21% and among re-treatment cases was 45%. HIV infection is a minor problem in Kazakhstan, as the prevalence of HIV among adults (aged 15–49) is very low (0.1%). Most TB patients (84%) know their HIV status, of which approximately 1% are HIV positive.

Laboratory service

The laboratory service in Kazakhstan comprises the National Reference Laboratory; 22 regional bacteriological laboratories, including one in the prison sector (Karaganda); and 466 district microscopy laboratories, including primary health care facilities.

Diagnostic algorithm

All individuals with presumptive TB are investigated by smear microscopy, culture and DST. Three samples are collected for smear microscopy and culture for all new presumptive TB cases and positive samples are automatically inoculated for first-line drug susceptibility testing (DST). If any resistance to first-line drugs is detected, second-line DST is carried out. Smear microscopy is conducted as a follow-up to treatment for drug-susceptible TB cases and smear microscopy and culture are used to follow up category IV treatment. Hain testing is available in 10 regional laboratories and is used for diagnosing MDR-TB in sputum smear-positive patients.

Diagnostic coverage

The diagnostic coverage in Kazakhstan is high: smear microscopy coverage is 100% and culture and DST coverage about 91–92%.

GeneXpert implementation

Since June 2012, United States Agency for International Development (USAID) TB CARE I in partnership with the KNCV Tuberculosis Foundation has provided support to the NTP for the phased implementation of GeneXpert in Kazakhstan.

Based on the result of a country analysis, it was agreed that the main goal for implementation of GeneXpert in Kazakhstan is improvement of diagnosis and management of MDR-TB. Taking into account the high coverage of culture and DST in the country, the biggest impact of GeneXpert in Kazakhstan is in reducing the time for MDR-TB diagnosis, allowing earlier initiation of adequate treatment. At the same time, in settings where culture and DST coverage is lower, GeneXpert improves diagnosis of MDR-TB.

The following risk groups were identified and prioritized by a GeneXpert coordination group:

- » contacts of MDR-TB patients with presumptive TB and/or with abnormalities in the X-ray film;
- » all re-treatment cases with presumptive TB;
- » category I, II and III TB patients with a sputum smear-positive result at the end of the intensive phase of treatment who do not have DST results;
- » patients with presumptive TB who have been previously treated not in accordance with Kazakhstan's guidelines (from Baikonur, Kyrgyzstan, the Russian Federation, etc.);
- » people with presumptive TB in prisons or after release;
- » medical and prison personnel with presumptive TB;
- » pregnant or postpartum women with presumptive TB;
- » severely sick TB patients, with caseous pneumonia or generalized forms of TB, including miliary tuberculosis;
- » patients with TB/HIV coinfection without DST;
- » people living with HIV with presumptive TB; and
- » others.

It was agreed that prioritization for GeneXpert will be given to the groups mentioned above, and depending on testing capacity could be expanded to other groups. Ideally, any person with presumptive TB should be considered as poten-

¹ *Global tuberculosis report 2012*. Geneva, World Health Organization, 2012 (http://www.who.int/tb/publications/global_report/en/, accessed 20 August 2012).

tially having MDR-TB; however, limitations in GeneXpert capacity restrict eligibility for testing. For instance, GeneXpert is used as a follow-on test after smear microscopy for new TB patients. Smear-negative samples can be analysed by GeneXpert, while smear-positive samples could be sent to the nearest regional laboratory to be tested with Hain. However, because Hain testing is not available in East Kazakhstan, GeneXpert is used for both negative and positive new cases.

Three GeneXpert machines are located at the regional level (bacteriological laboratories of the regional TB dispensary) in Akmola, East Kazakhstan and Almaty city. Samples are collected from the districts and transported to the laboratory through the existing transportation system.

One machine was placed at the National Research Laboratory in Almaty and performs GeneXpert testing for Talgar Region and for patients of the National TB Centre. This instrument is also used for trainings. After the pilot phase, the machine will be moved from the National Research Laboratory to a regional laboratory.

In the beginning of the implementation process, the capacity of machines will not be fully used, thus the TB CARE I project procured 1500 cartridges for each machine for 1 year, a total of 6000 cartridges for four 4-module machines.

Ensuring the sustainability of GeneXpert implementation

To ensure sustainability, the TB CARE I project has involved the NTP from the very beginning and signed a memorandum of understanding with a clear division of rights and responsibilities between TB CARE I and the NTP. In addition, implementation of GeneXpert has occurred in a phased manner at all sites, starting from preparation for implementation. The implementation process is divided into pilot and roll out phases.

Pilot phase

The aim of the pilot phase is to verify GeneXpert performance characteristics in Kazakhstan. GeneXpert is used in parallel with the existing routine diagnostic procedures, including smear, culture, DST and X-ray. A comprehensive monitoring and evaluation (M&E) system has been implemented to allow a detailed impact analysis of GeneXpert, assessing case detection and time to diagnosis of TB and MDR-TB among the different groups affected in Kazakhstan. TB CARE I will conduct an impact analysis of GeneXpert by the end of the pilot phase, allowing informed decision-making for future scale-up strategies.

Routine use

After completion of the pilot phase, routine use of existing diagnostics should be discontinued if GeneXpert performance has been satisfactory. The comprehensive M&E system will be reduced to standard indicators.

Challenges

Implementation of new technology is attended by different challenges. One of the biggest challenges has been to form an agreement on the goal and objectives for implementation of GeneXpert in Kazakhstan. With the help of laboratory consultants from the TB CARE I Programme Management Unit, the project conducted a series of meetings to reach an agreement on the goal and objectives.

Another big challenge was to define the list of priority risk groups. The GeneXpert coordination group changed the objectives and priority groups several times, following every discussion with a new international expert. Unfortunately, experts did not take into consideration the available quantity of cartridges and existing infrastructure – including the transportation system and laboratory services. Finally, the risk groups were approved by the NTP with the main focus on people with presumptive MDR-TB.

Another challenge was to convince clinicians at national level to use GeneXpert results in making clinical decisions on treatment, because according to national guidelines, MDR-TB treatment should be started based on the results of resistance to rifampicin and isoniazid. Since GeneXpert gives results on rifampicin resistance only, clinicians also need results on resistance to isoniazid. The GeneXpert coordination group issued a letter requiring clinicians in the GeneXpert sites to start treatment based on the results of the GeneXpert test.

Preliminary outcomes of the pilot phase

Preliminary data show that the GeneXpert test was effective in the MDR-TB risk group.

The average time to start treatment was reduced and is now less than two weeks on average. Before GeneXpert implementation, this took about three weeks to a month. Based on these results, GeneXpert can be considered effective in reducing time to diagnosis and initiation of treatment.

UZBEKISTAN

Expanding external quality assessment for sputum smear microscopy

External quality assessment (EQA) of sputum smear microscopy work in TB laboratories was implemented in Uzbekistan in 2005 in some regions of the country. As most TB laboratory personnel were not yet trained in the EQA technique and regional coordinators did not make regular monitoring visits to regions, most of the regional laboratories did not implement EQA. In addition, no regular feedback between the laboratories at regional and district levels occurred. To improve TB laboratory diagnostics, standardization and unification of TB laboratory diagnostic techniques in Uzbekistan and to enhance the EQA system of smear microscopy, the USAID/Quality Health Care Project (Quality Project) implemented a combined set of laboratory trainings and follow-up monitoring, which includes EQA based on blinded rechecking.

The Quality Project together with the Uzbekistan National Reference Laboratory has developed and adapted an EQA protocol for sputum smear microscopy. To support protocol implementation and eventual countrywide expansion, the Quality Project started conducting training on basic smear microscopy and on the EQA method of smear microscopy for the laboratory specialists of Chilanzar district of Tashkent city, Parkent district of Tashkent region and Samarkand district of Samarkand region. After the training, 36 monitoring visits/on-the-job trainings were conducted jointly with the National Reference Laboratory.

In 2013, while continuing to support the original pilot sites, the Quality Project supported further expansion of the EQA system to an additional five regions: Ferghana, Bukhara, Surkhandarya, Samarkand and Tashkent. In these regions, regional laboratory coordinators and facility-level laboratory staff were trained.

The Quality Project's support of EQA implementation contributed to increasing the number of laboratories participating in EQA to 129 out of 310 laboratories countrywide. Of participating laboratories, the percentage with good results (smear parameters) increased from 72% (5 out of 7 laboratories participating in EQA) in the first quarter of 2012 to 91% (107 out of 118 laboratories participating in EQA) in the first quarter of 2013. Improving the quality and reliability of laboratory diagnostics not only improves the timely detection of TB patients and obtains qualitative treatment results, but also improves the EQA system and allows laboratory managers to identify weaknesses in the system and to target improvements based on needs identified by data provided by the EQA system. This feedback ensures the long-term efficacy and sustainability of the laboratory network.

SCALE UP ACCESS TO
EFFECTIVE TREATMENT FOR ALL
FORMS OF DRUG-RESISTANT TB

ARMENIA

Compassionate use of new TB drugs

Rationale for the compassionate use of new TB drugs

Armenia is among the world's 27 high MDR-TB burden countries. According to National Reference Laboratory data from Armenia, as of 2011, MDR-TB estimates were 18.7% of new TB cases and 55.6% of re-treatment cases. Of the MDR-TB cases, 9% (6.7–11.2%) are XDR-TB and 10–15% of drug-resistant TB patients fail treatment. An estimated 25–30% of XDR/pre-XDR-TB patients remain in desperate situations; existing treatment options have serious limitations and as a result, nearly half of these patients fail or are lost to follow-up due to low or no response (failure), side-effects and intolerance.

One of the challenges to introducing compassionate use of new TB drugs in Armenia was the absence of a legal framework. The Ministry of Health needed additional information about what compassionate use means for TB patients.

Progress on the compassionate use initiative began when Armenia's NTP signed a confidentiality agreement with Janssen Research & Development, LLC (formerly Tibotec) in October 2012. In January 2013, the local Ethics Committee approved the importation of bedaquiline to Armenia on humanitarian grounds, while compassionate use legislation is processed and until a new, effective drug is approved for use. The first request to Janssen was submitted on the 6 February 2013 and as of the 18 July 2013, 23 M/XDR-TB patients have been approved by Janssen and 16 patients were put on treatment; others are waiting for drugs to arrive from Janssen. There are more patients going through the approval process.

Eligibility

In general, compassionate use is considered for patients presenting with a life-threatening condition (e.g. deteriorating clinical condition due to TB) and treatment options are severely limited.

In the bedaquiline program, compassionate use is limited to patients who have XDR-TB or pre-XDR-TB. Patients must be 18 years or older; women of childbearing age must be on adequate contraception.

Exclusion criteria

The following criteria may exclude patients from compassionate use treatment:

- » significant laboratory abnormalities including creatinine, lipase, aspartate aminotransferase or alanine, aminotransferase, and total bilirubin;
- » QT interval using Fridericia's correction (QTcF) >450 msec at baseline;
- » other clinically significant electrocardiogram (ECG) abnormality at screening; and
- » family history of long QT syndrome.

Submission and approval

Treating doctors, from the Ministry of Health and Médecins Sans Frontières (MSF), select patients for compassionate use treatment based on eligibility criteria delineated in a guidance document prepared by Janssen. They present the cases to the Armenian Drug-Resistant TB Committee for endorsement, and then submit the cases to the MSF/Partners in Health (PIH) Medical Committee for endorsement and clinical advice. This committee consists of seven members – three from MSF, two from PIH, one expert from the Argentina and one from the International Union Against Tuberculosis and Lung Disease. Patient confidentiality is maintained as the patient is only identified by number during this process. If there is disagreement among the committee over endorsement of compassionate use, two external experts are consulted. Endorsed patients' clinical dossiers are sent to Janssen for final approval. Lastly, written informed consent is required from the patients to be treated.

Dosage

Bedaquiline (diarylquinoline) is available as a 100 mg tablet. Compassionate use patients receive a 24-week course of bedaquiline (188 tablets). Bedaquiline is dosed at 400 mg once daily for 2 weeks, followed by 200 mg 3 times per week for 22 weeks.

Clinical follow-up

For patients receiving bedaquiline for compassionate use treatment, a baseline clinical assessment is performed includ-

ing: a complete blood count, liver and renal function tests, amylase and lipase tests, ECG and X-ray. Clinical follow-up is performed daily for the first two weeks, then weekly for the first two months, and in any emergency. Liver and renal function is assessed weekly for the initial two months, and ECG is performed weekly for the first month, then monthly if there are no abnormal findings. If bedaquiline is prescribed with fluoroquinolones, clofazimine or other drugs that may prolong QT interval, an ECG should be performed regularly (weekly in the case of Armenia) throughout the treatment period.

Serious adverse events

All serious adverse events, pregnancies and adverse drug reactions which are possibly, probably or very likely related to the administration of bedaquiline should be reported to the manufacturer within 24 hours. Serious adverse events are those resulting in death, are life-threatening, require inpatient hospitalization or prolongation of existing hospitalization, result in persistent or significant disability or incapacity, or result in congenital anomaly or birth defect.

Practical considerations

Bedaquiline is given with an optimized background regimen including group five drugs. In addition to any second-line drugs likely to still be effective, all patients have required the addition of linezolid and some patients have also required intravenous imipenem. Eleven patients are currently receiving a regimen that includes intravenous imipenem treatment in the Republican TB Dispensary. One patient stopped imipenem due to a lack of venous access. The intramuscular form of imipenem is not available in Armenia and is not currently recommended for the treatment of drug-resistant TB.

Linezolid may have severe side effects such as anaemia and neuropathy and hence a detailed baseline examination and close monitoring are required.

One patient with HIV/XDR-TB co-infection approved for compassionate use treatment passed away before starting treatment.

Status of patients receiving compassionate use in Armenia

Table 3 shows the status of patients receiving compassionate use treatment in Armenia, as of July 2013.

Consequences of the compassionate use initiative

Accompanying drugs like linezolid and imipenem were also needed for certain patients. The clinical skills of local TB doctors and nurses, both from the Ministry of Health and MSF, needed broadening to enable them to provide basic comprehensive care. For example, usually Armenian TB clinicians are very vertically focused on TB treatment. Even basic examinations of systems other than the lungs are not practiced. For skills like reading an ECG, intravenous drug administration and monitoring and treating side-effects, they are heavily dependent on specialists who are not always accessible.

Some patients have special ambulatory care or hospitalization needs (e.g. some patients who do not want to be hospitalized are now at home and need intravenous imipenem). Additional monitoring and reporting systems are required for adverse events, pharmacovigilance and cardiac monitoring.

The compassionate use initiative offers a potentially lifesaving option for patients who have failed treatment or are left with very few options. Within one to two months of new treatment some patients converted who had been positive for longer than two years. Although it is too soon to draw wider conclusions, the outcomes of the initiative look promising. The acceptance and successful implementation of compassionate use presents an opportunity to introduce new drugs in a TB treatment programme.

Budget and operational implications

Bedaquiline is available free of charge under the compassionate use programme, but in the near future, when the drug is brought to market, it may be expensive.

Table 3. Patient status

Patient status	Number of patients
On treatment including bedaquiline	16
Refused treatment with bedaquiline	3
Died before starting treatment with bedaquiline	1
Pending initiation treatment with bedaquiline	3
Pending decision from MSF and Janssen	6
Treatment not advised by Janssen or MSF according to eligibility criteria	3

Many of the challenges experienced have been due to the two accompanying drugs: linezolid and imipenem.

These drugs, especially linezolid, are expensive and are currently financed by MSF. However, programmes need access to generic drugs at a lower price through the Global Fund to fight Aids, Tuberculosis and Malaria (GFATM).

Administration of imipenem is operationally challenging; only intravenous treatment is recommended for TB patients, given in 2 infusions per day, 12 hours apart, via slow intravenous route over 1 hour. Ideally administration is through in-dwelling central venous lines; these have been implemented for a small number of patients.

Linezolid requires close clinical monitoring for serious side-effects. The additional activities related to preparing and assessing the patients and monitoring treatment are resource intensive and require much attention from the team.

Conclusions

Compassionate use is potentially lifesaving for individual patients and may provide some patients with new hope. Compassionate use also presents the opportunity to introduce other fifth-line drugs (never used for TB patients in Armenia) including imipenem and linezolid. Compassionate use of new TB drugs also promotes the idea of using experimental drugs for other life-threatening conditions (like HIV and cancer).



BELGIUM

BELTA-TBnet, an example of best practices in the context of MDR-TB management

The Belgian Lung and Tuberculosis Association (BELTA)-TBnet project was set up in 2005. Its aim is to ensure that all TB patients have access to free diagnosis and free treatment. This will result in better treatment adherence, which will contribute to limiting the transmission of *M. tuberculosis* and preventing the development of drug resistance. Funding for the project is provided by the Belgian Ministry of Health.

BELTA-TBnet's main target group is TB patients without any social insurance coverage. But patients with social insurance coverage who face difficulties paying their personal contribution as a result of the recent economic crisis can also appeal to the project. MDR-TB patients are automatically included as well, even if they have full health insurance, because several of the second-line drugs are not reimbursed. Overall, about 15% of the total number of TB patients in Belgium receive assistance from BELTA-TBnet.

Although the project was not created primarily to deal with MDR-TB, it soon became clear that BELTA-TBnet had a very positive impact on MDR-TB management in the country. In order for a patient to be registered with the project, a number of epidemiological, clinical and bacteriological data need to be provided. It soon became apparent that the available information was not standardized. This led to the establishment of an MDR-TB expert committee that formulated appropriate recommendations and offers advice to clinicians confronted with MDR-TB cases. The BELTA-TBnet coordinating unit developed into an interface linking all people and institutions dealing with MDR-TB: clinicians, hospitals, pharmacies, social services, peripheral laboratories, the national reference laboratory, etc.

The following practices can be credited, directly or indirectly, to BELTA-TBnet.

- » All occurrences of MDR-TB (and even suspected MDR-TB), whether based on GeneXpert, polymerase chain reaction (PCR) or first-line culture, are communicated to BELTA-TBnet.
- » BELTA-TBnet ensures that all MDR-TB (or suspected MDR-TB) strains are sent to the national reference laboratory.

- » Identification, standardized extended DST (12 antibiotics at present) and genotyping are systematically performed at the national reference laboratory.
- » Systematic investigation of all clusters is conducted, not only to identify transmission pathways but also to exclude laboratory contamination, switching of specimens, or clerical errors (mislabelling).
- » Standardized MDR-TB guidelines are used that outline:
 - proper diagnostic pathways;
 - adequate treatment regimens based on a cascade sequence; and
 - additional recommendations regarding the use of new drugs (linezolid, meropenem, thioridazine, bedaquiline).

Easy access is provided to the MDR-TB Expert Group that offers advice to clinicians managing MDR-TB patients.

- » Easy access is provided to second-line drugs that are not marketed in Belgium (prothionamide, cycloserine, capreomycin).
- » Full MDR-TB treatment is available at no cost to the patient.
- » A network of field workers ensures home-based management of the MDR-TB patients.
- » Coordination of the information flow ensures smooth communication between all actors involved in MDR-TB management.
- » Consistency is ensured among the various MDR-TB reporting systems (national register, national reference laboratory, BELTA-TBnet).

BELTA-TBnet has a clear impact on the treatment outcomes of MDR-TB patients in Belgium. The cure rate improved significantly ($p=0.023$), from 67.2% for the cohorts 2001–2004 (treated before BELTA-TBnet) to 84.4% for the cohorts 2005–2010 (which benefited from the project). In a parsimonious multivariate approach, this improvement over time remained significant, independent of citizenship, treatment history and/or drug resistance pattern.

FINLAND

National advisory group on TB treatment

In 2006, the Finnish Ministry of Social Affairs and Health established the NTP. One of the ideas recommended for the programme was to form a national expert group on TB treatment. The group was started and is funded by the Ministry of Social Affairs and Health. The purpose of the group is to acquire, maintain and develop knowledge concerning treatment of difficult cases of TB (among the members of the group), as well as to monitor and give guidance to clinicians treating cases of M/XDR-TB. The group also gives consultations in cases of TB/HIV coinfection and polydrug-resistant TB, as well as in other difficult to treat TB cases. The group is made up of pulmonary physicians and infectious disease specialists responsible for TB treatment in each university hospital (Helsinki, Tampere, Oulu, Kuopio, Turku); three paediatricians (infectious disease subspecialty), one representative from the mycobacterial reference laboratory, and other specialists are consulted as needed.

The advisory group meets 3–4 times a year; every patient in follow-up is discussed (represented by the member of the group responsible for that case). Special follow-up cards in electronic format are used as well and have a secured internet (extranet) forum designed for the group. A physician responsible for the treatment of a case can contact the local university hospital representative or the chair of the group. During the meetings, a case is presented and followed thereafter by

the group. The physician treating the patient can seek further advice from the group between meetings (when the patient is assessed routinely). In urgent cases or when problems arise, the advisory group uses an internet forum for discussion.

The practice was initiated in response to a concern in Finland that doctors treating TB did not have the necessary knowledge base, particularly for treating drug-resistant TB, due to the low incidence of the disease in Finland. There was a need for a group of doctors to be trained and strengthened in the field of special TB treatment, and to act as consultants for other doctors treating TB. There was also a need to standardize treatment and care for drug-resistant TB cases throughout the country.

The advisory group is able to follow up the treatment of all M/XDR-TB cases and thus has been able to standardize treatment of TB and M/XDR-TB in Finland. The group has been proved necessary, and constantly receives questions and requests for consultation. According to the WHO/ECDC and Control country visit 2010 report, the practice can be considered effective. Members of the group have developed their knowledge and interest greatly since 2007, which has enabled physicians treating TB throughout the country to seek and receive expert help and consultation.

IRELAND

Development and implementation of guidelines for the delivery of directly observed therapy in the community to persons with TB disease

In Ireland, the national TB control subgroup developed guidelines for the delivery of directly observed therapy in the community to persons with TB disease.¹

The guidelines outline:

- » a description of directly observed treatment (DOT);
- » the rationale for administering DOT;
- » selective versus universal DOT;
- » the target groups for selective DOT including those with MDR-TB or XDR-TB;
- » the roles and responsibilities of those involved in the DOT process; and
- » the management of the DOT process, e.g. referral pathway, procedures, missing doses, case conferences, home visits, documentation, etc.

Epidemiology

The TB notification rate in Ireland in 2011 was 9.2 per 100 000 population (424 cases). Three cases of MDR-TB were notified that year which accounted for 0.7% of all cases. Rates varied across the country, from 5.9 per 100 000 in the northwest to 14 per 100 000 in the south. In 2010, in some local health office areas in Dublin and Cork, rates of 17–23 per 100 000 were reported.

Rationale for DOT

It can be difficult to predict who will take medications as directed and who will not. People of all backgrounds, genders, ethnicities and age groups can have problems taking medications directly. Each patient with a diagnosis of TB should be assessed to determine the likelihood of adherence to treatment. DOT should be prescribed for all patients with presumptive or confirmed TB who demonstrate that they may be incapable, unreliable or unwilling to take TB drugs. DOT reduces the risk of drug resistance, relapse and

reactivation of TB disease and mortality from TB. In addition, it helps prevent TB spreading to others. DOT helps identify problems, which might interrupt treatment and allows the health-care worker to monitor the patient regularly for side-effects and response to anti-TB therapy.

A multidisciplinary team approach is critical for the effective implementation of DOT.

Universal versus selective DOT

Selective DOT means providing DOT only to clients who are considered to be noncompliant or at high risk of noncompliance or those with a history of resistance to prescribed medications for the treatment of TB. Universal DOT describes the policy where DOT is used for treating all patients with TB. Selective DOT is implemented in Ireland for the following groups:

- » patients with presumptive or proven drug-resistant TB requiring second-line treatment e.g. MDR-TB, XDR-TB;
- » patients receiving intermittent therapy;
- » patients with a history of recurrence or relapse;
- » patient with a history of treatment failure;
- » patients in correctional facilities (prisons);
- » patients coinfecting with HIV (if deemed appropriate following the clinician's assessment); and
- » patients with poor understanding of TB diagnosis or nonacceptance of diagnosis.

Reason for the project

Prior to the development of this guidance, there was no national, standardized approach to DOT delivery and different procedures and processes were implemented across the country. This led to an ad hoc approach to DOT delivery. The reason for the development of such guidance was to standardize DOT administration practice nationally. The guidance was also developed to act as a support tool for staff implementing and providing DOT to patients, especially to those for whom compliance is problematic, and to ensure the effective and safe management of clients referred for DOT.

¹ *Guidelines for the delivery of directly observed therapy in the community to persons with TB disease*. Dublin, Health Service Executive, 2013 (<http://www.hpsc.ie/hpsc/A-Z/VaccinePreventable/TuberculosisTB/Guidance/File,13937,en.pdf>, accessed 20 August 2013).

Implementation and early feedback

The guidance was issued in February 2012 and currently, at national level, these guidelines have been implemented by the majority of the eight regional health offices dealing with TB prevention and control.

Some feedback from those implementing the guidance has been very positive, highlighting that the guidance has clarified whose responsibility it is to prescribe, supervise and manage DOT. In addition, the template referral form has ensured that all relevant information is supplied to each discipline involved in DOT administration. It also facilitates follow-up when patients move to another area of residence.

KAZAKHSTAN

Health systems measures to improve the epidemiological situation of TB

Implementation of the WHO directly observed treatment, short-course (DOTS) strategy in Kazakhstan helped curtail the increase in TB incidence after its peak in 2003, when it was 174.8 per 100 000 population (for the civilian and prison sector). Increased attention from the Government of Kazakhstan to the problem of TB, an uninterrupted supply of first-line TB drugs and careful management of DOT allowed a significant decrease in TB incidence, morbidity and mortality. However, Kazakhstan has also experienced an increase in drug resistance among previously treated patients, as well as among new cases. Insufficient treatment coverage of patients with drug-resistant TB has resulted in a growing need for adequate second-line treatment.

Systems-related measures that are being taken by the Ministry of Public Health and local executive agencies contribute to improvement of the epidemiological situation for TB in Kazakhstan. In order to improve the current situation with MDR-TB, the DOTS-Plus programme has been implemented in the country. Standards for detection, diagnostics, treatment and monitoring were developed in line with WHO recommendations and evidence-based medicine. For the purpose of timely detection of drug-resistant TB, rapid methods of TB and MDR-TB diagnostics were introduced in all regions of the country: BACTEC MGIT960, Hain and GeneXpert (the latter has been introduced in 13 pilot regions). This allowed 98% coverage of DST, while the WHO standard is 90%. The methodology for DST for first- and second-line drugs, which includes internal and external quality assurance, was introduced in all regional and municipal bacteriol-

ogy laboratories and in the National Reference Laboratory at the National Centre for Tuberculosis. DST for first-line drugs contributes to the improvement of XDR-TB diagnostics.

The Government of Kazakhstan and the Ministry of Public Health allocate sufficient resources from the national budget for the provision of first- and second-line drugs to TB patients. Second-line drugs for treatment of MDR-TB patients are also being purchased through the Green Light Committee, funded by GFATM. As a result, the coverage of MDR-TB patients with the second-line treatment has consistently increased. In 2012, this indicator reached 86.9% (the WHO standard is 85%).

The Government of Kazakhstan has provided consistent financial support for TB control activities, which have led to a decrease in the rates of TB incidence and mortality. TB incidence has decreased from 95.3 per 100 000 population in 2010 to 86.6 in 2011 and 81.7 in 2012. The TB mortality rate in 2010 was 10.6, in 2011 was 8.4, and in 2012 had fallen to 7.4. Over the past 10 years, the TB incidence in Kazakhstan decreased by 49.1% and the mortality by 67%. The treatment outcomes of 3897 MDR-TB patients in the cohort of 2009, who were treated with the second-line drugs, are evidence of the high success of the therapy: 2953 (75.8%) were cured. In the cohort of 2010, 4197 (72.7%) were cured out of 5777 MDR-TB patients enrolled for treatment. It should be noted that 132 patients enrolled in the fourth quarter of 2012 are still continuing treatment.

KAZAKHSTAN

Psychosocial patient support

Abstract: A novel patient-oriented treatment delivery program was introduced for multi-drug resistant tuberculosis (MDR-TB) patients at high risk of treatment default in East region, The Republic of Kazakhstan. In parallel interventions were introduced to improve programmatic and clinical management for all MDR-TB patients. To assess the effects of the patient support program on patient default rates, we analyzed the characteristics of MDR-TB patients referred to the psychosocial support (PSS) program, treatment adherence before and during the intervention for patients referred to the patient support program.

In 2010, the total number of MDR-patients starting second-line drug MDR-TB treatment was 426. The PSS program supported 228 (53%) patients considered to be at high risk of treatment default. The program contributed to strengthening of management of all MDR-TB patients during the ambulatory, continuation phase of treatment. The proportion of drug doses taken under direct observation improved from 48% to 97%, while division of intake of second-line anti-TB drugs in 2-3 portions per day decreased from 20% in 2009 to 0%. Interruptions of anti-TB drugs for at least one day decreased from 18% to 4% among all MDR-TB patients. Among patients included in the PSS program, no treatment default was observed and only one patient missed doses of treatment.

In conclusion, our patient-oriented support program was successful in reducing rates of treatment default among MDR- TB patients.

From: Kaliakbarova G et al. Psychosocial support improves treatment adherence among MDR -TB patients: experience from East Kazakhstan. *Open Infectious Diseases Journal*, 2013, 7:60–64.

PORTUGAL

Northern Regional Reference Centre for M/XDR-TB

According to 2007 official data, 1.5% of new TB cases registered in Portugal were MDR-TB and 48% of them XDR-TB. In June 2007, Portugal's National Directorate of Health created the National Reference Centre for M/XDR-TB. Facing the need to decentralize the management of M/XDR-TB cases in a regional structure, the National Directorate of Health proposed the creation of one Regional Reference Centre for MDR-TB in each of the seven health regions of the country.

The Northern Regional Reference Centre started its activity in July 2009. The team is composed of a pulmonologist (group coordinator), an infectious disease specialist, a public health physician, a microbiologist, a pharmacist, a paediatrician and a thoracic surgeon. Certain standard operational procedures are applied in the regional reference centre.

- » When a multidrug-resistant *M. tuberculosis* strain is detected, the laboratory notifies the reference centre and the clinician responsible for the patient.
- » The clinical case is discussed with the clinician responsible for the patient from the hospital, outpatient clinic (public or private), primary health care centre, prison or other location. The therapeutic approach, decision whether to hospitalize or not and follow-up are also discussed.

- » Hospitalization is the first choice (not mandatory) at the beginning of treatment and until smear sputum conversion.
- » The regional centre is responsible for the clinical management of patients, including the choice of treatment regimen, the purchase of second-line drugs and the provision of medication to the health service where the patient is being treated (hospital, outpatient clinic).
- » DOT is provided through the whole treatment. After discharge, local nurses provide the medication, preferably at the patient's home.
- » The regional reference centre provides periodic appointments to the patients, with the aim of assessing disease progression and occurrence of adverse events.
- » The reference centre, together with the family physician and public health authority, identifies the best strategy for contact tracing.

All MDR-TB cases are notified and the NTP analyses data regionally and nationally. The number of cases of MDR-TB in the region has consistently declined in the last years, and no cases of XDR-TB have been detected since 2010. With this strategy, 73% of patients followed by the reference centre during 2010–2013 have had therapeutic success.

REPUBLIC OF MOLDOVA

Improving TB treatment adherence and increasing TB awareness

“Only Galina helped me in my treatment. Because she says I have to fight to live, that it is a pleasure to see the sun every day.”

Homeless patient who completed TB treatment

Speranta Terrei brings TB drugs and community support to the doorsteps of TB patients, finding them on the street or in dilapidated apartments and persuading them to complete treatment. In 2011 an anonymous survey was carried out among 53 patients and the results showed that patients perceived information about TB provided by medical staff to be insufficient; young families had many unanswered questions about TB and sex; relatives of TB patients did not know how they could support the patients; and families with children who have TB lack information on hygiene.

Balti, where Speranta Terrei implements their project, is the second largest city in Moldova in terms of area and economic importance and the third in terms of population. In 2011, in total in Balti, 12 people interrupted treatment compared to 5 people in 2012. Speranta Terrei works with all TB patients, starting with children above six years of age to the elderly, regardless of gender and social status. Speranta Terrei used the survey results to leverage support to TB patients from their families. Practical information sessions for the families were delivered through a relatives' support group. Activities with TB-patients, their families and wider community include mini lectures, discussions, presentation of videos and performances for children touching on issues such as cough hygiene.

The main direction of Speranta Terrei's work is DOT and treatment support at home. When the TB dispensary doctor realizes that a patient is missing visits, the doctor requests a treatment supporter, called a moderator. Moderators are mainly ex-TB patients or their relatives. Moderators work in close contact with the nurses and doctors. Besides providing DOT, moderators help monitor side effects and facilitate contacts between the patient and health-care staff. Meetings between moderators and TB dispensaries are organized

regularly, in particular to discuss individual patients and approaches in case problems arise. Currently there are 23 moderators.

Moderators take drugs to vulnerable patients, encouraging them to complete treatment. They also help TB patients resolve issues with passports and, where possible, help patients find employment and housing. Moderators receive a symbolic compensation of US\$ 55 for visiting 5 patients, each 28 times a month. Moderators receive basic TB information and may attend training sessions four times a year to get current TB information and discuss cases. From 2010–2012, 7 moderators took care of 86 patients and the related costs amounted to US\$ 8400. In addition, three psychologists work primarily with DR-TB patients and help to prevent suicides.

Speranta Terrei works on streamlining the impact indicators, which includes treatment interruptions even as low as once a day, the effectiveness of treatment and a questionnaire for relatives and doctors.

Speranta Terrei rents a small centre where it holds meetings and training sessions and has received a computer and equipment. Speranta Terrei's most important asset is the moderators. Basic resources, such as having small-scale social activities, are required to motivate and encourage moderators and TB-patients.

Since 2006 in Balti with the help of Speranta Terrei, 430 patients have been cured and 132 are continuing treatment. One of the important conclusions is that the focus cannot only be on delivering medicines; addressing social issues is important and has been emphasized in the work performed in the past three years.

RUSSIAN FEDERATION

Home-based ambulatory TB treatment in Orel Region

Activities aimed at the management of home TB treatment have been in place in Orel Region of the Russian Federation since 2004 and are being scaled up.

Background

In 2002, the DOTS programme for management of MDR-TB patients was launched in Orel Region of the Russian Federation. In the MDR-TB cohort of 2002, 71.4% of patients were effectively treated, 14.3% failed their treatment and 4.8% were lost to follow-up. In the cohort of 2003 only 58% were effectively treated, although the proportion of patients who failed the course of chemotherapy remained the same, 14.8%. The decrease in treatment success was due to an increase in the proportion of patients lost to follow-up, to 15.9%.

In Orel Region, 45–50 TB patients, including those with MDR-TB, receive treatment each year under the Management of Home TB Treatment programme. About 400 people have been treated under the programme since 2004. The essence of the programme is the mobile team of medical workers that visit patients at their homes to provide DOTS

and scheduled diagnostic examinations for treatment monitoring. The team consists of a nurse and a driver and has a dedicated vehicle. A physician visits patients once a week or as needed. Patients with limited mobility, including those with concomitant diseases that limit mobility; socially vulnerable patients with low motivation for treatment; and patients who refuse to visit medical facilities for drug administration, including patients with alcoholism are selected for treatment in the programme.

Results of the programme

Of patients in the home TB treatment programme, 88% completed the course of chemotherapy, and less than 3% interrupted treatment. In 2011 the percentage of patients lost to follow-up was 1.5%. In general, in Orel Region the proportion of successfully treated, new, smear-positive cases in the cohort of 2009 was 84.5% and in the cohort of 2010 was 79.6%. In Orel Region, TB incidence decreased from 67.0 per 100 000 people in 2002 to 41.1 per 100 000 in 2012. The mortality decreased from 8.3 per 100 000 in 2002 to 2.9 per 100 000 in 2012.

RUSSIAN FEDERATION

Management of DOT for M/XDR-TB patients in rural districts of Tomsk Region

One of the reasons for insufficient effectiveness of chemotherapy in treating TB is premature cessation of treatment, which makes up about 40% of all negative outcomes. In addition, constant treatment interruptions directly affect the frequency of sputum conversion and treatment failures and can lead to development of XDR-TB.

Compared to urban districts where the TB service can offer various options for treatment management, it is more difficult to ensure DOT of TB in rural areas.

In the Tomsk Region of the Russian Federation, since 2004, the TB service has been implementing programmes aimed at improving patients' adherence to treatment of drug-resistant TB in rural areas. These programmes comprise a comprehensive approach to management of TB patients at the outpatient phase of treatment, aimed at the reduction of chemotherapy interruptions and improvement of treatment outcomes. This work is conducted in partnership with NGOs and with financial support from the GFATM.

The Russian Red Cross plays an important role in treatment management in rural districts of the Tomsk Region. Because of its well-organized and sound work, the Russian Red Cross team in Tomsk manages DOT in 16 districts of the region, relying on the assistance of their coordinators and local volunteers. A district coordinator is responsible for management of the activities in their district. The coordinator

ensures delivery of food packages from the regional centre to the place of patients' residence and treatment, supervises the work of volunteers involved in provision of DOT and social support, and collects the necessary documentation. As a rule, the volunteers are nurses or feldshers (medical officers). Regular inquiries and questionnaires help the Russian Red Cross estimate the needs of patients and find some additional incentives for treatment. Analysis showed that the daily, rather than weekly, distribution of food packages is a more effective incentive for patients. Food packages are especially important for development of patients' adherence to treatment in rural areas. They contribute to a significant decrease in the number of patients lost to follow-up in this group.

To a large extent, the good treatment outcomes in Tomsk Region are associated with outpatient treatment management in rural areas; these results are highly appreciated by the regional government and neighbouring regions of the Russian Federation. Between 1 December 2004 and 30 November 2012, 3569 TB patients were treated in Tomsk Region with Russian Red Cross support – 3150 patients with drug-susceptible TB (88.2%), 324 (9.1%) with MDR-TB and 25 (0.7%) with XDR-TB. The success of adherence motivation activities can be seen in the rates for completion of treatment: 99.8% (3144) with drug-susceptible TB, 93.8% (304) with MDR-TB and 100% (25) with XDR-TB.

SWEDEN

National panel for advice on treatment for M/XDR-TB

The Swedish Institute for Communicable Disease Control facilitates a group of 12 experts who are experienced in different fields of TB (microbiologists, infectious disease specialists and lung specialists) and work in different geographical areas of Sweden. A teleconference is organized every two months, during which the national panel discusses all new cases of M/XDR-TB and advice is given regarding treatment.

In between meetings, clinicians can contact the head of the panel, Jerker Jonsson, by phone, mail or e-mail for consultation on M/XDR-TB and other TB cases. If a particular issue or problem can wait until the next conference, the clinician handling the case will also be invited to join the conference to present the case. For more urgent clinical issues, expert advice is given immediately.

This practice was initiated more than 10 years ago by a lung specialist with experience in TB who was often approached

for advice by clinicians with little or no TB experience. Realizing the need, since TB is relatively rare in Sweden, the national expert group on TB was formed.

An integral part of this group is its connection to the national surveillance programme. Although most physicians treating TB in Sweden know of the advisory group, it is also possible for the group to approach those clinicians who have diagnosed an MDR-TB case, but have not sought additional guidance. This ensures that the best possible treatment is provided from the start.

Since the practice was initiated, treatment outcomes have been much better documented and have possibly improved, although it is difficult to determine since older data is scarce. Currently, the treatment success rates in Sweden for MDR-TB cases are as good as those for drug-susceptible cases (above 85%).



From
Paris
with Love

TAJIKISTAN

Treating paediatric TB

The need for paediatric TB treatment

Médecins Sans Frontières (MSF) and the Tajik Ministry of Health began a comprehensive paediatric TB care project in 2011, with the main objective of improving diagnosis and treatment of drug-resistant TB in children, reducing mortality and morbidity and working towards providing universal access to comprehensive TB care for children.

Estimates for paediatric TB indicate that it accounts for 10–15% of all TB cases in the 22 highest-burden countries, and worldwide kills at least 130 000 children each year, making it one of the top 10 causes of death in children. Tajikistan has a TB incidence of 193 new cases per 100 000 population,¹ the highest TB incidence in the Region. A national drug resistance survey conducted during 2010–2011, estimated national average MDR-TB rates for new cases at 12.5% and re-treatment cases at 53.6%.

Children are an especially vulnerable patient group that has been neglected globally. A lack of diagnostic methods adapted to children's needs and a lack of appropriate drug formulations for children have contributed to a situation in which TB programmes often under-diagnose, under-treat, or omit children with TB altogether.

When the NTP in Tajikistan started treating drug-resistant TB in 2009, it had limited resources, including a shortage of drugs, and children were not considered to be such a public health priority as they are very often not as infectious as adults. Consequently, before MSF started its programme, children with MDR-TB and XDR-TB had not been treated at all in the country.

Initiating paediatric TB treatment

MSF's strategy in Tajikistan is underpinned by the introduction of new diagnostic methods and the development of new guidelines for managing paediatric TB in Tajikistan. MSF collaborates with the Ministry of Health in selected locations to deliver a Comprehensive Family TB Care programme

that provides effective treatment of both drug-resistant and drug-susceptible TB in children and a holistic treatment approach to the entire family. It is necessary to treat household contacts, if not already in the NTP, otherwise treating the child alone is redundant. Treatment of adults, therefore, is crucial to the success of the child's treatment.

The model of care in these locations includes improved contact tracing and active case finding, improved diagnostics and effective treatment – plus training, health system strengthening and infection control measures. Alongside this family support, close monitoring of the patients, follow-up and psychosocial adherence support is provided.

Drug-resistant TB in children is especially challenging in terms of diagnosis and treatment, the main obstacle being the difficulty in obtaining a specimen for DST. Even if a good sputum sample can be provided, it will be negative in up to 50% of cases, as children very often have a low bacillary load. To combat this, MSF is implementing the latest diagnostics methods and algorithm for children, including the use of sputum induction.

Sputum induction has been shown to be an effective and safe procedure, even in very young children. The yield of one induced sputum specimen is comparable to three gastric lavages and the procedure consists of three straightforward steps.

1. The patient inhales a bronchodilator; necessary as the hypertonic saline solution used in the second step causes bronchospasm in some patients.
2. After inhalation of the bronchodilator, the patient inhales nebulized hypertonic saline solution.
3. Older children should now be able to cough up sputum, for younger children it might be necessary to suction the sputum from the pharynx.

The crucial diagnostic accompaniment to sputum induction is GeneXpert. With sensitivity better than smear microscopy, albeit not as accurate as culture, its ability to detect rifampicin resistance and therefore indicate MDR-TB makes it an essen-

¹ *Global tuberculosis report 2012*. Geneva, World Health Organization, 2012 (http://www.who.int/tb/publications/global_report/en/, accessed 20 August 2012).

tial tool in effective and timely diagnosis. Furthermore, this supports improved infection control, as it allows for immediate patient segregation and thereby reduces the risk of drug-susceptible TB patients becoming infected with a drug-resistant strain. Having GeneXpert situated in a new laboratory in the same compound as the hospital and the sputum induction room enabled the project to take a baby of only a few months old through the diagnostic process in a single day.

Even with these diagnostic possibilities, however, there will still be children without biological proof and for these, Tajik doctors are trained and skilled to diagnose TB even without a positive smear or a positive culture, using a combination of clinical symptoms, history, contacts, X-ray and Mantoux test. However, they remain extremely reluctant to make a diagnosis of drug-resistant TB on anything but a sound biological confirmation, which remains elusive in every second case. This continues to be something of an obstacle to determining true levels of need for children with MDR-TB and starting them on appropriate treatment.

Another area which could be improved has been paediatric drug formulations, which are commercially unavailable. MSF provides second-line and side-effect drugs for patients; although, as exact weight-adapted dosing of second-line TB drugs for children is often very difficult, MSF has developed

a protocol for the preparation of paediatric formulations of a number of second-line TB drugs, using commercially available syrup as a liquid vehicle.

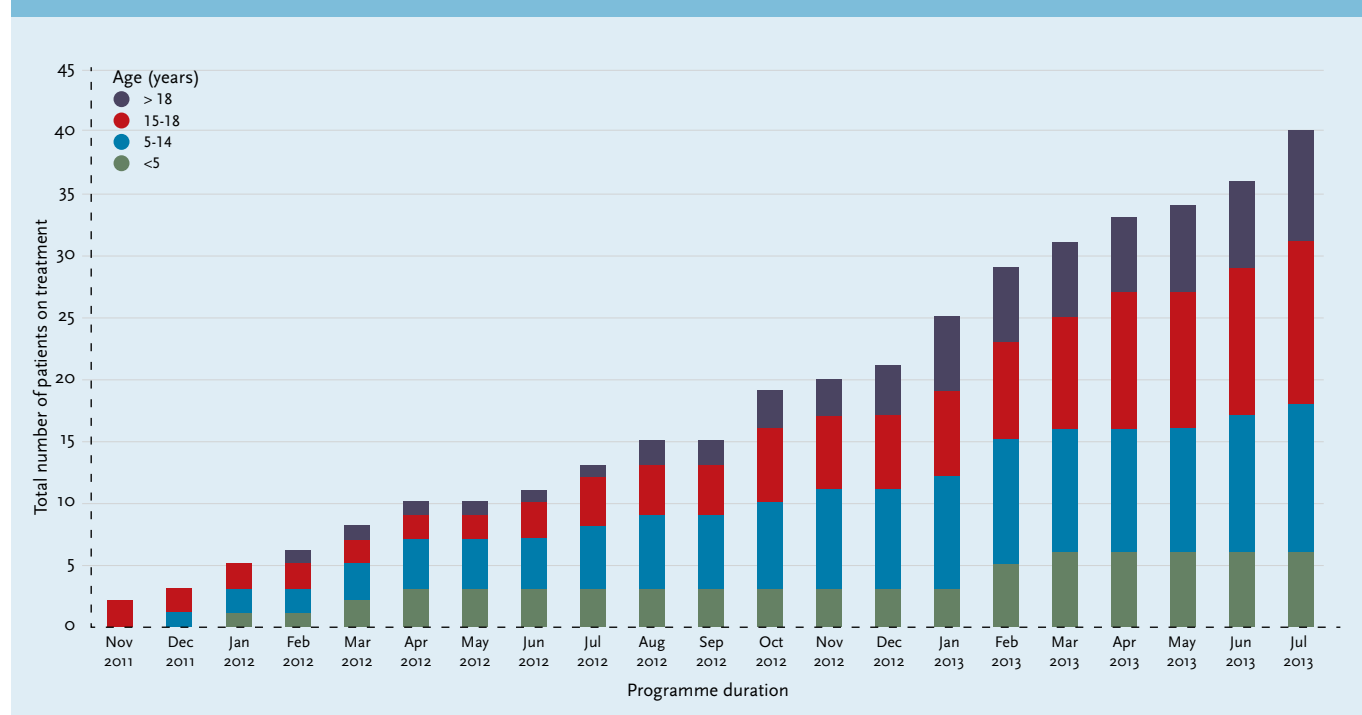
Outcomes

Currently MSF provides treatment to 40 patients, including adult household contacts, from all over Tajikistan. Of these, seven patients are younger than five years, the youngest being nine months old at commencement of treatment. Ten children are between five and fourteen years old, with thirteen patients older than fourteen years (see Fig. 3). The comprehensive response to families is intrinsic to providing paediatric care, as there is an integral link between paediatric disease and suboptimal diagnosis and treatment of adults.

Sputum induction has been introduced and successfully used, and all patients weighing less than 30 kg receive the appropriate drugs as a syrup formulation, with good acceptance to date.

Tajikistan Ministry of Health guidelines on paediatric TB (from 2011) make reference to MDR-TB. However, MSF felt that dedicated guidelines that reinforce and disseminate the latest developments and best practice in paediatric TB care were required, given the notable differences between chil-

Fig. 3. Age stratified MDR-TB cases in the MSF paediatric programme, Tajikistan, November 2011 to March 2013



dren and adult patients, not least the problems of biological proof. As a result, and together with technical input from WHO and the Ministry of Health, MSF developed a set of paediatric guidelines responsive to the Tajikistan context.

The guidelines include two diagnostic algorithms, one for children with the clinical suspicion of TB and one for contacts of known TB cases. Alongside the main components of sputum induction and GeneXpert testing, the guidelines cover ambulatory or home-based treatment for drug-resistant TB, child-friendly adherence support, contact tracing and, in particular, a careful history-taking for contact with cases of TB. These guidelines are currently undergoing the process for adoption by the Ministry of Health, including development of the supporting national law. Based on this,

and together with TB service provider partners, MSF provides training and expertise to Ministry of Health medical staff on paediatric TB and drug-resistant TB diagnosis and treatment.

With the Comprehensive Family TB Care programme, MSF has shown that provision of high-quality drug-resistant TB diagnosis and treatment for children is feasible in Tajikistan and therefore potentially in other resource-poor settings. While only in its early stages, having a national guideline for comprehensive management of paediatric TB with a patient-centred approach has improved case finding for drug-resistant TB in children. Despite the difficulties, MSF believes that children with drug-resistant TB can be successfully diagnosed, treated and ultimately cured.





UZBEKISTAN

Reconstruction and optimization of inpatient bed capacity in the TB service

In the framework of the national TB control programme in Uzbekistan for 2011–2015 and Resolution No. 62 of the Cabinet of Ministers of 5 March 2011, the work on reconstruction and optimization of inpatient bed capacity in the TB service is in progress. In 2010, the external review mission recommended reconstruction and optimization, which are now part of the national M/XDR-TB action plan. A situation assessment in the facilities showed that the facilities had to improve their TB infection control (TB-IC) standards. The total estimated budget for reconstruction in 2011–2015 is 176 billion Uzbek sum or 65 million euros. Activities include the construction of 3 new facilities, repairs in 8 facilities and capital repairs in 33 facilities. Alongside reconstruction efforts, Uzbekistan embarks on the optimization of bed capacity.

Both reconstruction and optimization of bed capacity were important in relation to the expected increase in the number of MDR-TB patients enrolled in treatment because, in 2013, the Green Light Committee and GFATM experts gave permission to roll out the MDR-TB treatment pilot sites' programme countrywide. MDR-TB patients during the continuation phase and some patients during the intensive phase will be treated as outpatients. The number of provinces with pilot sites increased from three in January 2013 to nine in July 2013. In 2014, the programme will have 14 pilot sites covering Tashkent and 13 provinces.

Optimization of bed capacity means changing the function of TB facilities with low bed capacity and facilities that cannot comply with TB-IC or be renovated. A total of 1830 beds

will be reduced while the facilities remain open, providing outpatient services. Before the pilot starts, staff members receive training. During the pilot, health-care staff will continue working at their facilities but will switch to outpatient work, such as home visits and consultations, and will work more at primary health-care facilities. Once ambulatory care is added to the job descriptions of TB specialists and (out-reach) nurses, the programme is planned to be rolled out countrywide. Budget savings resulting from the optimization of bed capacity will remain in the TB programme. For instance, due to the economy, a 50% increase in the basic salaries of TB doctors was already introduced in 2011.

The state reconstruction and optimization programme is rolled out in stages and some provinces already have encouraging results. The renovated facilities are now operating with increased compliance with the airborne infection control standards. The experience of MSF in the Republic of Karakalpakstan is positive and will be taken into account and adapted to lay a foundation for a unified approach, including provision of psychosocial support to patients and establishment of patient support groups.

Currently more than 1000 MDR-TB patients are treated in pilot sites. At pilot sites in Karakalpakstan, patients with drug-susceptible- and MDR-TB can choose between in- or outpatient care from the first day of treatment. In other pilot sites, the same choices are given to patients but the mechanism, including logistics, transportation and availability of psychosocial support still has to be improved in order to guarantee the same quality of care.

UZBEKISTAN

Ambulatory TB care from day one

The need for an ambulatory care approach

MSF has been involved in TB treatment alongside and in partnership with the Ministry of Public Health of Uzbekistan since 1998. From 2003 until 2010, MSF ran an MDR-TB programme in the Republic of Karakalpakstan; however, it became clear that an exclusive MDR-TB treatment model was neither optimal nor sufficient to tackle the burgeoning MDR-TB threat.

The priority then became to implement a comprehensive TB care-for-all approach, treating all drug-susceptible and drug-resistant cases in MSF and Ministry of Public Health TB programmes. This necessitated a scaling-up of services and the only feasible approach to achieve this required the centralization of TB diagnosis and treatment, including maintenance of DOT.

However, national programmes in former Soviet countries traditionally hospitalize smear-positive TB patients for a mandatory 60-day minimum duration. The rationale for a compulsory inpatient intensive phase was that this enabled segregation of patients and helped with infection control between patients and the population. There was, however, no segregation of drug-susceptible and drug-resistant cases, risking cross-infection among these patients.

The traditional model saw drug-susceptible patients hospitalized during the first two months of treatment in the intensive phase. For drug-resistant TB patients the intensive phase is 6–8 months. With the proportion of drug-resistant patients increasing, the traditional model of hospitalizing all patients in the intensive phase led to a bottleneck in the system. This diminished capacity to meet treatment needs and generated a long waiting list, further risking transmission in the population and rendering hospitalization outmoded, as a disease containment strategy. This growing reality meant that the main conceptual barrier to the ambulatory approach now became the catalyst for it.

Initiating ambulatory care from day one

Ambulatory care from day one (ACD1), alongside rapid diagnosis, enables people to start treatment more quickly and

without hospitalization, which relieves the bottleneck that risks prolonging untreated infection in the population, and so minimizes the spread of MDR-TB. Ambulatory care is not a new idea, but it was the ambition to deliver this treatment option from day one that represented a major challenge to health systems and processes, and would require a step-change in treatment practices.

A positive, evolving relationship with the Government of Uzbekistan and a close working partnership between MSF and the Ministry of Health of the Republic of Karakalpakstan has seen steady and consistent increases in access to diagnosis and treatment for all TB patients. Since 2002, MDR-TB has drawn increasing focus and support from the Ministry of Health of the Republic of Karakalpakstan. By 2010, backed by the essential Prikaz (laws), MSF's Comprehensive Care for All strategy was approved, and was followed in 2011 by ACD1 being formally accepted as a model of care in the Republic of Karakalpakstan.

Table 4 lists the chronology of significant events in MSF's MDR-TB programme in Karakalpakstan, Uzbekistan.

Reaching this point took significant system change and has been a lengthy process, requiring devolution of the decision-making process on TB diagnosis and care from a single, centralized consilium to community-based settings. With the formation of mini-consilium, in eight of the nine districts where MSF delivers comprehensive TB care, case review and decision-making is now permitted for some MDR-TB cases, whereas initially it was only possible for drug-susceptible TB cases.

Increasing patient load, duration of treatment and decentralization of care required task shifting of side-effect management from specialist doctors to rural medical centres and Feldsher-obstetrician posts. Simplifying guidelines and protocols was a precondition for switching responsibility for daily patient follow-up and management of basic side-effects from TB specialists to community-based practitioners. Developing standardized, simplified protocols for the 10

most common regimens streamlined training and upskilling of doctors with less experience of TB care, preparing them more rapidly for treatment supervision. Alongside this sat the major commitment to policy reform and drafting of new Prikaz in support of each medical development and every change in protocol.

Devolving tasks required substantial training; new staffing cadres – from patient support, to psychologists, to infection control specialists; and appropriately skilled staff ensure the quality of DOT delivery at polyclinics, and truly integrate TB care into the primary health care system. For example, the decentralized model requires non-TB specialized nurses at rural medical centres to take over responsibility for daily DOT and patient follow-up, rather than doctors. Added to this, MSF’s comprehensive model of care includes a psycho-social care and counselling component. For ACD1 patients to benefit from this, yet another duty would fall to these nurses.

In response, the Ministry of Health of the Republic of Karakalpakstan committed to appointing one dedicated adherence nurse officer per district to provide this function. MSF implemented a training of trainers programme to up skill this cadre of adherence nurse officers. A toolkit of support materials including adapted, simplified forms and checklists were provided with training on documentation and counselling techniques.

Structural upgrades were also required such as strengthening of infection control measures at a number of health centres, including the installation of ultraviolet lights in

the Republican TB #2 Hospital in Nukus and the renovation of numerous DOT corners in rural medical centres and districts.

Laboratory decentralization became possible with the introduction of GeneXpert, allowing testing to be conducted efficiently without specialist facilities in micro-laboratories in the districts. While it is not possible to decentralize culture tests, GeneXpert can indicate resistance to rifampicin, which is sufficient to commence MDR-TB treatment. Thus, GeneXpert plays a vital role not just in facilitating decentralization, but also starting MDR-TB patients on appropriate treatment sooner.

Community-based structures mean results now have to be disseminated to a number of locations. MSF has established structures to safeguard the cycle of sending samples from peripheral locations to the central laboratory in Nukus, then communicating laboratory results back to those locations. At the same time, the Ministry of Health of the Republic of Karakalpakstan mobilized GFATM resources to purchase six dedicated vehicles to meet the needs of decentralized sample, results, drug and follow-up realities.

Supporting this, a wholly MSF-managed warehouse enables efficient drug procurement, order management and distribution to ensure uninterrupted supplies of high-quality drugs and best-practice pharmacy management.

Results and outcomes

Of the 900 drug-resistant patients in the programme, around 70% started on ACD1 in 2012. Early cohorts of ACD1

Table 4. MSF MDR-TB programme chronology, Karakalpakstan, Uzbekistan

Date	Activity
Jul 2002	First staff appointed to MDR-TB programme (MDR-TB medical doctor position)
Aug 2003	DOT expanded to the last Karakalpakstan district, Turtkul
Sep 2003	First patients admitted to MDR-TB clinic (Republican TB-hospital #2)
Oct 2004	Out patient department opens in Nukus city for ambulatory care of MDR-TB patients discharged from MDR-TB hospital
May 2005	First cured MDR-TB patient
Sep 2005	Signed memorandum of understanding with Foundation for Innovative New Diagnostics for rapid DST
Jan 2006	GFATM TB programme starts to supply second-line TB drugs for Karakalpakstan
Oct 2007	Ministry of Health of the Republic of Karakalpakstan issues Prikaz (#366) on expansion of ambulatory care of drug-resistant TB
May 2008	Ministry of Public Health of the Republic of Uzbekistan Prikaz (#180) issued on management of MDR-TB
Nov 2009	MSF formally agrees to participate in expansion of drug-resistant TB treatment to all districts of Karakalpakstan
Aug 2010	Comprehensive TB Care for All strategy approved in Karakalpakstan
Apr 2011	Regional TB symposium hosted by MSF/ Ministry of Public Health of the Republic of Uzbekistan “Uniting to scale up TB care in Central Asia”

drug-resistant TB patients are at the half-way point of their treatment and patient numbers are still modest, so interim results are only indicative and success rates cannot yet be determined. However, the ACD1 model currently matches the previous approach in terms of adherence.

MSF and the Ministry of Health of the Republic of Karakalpakstan continue to work towards universal access to TB treatment in Karakalpakstan. The planned roll-out means

that by 2017, there will be full Ministry of Health control of comprehensive TB programmes in all 16 districts (see Table 5).

The extent, pace and ambition of project expansion is testimony to the ongoing commitment of both partners to tackle, arrest and reverse the threat of MDR-TB and establish high-quality, comprehensive TB diagnosis and care throughout the Republic of Karakalpakstan.

Table 5. Planned roll-out of the Comprehensive TB Care Programme, Karakalpakstan, Uzbekistan

Number of districts	Districts	Start	Hand over to Ministry of Public Health of the Republic of Uzbekistan
2	Takhtakupir, Karauzyak	2010	Handed over 2012
3	Khodjeily, Takhiatash, Nukus District	2011	For hand-over 2013
2	Kegeily, Nukus City	2012	For hand-over 2014
3	Chimbay, Shumanay, Kanlikul	To start 2013	For hand-over 2015
2	Muynak, Kungrad	To start 2014	For hand-over 2016
4	Amudarya, Beruni, Elik-kala, Turtkul	To start 2015	For hand-over 2017



SCALE UP TB INFECTION CONTROL

ROMANIA

TB infection control in prisons

The practice of TB infection control (TB-IC) in prisons started in April 2004 after it was noticed that Romania had a high TB burden when compared to the Centers for Disease Control and Prevention and WHO TB-IC guidelines, and due to poor infection control in many facilities. Prisons – with their overcrowding, lack of adequate ventilation and high mobility of prisoners – were the priority risk setting and required improved procedures for ventilation, proper use of ultraviolet germicidal irradiation (UVGI), respiratory protection and isolation of inmates. Mobilizing the prison staff was important to implement all these procedures in an overcrowded prison system.

Implementing activities regarding TB-IC in prisons is part of a project in Romanian prisons financed by the GFATM through the Ministry of Health in Round 2, and by the Transitional Funding Mechanism through the Romanian Angel Appeal Foundation in Round 6. In Round 2, 160 airborne infection isolation and sputum collecting rooms were installed in prisons and, in 2005, TB-IC training of non-medical staff, mainly prisons guards, was started. In Round 6 with the Transitional Funding Mechanism, TB-IC committees at administrative and at prison level were nominated and trained.

Commencing supra-structural activities in every prison included nominating TB-IC committees and developing TB-IC procedures and plans. To see the progress of each prison, supervisory visits by peer TB-IC commissions from other prisons were introduced. TB-IC committees analyse M&E reports at annual meetings. During monitoring, prison TB-IC plans are checked to see to what extent the plans are adapted to risks of transmission and if risks were evaluated in all prison areas (upon entry, in visiting rooms, in quarantine areas and during prisoner transport). If necessary, plans are revised on an annual basis. The supervision model was borrowed from the NTP where TB county coordinators carry out supervision in other counties.

Results of this best practice are evaluated annually and reflected in reports on the TB-IC Strategic Plan in the National Administration of Penitentiaries. From February 2006 to July 2013, approximately 3500 prison staff were trained in TB-IC. Members of TB-IC committees and TB doctors from the NTP use monitoring visits to prisons to train a minimum of 10 prison staff at a time. All prison health educators who were initially trained in the GFATM project participated in a training workshop on basic TB, using adult learning principles. After one year of implementation, prison health educators attended an evaluation workshop to discuss their experiences with health education activities and to be retrained on TB-IC subjects. A total of 848 health educators have been trained on TB-IC.

Advocacy, communication and social mobilization materials were given to health educators, mainly prison staff, providing them with information about TB rates worldwide, in Europe, in Romania and in the prison system; about what WHO and GFATM do, and about the projects in prisons and their results. In terms of impact, in 2002 the notification rate in prisoners was 20 times higher (almost 2967 cases per 100 000 inmates) than in the general population, which was 142.8 per 100 000. In 2011, the notification rate in prison decreased to 588 per 100 000 inmates compared to 82.8 per 100 000 general population. Other factors that may have contributed to this decrease were less overcrowding and fewer inmates; there were 48 081 inmates in 2010 compared to around 30 694 inmates in 2011. Fewer people are entering prisons with TB because the overall notification rate in the general population has dropped. Ninety-five per cent of all prisons have TB-IC plans.



RUSSIAN FEDERATION

Vladimir Centre of Excellence for Tuberculosis Infection Control

In October 2008, the Vladimir Centre of Excellence for Tuberculosis Infection Control was established. The Centre is a partnership including the Vladimir regional administration; USAID; the Centers for Disease Control and Prevention, Division of Tuberculosis Elimination; the Central Tuberculosis Research Institute; and the WHO Country Office for the Russian Federation, and is located at the Vladimir Region Tuberculosis Dispensary. The Centre is involved in monitoring and implementing infection control measures and also serves as a training hub for the Russian Federation and other Russian-speaking countries. Participants receive training in infection control measures on topics including: the concept of airborne TB transmission; the hierarchy of TB-IC measures; TB transmission risk assessment; the cost-effectiveness of various environmental controls; prioritized, structured TB-IC plan development; development of TB facility floor plans for (re)construction with ventilation requirements; measurement and assessment of ventilation and UVGI parameters, upper room UVGI concept; testing and safe practices of biosafety cabinets use; sputum collection booth design, installation and use; respiratory protection programme development and respirator fit-testing; costing, budgeting, advocacy and resource mobilization for TB-IC.

The risk of TB among health-care workers in the Russian Federation exceeds the risk in the general population by more than 20 fold and the Russian Federation has among the highest levels of MDR-TB in the world. The occurrence of TB among health-care personnel and prison guards in Vladimir Region heightens anxiety about institutional transmission.

In response, the Centers for Disease Control and Prevention, WHO, and Russian Federation partners implemented the Centre to adopt infection control measures that protect health-care personnel, patients, homeless shelter personnel, prison personnel, and prisoners from nosocomial TB transmission. Institutional transmission of TB is prevented by a three-tier hierarchy of control measures: administrative (organizational and managerial) controls, environmental (engineering) controls, and personal respiratory protection.

High-quality infection control practices prevent TB transmission and provide a safer environment for all.

The Centre strives to sustain multiplicative effect through its emphasis on training and, in particular, on developing local sites as examples and training centres for other territories of the Russian Federation and Commonwealth of Independent States (CIS). The Centre is the only location in the Russian Federation capable of providing such high-level training.

The goals of the Centre are:

- » to achieve the sustainable decrease of occupational TB among staff, to substantially decrease the spread of nosocomial (re)infection in TB institutions;
- » to disseminate the infection control experience of the Vladimir Region Tuberculosis Dispensary to other TB institutions in the Russian Federation and CIS;
- » to assist in development of TB-IC programmes in the Russian Federation and CIS;
- » to train others to implement new infection control measures including administrative controls, environmental engineering controls and personal respiratory protection according to the Centers for Disease Control and Prevention, WHO, Russian Federation and other recommendations in facilities with high risk of TB transmission in the Russian Federation and CIS;
- » to provide training courses for the health-care professionals of the Russian Federation and CIS using the Vladimir Region Tuberculosis Dispensary as a working classroom, as well as using a state-of-the-art lecture hall and engineering control laboratory; and
- » to develop new training courses on TB laboratory biosafety; certification of biological safety cabinets; and design, commissioning, operation and maintenance of ventilation systems.

Several infection control interventions have been implemented at the Vladimir Region Tuberculosis Dispensary.

Infection control training, including respirator fit-testing, was initially conducted in 2002 by Centers for Disease Control and Prevention specialists. After the training, the dispensary staff developed an infection control programme for their new location. Included in the plan were administrative measures, engineering measures and respirators. Three key administrative control measures included: patients separated according to smear status and drug susceptibility; limited access to high-risk zones; and transfer of patients from other facilities to the TB hospital immediately upon receiving smear-positive test results. The key engineering control measures included: an updated and improved ventilation system to meet Russian Federation and international standards; biosafety equipment; shielded UVGI fixtures that allow for 24-hour usage; and sputum collection booths. A respiratory protection programme, including training and fit-testing, was initiated. European Union FFP2-certified respirators were given to staff working in areas with significant risk of occupational exposure to airborne TB.

As a result of these infection control interventions, a remarkable reduction in occupationally-acquired TB was achieved in the Vladimir Region Tuberculosis Dispensary: from 1083 to 166 new cases per 100 000 during the first 5 years of the programme, and no new cases of occupational TB in 2008–2012. Funds were allocated from the regional government budget in 2005 for ventilation reconstruction and for the purchase of respirators. Infection control measures were included as an important part of the Regional Target TB Control Programmes (2004–2006, 2007–2009, 2010–2012). However, district level TB institutions lack resources and expertise for the effective protection of staff and patients from the risk of nosocomial TB. Although it may not be possible to completely eliminate the risk of TB transmission in all health-care facilities, implementation of and adherence to the internationally recommended measures in other places has dramatically reduced the incidence of nosocomial transmission of TB.

During the 4 years of operation, 27 training courses have been organized:

- » nosocomial TB transmission risk reduction Programme – for administrators, TB doctors, nurses, epidemiologists and regulators (15 courses);
- » biological safety in TB laboratories – for managers of chief technicians, epidemiologists of federal and regional TB laboratories (including both civilian and prison sectors) (5 courses);

- » engineering aspects of airborne nosocomial TB transmission risk reduction – for engineers of ventilation companies and TB hospitals responsible for design, installation, commissioning and maintenance of ventilation and other engineering systems (4 courses); and
- » biological safety cabinet (BSC) maintenance, testing and certification – for engineers of companies that design, manufacture, install and maintain BSCs, including dealers of major world BSC manufacturing companies (3 courses).

Almost all regions of the Russian Federation (83 of 95) have been represented in the trainings to date, which included a total of 513 participants. Also included were representatives from MSF, the International Federation of the Red Cross and Red Crescent Societies, the KNCV Tuberculosis Foundation, University Research Co., NTPs and country programmes of the GFATM from Belarus, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

The Centre also supported the development of national TB-IC policies and guidelines for the Russian Federation (updated according to international approaches), and national guidelines for Armenia, Azerbaijan, Belarus, Nepal, Tajikistan, Turkmenistan and Ukraine. The impact of BSC courses includes development and approval of Russian Federation BSC standards (compliant with EN 12469), and design by Russian manufacturers of BSCs according to international biosafety principles. The Centre has participated in all five courses on building design and engineering approaches to airborne infection control at the Harvard School of Public Health. The 2010 course included 10 representatives (Russian Federation and Ukraine) and simultaneous Russian–English/English–Russian translation was provided. In addition to impacting TB-IC policies at regional and national levels, the centre partnered with the Russian Association of Engineers for Heating, Ventilation, Air-Conditioning, Heat Supply and Building Thermal Physics (ABOK) to develop a draft ABOK Hospital Ventilation Guideline for the Russian Federation.

Core funding from USAID and consistent support from the WHO TB control programme in the Russian Federation has enabled the Centre to expand to other former Soviet countries.

RUSSIAN FEDERATION

Improving hospital TB infection/transmission control using the F-A-S-T strategy

TB treatment in the Russian Federation is heavily hospital dependent, and renovating thousands of hospitals to improve the infrastructure, in addition to instituting administrative controls and respiratory protection, is a daunting challenge. Currently, patients with newly diagnosed TB are admitted to general hospitals or TB hospitals based on sputum smear microscopy or clinical findings. These patients are usually started on the standard four-drug first-line short-course chemotherapy regimen while awaiting culture confirmation and DST. Obtaining results can take as long as two to four months, delaying bacteriological diagnosis of MDR-TB and XDR-TB and resulting in prolonged infectiousness from undiagnosed TB cases or undiagnosed drug resistance. Because patients being treated for TB in the Russian Federation are usually hospitalized for a prolonged period, the result is that patients with undiagnosed drug-resistant disease often share the same wards and rooms with patients with drug-sensitive disease. Through this mechanism, nosocomial transmission of drug-resistant disease can occur.

The most important aspect of stopping transmission of TB at hospital settings is to control the time from presentation with cough and diagnosis of TB (including DST) to the initiation of appropriate treatment. The advent of rapid deoxyribonucleic acid-based (DNA-based) diagnostic methods, such as GeneXpert, allows for the rapid diagnosis of rifampicin resistance in *M. tuberculosis*. In many settings, this diagnosis is believed to be a good surrogate for MDR-TB.

As a core package of TB transmission control/infection control interventions, Partners In Health (PIH), supported by the Eli Lilly Foundation and in collaboration with Brigham and Women's Hospital and Harvard Medical School, formally launched a MDR-TB project in the Voronezh Regional TB Hospital and the Republic of Karelia (Petrozavodsk) TB Dispensary. The implementation process of the F-A-S-T strategy¹ at these two oblasts' TB services started in January 2013.

PIH has been employing rapid DNA-based diagnostics (GeneXpert System) to find cases actively (identifying MDR-TB patients), to separate patients safely to reduce exposure to drug-resistant strains (stopping nosocomial transmission), and to treat effectively with second-line drugs (where appropriate). Through the F-A-S-T approach, the expectation is to reduce the time for diagnosing MDR/XDR TB from months to days. The faster diagnosis will stop transmission rapidly in hospitals, and with sufficient empirical data from the training/implementation cycles, will provide a basis for major policy change in the Russian Federation and elsewhere. Several levels of indicators can be used to measure and analyse whether rapidly provided data helps in the early separation of patients with drug-resistance from those with drug-sensitive disease.

In 2012, PIH organized site visits to the regions and met with the regional TB services to discuss the five-year plan, collected data and baseline parameters, and assessed TB hospitals' infection control status and the laboratories' capacity.

In December 2012, PIH organized a workshop for rapid DNA-based DST and started training key staff at oblast level and gave an orientation to Russian Federal TB Research Institutes as to the exact project protocols and activities.

In addition, PIH collaborated with Dr Grigory Volchenkov (Russian and WHO transmission control/infection control expert) in organizing his visits to the regions to assess needs, and evaluate gaps and barriers that undermine and prevent implementation of infection control tools at TB hospitals, and with planning and implementing an infection control strategy for TB facilities (March 2013). During the visits, Dr Volchenkov completed workshops with the hospital's staff (a total of 120 medical personnel) to analyse specific problems at the facilities and offer suggestions for their improvements.

¹ F-A-S-T stands for Finding TB cases Actively, Separating safely, and Treating effectively.

Two courses were conducted in the first half of 2013: (1) Nosocomial TB transmission risk reduction and (2) Engineering aspects of nosocomial transmission risk reduction. For two weeks, seven TB specialists from Voronezh and three from Petrozavodsk learnt infectious control principles from leading experts at the Center of Excellence for Tuberculosis Infection Control in Vladimir, the Russian Federation. The courses were designed for a range of TB specialists (nurses, hospital epidemiologists, laboratory technologists and engineers) with a focus on administrative, environmental and personal protective equipment components of airborne infection control.

One of the issues encountered concerns a group of patients with uncertain TB diagnosis (for example, patients with pneumonia or lung cancer with atypical X-rays). These patients were placed in a special diagnostic unit before their diagnosis confirmation. Time of hospitalization for some of those patients could be up to 30 days without treatment. This project raised the question of feasibility of applying rapid diagnostic tests for these patients (clinical and financial justification). More data and work is needed to find an optimal solution.

Project realization process in Voronezh TB Hospital

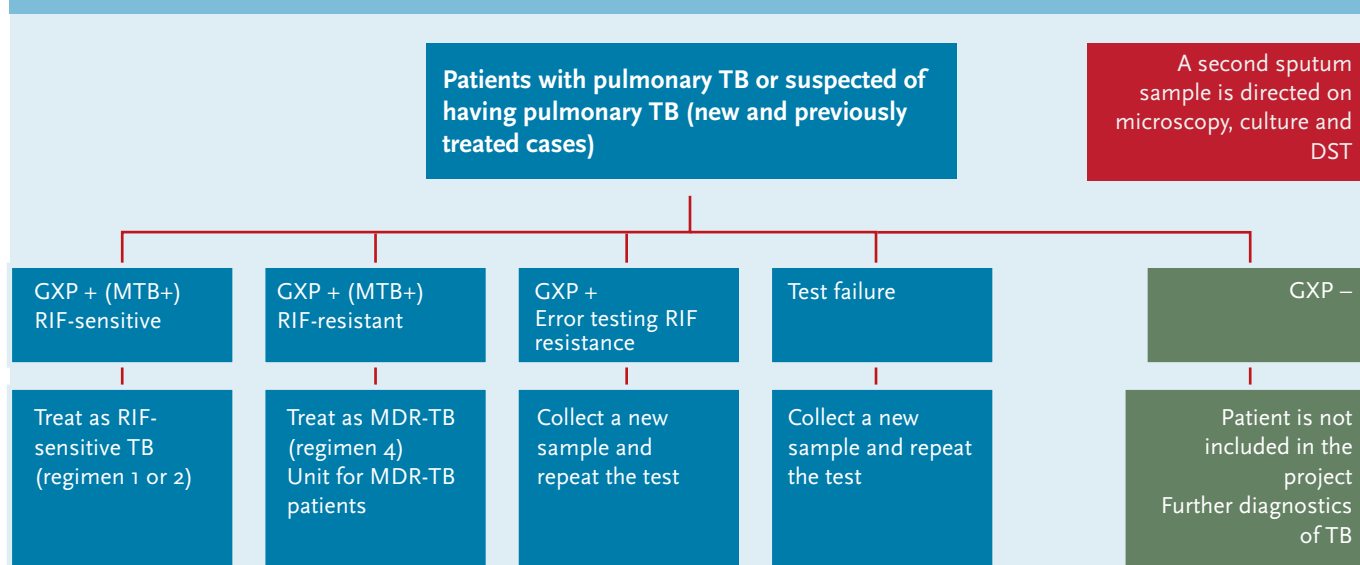
To begin this project, the Voronezh TB Hospital administration had to amend the accustomed way of working at the facility and make important modifications in patient flow protocols.

The first critical point in initiating this project is when TB doctors make the decision at the Admission Department. An Inclusion/exclusion criteria form was developed and is completed for 100% of the hospitalized patients. By answering questions on the form, a doctor determines if a patient has to be tested by GeneXpert. All patients with pulmonary TB or suspected of having pulmonary TB who were admitted at a TB inpatient facility are immediately tested for MDR-TB with GeneXpert MTB/RIF. The medical personnel follow the algorithm in Fig. 4.

Using GeneXpert MTB/RIF, results for rifampicin resistance usually come back from the laboratory the same or the next day. While doctors wait for the results, patients are placed in a specially designated isolation unit. This unit is considered a high-risk infectious area and admits patients with unknown TB status who are not currently treated for TB. PIH participated in the construction of the isolation unit, which is separated with closed gates and is well equipped with UVGI open light systems (work for 24 hours), and patients and medical personnel wear respirators.

Patients diagnosed with rifampicin resistance are placed on effective treatment (regimen 4, according to national MDR-TB guidelines) and transferred to MDR-TB units (for newly diagnosed or previously treated patients). Patients who are diagnosed as rifampicin sensitive by GeneXpert MTB/RIF are placed on standard TB treatment according to national guidelines regimen 1 or 2.

Fig. 4. Algorithm for patient testing with GeneXpert using the F-A-S-T strategy



GXP=GeneXpert, MTB=*Mycobacterium tuberculosis*, RIF=rifampicin



The M&E plan includes specific indicators, such as coverage by project activities, enrolment into the project, results of rapid testing and timely detection of amplification. The first analysis will be performed at the end of the year.

According to the M&E plan, the following time intervals for effective implementation will be collected:

1. from the patient entering the facility to laboratory receipt of specimen;
2. from laboratory receipt of specimen to laboratory result available;
3. from laboratory result available to laboratory result received by TB doctors;
4. from laboratory result received to effective treatment initiation;
5. date of patients' discharge.

In addition, information on patients' TB outcomes will be collected.

STRENGTHEN SURVEILLANCE, INCLUDING RECORDING
AND REPORTING OF DRUG-RESISTANT TB AND
TREATMENT OUTCOME MONITORING

BELARUS

Nationwide representative TB drug resistance survey 2010–2011

Excerpt from: Alena Skrahina et al., Multidrug-resistant tuberculosis in Belarus: the size of the problem and associated risk factors. *Bulletin of the World Health Organization*, 91, no. 1 (January 1, 2013): 36–45, doi:10.2471/BLT.12.104588.

In recent years, the annual incidence of TB in Belarus has been slowly but progressively falling: 84 and 70 new cases were recorded per 100 000 population in 2000 and 2011, respectively.¹ However, the high prevalence of MDR-TB among TB patients in Belarus has raised major concerns. In a survey conducted in 2010 in Minsk, the capital city, nearly one out of every two (47.8%) TB patients investigated was found to have MDR-TB; this was the highest prevalence of MDR-TB ever recorded among TB patients worldwide.² The Minsk survey was, however, relatively small and limited to a highly urbanized area. The national Ministry of Health therefore decided to conduct a larger, nationwide survey, not only to have a better understanding of the levels of drug resistance throughout Belarus but also to investigate the risk factors for the development of MDR-TB.

Methods: In a nationwide survey in 2010–2011, 1420 tuberculosis (TB) patients were screened and 934 new and 410 previously treated cases of TB were found to meet the inclusion criteria. Isolates of *Mycobacterium tuberculosis* from each eligible patient were tested for susceptibility to anti-TB drugs. Socio-behavioural information was gathered in interviews based on a structured questionnaire.

Findings: MDR-TB was found in 32.3% and 75.6% of the new and previously treated patients, respectively, and, 11.9% of the 612 patients found to have MDR-TB had extensively drug-resistant TB (XDR-TB). A history of previous treatment for TB was the strongest independent risk factor for MDR-TB (odds ratio, OR: 6.1; 95% confidence interval, CI: 4.8–7.7). The other independent risk factors were human immunodeficiency virus (HIV) infection (OR: 2.2; 95% CI: 1.4–3.5), age < 35 years (OR: 1.4; 95% CI: 1.0–1.8), history of imprisonment (OR: 1.5; 95% CI: 1.1–2.0), disability sufficient to prevent work (OR: 1.9; 95% CI: 1.2–3.0), alcohol abuse (OR: 1.3; 95% CI: 1.0–1.8) and smoking (OR: 1.5; 95% CI: 1.1–2.0).

Conclusion: [This drug resistance survey enabled the following conclusions to be made in order to strengthen MDR-TB prevention treatment and care in Belarus.] The levels of MDR-TB documented in Belarus are among the highest ever recorded globally. In light of these findings, rapid testing for drug resistance for all patients with TB, a revised treatment regimen for patients with a history of previous TB treatment, an uninterrupted supply of second-line drugs, and measures to reduce the nosocomial transmission of *M. tuberculosis*, including the shortened hospitalization of non-contagious patients, should be rapidly introduced. Furthermore, the positive association between MDR-TB and HIV infection observed in this study calls for stronger collaboration between TB and HIV control programmes to provide greater support to co-infected patients. To improve TB treatment adherence and reduce opportunities for the development of MDR-TB, the integration of treatment for alcohol use disorders with TB services and the strengthening of patient incentives and enablers should also be explored.

1 *Global tuberculosis control*. Geneva, World Health Organization, 2012 (WHO/HTM/TB/2012.6).

2 Skrahina A et al. Alarming levels of drug-resistant tuberculosis in Belarus: results of a survey in Minsk. *European Respiratory Journal*, 2012, 1425–1431, doi:10.1183/09031936.00145411 PMID:22005924.

REPUBLIC OF MOLDOVA

Interaction and collaboration of national partners in TB detection and diagnostics among inmates of the prison system

The health status of prison inmates in the Republic of Moldova is significantly lower than the national average due to the congregation of vulnerable population groups in correctional facilities. The specific environment of prisons contributes to the transmission of TB between inmates, and the development of latent TB infection into TB disease: close confinement in cells; overcrowded and poorly ventilated spaces; the poor health of inmates, who are afflicted with various chronic diseases affecting their immunity; insufficient involvement of the civilian health sector with vulnerable groups, from which many inmates originate; and stress caused by imprisonment. Time spent in prison should be used both for the benefit of the individual health of inmates and public health in general. These challenges are not isolated, because upon release the majority of inmates return to the community. Therefore, adequate measures for detection and treatment of TB in prisons should be an integral part of public health, and the opportunity to successfully approach vulnerable groups should not be missed.

The Republic of Moldova received over US\$ 50 million for TB control activities, including in the prison sector, from the GFATM, fourth round. In 2013, first-line TB drugs and supplies for microscopy examinations were purchased with these funds. The prison medical service applies Ministry of Health standards and international recommendations; it develops its own regulations and executive orders with due consideration of specific implementation needs. In 2012, with the help of the Stop TB Partnership, WHO, and TB Reach Wave-2, GeneXpert was purchased, allowing rapid diagnostics of TB and resistance to rifampicin. From the point of view of infection control, early diagnosis of drug-resistant TB helps in the proper separation of prison inmates based on their resistance patterns, therefore avoiding resistance amplification.

The Moldovan prison system comprises 18 facilities: 5 pre-trial detention centres, 2 prison hospitals, 11 prisons/correctional colonies (including 1 prison facility for women and 1 juvenile detention facility) with a total capacity of 7578

inmates. As of 1 January 2013, the prison system held 6583 inmates, 5% of whom were women and 2% were adolescents. Among these inmates, 201 (3%) had TB; 107 (1.6%) were living with HIV, and of them, 16 had HIV/TB coinfection. The Department of Prison Institutions' Comprehensive Plan on TB Control and Prevention among Inmates was developed in line with the NTP and international recommendations for confinement institutions. The main TB control activities in the prison system are as follows:

- » mandatory chest X-ray examinations at the time of admission to the prison system (pretrial detention centre) and then every six months of imprisonment among healthy inmates; interim health assessments;
- » timely detection, isolation and hospitalization at the prison hospital of all inmates presumed to have TB, for the purpose of more detailed examinations and consultations with a phthisiopulmonologist;
- » enrolment of patients for TB treatment in line with the DOTS and DOTS-Plus strategy;
- » collaboration in and continuation of TB treatment upon release; and
- » social support for successful completion of treatment.

TB detection among inmates

To detect TB among inmates, twice a year, according to the established schedule, a bus equipped with a digital X-ray unit goes from the prison hospital to 11 facilities to examine inmates (on average 5000 examinations). In 2008–2012, X-ray examination coverage in the prison facilities was 99.0–99.4%; 87.5–90.0% of individuals admitted to the prison facilities have their X-ray examinations done within the first 72 days of confinement. In 2010–2012, the annual percentage of TB patients detected at the time of admission to the prison facilities was about 25–30%.

To detect TB among people with symptoms, between X-ray, coughing patients from whom sputum can be collected are examined by sputum smear microscopy. Every year about 15–17% of all reported TB cases are passively detected.

The prison system has 4 microscopy centres; the remaining 14 prisons are served by the local civilian microscopy centre. Sputum examinations are free of charge for inmates. With the support of the NGO, Act For Involvement (AFI), 19 sputum collection booths were installed in the prison system, including 8 booths in the correctional colonies for healthy inmates. Only the national and regional reference laboratories (four in the country) perform sputum cultures for prison inmates; those tests are covered by the prison system budget. The following examinations are available for inmates: cultures on solid and liquid media, and BACTEC and PCR (in civilian laboratories). In 2012, a new rapid method of TB diagnostics (GeneXpert) was introduced in the country, including at the prison hospital and the largest detention centre (two sets of equipment). It allowed rapid testing for rifampicin resistance and selection of adequate treatment regimens, as well as proper isolation of patients. It is an important component of infection control in the country.

When the patients are admitted to the general ward of the prison hospital, chest X-rays are mandatory, if the last examination was performed four or more months ago. In cases of abnormalities in the lungs (including residual post-tuberculosis changes) sputum smear microscopy is also performed. For inmates with HIV or for the purpose of differential diagnosis of difficult cases, GeneXpert, BACTEC and PCR examinations are available.

Significant developments

Ongoing efforts are being made to detect symptomatic TB patients, using screening examinations at the time of admission to prison and through regular chest X-rays and microscopy examinations. All symptomatic inmates can be examined by sputum microscopy in local civilian facilities.

TB patients are being detected by quality assured bacteriological examinations through an agreement with the civilian sector. DST is centralized. The quality of tests in the prison sector is satisfactory and equal to that of the civilian sector. Prison laboratories perform only partial microscopy examinations, while the civilian laboratories perform culture examinations and DST. Culture results are entered into the national database, Centrul Național de Management in Sănătate TB.

Culture examinations are available for all inmates with presumptive TB. Consultations with a phthisiopulmonologist are mandatory in cases of confirmed or ruled out TB.

The prison system is connected to the SIME TB and SIME TB MDR electronic databases. This allows quick tracking

of detected cases and their proper registration, it ensures transparency within the prison system and promotes patient transfers upon release. The prison system provides reports to the NTP. With the help of the NGO AFI, partnerships have been established between the prison and civilian medical services. Non-medical services are also engaged in the implementation of the TB control programme, which has improved adherence to scheduled X-ray examinations and TB treatment.

Prisoners make up about 4% of the total TB incidence in the Republic of Moldova (as of 2012). Due to early detection and adequate treatment, all epidemiological indicators have improved. Between 2001 and 2012, TB incidence among inmates decreased four-fold (from 550 patients in 2001 to 161 in 2012). The total number of TB patients among inmates decreased five-fold (from 1152 patients in 2001 to 201 patients registered by the end of 2012). After a long time when tuberculosis was top ranking among the leading causes of death, now it holds fourth position after noncommunicable diseases (from 47 deaths from TB in 2001 to 7 deaths in 2012). The proportion of deaths due to TB among inmates was 54% in 2001 and 22% in 2012.

The total number of MDR-TB cases has decreased. In 2008, 104 MDR-TB cases were detected (including 30 cases with primary resistance), in 2012 only 21 cases were reported (including 15 cases with primary resistance).

The number of TB patients being released from the prison sector has also decreased. In 2009, 99 people with TB were admitted to the prison system, and 112 people with TB were released, while in 2012, 88 were admitted and 53 released.

Lessons learnt

The TB control programme in the prison system of Moldova has demonstrated its efficiency. It allowed a significant reduction of TB transmission in prisons. The small size of the country and external financing contributed to the maximum integration of civilian and prison TB services. Access to TB diagnostics and treatment for prison inmates is equivalent to that available in the civilian sector. Active TB detection among inmates and adequate treatment has made prisons safer, which has a positive effect on public health. Historically, prisons have been considered sources of TB transmission to the civilian community. Although Moldovan prisons are still far from complete elimination of TB, the situation has changed dramatically: now the risk of TB transmission in the civilian sector is higher than in the prison sector.

EXPAND COUNTRY CAPACITY TO SCALE UP THE
MANAGEMENT OF DRUG-RESISTANT TB, INCLUDING
ADVOCACY, PARTNERSHIP AND POLICY GUIDANCE

BELARUS

Development of TB guidelines

The development of TB guidelines was initiated because – in the absence of guidelines – there was no basis for the operationalization and standardization of practices related to diagnosis and treatment of MDR-TB and M&E.

The three guidelines are:

1. laboratory TB diagnostics
2. M&E of TB control activities in Belarus
3. clinical guidelines on TB and MDR-TB treatment.

The guidelines on laboratory TB diagnostics reflect a modern vision and include rapid diagnosis of M/XDR-TB. A working group of local experts developed the guidelines, which was a labour intensive process that took one and a half years because it provided a detailed technical description of every process. International experts assisted by ensuring that the guidelines were in accordance with current international standards. Rapid testing was included in the laboratory guidelines as well as in the treatment guidelines to underline its importance.

The guidelines on M&E of TB control activities in Belarus help to standardize the main indicators of TB control activities provided by the national TB service, establish uniform protocols for supervisory visits, and allow timely and adequate decision-making. The guidelines contain many recommendations and methods to ensure a uniform approach to M&E across Belarus. Key indicators are given for diagnosis, treatment, TB/HIV collaborative activities, MDR-TB, etc. Prescribed methodologies are based on international standards and the guidelines were reviewed by international experts. The guidelines contain a scoring system, and monitoring within and across regions and across different levels of health care (including laboratories) is now possible

in Belarus. The guidelines for monitoring were finalized six months ago and are already used widely; the results are to be assessed.

The clinical guidelines on TB and MDR-TB treatment present evidence-based approaches to TB and M/XDR-TB diagnostics, treatment and palliative care. The key to developing treatment guidelines was adaptation to international standards, as there are rapid changes in the field of TB treatment that make old guidelines obsolete in a matter of a few years. The development of the treatment guidelines took about six months. New information on the development of the guidelines was collected during the two drug resistance surveys conducted in Minsk and countrywide. The surveys provided evidence for the need to change diagnosis and treatment. The MDR-TB situation was assessed as more serious than three years ago and underlined the urgent need for rapid diagnosis, treatment and surgeries, and palliative care, which are reflected in the new treatment guidelines.

A four-person working group developed the clinical guidelines. An international specialist reviewed the draft version during a 3–4-day workshop where topics – such as changes in Category II or if a standard treatment should be nationwide – could be discussed and consensus could be reached. Difficulties in documenting diagnosis algorithms arose because of the differences in conditions and availability of equipment in health care units, despite the need for a universal treatment algorithm applicable in all conditions. WHO experts evaluated the guidelines. Monitoring visits still indicate some problems with logistics, but health personnel are all informed about the procedures to treat and monitor MDR-TB patients, which are the basis for a uniform approach and eliminate deviations in treatment.

ESTONIA

Involuntary isolation of TB patients and treatment of high-risk groups

With regards to TB, the first public health priority is to prevent further transmission in the community by an infectious individual. This is accomplished by identifying all individuals with active TB and ensuring appropriately prescribed treatment is completed. In order to safeguard the appropriate use of resources and comply with the human rights of the individual, it is important that all other treatment options and the less restrictive levels of care have been attempted before resorting to involuntary isolation.

The priority of the Estonian NTP is to implement flexible and patient-friendly options for ambulatory or homecare treatment of TB patients. The use of incentives and enablers and other social support should also be provided to increase patient adherence to treatment. However, in order to achieve TB control in patients who lack sufficient treatment compliance – who repeatedly default on TB treatment, and who (due to infection) are a danger to themselves and others – Estonian courts have the power to issue orders for mandatory isolation and treatment.

According to the Estonian Communicable Diseases Prevention and Control Act, passed on 12 February 2003, (Chapter 2, sections 4 and 5) involuntary isolation and treatment of infectious TB patients can be performed for up to 182 days, based on a written statement from a physician indicating that the person poses a threat to the public health. The procedures for determining the application of involuntary isolation have been established by a regulation issued by the Minister of Social Affairs.

In practice, a person may be subjected to involuntary isolation within 48 hours of hospitalization, based on the decision of a physician. The decision is made on the basis of a medical examination of the patient, initial mycobacteriological analyses or radiography findings.

Involuntary isolation of TB patients was initiated due to a steep rise in TB incidence in the last decade of the 20th century, and due to a high rate of M/XDR-TB in Estonia and its connection with alcohol abuse. TB incidence doubled in 5

years from 1992 to 1996, and was 48 per 100 000 population in 1997.

Involuntary isolation is carried out in the TB department of the psychiatric clinic in Viljandi Hospital (in south Estonia) and is financed from the Estonian Health Insurance Fund and national budget. The department has excellent infection control measures. All rooms are designed for 1–2 patients, with their own sanitary facilities. The department is divided into three zones, according to patients' infectiousness status (smear- or culture-negative, drug-susceptible TB and drug-resistant TB) to avoid hospital re-infection. Patients are free to walk in the corridor and other rooms of their zone. They are not locked in their rooms. Three times per day the patients are allowed to go outdoors and have a walk in an area specially designed for this purpose.

During the involuntary isolation period, patients can also go to the nearest shop or bank, but only with an accompanying member of the clinic staff.

The Chancellor of Justice of Estonia has made several inspection visits (both announced and unannounced) of Viljandi Hospital, and the human rights, treatment and living conditions of TB patients have been approved. Many patients stay on TB treatment at Viljandi Hospital even after their isolation period is over. In the period 2004–2012, involuntary isolation was performed 154 times on 135 people (some patients have been in isolation several times).

All of the patients were from high-risk groups: 99.3% were alcohol and/or drug abusers, 36.3% had previously been in prison, and 87.6% were unemployed.

All patients get full TB treatment according to DST (first- and second- line treatment is available; M/XDR cases are consulted by consilium specialists every three months). An HIV test is suggested to all patients and HIV-positive patients receive antiretroviral treatment.

Since 2011, the NTP has allocated additional finances for

provision of voluntary treatment of alcohol use disorder and/or drug abuse, and for psychosocial counselling and support, together with TB treatment. These additional services are given by a team consisting of social workers, psychologists and psychiatrists.

Several trainings on motivational interviewing in health care have been provided to the staff of the Viljandi Hospital psychiatric clinic TB department.

The patients are provided with occupational therapies (including handicrafts, drawing, board games, magazines and access to the internet).

In the TB department of Viljandi Hospital, the treatment success rate for patients with drug-susceptible TB is 98.2%; only one patient has died from TB. The treatment success rate for drug-resistant TB is 66.7%: 8.3% have been lost to follow-up and 23.6% have died of TB or other causes. But all treatment interruptions and most of the deaths happened when the patients left the department after conversion and there was no reason to stay in isolation any longer. Eleven patients are still on treatment (six of them as chronic failures).

Lessons learnt

Due to the currently applied methods, the TB epidemiological situation has improved since 2000: incidence of new TB cases is below 20 per 100 000 population (18.7 in 2010,

19.8 in 2011 and 18.1 in 2012) and absolute numbers of M/XDR-TB cases are steadily decreasing (from 115 in 1999 to 45 in 2012, among new TB cases and relapses).

TB patients from risk groups, with alcohol use disorder and/or drug users should be isolated from the general population and monitored carefully.

Involuntary isolation should be conducted according to human rights and ethical standards and afford all possible treatment options for TB (including second-line treatment) and comorbidities. Special emphasis should be given to vulnerable groups.

Involuntary isolation for 182 days is enough to cure drug-susceptible TB, and enough to convert drug-resistant TB, but is not enough to cure drug-resistant TB.

The fact that in Estonia, pulmonary physicians have the legal authority to order involuntary isolation has significantly contributed to the achievement of better treatment outcomes countrywide.

Our positive experience of using involuntary treatment is preconditioned by having access to all possibilities for treatment, the existence of a supportive legal framework, excellent infection control measures, permanent staff training and respect of patient's dignity.

HUNGARY

Role of civil society in TB prevention

The civil society – the Hungarian Maltese Charity Service – has an accepted role and is deeply involved in national efforts to detect TB by reaching and screening vulnerable populations like prisoners, the homeless and shelterless. In the 1990s, the former downward trend in TB incidence reversed significantly (Fig. 5).

The number of homeless and shelterless people increased and the incidence of TB was 15 times higher in this group of hard-to-reach people than in the general population. Among, homeless and shelterless people, TB detection (screening), treatment and after-care required special approaches and conditions.

These facts directed the attention to the need of a special programme for screening and treatment of this vulnerable population. In 1995, a private foundation, the Soros Foundation, responded to a call to establish and implement a TB screening and treatment programme specifically for the homeless and shelterless.¹ The pilot programme (1 December 1995–31 August 1996) financed by the Soros Foundation was carried out with the coordination of the Hungarian Maltese Charity Service. It involved several governmental and nongovernmental actors of health care and social care, establishing dialogue with each other. The key achievement of this programme was that a mobile facility, a screening bus, equipped with an X-ray device started to operate in 1995. In 1997, a NGO donated a new bus and the Ministry of Human Resources covered the

maintenance cost. In 2010, with the financial help of a Norwegian Grant, a new up-to-date screening bus was put into operation by the Hungarian Maltese Charity Service and social insurance has funded the project.²

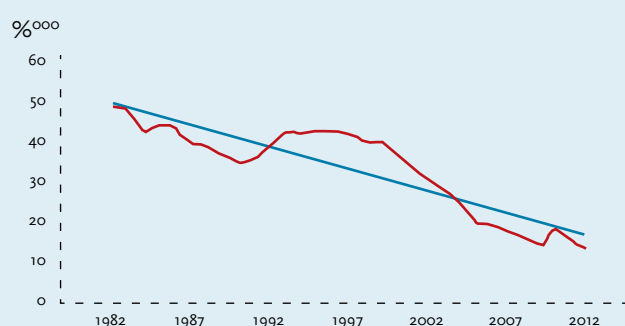
The aim of the pulmonary screening programme run by the Hungarian Maltese Charity Service is to:

- » reach and screen the homeless and shelterless for TB and comorbidity;
- » have the pulmonologist in the mobile facility provide on-the-spot evaluations of chest X-rays;
- » give pulmonary social care, such as accompanying and supporting patients in the process of their TB care;
- » detect the needs of hospitalized patients and visit patients who receive care at home; and
- » administer pulmonary screening in other settings, such as prisons, socially disadvantaged settlements and districts, retirement homes, etc.

During the past years the Hungarian Maltese Charity Service established close collaboration with the leading and only hospital to treat MDR- and XDR-TB cases. The epidemiological data show that due to these efforts around 15% of the new TB cases are screened out and the TB incidence rate shows a slightly decreasing tendency among the growing population of homeless and shelterless.

In 2010, based on the traditionally excellent relations between the parties, a Cooperation Agreement was signed between the Government of Hungary and the Sovereign Military Hospitaller Order of St. John of Jerusalem of Rhodes and of Malta (CXL. Law 2010). Within the framework of this Agreement, the Hungarian Maltese Charity Service, as one of the appointed organizations, has the right to consult and negotiate with Hungarian authorities; carry out all activities concerning education, cultural and social development, health care, disaster relief, sport, and the protection of children; may establish and maintain services and institutions and carry out projects; may take part in the execution of public tasks; and should cooperate with the state and local authorities and organizations.

Fig. 5. The trend in TB incidence over 30 years



¹ Dávid B et al. *Homelessness and TB*. Budapest, Soros Foundation, 1998 (In Hungarian).

² Hungarian Maltese Charity Service (www.maltai.hu, accessed 20 August 2013)

KAZAKHSTAN

Policy, legislation and guidelines for TB

In Kazakhstan, TB treatment has been carried out for many decades; however, from the beginning of the 1990s the morbidity rate rose steeply. Implementation of the DOTS strategy developed by WHO helped reverse the rise in TB morbidity after its peak in 2003, when it was 174.8 per 100 000 population (including the prison sector). Improved attention to the issue of TB by the Government of Kazakhstan, regular procurement of first-line drugs and the careful management of DOTS led to a reduction in TB incidence, prevalence and mortality in Kazakhstan.

In the course of 5 years, from 2003 to 2012, the morbidity indicator (per 100 000 population, including the prison sector) was reduced from 174.8 to 84. Prevalence was reduced by more than half, from 482.1 in 2003 (including the prison sector) to 162.9 in 2012. TB mortality was reduced from 22.4 in 2003 to 7.2 in 2012.

Even with good implementation of DOTS and a reduction of TB incidence, prevalence and mortality, Kazakhstan suffers from a high level of MDR-TB. This can be attributed to the following:

- » interruption and low adherence to treatment by patients;
- » absence of drug administration control by health-care workers;
- » absence of standard treatment, before DOTS implementation, and a consequent increase in chronic TB cases;
- » stoppages in TB drug procurement before 2002; and
- » inadequate treatment of patients with drug-resistant TB because of a limited quantity of second-line drugs.

As a result of these problems, the number of MDR-TB cases is steadily rising, both in civilian and prison sectors. In 2006, primary drug resistance was 13.1% in the civilian sector; by 2012 it had increased to 20.8%. The number of MDR-TB cases among previously treated patients also increased from 39.1% in 2006 to 53.6% in 2012. However the National Cen-

tre of Tuberculosis Problems forecasts a gradual reduction of primary drug-resistance levels as coverage of MDR-TB treatment improves.

The level of primary drug resistance in the prison system is higher than in the civilian sector. In 2006 it was 15.1%, with 191 patients registered with MDR-TB; in 2012 it had reached 30%. Drug resistance levels among previously treated patients are also higher in the prison system: increasing from 48.2% in 2006 to 63.4% in 2012. The development of drug-resistant TB in the prison system was fuelled by the absence of second-line drugs until 2010.

In 2012, treatment coverage with second-line drugs increased to 75%. Several factors have allowed Kazakhstan to quickly scale up treatment for M/XDR-TB patients in civilian and prison settings.

The Government and President of Kazakhstan have given a strong political commitment to this need. In 2009, 3980 MDR-TB patients received second-line drugs from the national budget. Increasing government funding has allowed treatment of more patients. In 2012, government funding was allocated to treat 8868 MDR-TB patients; 82% of second-line drugs were purchased through the government budget and 18% with funding from GFATM. In the prison system this proportion was 24% and 76% respectively.

A national strategy to fight TB and drug-resistant TB has been developed for 2013–2020.

Ministry of Health directives on drug-resistant TB control are in line with the latest WHO recommendations (including rapid diagnostic algorithms, corrected treatment regimens, criteria of hospitalization, ambulatory care principles, management of TB in children, etc.).

Protocols on programmatic management of drug-resistant TB have been developed and introduced nationwide.

The national guidelines on management of drug-resistant TB are currently being updated in accordance with WHO recommendations.

The Ministry of Health provides measures for separation of TB patient streams according to bacteriological status, and isolation of children and adolescents from TB contacts.

Ministry of Health guidelines on TB/HIV coinfection have been adjusted in line with the latest evidence base.

With the implementation of new national TB/ MDR-TB policies and guidelines in Kazakhstan, continued strengthening of programmatic management of drug resistant TB is needed in order to maintain the present level of performance and national expansion in treatment with second line drugs.

TAJIKISTAN

Mobilization of religious leaders for TB stigma reduction

People with TB often suffer from discrimination, stigmatization, rejection and social isolation. This phenomenon creates serious obstacles for implementation of effective TB prevention and treatment programmes. Fear of discrimination may prevent people from seeking timely treatment. In Tajikistan there are cases when a husband leaves his wife after her TB diagnosis, or because of the stigma, a girl who was previously ill with TB has a more difficult time getting married. According to a study of TB patients' needs conducted by Project HOPE in Tajikistan in 2011, 43% of patients surveyed were concerned with being rejected by friends and society if diagnosed with TB. Seventeen per cent of young patients said that their biggest concern after they were informed about having a disease was their marriage prospects. This immense fear of being outcast from society along with associated depression and anxiety are important contributing factors that increase the burden of TB.

In Tajikistan the role of religious leaders in community life is significant. Most of the population often goes to mosques and talks to mullahs (religious leader) for solutions to various social and other problems. As mullahs consult with their community about all current socially significant questions, mosques became a place where public opinion is formed. Using this information, the NTP supported the Project HOPE initiative to involve religious leaders to combat the stigma and discrimination of TB patients.

A round table was conducted – with the Head of Department of Religious Affairs under the Government of Tajikistan and with participation of religious leaders from the main mosques – to present country TB data and discuss the issues related to stigma and discrimination of TB patients and their family members. Religious leaders were involved and helped develop training materials and a booklet on TB by adding information from the Koran on compassion and support of sick people. Trainings were conducted for religious leaders in all project sites. In total, 129 religious leaders were trained and spread key messages on TB among the population

and distributed booklets. The main messages were on the curability of TB, the need for supporting TB patients and their family members, and the importance of seeking care in a timely manner when TB symptoms appear.

Taking into consideration that the Tajik population traditionally and culturally enjoys watching performance and soap operas, Project HOPE supported the production of a soap opera with key messages on TB addressing stigma and discrimination. The Tajik State Film studio produced the film.

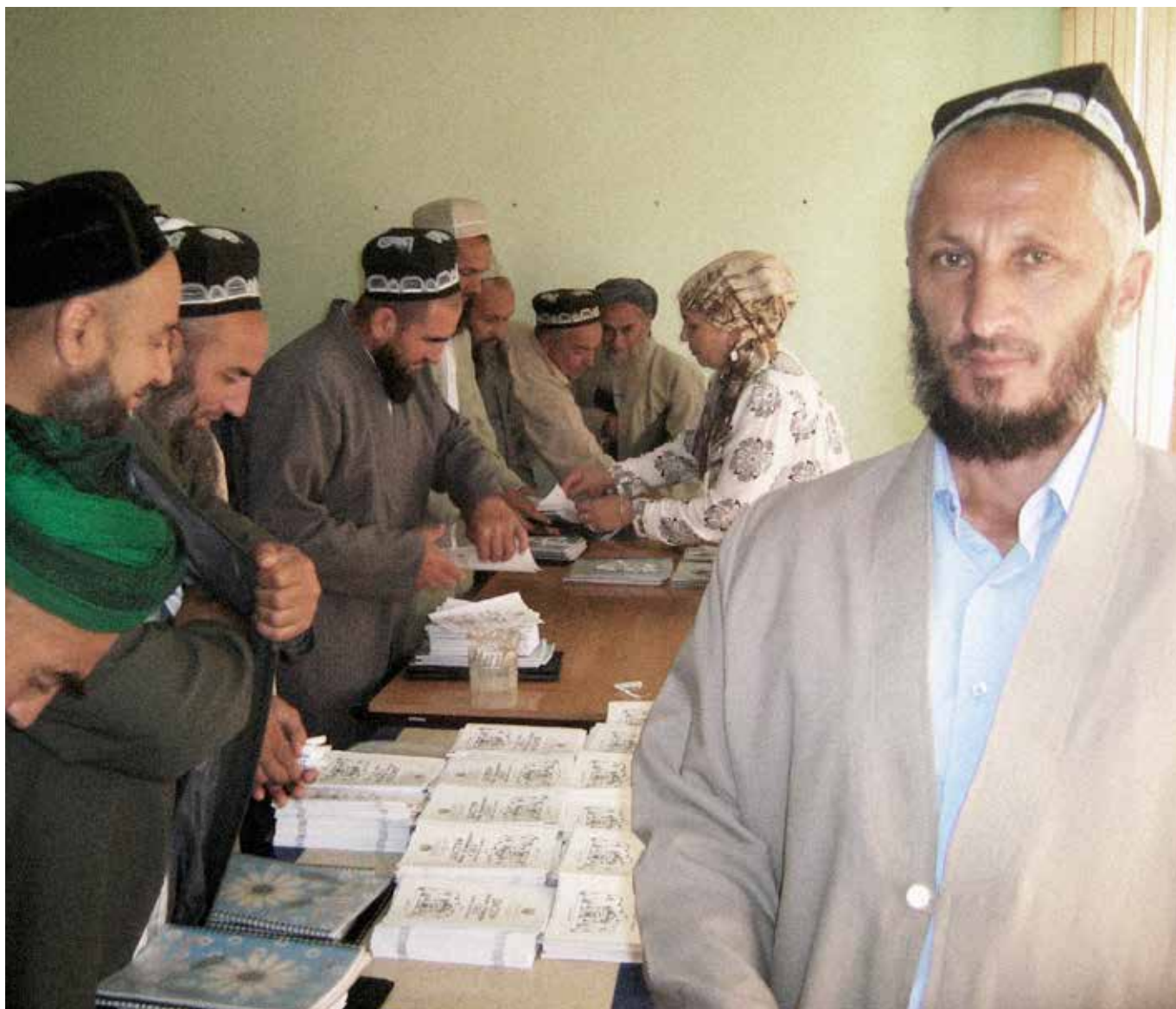
A professionally written script with key messages on TB is interwoven into a scene showing the love story of two young students from Dushanbe. The soap opera shows problems that a majority of Tajik families face, including the lack of basic knowledge about TB, becoming ill with TB and high stigmatization from parents, which can prevent the future wedding of the film characters. The soap opera shows that love and care can help the patient recover from disease. It was broadcast in Jomi cinema and by local television channels at national and oblast levels. A newspaper published an article about the soap opera, entitled The miracle of love gives hope.

To assure broader coverage of the population, 100 copies of the soap opera were made on DVD and distributed to partner organizations, local NGOs and community leaders. The film was broadcast to support the religious leaders' activities to reduce the stigma of TB.

In total, trained religious leaders held 3096 talks on TB during the main Friday's prayers, which were attended by more than 263 160 men. Religious leaders referred 1349 people for TB diagnostics and 448 were diagnosed with TB. Religious leaders and community members supported 1803 TB patients by providing food packages, making charitable donations to mosques to cover transportation costs and bringing medication from health facilities to patients' home to assure DOT.

The production of a soap opera with key TB messages addressing stigma and discrimination was a successful and innovative method of communication and social mobilization it provided the NTP an opportunity to inform more of the population with important messages on TB and its prevention.

The national television channel Safina developed and broadcast two animated television spots on TB symptoms, stigma and discrimination to the general population. The TV spots can be downloaded from <http://sharebox.tj/download.php?fileid=522018288>.



TAJIKISTAN

Organization of patient support groups for TB patients

In 2011, under the initiative of the USAID Quality Health Care Project (Quality Project) and with the support of the Tajik NTP, patient support groups (PSGs) were established in Quality Project pilot sites. These groups were established to address national TB data, which showed increases in the numbers of treatment interruptions and relapses, and increasing numbers of MDR-TB patients. To supplement other efforts addressing these issues, the Quality Project employed a different approach that enables patients to take more responsibility for their health and, in particular, for adherence to treatment.

Many studies have shown that a lack of knowledge of TB patients about their disease may lead to low adherence to treatment and treatment interruption.¹ A central element of the PSG is empowering and involving TB patients in the management of their disease, promoting adherence to the treatment regimen and addressing poor adherence when it occurs.

According to the results of a knowledge, attitudes and practices study conducted in Tajikistan, TB patients' need for information is mostly focused on obtaining additional information on TB treatment (over 69%). The majority of patients (68%) preferred to receive information by direct communication from health providers.²

To identify topics to be covered during the PSG meetings and the problems encountered by patients during their treatment, formative research in the form of interviews was conducted among TB patients in the outpatient phase of treatment. During these interviews, patients' consent to participate in the PSG meetings were obtained.

Training and information, education and communication materials were developed based on the formative research, and used to organize and manage PSG meetings. Trainings

on organization of PSGs and communication/counselling skills were conducted for health providers at primary health-care level with the involvement of TB specialists, social workers and community leaders.

The training included elements of participatory rapid assessment to identify the existing problems and barriers that TB patients can face during their treatment and ways of solving these problems. Different approaches for supporting TB patients were discussed with an emphasis on the organization of PSGs. The trainings focused on coordination of different stakeholders and partners, such as health and social support workers, NGOs and community members, including having former TB patients support TB patients complete their treatment.

Currently, monthly PSG meetings are organized at primary health-care level for TB and MDR-TB patients on the continuation phase of treatment. TB and MDR-TB patients, including their family members participate in these PSGs meetings together with medical workers (TB doctors, healthy-lifestyle centre doctors, family doctors and nurses) and community leaders.

The Quality Project provides support for PSGs with training seminars and information, education and communication materials and assists in the organization of PSG meetings. TB doctors are assigned as coordinators in each pilot site to supervise the groups. Former TB patients are invited to take part in PSG meetings to share their experiences and community leaders provide support by sharing information and inviting newly diagnosed TB patients to attend the PSG meetings and to provide social support to TB patients.

To date, the Quality Project created 28 PSGs in all project pilot sites and more than 400 patients and their relatives participated in these groups over the last 2 years.

These groups contributed to improved treatment adherence, improved control of treatment and improved treatment outcomes. In addition, the attention patients received

1 Munro SA et al. Patient adherence to tuberculosis treatment: a systematic review of qualitative research. *PLoS medicine*, 2007, 4(7):e238.

2 *Knowledge, attitudes and practices (KAP) survey on TB, Tajikistan*. Almaty, Project HOPE, 2010.



from attending PSGs motivated them to be more committed to their treatment. Evaluation of the treatment outcomes among TB patients in one of the pilot sites in Dushanbe showed the improvement of treatment success rate among new TB cases of Dushanbe from 70% (2011) to 82% (in 2012) and decreased the number of defaulters from 5% to 3%.

The contribution of PSGs to improved treatment outcomes was recognized by the NTP, and as a result an order (Decree) on the organization of TB PSGs was approved by the Ministry of Health (Decree # 421 on PSG from 15 July 2013). The decree gives PSGs official status in Tajikistan and ensures their sustainability. As a result of the decree, this practice can now be implemented countrywide.

UNITED KINGDOM

Advocating for involvement of civil society organizations in TB prevention, control, treatment and care

TB Alert is the United Kingdom's national tuberculosis charity, and its national work focuses on the valuable role of civil society organizations (CSOs) in TB control and care. Among numerous programme activities, TB Alert initiated partnership work, which has been successful in bringing key statutory and CSOs together to discuss, prioritise and commission local TB activities (known as local TB Partnerships). TB Alert provides funding for CSOs working in areas where local TB partnerships have been established to undertake TB related activities focusing on vulnerable communities. TB Alert promotes the involvement of CSOs throughout the TB patient journey, and in this way has moved from having a traditional role in awareness raising and prevention, to supporting clinical services in reducing non-attendance to appointments, earlier presentation to services and treatment adherence.

Background

TB has increased in the United Kingdom since the late 1980s, in contrast with global and western European trends. Reducing rates of TB is a key Public Health England priority for 2013–2014.

The Health and Social Care Act (2012) has changed the way that TB services are commissioned, placing a renewed emphasis on a multiagency approach.

TB Alert fights TB nationally and internationally. The flagship programme in England, The Truth About TB, brings local communities and statutory agencies together to tackle TB.

Interventions

The Truth About TB programme:

- » raises awareness of TB among people most at risk, recognising the social, cultural and economic factors that make people more vulnerable to the illness;
- » develops the role of CSOs to deliver locally commissioned TB services, building their skills in TB awareness, prevention, peer support and treatment completion;

- » empowers people affected by TB to help improve the design and delivery of TB services;
- » establishes and supports local TB partnerships in high-incidence areas to take a whole system approach to TB;
- » supports the TB Action Group, a unique network of United Kingdom TB advocates and peer support workers;
- » gathers best practice and contributes to Department of Health and National Institute for Health and Care Excellence consultations; and
- » supports access to services and treatment completion through our Patient Support Fund.

“TB Alert allowed me to regain a purpose to live. People who listened, understood and never judged. I am now proud to be part of the team which is able to offer peer support to others.”

TB Action Group member

“The Truth About TB is a national programme of action coordinated by TB Alert, the UK's national tuberculosis charity, and I believe it can play an important role in reversing over 20 years of rising TB in England.”

Dame Sally Davies, Chief Medical Officer

Outcomes

More than 350 CSOs and local government programme staff have attended 18 The Truth About TB training events.

Four local TB Partnerships were established in the West Midlands, Greater Manchester and the London boroughs of Redbridge and Brent. These have delivered TB training to frontline workers, who are now raising awareness of TB among their communities and client groups.

An E-learning course for primary care professionals was launched in partnership with the Health Protection Agency and the Royal College of General Practitioners. Within 8 months, there were over 1400 users and the course was top ranked based on user feedback.

Partnership work in Hounslow led to the recruitment of a TB Outreach Worker and an additional TB specialist nurse.

TB Alert's advocacy alongside clinical and parliamentary stakeholders influenced the establishment of a Public Health England-led TB Oversight Group to develop a national TB strategy.

TB Alert provided consultancy on community-facing literature for latent TB screening in Brent and Ealing.

TB Action Group members advocated in the United Kingdom and European Parliaments for a patient-centred approach to TB.

Conclusions and next steps

CSOs have an understanding of and access to hard-to-reach communities. As commissioned partners of statutory services they can:

- » increase registration and presentation to primary care, particularly among the most at-risk communities;
- » deliver targeted awareness messaging;
- » support treatment adherence;
- » reduce do-not-attend rates;
- » facilitate peer and social support for patients;
- » increase the voice of people affected by TB within TB services; and
- » ensure TB prevention, care and control reflects the social as well as medical aspects of TB.

MULTICOUNTRY

Impact of political advocacy for TB care and control

Global Health Advocates (GHA) is a NGO that promotes the health-related Millennium Development Goals worldwide. GHA advocate for social changes and mobilizes society against diseases that keep people in poverty. As part of this effort, GHA is currently co-hosting the Secretariat of the European Parliament Working Group on Innovation, Access to Medicines and Poverty-related Diseases jointly with MSF. This working group specifically attempts to ensure that European policies deliver a comprehensive and proactive response to confront the need for innovation, access to medicines and high-quality health-care. GHA is also coordinating the secretariat of the TB Europe Coalition, an informal regional advocacy network gathering individuals and CSOs that are active in the fight against TB.

Why is political advocacy applicable to TB care and control?

GHA strives to fill the gap in TB advocacy at the European Union level. Through the European Parliament Working Group, GHA organizes regular roundtables, conferences and debates at the European Parliament on the topic of TB, to raise awareness among TB policy-makers and to make sure that research, development and health policies take TB into greater consideration in Europe and worldwide. GHA, together with partners in the field, also organizes field visits for Members of the European Parliament, which gives them first-hand experience of the importance of the TB issue and projects on the ground. The TB Europe Coalition conducts country visits in the Region to meet with CSOs and build their advocacy capacity when the context is appropriate. It strives to raise awareness on the importance of civil society and advocacy in TB care in the Region.

What is the impact?

Continuously raising awareness on TB directly increases the attention and hence the political will to address the disease. In turn, this can generate greater financial commitment from major donors to the fight against TB. At a time when most international donors are withdrawing from middle-income countries, it is important that domestic governments take over and address the TB problem in their countries and regionally. However, they need to be aware of the TB threat. Advocacy to increase political will and financial means to fight TB is crucial if this disease is to be eradicated.

Advocacy at the European Union level, for instance, has generated greater financial commitment to TB in the past five years, especially in research, development, health policies and budgets. After numerous roundtables organized in the European Parliament on TB and MDR-TB, hosted by the European Parliament Working Group on Poverty-Related Diseases, 14 Members of the European Parliament launched a Written Declaration on the threat of drug-resistant TB to the Region. Two hundred Members of the European Parliament signed the declaration within 3 months of its launch. This declaration called on the European Union to increase its political and financial commitment to the GFATM, the Consolidated Action Plan, and to address the TB crisis in middle-income countries of the Region.

Other best practices and examples can be found on the TB Europe Coalition website (www.tbcoalition.eu).

ADDRESS THE NEEDS OF SPECIAL POPULATIONS

AZERBAIJAN

TB control programme in the prison system

Background

The Main Medical Department of the Ministry of Justice in Azerbaijan provides TB services to 23 prisons with a population of about 17 000, 2% of which are women. At the end of 2012, the TB notification rate was 3565 per 100 000 people; 19% of notified TB cases were among people living with HIV.

Since approximately 1995, the TB control project has been successfully developed in line with WHO recommendations, by virtue of political commitment, standardized TB treatment with strict compliance, a standard registration and reporting system, and a continuous supply of certified medicines. The most successful aspects of the programme are highlighted below.

TB detection and diagnosis

TB case detection practice in the prison system is based on screening at the entrance to pretrial isolators, mass screenings and responsive screenings. The use of a screening algorithm and the availability of new, on-the-spot diagnostic tools and qualified staff are key to early detection of TB cases. Identified TB cases are immediately isolated and transferred to the Special Treatment Institution in Baku.

The Decentralized TB Laboratory Service is equipped with modern diagnostic equipment for fluorescence microscopy, culture and drug DST on liquid and solid media, and PCR. Since 2006, the Special Treatment Institution laboratory has been accredited by the Supranational Reference Laboratory in Borstel, Germany.

TB treatment

At the Special Treatment Institution, treatment is provided free of charge and on a voluntary basis for all TB patients, regardless of gender, age or designated punishment. Infection control is applied with an emphasis on administrative and engineering methods in tandem with regular monitoring of the treatment process. Contributing to the successful treatment of TB has been the absence of waiting times for treatment integration, vigilant quality control of anti-TB drugs, timely HIV identification and antiretroviral therapy

(ART) initiation, treatment adherence promotion and psychological support for stresses associated with the disease, and the general confinement approach.

Timely initiation of ART for HIV-positive TB patients is a priority for TB/HIV coinfection management in the prison system.

Continuum of care between prison and civilian institutions

The TB control started within the prison system is maintained after release, if treatment is not complete. The Main Medical Department has been working for several years with the Scientific-Research Institute for Lung Diseases to ensure the necessary legal framework and with NGOs that support former prisoners with TB.

The Special Treatment Institution operates a training centre for medical and non-medical prison staff to provide education on fighting TB infection. Training centre managers are working towards obtaining the WHO collaborating centre status.

Using the theoretical base of the training centre and practical framework of the programme, operational research and studies of the latest developments and recommendations from WHO are carried out. With the support of WHO, delegations from different countries are visiting the programme to exchange experiences.

Results

TB detection and diagnosis

All newcomers are tested for TB on admission to pretrial isolators and more than 95% of inmates annually undergo a mandatory TB mass screening (questionnaires, X-ray, sputum examination) by means of mobile medical teams and digital X-ray diagnostics.

As a result of early detection, the proportion of prisoners identified with lung damage has decreased significantly. The proportion of MDR-TB among inmates has decreased by 22%, and the proportion of drug-susceptible TB has increased by 18%.

TB treatment

Treatment success was only 55% for the cohort of new sputum smear-positive drug-susceptible TB patients in 2008. This low figure was mostly due to nearly 25% of patients in the cohort failing to continue treatment after release. Currently (2011 cohort), the rate of loss to follow-up after release has been reduced to almost zero and the treatment success rate for new sputum smear-positive drug-susceptible TB patients has increased to 88%.

Similarly, in 2008, 10% of the MDR-TB patient cohort was lost to follow-up after release and the treatment success was less than 65%. According to the latest data (2010 cohort) there were no patients lost to follow-up after release and the treatment success rate was 83%.

In the last 6 months, the number of HIV-positive TB patients enrolled in ART has increased to 17%.

Continuum of care between prison and civilian institutions

Prior to 2009, support and maintenance for former inmates with TB was not provided consistently. During 2009–2011, the Main Medical Department in collaboration with the International Committee of the Red Cross and the Scientific-Research Institute for Lung Diseases conducted support and maintenance for released prisoners with MDR-TB. Since 2011, under the framework of WHO's Stop TB Strategy "Empowering people with TB, and public organizations through partnerships", the project has expanded to provide full coverage of all released prisoners with TB.

Every year, on average, 120 drug-susceptible TB patients and 20 MDR-TB patients under treatment are released. Prior to the start of this programme, only about 10% continued TB treatment after release, which had a negative effect on treatment outcomes. Nowadays, follow-up procedures are actively applied and treatment adherence in the civilian setting has increased to 98%.

Lessons learnt

TB detection and diagnosis

Maximum coverage and rapid detection of TB cases in Azerbaijani prisons was achieved through capacity building in

TB case detection – specifically in the use of mobile X-ray machines and systematic sputum transportation to the laboratory network.

Another example of a good practice has been screening at the entrance to pretrial isolators, optimized by the introduction of digital radiography and rapid methods of sputum investigation (GeneXpert).

Combination phenotypic and genotypic methods for TB diagnosis (Hain, MGIT, GeneXpert) are the most appropriate for combating TB in prison settings, in order to ensure rapid diagnosis and initiation of appropriate treatment regimens.

TB treatment

Experience suggests that a centralized TB treatment model is optimal for the prison systems of former Soviet Union countries. The best results can be achieved through timely TB/HIV coinfection diagnosis and management, patient segregation according to infection and DST profiles, the use of the latest TB laboratory tools, as well as appropriate treatment regimens according to DST.

Additionally, regular treatment monitoring and adequate side-effects management, provide high cure rates.

TB/HIV coinfection demands a special attention. Early detection and treatment of coinfection increases the chances of successful completion of TB treatment.

Continuum of care between prison and civilian institutions

Along with the traditional support methods for treatment after release, namely the provision of transport costs and incentive packages, intensive patient education plays an important role in ensuring the continuity of TB therapy and patients' integration into civil society. These educational and motivational initiatives should start in prison and continue after release, during the remaining treatment period.

AZERBAIJAN

Follow-up of MDR-TB patients after release from prison

Active involvement of national NGOs in the follow-up of MDR-TB patients has dramatically improved treatment adherence and success rates among released prisoners in Azerbaijan. NGOs play a valuable role in providing psychosocial care, working closely with patients and their family members and providing incentives and enablers.

In March 2011, Saglamliga Khidmat (translated as Support to Health), an Azerbaijani NGO launched a follow-up treatment project for former prisoners with MDR-TB, with the support of the Main Medical Department of Ministry of Justice and financing from the GFATM. In order to address treatment interruption problems, needs were assessed and the following motivational tools were identified.

Patients were in need of social and consultation support by adherence counsellors, in the month prior to release from prison.

Monthly food packages and daily transport fees motivate patients to arrive at DOT centres to take their medication.

Incentives should be given to DOT supporters, in recognition that these patients need more attention from medical personnel.

The impact of the project has been periodically evaluated by the Project Implementation Unit of the Ministry of Justice, by the oversight committee of the Country Coordination Mechanism, and at international level by WHO and the GFATM Office of Inspection General (October 2012). Through the project, Saglamliga Khidmat was able to follow up 99% of released patients with psychosocial and counselling sessions and provide incentives for them to attend DOT centres every day. By comparison, treatment follow-up was only 10% in previous years. Since Saglamliga Khidmat's involvement, 94 MDR-TB patients have been discharged from prison and all except for two cases (1%) continued treatment after release.

This project demonstrates that patient support programmes can significantly improve TB treatment adherence and success rates among released prisoners through the involvement of local NGOs.



BULGARIA

Focalize spreading of TB among drug users and alcohol addicted people

The programme, Focalize spreading of TB among drug users and alcohol addicted people, was initiated by the Bulgarian Ministry of Health in the framework of the GFATM supported programme for TB. The activities took place from 2008 to October 2012. The efforts ensured increased awareness, knowledge and access of the vulnerable populations, e.g. drug- and alcohol-addicted, to the services offered by TB institutions. One of the best programme results was establishing a bridge and cooperation between TB institutions and a NGO working with vulnerable populations. The programme ensures sustainability after its completion as the created partnerships continue to give results. But more sustainable actions in TB control and prevention are still necessary. The priority should be on the most vulnerable population, especially injecting drug users (IDUs) from the Roma community, and services should be accessible, free of charge and non-discriminative.

The goal of the project was to ensure adequate prevention of TB risks among the target group and to motivate them for treatment. According to the statistics and data from the Dose of Love Association team working with the target group for 14 years, the number of drug users is about 600–800 IDUs from the Bulgarian community in the Burgas region and about 150–350 IDUs from the Roma community in the Nova Zagora region. Alcohol users reached by the programme were mainly from Burgas and nearby small villages not well covered by the health and social system and specific TB services.

The programme consisted of TB prevention activities. The target group was screened to establish adequate data for their TB risk. About 90% of the screened clients were at risk for contracting TB. Clients were motivated to undergo testing if risk factors were present. If active or latent TB was found, clients were motivated to undergo treatment. TB patients were followed up and their contacts were encouraged to undergo testing. Working methods included outreach activities inside the target group, motivation using different techniques and counselling. Most of the NGO team working with IDUs are trained social workers and use mainly motivational interviewing or fast interventions. Part of the internal train-

ing of the team before working with clients is to learn how to motivate clients to get tested for medical conditions or to motivate them for safer behaviour or treatment adherence. Social workers try to encourage clients to be involved and make decisions by themselves.

The help of gatekeepers is also significant. The idea of a gatekeeper who reaches out to the target group was initiated in a Risknet partnership project in 2008. Gatekeepers voluntarily promote NGO's services and are usually from any hard to reach or hidden community or have good contact with the target group, for example, a bartender of a bar attended by people who use drugs, a taxi driver or a relative. The main goal is that if the NGO cannot directly contact the target group, it can use the help of a gatekeeper to contact the clients. Gatekeepers are especially instrumental in the work with IDUs and the Roma community. Gatekeepers follow specific guidelines and use an open-the-door methodology. The main role of a gatekeeper is to open the door to the hidden target population and to make services available to more people. Potential gatekeepers are identified by the working team and usually satisfy a set of criteria to become gatekeepers; they should be visible to the target group and have contact with those who cannot be reached directly by the NGO. Their main purpose is to support the prevention of TB and to ensure direct or indirect reach.

Health and education information that is easy to understand was presented to the target group and TB consultations were provided to drug and alcohol users. The organization implemented group TB informational sessions and provided trainings to the target group in non-clinical settings. Examples of non-clinical settings include hotels, bars and cafeterias. The activities included regular TB testing and mediation in reaching people who had been in contact with TB patients. Clients were directed to TB treatment structures, followed-up and supported during treatment.

In 2012, the Dose of Love Association team worked with 351 unique clients (72 women and 279 men). The age range among IDUs was from 19 to 34 years old and, among alco-

hol users, from 35 to 54 years old. Of the 831 total contacts with the target groups, 119 were screened for TB. More than 349 people (> 90%) received a consultation. Outside of Burgas town, the Dose of Love Association works with alcohol addicted people in the villages of Zvezdec, Veselie and Rosen, and the town of Nova Zagora. Two trainings were organized for the clients. There is one trained and actively working gatekeeper. Sustainable preventive work in the Roma community in Nova Zagora town was established.

The town and region of Burgas currently have a low rate of TB among people who use drugs. A lack of information among the target group regarding the available social and health services from TB institutions still exists. People reached by this programme showed an improved basic knowledge about TB as a medical and social problem. The current TB prevention work is already part of the group community culture of the target group.

ISRAEL

A country of immigration with a multifaceted NTP

Background

Israel, a country of low TB incidence, received mass migration waves in the early 1990s from high-TB prevalence countries. This occurred at a time when depletion and fragmentation of anti-TB resources were rampant in Israel.¹ In response, the new Israeli NTP was launched in 1997, based on all five components of the DOT strategy recommended in 1994 by the WHO, together with a series of additional measures focused on the specific needs of migrants.¹

In addition, two significant measures were adopted in Israel.¹ First, DOT was performed for all patients for the entire duration of treatment, and not only for the acute phase.¹ Second, TB notification and monthly evaluation of DOT by the District Health Office were directly linked to reimbursement of TB clinics by health maintenance organizations, as an important incentive for good notification and supervision of the TB clinics.¹

Currently in Israel, all patients with suspected pulmonary-TB are advised to provide sputum or other biological specimen for smear and culture, and most suspected extra-pulmonary cases undergo biopsy to have tissue for histopathology examination and culture.^{1,2} All cultures processed in Israel are sent for confirmation to the National TB laboratory, which also performs DST for all first-line drugs and for most second-line drugs. Most TB-IC measures are implemented in TB clinics and wards, and specific directives have been given to all hospitals in order to improve TB-IC administrative measures (including using GeneXpert MTB/RIF for rapid diagnosis), environment control, and the use of personal protective equipment. All TB laboratories are at a biosafety level two or three. Diagnosis and treatment with first- and second-line drugs are provided free of charge, both for Israeli and non-Israeli citizens.¹ DOT is usually administrated at primary care community

clinics, which are the preferred location of most patients, including those with MDR-TB. In cases where a patient is reluctant to visit a clinic, community workers provide DOT at the patient's home. When necessary, patients are hospitalized in an expert ward, with an emphasis on continuity of care at the time of discharge from the hospital to the community.¹

Almost all components of the Israeli NTP briefly described above have had a positive impact on prevention and treatment issues related to MDR-TB patients. Therefore, only few of these measures and results are further described below.

Epidemiology of MDR-TB in Israel

From 1999–2010, 4652 adult TB patients were reported, and specimens from 3552 patients (76.3%) were cultured. Among those patients with cultured specimens, MDR-TB was diagnosed in 207 cases (5.8%) (annual range: 1.8–8.5% for the time period). XDR-TB was detected in 12 cases (0.34%). The annual number of MDR-TB cases varied between 6 to 40 patients. Of MDR-TB cases 74.3 % were migrants originating from the former Soviet Union. The average treatment duration was 16.6±12.5 months. Of all MDR-TB patients, 71.0% achieved treatment success as defined by WHO and 19.8 % died.

Social support and incentives that may increase adherence

In Israel, medical staff evaluates each TB patient's personal and/or social resources to fight the disease. TB patients who are not able to support themselves financially are eligible for disability welfare subsidies. In addition, other incentives are provided, such as refreshments at TB clinics and tokens for public transportation to encourage regular visits to the TB clinics. In specific cases, financial support is even extended to housing assistance during supervised treatment.

1 Chemtob D et al. The new National Tuberculosis Control Programme in Israel, a country of high immigration. *International Journal of Tuberculosis and Lung Disease*, 2003,7(8):828–836.

2 Mor Z et al. Epidemiology of extra-pulmonary tuberculosis in Israel, 1999–2010. *International Journal of Tuberculosis and Lung Disease*, 2013,17(2):229–233.

Special populations of TB patients with additional special care

Migrants

Migrants from other countries may have different health beliefs and unique lifestyles, which may hamper treatment adherence. In this context, anthropological tools are used to evaluate and address potential specific needs of migrants with TB. For example, following an evaluation of TB patients of Ethiopian origin, Ethiopian health workers were trained to assist the medical staff at the District Health Office and TB clinics to bridge the cultural gap between these patients and the health professionals responsible for their treatment. This study is described in detail elsewhere.³

Injecting drug users

IDUs and their care-givers are additional populations with special needs. Considering the fact that some IDUs manifest severe psychosocial disorders, the Public Health Services designed an intervention based on the therapeutic milieu model, which was implemented within the TB ward. Patients and staff groups met regularly within the TB ward and the sessions, guided by the social worker, were performed and evaluated.⁴

Recalcitrant TB patients

Prior to the establishment of the NTP, defaulting from treatment was sufficient to prompt legal action, i.e. a compulsory

isolation. However, following the implementation of the new TB program, court orders for detaining recalcitrant TB patients decreased significantly.⁵ For the several last years, there has been no court order needed in Israel for establishing patient cooperation.

Lessons learnt and conclusions

As recommended by WHO and described above, an overall set of measures should be in place in the NTP in order to prevent, diagnose, support and treat MDR-TB cases.

Since many MDR-TB patients experience difficulties in coping with substance abuse, personality disorders and/or immigration-related crises, they require special care and individual support to comply during the course of their treatment, which should be supervised for the entire duration. Socioeconomic difficulties should also be addressed to allow patients to complete the treatment and prevent further transmission in the community.

Incentives may be useful both for the patient and for the health system in order to enhance the quality of the NTP and to increase the rate of successful treatment outcomes, both for sensitive and MDR-TB patients.

3 Medical anthropology - an important adjunct to international TB control. In: *Tuberculosis: a comprehensive international approach*, 2nd ed. Reichman LB Hershfield ES, eds. New York, Marcel Dekker Ed., 2000:745-770.

4 Chemtob D and Levy A. Rationale and staff evaluation of using a "Therapeutic Milieu" for substance users within a tuberculosis ward. *Substance Use & Misuse*, 2009,44:672-683.

5 Weiler-Ravell D et al. Compulsory detention of recalcitrant patients in the context of a new tuberculosis control programme in Israel. *Public Health*, 2004,118(5):323-328.

NORWAY

National legislation ensures the right to reside if necessary until TB treatment is completed

In Norway, since the mid 1990's, any person without legal right to stay in the country, has been allowed to stay if they are under treatment for TB and there is reason to believe that this treatment would be discontinued in their home country. They are entitled to free treatment and care. The Norwegian law regarding foreigners (Utlendingsforskriftens § 17.14) specifically states: "A foreigner under investigation or treatment for tuberculosis, shall not be forced to leave the country until the patient has converted to a state of sputum smear-negative or the treatment has been completed. Exceptions can be made in cases where the possibility of completing the treatment is considered medically acceptable, or if there are specific reasons." (unofficial translation)

The practice was initiated to ensure that illegal immigrants and other groups would not avoid being investigated for TB.

Since it was introduced, this practice has only been used for a handful of individuals. Thus, the practice has not led to an influx of TB patients from poor countries. The importance of the practice, however, goes far beyond these few patients. With reference to this law, those screened can be confidently assured that it is for their own benefit, not only for the benefit of Norwegian society. This practice has thus increased the legitimacy and the coverage of the screening programme of immigrants in Norway, although many challenges remain.

An important lesson learnt from this practice is that the right to stay in the country until TB treatment is completed has not lead to an influx of poor TB patients.

REPUBLIC OF MOLDOVA

Follow-up of TB patients released from prisons

The NGO, Act For Involvement (AFI) has been active in the Moldovan prison sector since 2001. With the support of the Caritas Luxembourg Foundation, the first DOT project in the Moldovan prison system was implemented by AFI. Since 2001, the DOT project has expanded to include a TB/HIV programme in prisons. Currently, AFI focuses on several areas of TB control in prisons, including:

- » increased TB treatment adherence;
- » intensified case finding;
- » TB infection control;
- » TB patient follow-up after release; and
- » HIV prevention and follow-up of released inmates living with HIV.

The Follow-up of Released TB Patients project started in 2011 under a grant from GFATM. Prior to this programme, TB treatment outcomes were characterized by high default and mortality rates.

The project covers the whole Moldovan prison system, including Pruncul Republican Hospital, and pretrial institutions PI-5 Cahul, PI-13 Chisinau, PI-11 Balti and PI-17 Resina.

The project algorithm comprises two phases. Phase one is discharge and referral planning and it consists of four steps. Prison staff, in collaboration with AFI, prepares TB patients for release and ensure an efficient referral to the next service provider. The following steps are included in this stage.

First, prison health staff prepare for the prisoner's eventual release. Case managers, usually AFI staff, coordinate prisoner follow-up with civilian health-care providers such as the local health centre or district TB supervisor from the NTP to ensure continuity of TB treatment.

Then, prisoners receive education and counselling about TB from prison TB doctors. In addition, psychological counselling is provided, if needed, before release.

Next, AFI staff, in collaboration with prison educational services, document the names, addresses and telephone numbers of relatives and friends, and where the patient plans to live and seek health care. To prevent situations where inmates provide incorrect contact information, which would present a significant challenge to post-release health care, a trustful relationship must be established between the service providers and the inmates.

Finally a social worker, in collaboration with AFI staff, evaluates the TB patient's needs after release, such as temporary residence, as some inmates do not have a place to live. Homeless TB patients are referred to TB hospitals or shelters for homeless people, if they are smear-negative at the moment of release. Former prisoners are also referred to social canteens and organizations that provide free clothing, food and medicines etc. such as Caritas, the Red Cross, religious organizations and local authorities. If a TB patient/Inmate does not have the necessary identification documents, AFI provides support to obtain an identification card.

The second phase is the post-release follow-up. When needed, after release, TB patients are introduced to the TB programme manager or district TB programme supervisor who is responsible for treatment and care in the community (local health centre staff and district NTP).

A routine monthly check of treatment adherence takes place by phone.

Provision of incentives and enablers for better treatment adherence includes monthly food vouchers; cost-covering for special needs, such as medicines, clothing, etc.; and transportation costs directly related to TB treatment.

The results are evaluated at the end of phase two by the Prison Health Department of the Ministry of Justice. The treatment outcomes, by cohort (including released TB patients), are reported by this service to the NTP.

During the first year of implementation, the treatment outcomes were as follows:

- » 50% (26 patients) were cured in 2011 compared to 43.2% (19 patients) in 2010;
- » 30% (16 patients) interrupted treatment in 2011 (9.8% were identified and restarted the treatment after being lost to follow-up) compared to 43.2% (19 patients) in 2010;
- » 0% mortality rate during 2011 compared to 7% (3 patients) in 2010, and 7.6% (6 patients) in 2009;
- » 14% (7 patients) from the 2011 cohort are still on treatment; and
- » 6% (3 patients) failed the treatment during 2011.

RUSSIAN FEDERATION

Effective interaction between government and NGOs in detection of active TB among people living with HIV and other vulnerable population groups

Tomsk Region, in the Russian Federation, has a high incidence of TB, and MDR-TB was found in 18.2% of new cases in 2010. In 2000, a collaborative MDR-TB programme was initiated in Tomsk Region to provide treatment to all patients diagnosed. Participants of the programme included Tomsk TB Services, Tomsk Prison System, the Ministry of Health, Partners In Health and Tomsk Region AIDS Centre. The MDR-TB programme includes all aspects of MDR-TB control and prevention, such as procurement of second-line drugs, a patient-centred approach, social support, reducing alcohol dependence among TB patients, early TB detection and a TB/HIV subprogram. As for TB treatment, all activities are performed properly and are well coordinated due to the development of new protocols for MDR-TB treatment and interagency collaboration. However, there is a lack of activities for TB detection in high-risk groups, and medical facilities face difficulties in attracting people from vulnerable groups for TB screening.

Vulnerable population groups (people living with HIV, migrants, homeless, commercial sex workers and substance users) are all at greater risk of TB infection and disease, and are likely to have worse treatment outcomes than the general population. They experience longer delays in seeking care resulting in increased suffering and expense and higher risk of community transmission. Important factors include disrupted social networks; social exclusion; reduced accessibility to health care; lack of equitable participation in society; and lack of trust, understanding or respect for the system.

In 2010, the Tomsk Anti-AIDS Foundation, in collaboration with Tomsk Region TB Services and Tomsk Region AIDS Centre launched a TB screening project for vulnerable groups in the city of Tomsk.

The main goal of the programme is to increase coverage of preventive screening for TB among vulnerable groups and thereby improve the detection of active TB. It was very important to assess the prevalence of TB infection and factors associated with it among vulnerable groups in the city of Tomsk. Effective TB monitoring among these groups pro-

vides a basic understanding of the risks and helps inform revision of TB control activities. Also, by engaging with the community, Tomsk Anti-AIDS Foundation helps overcome some of the resistance and distrust often encountered in these groups. The foundation runs a client-centred programme called Our Clinic, based in a low-threshold medical, social and psychological services centre.

Outreach workers make efforts to motivate clients to take part in TB screening and, if necessary, keep them on treatment in the future. During 2010–2012, a cohort of 2039 people was identified as a risk group for TB. Screening was conducted twice a year and included basic evaluation of symptoms (chronic cough, weight loss, night sweats and haemoptysis), tuberculin testing, chest fluorography and sputum microscopy.

Outreach workers from Tomsk Anti-AIDS Foundation provide field counselling, TB and HIV education, phlebotomy and tuberculin testing with further referral to Tomsk Region TB Services for medical evaluation. Nutritional support, hygiene packages and accompaniment are used as incentives to complete the screening process.

The main principles for effective work with vulnerable groups in this programme are:

- » anonymity;
- » involvement in TB prevention and TB screening of outreach workers and peer consultants from a harm reduction project;
- » mobility of outreach workers from Tomsk Anti-AIDS Foundation, using a designated vehicle to provide personal field counselling and other activities;
- » provision of motivation sets for every client after completing TB screening;
- » provision of multiple services on-site – for example, syringe exchange, consultation, sputum collection and provision of appointment cards for fluorography for IDUs;

- » multi-professional approach to each client, through strong relations between TB and HIV services, social welfare departments, rehabilitation programmes and a drug addiction specialist; and
- » compliance with the principles of low-threshold service is an opportunity to provide a client with care even when he/she does not have an identity card.

Results

In 2010, 619 people from vulnerable groups were screened for TB (revealing 6 newly diagnosed TB cases, including three MDR-TB cases). Incidence of TB among vulnerable groups was 969 per 100 000 compared to 62.4 per 100 000 in the general population of Tomsk Region.

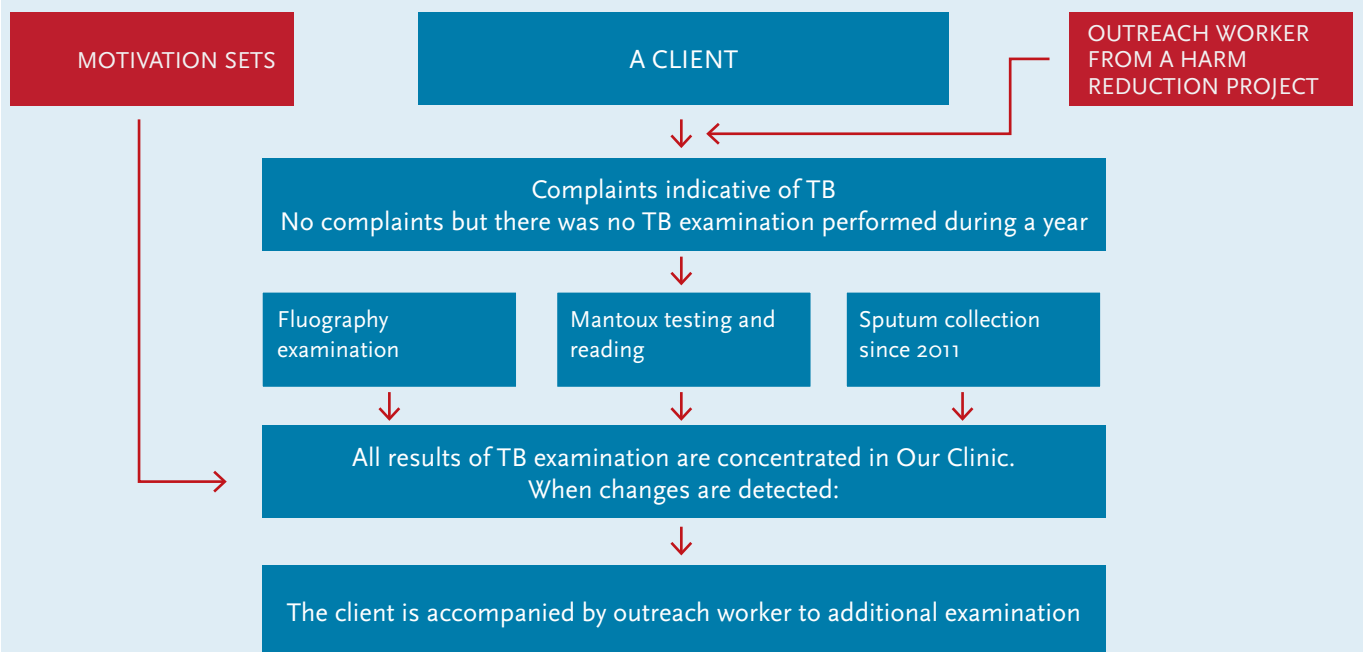
In 2011, 576 people from vulnerable groups were screened (uncovering 7 newly diagnosed TB cases, including two MDR-TB cases). Incidence of TB among vulnerable groups was 1215 per 100 000 compared with 60.4 per 100 000 in the general population of Tomsk Region.

In 2012, 844 people from vulnerable groups were screened (revealing 6 newly diagnosed TB cases). Incidence of TB among vulnerable groups was 711 per 100 000 compared to 46.2 per 100 000 in the general population of Tomsk Region. The data suggests that TB screening for this population has improved significantly since the beginning of the programme. In 2012, the reduction in TB incidence of 41.5% among this population correlated with the decreasing incidence in the general population.

Effective collaboration between the Tomsk Anti-AIDS Foundation and the government TB and HIV services has led to strengthening of TB control and early detection. Implementation of such programmes requires the involvement of both governmental and nongovernmental sectors. Such a client-centred approach to TB prevention is an urgent priority within the anti-TB/HIV movement in the Russian Federation and other countries of the former Soviet Union.

Fig. 6 presents a model for collaborative MDR-TB treatment for vulnerable groups.

Fig. 6. A subprogramme model





SLOVAKIA

Roma health assistants in the fight against TB

The most vulnerable and disadvantaged population group in Slovakia is demonstrably the Roma community living in segregated settlements. They are the poorest of the poor. Low income is usually the main indicator of poverty, but the Roma also experience poor educational opportunities, lower chances of employment, a poor state of health, and social exclusion. The poor state of health among the Roma community, compared to that of the general population, contributes to higher costs of medical treatment, incapacity to work, hospitalization and disability, and social marginalization. Members of the Roma community who are integrated into mainstream society are able to participate in public health support programmes intended for the whole population.

Continuous monitoring, effective elimination of inequalities and positive influencing of social and economic determinants of health are among the most important tasks of the public health system in Slovakia, and are priority tasks for WHO and the European Union.

The Health Support Programme for the Disadvantaged Roma Community is based on the results of a pilot project, Improving Accessibility to Health Care for Marginalized Roma Communities in Slovakia, implemented by the Ministry of Health in 2004–2006, and on a health education project, Health of the Roma, implemented by the Regional Association of Roma Initiatives in Banská Bystrica. These projects brought considerable improvements in the quality of life of the target group, and had a significant influence on relevant partners in the micro-regions defined by the project.

The long-term objective of the programme is to achieve the following for disadvantaged communities in Slovakia by 2015:

- » enforcement of equality and justice in terms of health
- » improvement in state of health
- » increase individual responsibility for health.

In June 2007, the programme was launched in each of the 10 regional offices of public health, with activities performed by community workers (Roma health assistants) who are managed by regional offices of public health. Their task is to enable communication, to increase knowledge and to spread health education. The engaged parties include regional offices of public health, general practitioners, paediatricians, specialized doctors, and the community.

With regards to TB, the role of the Roma health assistants is to work in communities to: assist in the investigation of contacts; help compile lists of who should be investigated; initiate TB contact examinations; conduct physical examinations; and provide transportation to the doctor. After a patient is released from hospital care, Roma health assistants help them during examinations at the regional pulmonologist, provide them with drugs through public pharmacies, directly observe the daily ingestion of drugs, keep patient records, and conduct daily interviews with the patient. Roma health assistants are trained to be able to judge the possible side-effects of treatment. They have the role of educators, supervising the observance of basic hygiene standards.

In 2013, 40 new Roma health assistants were recruited. Comprehensive training is provided by the Institute of Public Health, in cooperation with Comenius University Faculty of Medicine, the Agency of Domestic Nursing, and other institutions accredited by the Ministry of Education, Science, Research and Sport.

The programme was implemented in cooperation with the Ministry of Health, the Office of the Plenipotentiary of the Slovak Government for Roma Communities and its regional offices, regional offices of public health, the Slovak Health Care University, and NGOs involved in providing assistance to Roma communities.

The Health Support Programme for the Disadvantaged Roma Community is evaluated regularly by the Ministry of Health. Community workers in Roma settlements play a vital role in ensuring the overall control of TB, from prevention to observation of treatment.

As a result of the systematic work of Roma health assistants, 80% of adult Roma people with TB have been successfully treated. In addition, the Roma health assistant programme helps to insure that high-risk Roma communities are under constant TB surveillance and every outbreak of TB is immediately identified and contained. Those affected are brought to hospital for examination and treatment, which is afterwards controlled through DOT by Roma health assistants in the community.

UKRAINE

Strengthening TB/HIV integration

Executive summary from: Takasawa H et al. *Strengthening HIV-TB integration: A case study from Alliance Ukraine*. Brighton, International HIV/AIDS Alliance, 2013. Reproduced with permission.

Many NGOs and other CSOs working in HIV are now seeking to integrate TB into their work. These organizations often have particular strengths that can be useful in TB programming, such as an understanding of their local context, an ability to reach key populations, and the capacity to provide peer support and tackle stigma.

The challenge

However, many of them do not know how practically to integrate TB into their work. They often encounter barriers related to the misconception that TB programming is highly technical; they may experience difficulties in fundraising for TB; and they may lack trained staff who understand TB programming. Moreover, there are few case studies documenting the steps that HIV CSOs can follow to successfully integrate TB into their HIV work. This case study provides a detailed account of how Alliance Ukraine strengthened its capacity to implement TB programming. It will be particularly relevant for other organizations working in countries with a high burden of HIV and TB who are considering integrating TB into HIV work.

Ukraine has a high burden of both HIV and TB, with one in five TB patients also being HIV positive. However, responding to TB and HIV in Ukraine has been challenging due to a vertical health system and limited capacity in the TB sector. HIV and TB are continuing to impact significantly on key populations, who are often isolated and hard to reach. For instance, around 50% of HIV/TB coinfecting patients in Ukraine are people who inject drugs.

The response

The convergence of injecting drug use and TB in Ukraine provided the Alliance with an entry point into TB programming. Alliance Ukraine wanted to respond to the holistic needs of those affected by the HIV epidemic, and that meant a long-term commitment to TB integration. So the Alliance sought

to position itself at the centre of the national response to TB, participating in national technical working groups and identifying TB as a priority in its organizational strategy.

As a result of these and other efforts, Alliance Ukraine became a Principle Recipient of the GFATM Round 1 HIV grant in 2004.

Alliance Ukraine worked with implementing partners to approach TB integration from various angles. Initially, programme activities all fell within the scope of the Alliance's existing expertise: creating information and educational materials on HIV/TB coinfection, providing referrals, and addressing TB within the framework of opportunistic infection management.

In addition, transferrable expertise, such as procurement and supply management, supporting the national M&E, and case management, was put to use to position Alliance Ukraine within the country's TB response.

As an HIV organization targeting hard-to-reach key populations, Alliance Ukraine already had a mechanism in place to learn about specific TB programming issues at the service delivery level. Using its strong communication and advocacy skills, Alliance Ukraine was able to engage policy-makers on those issues, helping to create an environment in which the integration of HIV and TB responses could be most meaningful for those affected and most efficient for those involved.

What the Alliance Ukraine programme has created is an HIV response that addresses TB and other comprehensive needs of the target population, supported by a multidisciplinary team of health service providers, up-to-date protocols based on international evidence and policies, and a broad network that carries essential information and messages to and from patients and policy-makers.

Lessons learnt

Based on their experience in Ukraine, the Alliance's HIV/TB

team have summarized the essential organizational capacity requirements in TB integration as follows:

- » a basic knowledge of TB as a communicable disease, of technical terms used in TB programming, and of the architecture of the NTP;
- » good case management capacity, including strong partnerships to support it, and funding that enables its implementation; and
- » an ability to engage in advocacy (either to lead it or mobilize others to do so) to create an enabling environment for integration to succeed, including good intersectoral coordination and a shared vision and direction between government and civil society.

Key messages from this case study, and essential questions for any HIV organization considering TB integration, are included below.

Key messages

TB prevention and treatment among HIV target populations is an integral part of HIV work. But whether, when and how to integrate is a strategic question best answered by understanding the local epidemic and the needs of the target populations.

In order to work in HIV/TB integration, a basic knowledge of TB and an ability to work with the TB sector and influence

policy-makers are essential. Further capacity building needs will be determined by the scope of the HIV/TB intervention.

Starting TB work need not be too challenging. Begin with activities that the organization can deliver confidently, and then align new areas of work to the organization's long-term goals and ambitions.

A good HIV organization already has areas of expertise and strengths that can be used to support nascent TB programming. Typical examples are outreach, community mobilization and case management. Use the organization's comparative advantage to create a niche for itself.

Vertical health system structures, with a focus on specific diseases, often create challenges to integrated service provision. For this type of health system to facilitate HIV/TB integration, close cooperation between the two sectors is essential. Coordinated or joint advocacy by HIV and TB service providers (doctors, other health professionals and civil society) to national-level policy-makers promotes change.

Finding the right partners at grassroots, regional and national levels is essential for effective delivery of interventions and better influencing decision-makers. Partnerships help to promote the voices of target groups, and allow the organization to reflect them in programming and communicate them to policy-makers.

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.

Member States

Albania	Hungary	Russian Federation
Andorra	Iceland	San Marino
Armenia	Ireland	Serbia
Austria	Israel	Slovakia
Azerbaijan	Italy	Slovenia
Belarus	Kazakhstan	Spain
Belgium	Kyrgyzstan	Sweden
Bosnia and Herzegovina	Latvia	Switzerland
Bulgaria	Lithuania	Tajikistan
Croatia	Luxembourg	The former Yugoslav Republic of Macedonia
Cyprus	Malta	Turkey
Czech Republic	Monaco	Turkmenistan
Denmark	Montenegro	Ukraine
Estonia	Netherlands	United Kingdom
Finland	Norway	Uzbekistan
France	Poland	
Georgia	Portugal	
Germany	Republic of Moldova	
Greece	Romania	

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