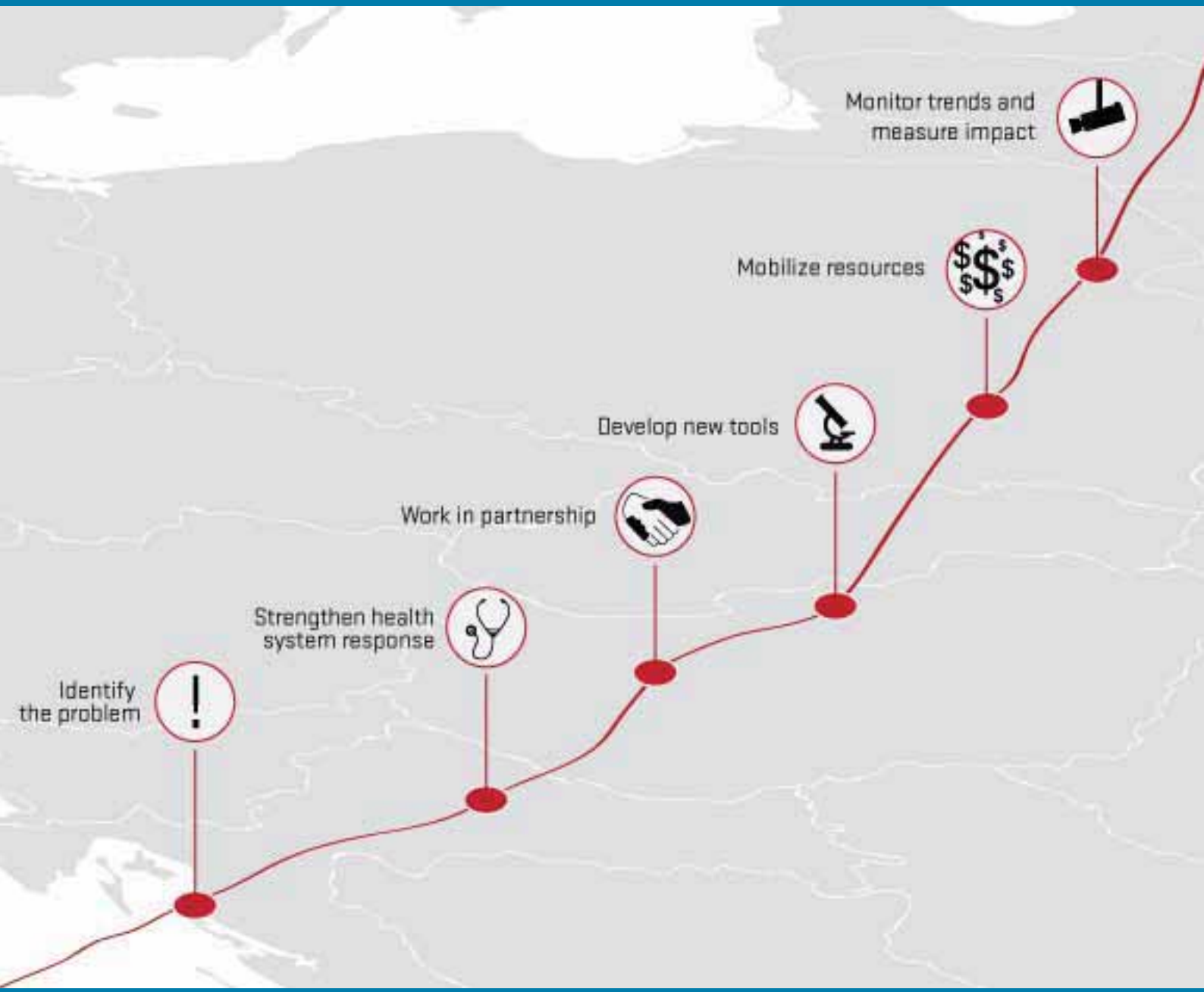
Roadmap to prevent and combat drug-resistant tuberculosis



World Health Organization
REGIONAL OFFICE FOR Europe

ROADMAP TO PREVENT AND COMBAT DRUG-RESISTANT TUBERCULOSIS

The Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011-2015

World Health Organization
REGIONAL OFFICE FOR Europe

Abstract

In response to the alarming problem of multidrug- and extensively drug-resistant tuberculosis (M/XDR-TB) in the WHO European Region, and in order to scale up a comprehensive response and to prevent and control M/XDR-TB, a consolidated action plan has been developed for 2011–2015 for all 53 Member States of the WHO European Region and partners. The Plan was endorsed by the sixty-first session of the WHO Regional Committee in Baku on 15 September 2011. It has six strategic directions and seven areas of intervention. The strategic directions are cross-cutting 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, to provide universal access to diagnosis and treatment of MDR-TB. The implementation of the Consolidated Action Plan would mean that the emergence of 250 000 new MDR-TB patients and 13 000 XDR-TB patients would be averted, an estimated 225 000 MDR-TB patients would be diagnosed and at least 127 000 of them would be successfully treated thus interrupting the transmission of M/XDR-TB, and 120 000 lives would be saved. The cost of implementing the Plan is estimated at US$ 5.2 billion. Based on the economic analysis of lives saved and disability-adjusted life years, the Plan should prove to be highly cost-effective.

Keywords

EXTENSIVELY DRUG-RESISTANT TUBERCULOSIS – diagnosis – prevention and control
TUBERCULOSIS, MULTI-DRUG RESISTANT – diagnosis – prevention and control
DELIVERY OF HEATLH CARE – organization and administration
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Target audience

This document is written primarily for those responsible for tuberculosis control in WHO European Member States, including ministries of health and other government bodies responsible for health in penitentiary services, health financing, health education and social services. It also urges and supports the intensified involvement of civil society and communities affected by the disease, professional societies, partners and donors, national and international technical agencies and all stakeholders engaged in tuberculosis control in the Region.

Abbreviations

ACSM	advocacy, communication and social mobilization
AIDS	acquired immunodeficiency syndrome
DALY	disability-adjusted life-year
DOT	directly observed treatment
DOTS	first component and pillar element of the Stop TB Strategy recommended for the control of tuberculosis
DRS	drug resistance survey
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EU	European Union
EXPAND TB	Expanding Access to New Diagnostics for TB, Project
GDP	Gross domestic product
GLC	Green Light Committee
HIV	human immunodeficiency virus
HMDRC	High MDR-TB burden countries
HPC	High TB priority countries (in the WHO European Region)
LPA	Line Probe Assay
MDR-TB	multidrug-resistant tuberculosis, resistant to isoniazid and rifampicin
NTP	National Tuberculosis Programme
PHC	primary health care
TB	tuberculosis
USAID	United States Agency for International Development
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)
Xpert MTB/rifampicin	A cartridge-based, automated diagnostic test that can identify *Mycobacterium* tuberculosis and resistance to rifampicin

Foreword

Since I took office as the WHO Regional Director for Europe, I have intensified our support for Member States in their efforts to improve public health, prevent disease and provide equitable access to health services in the framework of the new European health policy Health 2020. Health 2020 will build partnerships for action and capture promising innovations to address drivers of health and health equity. While tackling the complex determinants of health and noncommunicable diseases, we cannot afford to let tuberculosis take lives. Europe has been in the forefront of tuberculosis prevention and control for centuries; however the emergence of drug-resistant tuberculosis (MDR-TB) is now seriously hindering our efforts to achieve the Millennium Development Goals.

The European Region has the highest rate of MDR-TB in the world, which speaks of the failure of health systems to treat the disease effectively. Additionally, the social determinants contributing to emergence and spread of the disease still prevail in most settings. People living with HIV, migrants, prisoners and other vulnerable populations are at most risk, but TB can practically infect everyone. Despite the availability of new diagnostic techniques, only one third of estimated MDR-TB cases are diagnosed and only two thirds of these are reported as receiving adequate treatment. Our Region has the lowest success rate for treatment of pulmonary TB patients; this contributes to the further spread of MDR-TB. Based on a decision of the sixtieth session of the WHO Regional Committee for Europe in 2010, the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis (M/XDR-TB) in the WHO European Region 2011–2015 has been developed to strengthen and scale up efforts to address the alarming problem of drug-resistant TB in the Region.

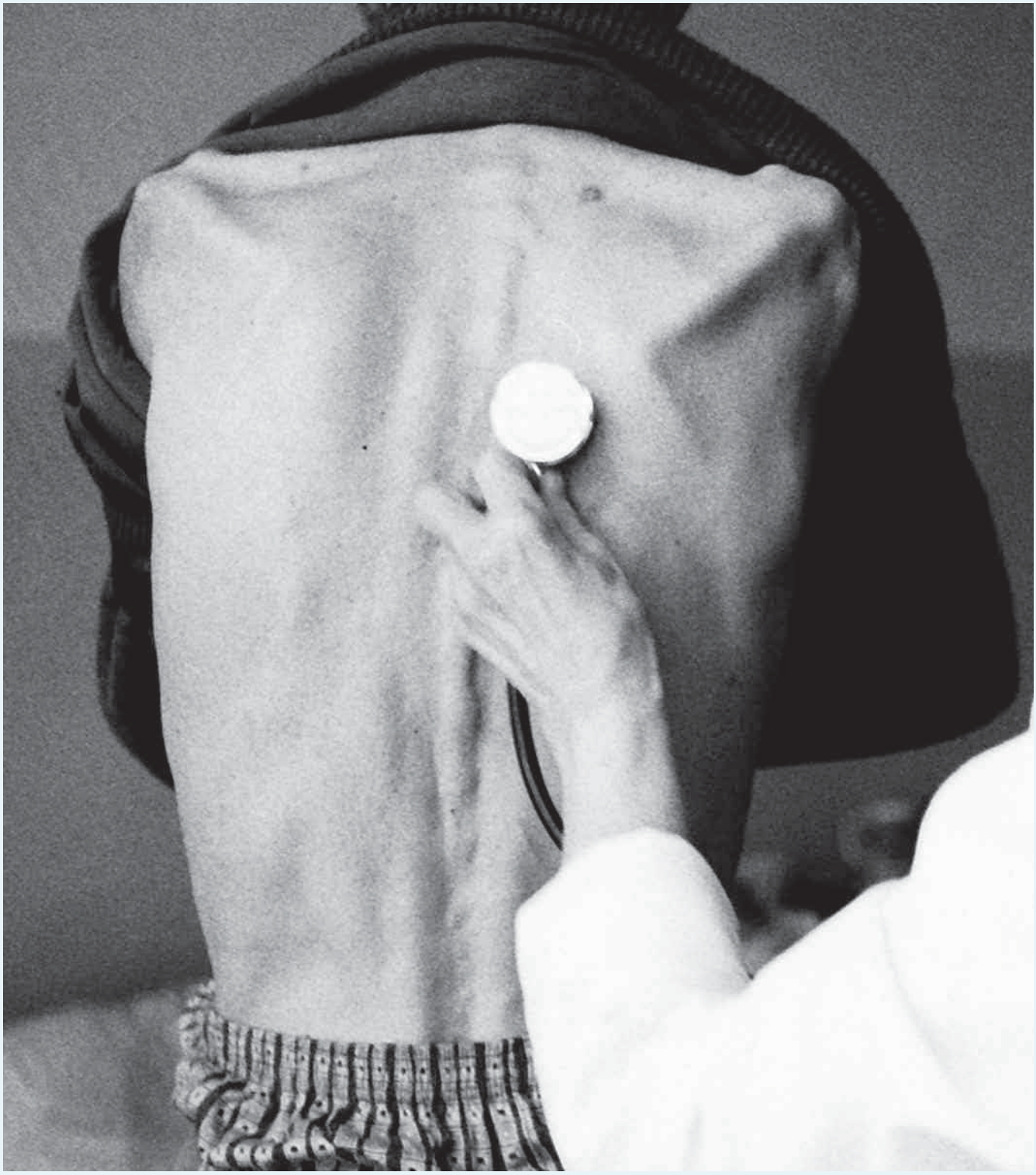
This Plan, which has been drawn up with unprecedented consultation among the 53 Member States, experts, patients and communities suffering from the disease, takes account of the new diagnostic techniques, patient-centred models of care and tailored services for specific populations. The Plan and its accompanying resolution were fully endorsed by the sixty-first session of the WHO Regional Committee in Baku in September 2011.

We need to act urgently to prevent and combat MDR-TB and XDR-TB. The implementation of the Consolidated Action Plan would mean that the emergence of 250 000 new MDR-TB patients and 13 000 XDR-TB patients would be averted, an estimated 225 000 MDR-TB patients would be diagnosed and at least 127 000 of them would be successfully treated.

In order to implement the Plan, US$ 5.2 billion is needed. Although the majority of the resources are expected to be provided by the Member States, there will be a funding gap. We believe that the funding agencies, particularly the Global Fund to Fight AIDS, Tuberculosis and Malaria, will assist. Implementing the Plan would be a cost–effective intervention through the number of MDR-TB cases averted and lives saved. If the Plan is not implemented, the economic loss to the Region would be US$ 12 billion within five years.

This Action Plan is breaking new ground. The Regional Office and its partners will provide technical and moral support to Member States as they commit themselves to implementing it. It comes at the right time, when we still have the opportunity to beat this insidious disease.

Zsuzsanna Jakab
WHO Regional Director for Europe



Executive summary

The Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis (M/XDR-TB) in the WHO European Region 2011–2015 has been developed to strengthen and intensify efforts to address the alarming problem of drug-resistant TB in the Region.

The Plan has been prepared in Region-wide consultation with representatives of the 53 European Member States, experts, patients and communities suffering from the disease. The participatory process of developing the Plan was led by the Regional Director's Special Project to Prevent and Control M/XDR-TB and was overseen by an independent steering group composed of representatives of key technical and bilateral agencies, Member States and civil society organizations.

In order to scale up a comprehensive response and to prevent and control M/XDR-TB, the Action Plan has been 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 2020 strategy and highlight the corporate priorities of the WHO European 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.

Following a detailed assessment of interventions in the Region to tackle TB and MDR-TB, and considering the Member States' responses to the Regional Director's request for input and feedback at the Eighteenth Standing Committee of the Regional Committee's second session (Andorra, 18–19 November 2010), the first draft of the Consolidated Action Plan was prepared. The WHO Regional Office for Europe organized a three-day workshop in Copenhagen from 6 to 8 December 2010 and finalized the second draft of the Plan with the participation of country representatives and key experts in the field. The Plan was posted on the Internet between 25 February and 11 April 2011 for consultation with the public and civil society and sent on 5 May 2011 to Member States for their review and inputs. This document includes the comments and inputs received.

The Regional Office has developed a monitoring and evaluation framework and integrated it in the Consolidated Action Plan. A joint platform with partners will be established to follow up and assist in the implementation of the Plan.

The Consolidated Action Plan was endorsed by the WHO Regional Committee for Europe at its sixty-first session in Baku, Azerbaijan, in September 2011, together with the supporting resolution (Annex 1).

The Regional Office has assisted Member States with high burdens of MDR-TB to develop summary national MDR-TB response plans based on the commitment made by ministers from the 27 countries in the world with a high M/XDR-TB burden meeting in Beijing in 2009. These summary plans have not, however, been fully costed and endorsed in most Member States. The Consolidated Action Plan will act as a guide for Member States in the further development and integration of national MDR-TB response plans into their national TB and/or national health strategy plans.

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

Successful implementation of the Action Plan would mean that the emergence of about 250 000 new MDR-TB patients and 13 000 XDR-TB patients would be averted; an estimated 225 000 MDR-TB patients would be diagnosed and at least 127 000 of them would be successfully treated, thus interrupting the transmission of MDR-TB; and about 120 000 lives would be saved.

Implementation of the Plan would lead to direct savings of US$ 5 billion in the short term and US$ 48 billion in the long term. In addition, US$ 7 billion would be directly saved on costs for treatment of M/XDR-TB cases that will be averted during the period 2011–2015. These costs only represent the estimated impact of the Plan within its five-year duration, although its implementation will have an undetermined impact on preventing transmission and thus averting many more MDR-TB cases beyond 2015.

Furthermore, the estimated budget of US$ 5.2 billion is a conservative estimate, because it was based on a costing scenario of the average cost of three months inpatient care for MDR-TB patients. Under this scenario, 38% of the budget would be for inpatient care. If the average length of stay is eight months, as it is in many countries of the Region, the percentage of inpatient care would be above 70% of the overall budget. Analysis of various costing scenarios showed that with variations in inpatient care, the budget for implementation of the Plan could range from US$ 3.7 billion to US$ 9.8 billion. Resource availability and gap analysis showed that with assumptions of increase of funding the gap to fund the US$ 5 billion will be 13% of the needs. However, without the increase in funding, the gap will be 68% of the needs.

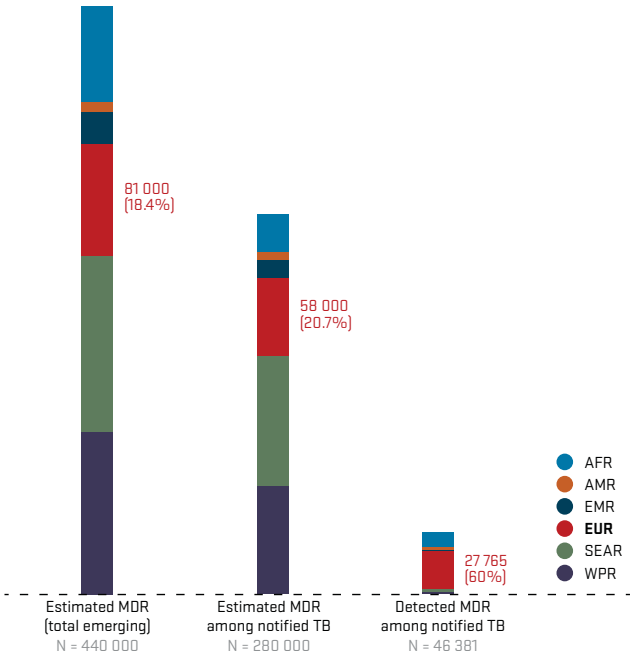
Introduction and background

Multidrug- and extensively drug-resistant tuberculosis (M/XDR-TB) is a man-made phenomenon that emerges as a result of inadequate treatment of tuberculosis and/or poor air-borne infection control in health care facilities and congregate settings. In 2009, over 330 000 new and relapsed cases of TB (5.6% of the global burden) and more than 46 000 deaths due to TB were reported in the WHO European Region, the majority of them in 18 countries which have made it a high priority to stop TB (HPC) *(1)*.[1] Although the trend in TB notification has been falling since 2005, the notification rate of new and relapsed cases of TB in the 18 HPC is still eight times higher than in the rest of the Region (73 vs. 9 cases per 100 000) and double the regional average (37 per 100 000 population) *(2)*.

Of the 440 000 (range 390 000–510 000) estimated multi-drug-resistant TB (MDR-TB) cases, both primary and acquired, in the world, 81 000 (range 73 000–90 000) are estimated to be in the European Region (18.4% of the global burden). The Region also contains the top 15 countries in the world with the highest proportion of MDR-TB among newly diagnosed and previously treated cases of TB (Fig. 1, 2) *(3)*.[2] Of the 27 countries worldwide with a high burden of MDR-TB, 15 are in the Region *(4)*. The profiles of the 15 high MDR-TB burden countries can be found in Annex 5. MDR-TB is also reported as being linked to upstream determinants of health such as low socioeconomic status, migration and urbanization, leading to downstream TB risk factors such as poor living conditions (indoor pollution, malnutrition), imprisonment, specific health behaviour (tobacco use, alcohol and drug abuse, diabetes) and HIV infection that are of great concern for most countries of the Region, irrespective of their burden of TB.

Both globally and regionally, TB and MDR-TB are observed to occur disproportionately among men, as they are more likely to be exposed to risk factors such as tobacco and alcohol consumption or imprisonment. Gender differences in TB notification rates in some eastern European countries are, however, higher than expected, suggesting that some women may be failing to seek diagnosis and care in time.

Fig. 1. **Proportion of cases of MDR-TB emerged and notified in the WHO European Region compared to other WHO regions, 2009**



Source: Data extracted from *Global tuberculosis control: WHO report 2010 (3)*. AFR: African Region; AMR: Americas Region; EMR: Eastern Mediterranean Region; SEAR: South-East Asia Region; WPR: Western Pacific Region.

MDR-TB is also the result of differential exposure to the risk factors described above and inequitable access to health and social protection systems.

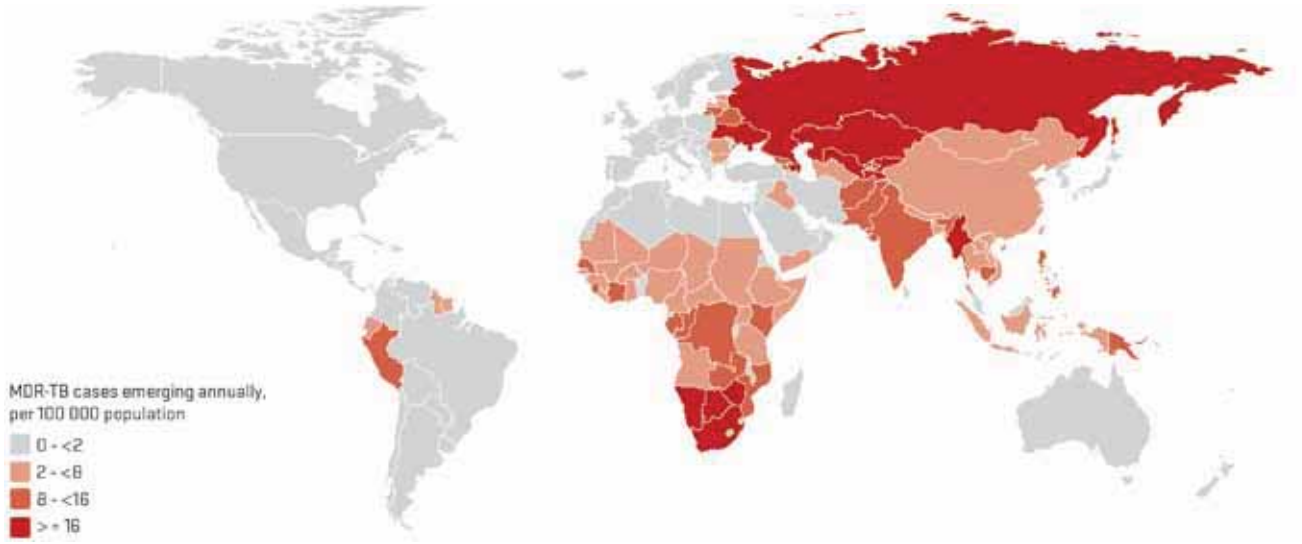
In 2009, the proportions of MDR among newly diagnosed and previously treated TB patients were very alarming, at 11.7% and 36.6%, respectively (Fig. 3). Furthermore, many countries in the Region have reported extensively drug-resistant TB (XDR-TB), including those in the European Union/European Economic Area (EU/EEA).[3] In spite of the still very low coverage (2.7%) of drug susceptibility testing with second-line drugs, especially in eastern Europe,

1 Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Romania, Russian Federation, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan.

2 High-burden MDR-TB countries were selected on the basis of an estimated absolute number of at least 4000 MDR-TB cases arising annually and/or at least 10% of all newly registered TB cases estimated with MDR-TB, as of 2008. The 15 countries of the WHO European Region with a high MDR-TB burden are Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Ukraine and Uzbekistan.

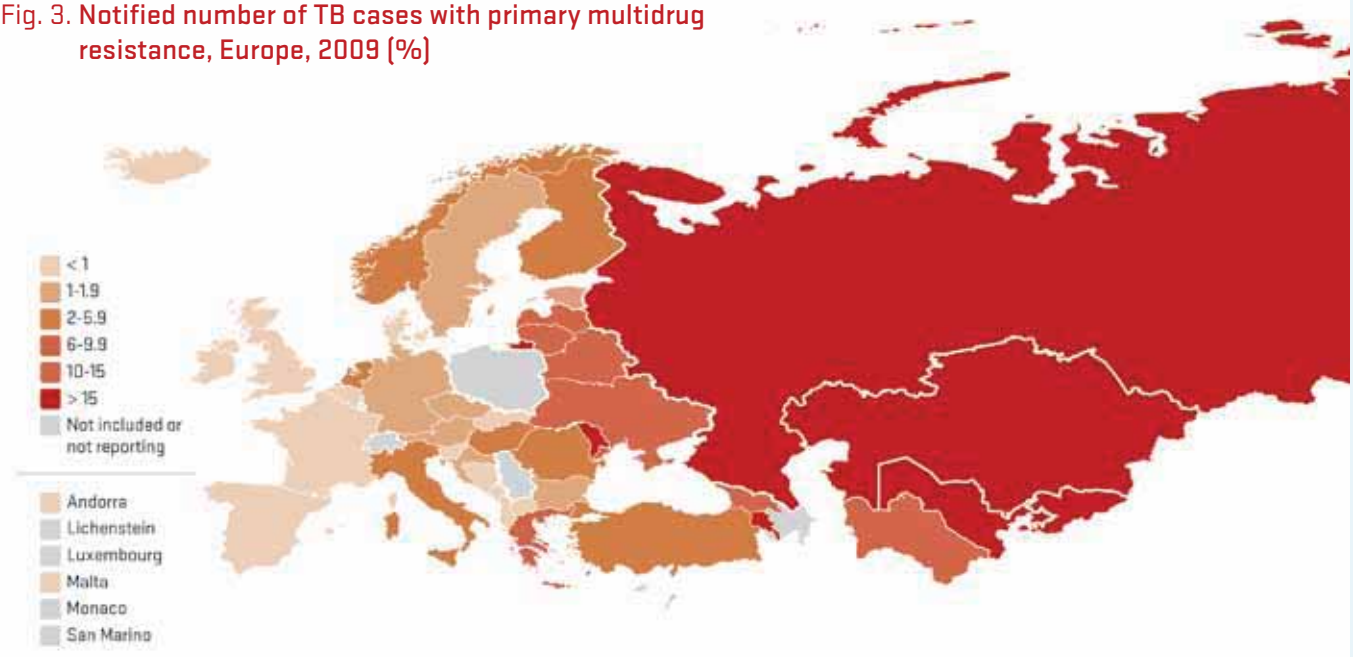
3 The 30 EU and EEA countries are: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom. The 24 countries in the rest of the European Region (non-EU/EEA) are: Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Croatia, Georgia, Israel, Kazakhstan, Kyrgyzstan, Monaco, Montenegro, Republic of Moldova, Russian Federation, San Marino, Serbia, Switzerland, Tajikistan, the former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine and Uzbekistan.

Fig. 2. **Estimated global MDR-TB incidence, 2009**



Source: Data extracted from *Global tuberculosis control: WHO report 2010 (3).*

Fig. 3. **Notified number of TB cases with primary multidrug resistance, Europe, 2009 (%)**



Source: European Centre for Disease Prevention and Control/WHO Regional Office for Europe *(2).*

the total number of patients with XDR-TB notified in the Region almost tripled from 132 in 2008 to 344 in 2009, the vast majority of them (81%) in non-EU/EEA countries. In order to diagnose XDR-TB, there is a need for second-line drug susceptibility testing, which is not readily available for all patients.

In 2009, from an estimated 81 000 (range 73 000–90 000) MDR-TB patients, only 27 765 cases (34%) were notified due to limited laboratory capacity (Table 1) *(2, 3)*. Of these, only 61.8% (17 169 cases) were reported as receiving adequate treatment with quality second-line drugs.

The treatment of MDR-TB patients is lengthy, taking up to two years with second-line drugs and sometimes surgery, often accompanied by adverse effects, imposing a further burden on patients and their families. In 2008, the treatment success rate among MDR-TB patients in the Region receiving quality-assured second-line drugs was 57.4%, while the other one third of notified MDR-TB patients had no (or were not reported as having) access to quality treatment. Access to quality second-line drugs for treatment of M/XDR-TB is limited in many Member States. Some of these drugs are too expensive and/or not available for all the patients.

The drug supply system often fails to ensure treatment for the whole course of treatment. Hospital services have serious setbacks, which in some cases contribute to the development of M/XDR-TB, while outpatient services face serious challenges to ensure continuity of care and access by socially vulnerable groups.

Despite good progress in several countries, the TB control network has not fully included the prison system. There are still wide differences in policy and administration, including financial capacity, between ministries of health and penitentiary health authorities in many countries, leading to unequal health care services.

The WHO-recommended package of airborne infection control measures is not at present being implemented in most diagnostic and treatment facilities. The latest available data from the 15 high MDR-TB burden countries indicate that implementation of TB infection control interventions is still limited. Infection control assessments have been carried out in 10 of these countries, but only 4 have national infection control plans while 6 are in the process of preparing them.

In response to the alarming problem of M/XDR-TB in the WHO European Region, the Regional Director has established a Special Project to Prevent and Combat M/XDR-TB in Member States. The Regional Office, in collaboration and coordination with other partners, has provided guidance and technical assistance to Member States to improve TB, MDR-TB and TB/HIV prevention, control and care, including planning and programme management, airborne infection control, surveillance, monitoring and evaluation, development of human resources capacity, quality-assured laboratory diagnosis, guidelines and policy development, provision of quality medicines through the Global Drug Facility and Green Light Committee, advocacy, communication and social mobilization. The institutional capacity of health systems needs to be improved to ensure sustainable and effective TB and M/XDR-TB prevention and control.

Bacille Calmette-Guérin (BCG) – the only vaccine so far available against TB – was first used in 1921. It has limited efficacy for protection against the disease and cannot be administered to people living with HIV, although it can protect, to some extent, against the severe form of TB in children. The most effective medicines against TB were discovered in the 1950s; since then, other agents have been introduced with often more frequent and serious adverse events. There is an urgent need for more effective medicines and vaccines, including for children and people living with HIV. European scientific institutes can play an important role in research and development of new medicines and vaccines.

In mid-2010, an automated rapid nucleic acid amplification test was endorsed by WHO as a rapid method for diagnosis of TB and rifampicin resistance. However, this technology and other WHO-endorsed diagnostic methods are not yet widely available in most countries with a high MDR-TB burden in the Region and their introduction is urgently needed.

Table 1. **The 15 high MDR-TB burden countries in the WHO European Region with an estimated annual incidence of over 4000 MDR-TB cases per year and/or at least 10% newly registered cases with MDR-TB**

Country	Estimated MDR-TB annual incidence, cases (95% CI)	Estimated MDR-TB among new TB cases (%)	Reported MDR-TB in 2009
Armenia	480 (380–580)	9.4 (7.3–12.1)	156
Azerbaijan	4 000 (3 300–4 700)	22.3 (19.0–26.0)	–
Belarus	800 (260–1 300)	12.5 (0.0–25.3)	867
Bulgaria	460 (99–810)	12.5 (0.0–25.3)	43
Estonia	94 (71–120)	15.4 (11.6–20.1)	86
Georgia	670 (550–780)	6.8 (5.2–8.7)	369
Kazakhstan	8 100 (6 400–9 700)	14.2 (11.0–18.2)	3 644
Kyrgyzstan	1 400 (350–2 400)	12.5 (0.0–25.3)	785
Latvia	170 (140–200)	12.1 (9.9–14.8)	131
Lithuania	330 (270–390)	9.0 (7.5–10.7)	322
Republic of Moldova	2 100 (1 700–2 400)	19.4 (16.8–22.2)	1 069
Russian Federation	38 000 (30 000–45 000)	15.8 (11.9–19.7)	14 686
Tajikistan	4 000 (2 900–5 100)	16.5 (11.3–23.6)	319
Ukraine	8 700 (6 800–11 000)	16.0 (13.8–18.3)	3 482
Uzbekistan	8 700 (6 500–11 000)	14.2 (10.4–18.1)	654

Source: World Health Organization *(5)*.

In the Berlin Declaration on Tuberculosis, endorsed in 2007, all Member States committed themselves to respond urgently to the re-emergence of TB in the Region and properly addres M/XDR-TB *(6)*. Adequate interventions addressing drug-resistant TB require proper national planning and effective implementation, comprehensive approaches in and across countries and strong support from national and international partners. They therefore depend on strong institutional capacity at national, subnational and transnational levels. Ministers from the 27 countries of the world with a high M/XDR-TB burden met in Beijing, China, from 1 to 3 April 2009 to address urgently the alarming threat of M/XDR-TB. 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 *(7)*. In May 2009, the sixty-second World Health Assembly in its Resolution 62.15 urged all Member States to achieve universal access to diagnosis and treatment of M/XDR-TB as part of the transition to universal health coverage, thereby saving lives and protecting communities *(8)*. The 15 high MDR-TB burden countries in Europe have already developed their national M/XDR-TB response plans for 2011–2015. They now need to align their approved national TB plans with the new commitments in preventing and controlling M/XDR-TB.

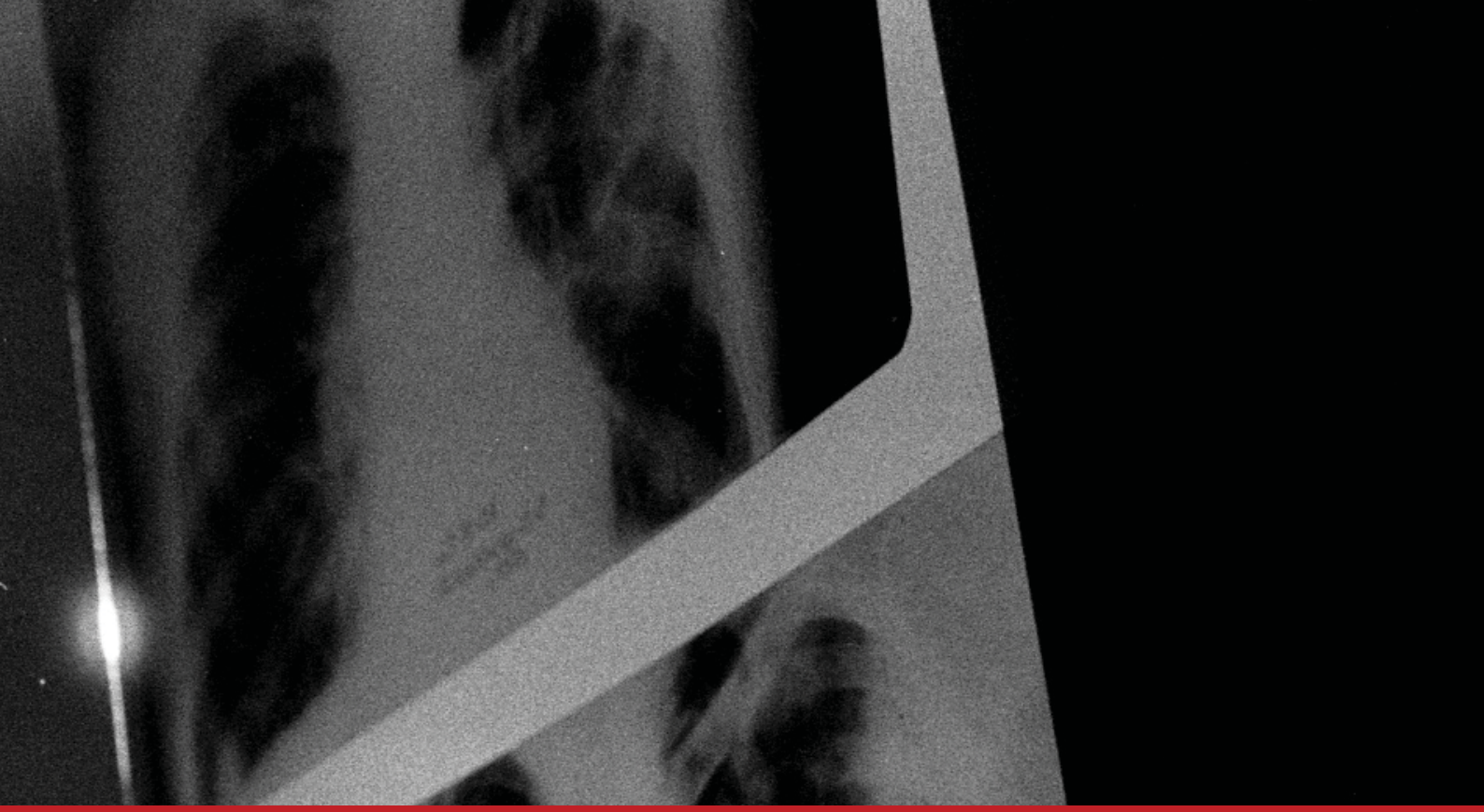
The WHO Regional Director for Europe has confirmed WHO's strong commitment to fight against TB and M/XDR-TB as a regional priority and to develop an action plan to prevent and combat M/XDR-TB in the Region. This position was endorsed by the Regional Committee at its sixtieth session in Moscow in September 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 in the WHO European Region 2011–2015 has been 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 2020 strategy and highlight the corporate priorities of the WHO European 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.

The Action Plan has been developed under the guidance of an independent steering group, which included representatives of selected Member States, technical agencies and civil societies involved in TB control in Europe.[4] It is consistent with the Beijing Call for Action and the Berlin Declaration.

A task force led by the Regional Office has developed a comprehensive monitoring and evaluation framework to document progress in the implementation of the Plan (Annex 2).

4 The steering group included: the European Centre for Disease Prevention and Control, the European Commission, the European Respiratory Society, the Global Fund to Fight AIDS, Tuberculosis and Malaria, the International Union Against Tuberculosis and Lung Disease, KNCV Tuberculosis Foundation (Netherlands), Partners in Health, United States Agency for International Development (USAID), WHO headquarters and the Regional Office. In October 2010, the steering group was expanded to include civil society representatives (TB Europe Coalition) and English-speaking TB focal points from Germany, Netherlands, Romania, Russian Federation, Slovakia and Uzbekistan.



Outline of the Consolidated Action Plan

Goal

To contain the spread of drug-resistant tuberculosis by achieving universal access[5] to prevention, diagnosis and treatment of M/XDR-TB in all Member States of the WHO European Region by 2015 *(8)*.

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;[6]

» to diagnose at least 85% of all estimated MDR-TB patients by the end of 2015;[7]

» 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 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);

6. to monitor the trends of M/XDR-TB in the Region and measure the impact of interventions (area of intervention 5) (Annex 3).

Areas of intervention

Based on the objectives in the Global Plan to Stop TB 2011–2015 *(9)*[8] 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;

7. address the needs of special populations.

Milestones

It is anticipated that the following milestones will be achieved:

» by the middle of 2012, establishment of a regional mechanism for coordination and collaboration among partners for provision of technical assistance and scale-up of the response to M/XDR-TB;

» by the end of 2013, availability of a rapid molecular diagnosis test for MDR-TB[9] endorsed by WHO and in use for all eligible patients in Member States;

5 Universal access is defined as evidence-based practices and quality services that are available, accessible, affordable and acceptable by people irrespective of their age, sex, sexual orientation, religion, origin, nationality, socioeconomic status or geographical background.

6 It would, however, be difficult within the time span of this Consolidated Action Plan – if indeed possible – to reduce primary MDR-TB significantly enough to be attributable to interventions under the Plan. Apart from the need to improve airborne infection control in health care facilities and congregate settings, many primary MDR-TB patients who have been infected in the community might develop MDR-TB in the near future. The proportion of MDR-TB among previously treated patients would be a more sensitive indicator of improvement in case-holding and appropriate treatment of patients and thus preventing the further development of MDR-TB.

7 In 2009, only 34.5% of estimated MDR-TB patients were notified. With universal access to diagnosis, it would be expected that most sputum culture-positive patients would be identified, notified and reported, although many culture-negative TB patients may not be detected.

8 It has been decided to refer to the objectives in the Global Plan as "areas of intervention" and to define specific objectives under each of these areas, to ensure they are "SMART" (specific, measurable, achievable, realistic and time-bound).

9 A rapid test is defined as one which provides a diagnosis within 48 hours of the specimen being tested and can therefore influence the initial treatment on which a patient is placed.

- by the end of 2014, introduction of an electronic case-based database for notification and treatment outcome of MDR-TB patients at national level in all high MDR-TB burden countries;
- by the end of 2013, reporting by all high MDR-TB burden countries of more than 50% of estimated MDR-TB cases;
- by the end of 2013, completion by all 18 European HPC of a knowledge, attitude and practice survey and undertaking of a health system assessment needs related to TB and MDR-TB;
- by the end of 2012, national M/XDR-TB action plans adopted, budgeted and embedded in the national TB strategic plans of all 18 European HPC;
- by the end of 2013, provision by all Member States of an uninterrupted supply of quality-assured first and second-line drugs for treatment of all TB and M/XDR-TB patients;
- by the end of 2013, monitoring and reporting of treatment outcomes of M/XDR-TB patients by all Member States according to internationally recommended methods;
- by the end of 2012, testing of all previously treated TB patients for resistance to first- and second-line drugs;
- by the end of 2015, availability of at least one new medicine for M/XDR-TB patients with a more effective and shorter treatment regimen for use.

Costs and economic benefits of implementing the Plan

The Regional Office has commissioned the Royal Tropical Institute in Amsterdam to develop a detailed costing tool for the implementation of the Action Plan. The front-line services have been costed, including the detection and treatment of MDR-TB and XDR-TB patients. Stewardship costs include funds needed for human resource capacity-building and technical assistance. Based on the best estimates, implementation of the Plan would cost US$ 5.2 billion. The cost of treating an MDR-TB patient undergoing a standard treatment cycle of 24 months was calculated, and the direct cost of treating an MDR-TB patient amounted to US$ 25 400 in HPC and US$ 56 300 in non-HPC. Inpatient treatment represented about 43% and 68% of the treatment cost for MDR-TB and XDR-TB cases, respectively. The cost–effectiveness of implementation of the intervention was assessed by calculating the costs per life saved, and by comparing the costs per disability-adjusted life-year (DALY) gained with the gross domestic product (GDP). The latter method showed that the intervention was highly cost-efficient, an average cost of US$ 2044 per DALY gained versus an average GDP of US$ 24 346 in the Region.

The economic gain of implementing the Plan was derived from saving 120 000 lives and averting 263 000 M/XDR-TB cases. The direct economic gain from saving 120 000 lives amounted to US$ 5 billion in the short term (DALYs gained up to 2015) and US$ 48 billion in the long term. The short-term indirect economic gain from averting 263 000 M/XDR-TB cases amounted to about US$ 6.9 billion. The long-term indirect economic gain has not been determined, but will go beyond this number because many future transmission events may be averted, which could be shown through development of extensive transmission modelling. Annex 4 presents an overview of the costs, economic benefits and methodology.

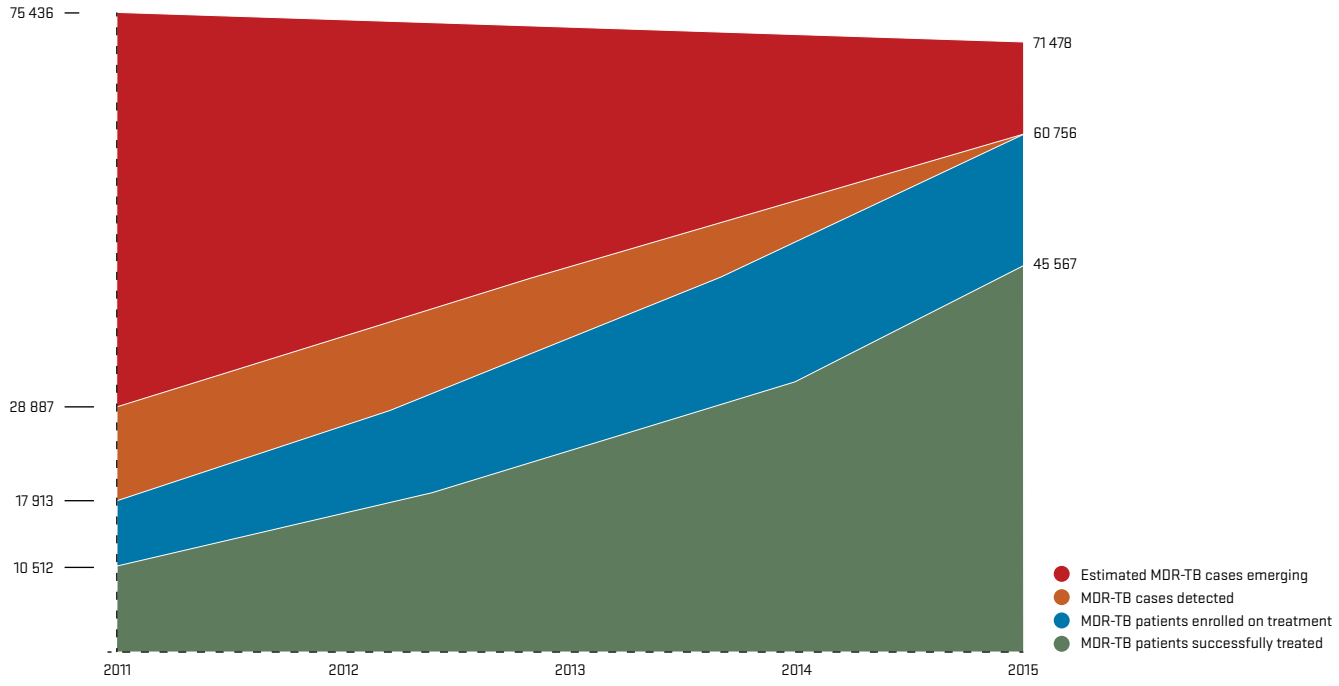
Expected achievements[10]

Epidemiological modelling developed by the Regional Office together with the M/XDR-TB costing tool indicate that the implementation of the Consolidated Action Plan will result in:

- 225 000 MDR-TB patients being diagnosed within three days of presenting to a health care service with TB symptoms;
- 127 000 DR-TB patients being treated successfully (Fig. 4);
- 250 000 cases of MDR-TB and 13 000 XDR-TB cases being averted, saving US$ 7 billion;
- 120 000 lives and US$ 5 billion being directly saved in the short term and US$ 48 billion being saved in the long term.

10 The method to determine the expected achievements has been developed in collaboration with the Royal Tropical Institute in Amsterdam. Costs for MDR-TB case detection and treatment, as well as for stewardship, and the epidemiological data used were taken from the following sources: WHO, the European Centre for Disease Prevention and Control, the Foundation for Innovative Diagnostics, UNAIDS and academic publications. When data on TB epidemiology in Europe were not available in these sources, assumptions based on expert opinions and linear progression of targets and milestones defined in the Plan were used. The costs saved by implementation of the Action Plan were defined as the direct costs for the number of lives saved as well as the costs saved from averting M/XDR-TB cases.

Fig. 4. **Expected achievements from the implementation of the Action Plan, 2011–2015**



Regional analysis of the strengths, weaknesses, opportunities and threats in relation to M/XDR-TB

The Consolidated Action Plan is based on a detailed analysis of the strengths, weaknesses, opportunities and threats in relation to M/XDR-TB in the European Region. Annex 3 provides an overview of the problems identified and how the Plan addresses them.

Strengths

Governance

- Member States have evinced a strong political commitment to address the problem of TB through their endorsement of the Berlin Declaration *(6)*, the Beijing meeting of high MDR-TB burden countries *(7)* and World Health Assembly resolutions *(8)*.
- The Regional Director has established a special project to prevent and combat M/XDR-TB in the Region.
- WHO headquarters and the Regional Office have assisted high MDR-TB burden countries to prepare national MDR-TB response plans.
- All 15 high MDR-TB burden countries have finalized their national MDR-TB response plans.
- There is good intelligence on drug-resistant TB based on surveillance of drug resistance in countries, well-established reporting to WHO and the European Centre for Disease Prevention and Control (ECDC) and operational research exploring some social determinants of and risk factors for TB.

National policies

- Some countries in the Region are participating in the WHO Good Governance for Medicines programme.

Partnerships

- The Regional Office and partners have intensified their support to Member States to prevent and control TB and M/XDR-TB.
- An increasing number of national and international organizations are willing to strengthen partnership and coordination.

Implementation

- WHO headquarters, the Regional Office and country offices and other technical agencies have been providing technical assistance to Member States.
- The Global Fund to Fight AIDS, Tuberculosis and Malaria has been instrumental in pilot implementation of MDR/TB control projects.
- Under the Green Light Committee mechanism, 19 countries in the Region have set up MDR-TB control projects.
- Two medicines quality control laboratories in non-EU countries in the Region have been pre-qualified by WHO.
- Several pharmaceutical manufacturers in non-EU countries have initiated a process for pre-qualifying their TB drug products through the WHO pre-qualification mechanism.
- Strong WHO collaborative centres and centres of excellence for MDR-TB control have been established in the Region.
- Member States have skilled health care staff involved in TB prevention and control.

Weaknesses

Health systems

- National TB control programmes are insufficiently engaged in reforms of health systems (with both national and international institutions).
- Interaction with other levels of health systems, including primary health care (PHC) services, is limited by the vertical structure of TB control programmes.
- There is only limited involvement by other sectors (including the private health sector and social services).
- Health and public health professionals and practitioners lack capacity and training in working intrasectorally and intersectorally.
- Coordination is poor between TB and other programmes for collaborative activities (such as for HIV, alcohol, drug users and tobacco and other communicable and noncommunicable diseases).
- TB care for children is not consistently integrated into HIV and primary health care and maternal and child health programmes.
- Collaboration mechanisms for a continuum of care between countries (cross-border TB control, migrant labour) are lacking or inadequate.
- Financing mechanisms provide disincentives in some settings (such as financing based on bed occupancy rather than performance of services, which results in large bed capacity and long hospitalization).

- Fragmentation in financial flows by programme, as well as inappropriate incentives, inhibits coordinated responses by health systems and causes misalignment between policies and implementation on the ground. Unclear mandates and stewardship across agencies (for example, penitentiary and civil), actors and levels of care regarding M/XDR–TB are hampering an effective response by Member States.
- Inefficient and unequal distribution of health resources (notably in human resources and pharmacies) is leading to ineffective responses from health systems.
- Weak provider networks and referral systems are undermining the capacity of health systems to ensure case detection, follow-up and continuity of treatment in PHC and other ambulatory care facilities and are likely to contribute to X/MDR-TB.
- Entrenched political power in TB hierarchies has created a strong resistance to change.
- DOTS is being poorly implemented in some countries.

National policies

- TB policy and guidelines are outdated in some countries.
- Most countries lack policies for multidisciplinary approaches to patients' problems (socioeconomic status and poverty, unemployment, psychiatric disorders, alcoholism and drug addiction).
- There is a lack of policies on preventive treatment regimens for M/XDR-TB.

Case-finding and diagnosis

- MDR-TB is being under-diagnosed in children, with a consequent risk of drug resistance spreading.
- Contact-tracing is poor in some settings.
- Limited coverage of culture and drug susceptibility testing led to only 34% of estimated MDR-TB being detected in 2009.
- Most Member States have only a limited diagnostic capacity for early detection of TB and M/XDR-TB.
- External quality assurance of culture and drug susceptibility testing has not yet covered all patients.
- External quality assurance drug susceptibility testing for second-line TB drugs (especially second-line injectables and fluorquinolones) is largely unavailable.
- Good established laboratory networks are lacking.
- There is a lack of paediatric diagnostic tools and inadequate surveillance and reporting of TB in children.

Treatment

- Medical care for M/XDR-TB is inadequate in some settings.
- Treatment regimens in some settings are inappropriate.
- There is a lack of novel medicines for shorter and more effective treatment regimens.
- National TB control programmes are either not, or only to a limited extent, involved in strengthening outpatient treatment in some settings.
- Default prevention and retrieval in most settings are weak or non-existent.
- Palliative care for patients who fail M/XDR-TB treatment is not available.
- Management of TB in children is outdated in some countries.

Drug management

- In 2009, only 61.8% of patients diagnosed with MDR-TB benefited from adequate treatment owing to Member States' difficulties in procuring quality second-line drugs.
- Quality-assured second-line drugs are in short supply in some countries.
- Pharmaceutical regulations and inspection in many non-EU countries are weak and lack enforcement mechanisms to assure universal drug quality and prevent over-the-counter sales of antimicrobials (such sales occur in some Member States).
- Weak pharmacovigilance mechanisms and a lack of unbiased drug information for prescribers and patients in most high MDR-TB burden countries are possible contributors to irrational (improper) use of TB medicines.
- Most countries in the Region do not have a law on procurement of medicines that would define medicines as products requiring unique specifications and action to assure their quality.
- There is a lack of centralized units for procurement and distribution of second-line drugs.

Information systems

» Reporting and information-sharing among international technical agencies and bilateral donors is poor.

» Many Member States lack surveillance of M/XDR-TB.

» Treatment outcome definitions for M/XDR-TB are either absent or applied differently so that comparability of treatment success cannot be used as an important indicator of TB control quality.

» Surveillance mechanisms based on matched information coming from both laboratories and clinicians are inadequate.

» Reporting on social determinants and equity is limited, so it is difficult to establish which populations are most at risk beyond general categories (for example, prisoners and injecting drug users).

Infection control

» Airborne infection control is poor in most inpatient facilities and laboratories.

» The infrastructure of many TB inpatient and outpatient facilities is below national and international standards.

» There is a lack of evidence-based policies on hospitalization in most settings, including excessive and long admissions and poor preparation for discharge to ambulatory care.

Human resources

» Human resources are overburdened (TB services are understaffed, at least in some settings): staff are poorly motivated, underpaid and overloaded.

» In some settings, human resources are not being organized in such a way as to guarantee that M/XDR patients receive dedicated high-quality health care.

» TB clinical expertise is getting weaker in low-prevalence countries.

Community involvement

» Civil society is only involved to a limited extent in TB prevention, control and care.

» Patient-centred approaches are not fully established in most high MDR-TB burden countries and there is a lack of mechanisms/initiatives for community-based treatment.

» Public health education is inadequate, leading to a prevailing stigma.

» TB and MDR-TB patients are insufficiently involved in advocacy and a watch-dog role.

Special populations

» Coordination is weak between the different health authorities involved in TB control and the civilian and penitentiary services.

» Marginalized populations (homeless, migrants, etc.) and vulnerable groups (such as children and pregnant women) lack access to adequate diagnosis and treatment.

» Stigma and discrimination associated with MDR-TB worsen adherence to treatment.

Opportunities

(Subregional) partnerships

» Intercountry cooperation would address cross-border TB control and care and improve second-line drug availability.

» Cities or institutes responsible for TB control could be twinned.

» Goodwill ambassadors and private entrepreneurs could be involved in TB control.

» The involvement of civil society, patients' associations and professional societies could be increased.

Health systems

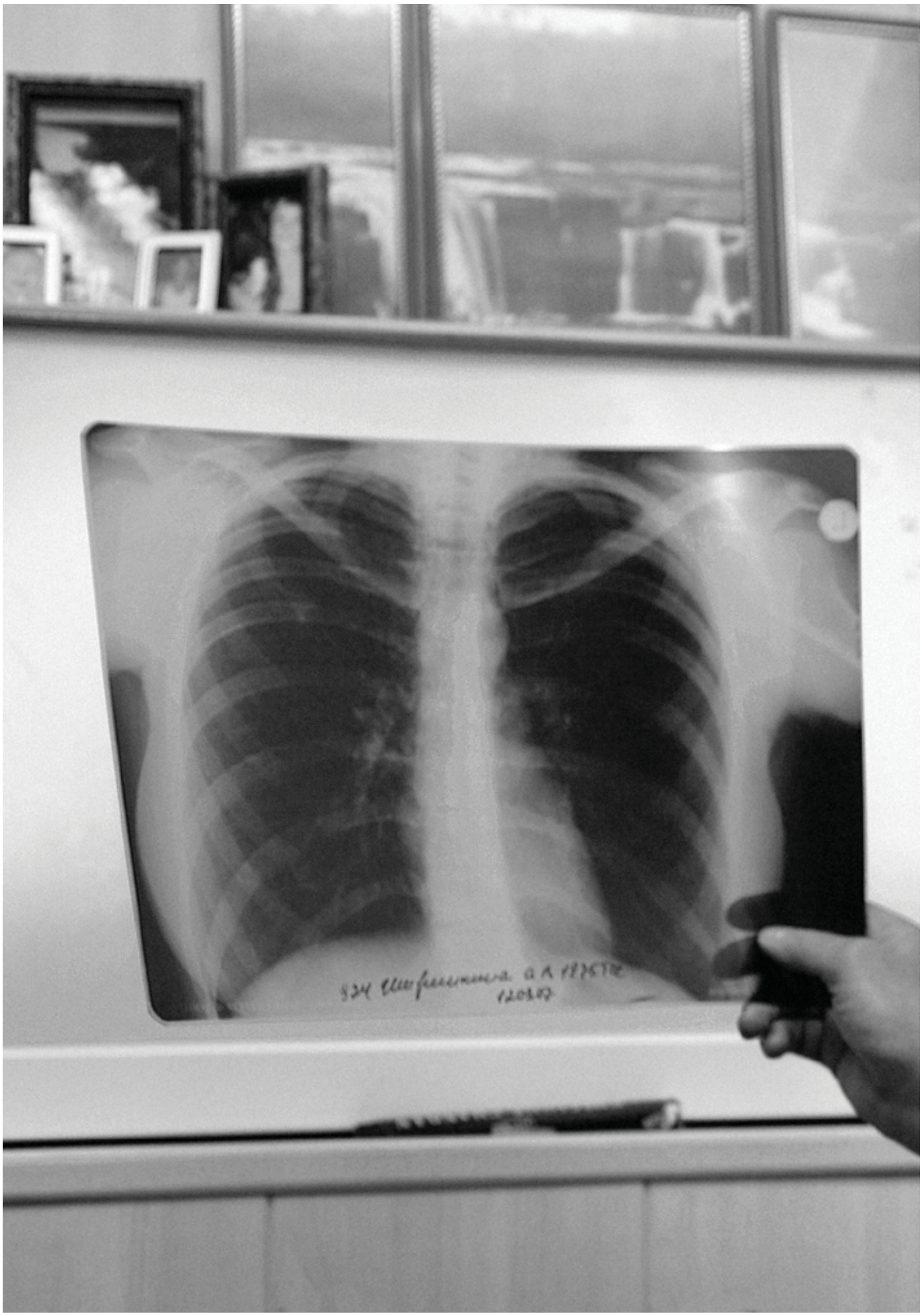
» The private sector could be involved. Services could be purchased by health insurance funds and university health care services from ministries of health.

» The involvement of bilateral agencies, the Global Fund, UNITAID, TB REACH and other funding mechanisms could be stepped up to fill the gaps in financing.

Technical

» A new rapid diagnostic test has been endorsed by WHO, which can confirm rifampicin resistance with high positive and negative predictive values.

» The Regional Office has started a European Review of Social Determinants and the Health Divide, which will also be looking at the social determinants of TB and their distribution and how to address them in the Health 2020 strategy.



Threats

Health systems

» Social determinants, risk factors and health system factors contributing to an increase in MDR-TB still prevail.

» Health systems in transition and the global financial crisis are threatening health and health protection systems and contributing to a widening of the health divide.

» Interventions initiated under the Global Fund grant will not be taken over by national health authorities owing to shortages of funds and the financial crisis.

» Civil society organizations and patients' associations supported through the Global Fund may be obliged to reduce or end their activities if national health authorities do not take over all components of the TB programme and continue to finance them.

» Global Fund eligibility criteria can be modified and as a result some high MDR-TB burden countries may not be eligible for grants.

» The financial crisis and budget cuts are leading to fewer resources available for TB and M/XDR-TB control.

» Funds to scale up MDR-TB prevention, diagnosis and treatment are lacking.

» Such lack of funds may slow down or even interrupt the development of new tools against TB.

» Poor quality DOTS implementation and MDR-TB management are seriously contributing to an increase in M/XDR-TB.

» The vertical structure of TB control programmes leads to limited interaction with other levels of health systems, including PHC services.

» Other sectors (such as the private health sector or social services) are only involved to a limited extent.

» Coordination is poor between TB and other programmes for collaborative activities (such as for HIV, alcohol, drug users and tobacco and other communicable and noncommunicable diseases)

Technical

» HIV infection and other co-morbidities continue to rise, particularly among vulnerable groups.

» There is only limited or no uptake of findings with regard to social determinants (particularly upstream factors such as gender) and their impact on X/MDR-TB.

» Existing pharmaceutical policies, regulations, and practices may not support the rapid introduction, adoption and implementation of new TB tools and their proper utilization.

International dimensions

» Reporting and information-sharing is poor among international technical agencies and bilateral donors.

Areas of intervention
(adapted from the objectives of the Global Plan 2011–2015)

1. Prevent the development of M/XDR-TB cases

In order to decrease the burden of the disease, every effort should be made to prevent the development of drug-resistant TB and particularly MDR-TB.

Among the main causes for the emergence of MDR-TB is inadequate and inappropriate treatment. TB patients diagnosed should be put on appropriate treatment regimens as early as possible. They need to be counselled and supported throughout the course of treatment in order to increase their adherence to treatment. Some of the interventions related to this area are discussed under scaling up the management of drug-resistant TB (area of intervention 6) and TB infection control (area of intervention 4). In this area, two other distinctly relevant interventions are considered: improving patient adherence and preventive treatment.

1.1 Identify and address social determinants related to M/XDR-TB

Activity 1.1.1 The Regional Office and partners, in collaboration with the Member States, will conduct studies on social determinants and reasons for defaulting from treatment for M/XDR-TB by the end of 2012.

Activity 1.1.2 All Member States will include action in their national health strategies to address the social determinants of M/XDR-TB in their national budgets by the end of 2013.

Activity 1.1.3 All Member States will define measures to engage national and local governments, together with partners, in providing psychosocial support for TB and M/XDR-TB patients by the end of 2013.

1.2 Improve patient adherence to treatment

Activity 1.2.1 In collaboration with partners, the Regional Office will document the best practices for models of care and patient support (inpatient, outpatient, home/community-based models of care) in different settings and provide a compendium of models and minimum packages of interventions enabling and facilitating patients to adhere to treatment by the end of 2012.

Activity 1.2.2 In collaboration with partners, the Regional Office will provide technical assistance to Member States on aspects of health systems and patient-centred approaches on a continuous basis, notably health system stewardship/governance, financing, service delivery and resource creation and management, with particular emphasis on enabling PHC and ambulatory care services to assume the responsibility for action regarding TB and M/XDR-TB as stated in this Action Plan, including "boundary management" between the prison and civil health systems to ensure continuity of care.

Activity 1.2.3 From 2012 onwards, the Regional Office and other partners will analyse and assess every other year the options for models of care and case-holding in collaboration with national TB programme managers and health authorities.

Activity 1.2.4 All Member States will strengthen and/or establish measures to improve the prevention of treatment default and retrieval by the end of 2012. These efforts and their impacts are to be reported during the national TB programme managers' meeting in 2013.

Activity 1.2.5 By the first quarter of 2014, all Member States will specify strategies and mechanisms for expanding ambulatory treatment and social support and their linkages with the national health plans, and measures to engage national and local governments in the provision of continuous quality ambulatory treatment. They will also support interventions such as incentives and social and psychosocial support for TB and M/XDR-TB patients.

1.3 Increase the efficiency and availability of health financing for TB control

Activity 1.3.1 By the end of 2013, the Regional Office and partners, in collaboration with the Member States, will conduct an in-depth health financing analysis of current resources available for TB prevention and control interventions, including the organization of funding flows, in order to identify: sources of fragmentation, potentially perverse or misaligned provider payment incentives associated with different types of TB intervention, formal or informal out-of-pocket payments that hinder access to care, and other financial and non-financial barriers to access as well as the role of private and public providers and the financial incentives in place for each. They will recommend measures to improve the alignment of financing arrangements with the service delivery strategies that are defined for more effective TB prevention and control.

Activity 1.3.2 The Regional Office, in collaboration with other international donors, will conduct country-specific

operational cost–effectiveness or option assessments of the advantages of different policy options and models of care focused on strengthening case-holding in the 18 HPC by the end of 2013.

Activity 1.3.3 Member States and partners will explore the possibility of establishing financing mechanisms for MDR-TB treatment at supranational level through the development and creation of a European Fund for Treatment of MDR-TB by the end of 2013. Such a Fund could provide financial support to countries according to the number of MDR-TB cases treated.

1.4 Apply the full capacity of PHC services in TB prevention, control and care

PHC services that will assume TB responsibilities must be fully operational to deliver prevention, control and care services and integrated into the TB referral system as well as diagnostics and treatment chains. Member States need urgent investment in human resources, infrastructure and technology to scale up PHC capacity and access to quality prevention, control and care.

Activity 1.4.1 The Regional Office and partners will provide technical assistance to Member States on measures to strengthen PHC involvement in TB prevention and control.

Activity 1.4.2 The Regional Office will support the development of formal collaboration agreements between regional TB and public health centres of excellence on the one hand and national TB programmes and health authorities responsible for TB policy in the Region. The collaboration agreements and twinning mechanism will form the basis for a strong partnership between these centres and national TB programmes and relevant health authorities for the development of medium- and long-term national TB strategic plans for strengthening case detection, follow-up and treatment of TB and X/MDR-TB in each of the 18 HPC by 2012.

Activity 1.4.3 The Regional Office, in collaboration with TB and public health centres of excellence as well as cooperating national TB programmes, will prepare a guide for expanded and accelerated quality case-finding and diagnosis and treatment of TB in PHC and ambulatory facilities by 2012.

Activity 1.4.4 The Regional Office, in collaboration with TB and public health centres of excellence as well as cooperating national TB programmes, will develop a three-year plan to strengthen the development of PHC towards more effective TB prevention, control and care for each of the 18 HPC by 2013.

Activity 1.4.5 The Regional Office and partners will provide technical assistance to HPC on implementation of the Practical Approach to Lung Health (PAL).

Activity 1.4.6 The Regional Office will support TB and public health centres of excellence as well as cooperating national TB programmes in the provision of technical assistance to health authorities to help accelerate the uptake of quality-assured WHO-backed best practices in TB case detection, follow-up and complete treatment through new and existing funding mechanisms, including the EXPAND-TB project and Global Funds by 2012.

Activity 1.4.7 The Regional Office will support the TB and public health centres of excellence as well as cooperating national TB programmes in (i) building human resource capacity through regular country visits to monitor the performance of national and subnational health authorities and PHC providers involved in TB prevention, control and treatment, and (ii) the provision of technical assistance both in-country and through internships of one to two months in their reference centres of excellence and twinning national TB programmes.

Activity 1.4.8 Member States will specify the strategies and mechanisms for integrating TB ambulatory treatment and patient support in PHC services by the end of 2012.

1.5 Consider management of M/XDR-TB contacts

At present no preventive or prophylactic treatment is available to be given to individuals who have been recently infected with or exposed to M/XDR-TB strains.

Activity 1.5.1 The Regional Office and partners will facilitate the review of the cost–effectiveness of current practices in the management of contacts of M/XDR-TB patients by the end of 2012.

Activity 1.5.2 The Regional Office, in collaboration with other partners, will put forward a set of recommendations for management of M/XDR-TB contacts and their prophylactic/preventive treatment by mid-2013.

Activity 1.5.3 Member States will introduce the Regional Office's recommendations on contact-tracing and management of M/XDR-TB contacts by the beginning of 2014.

Examples of best practice

Norway

To prevent morbidity, mortality and development of M/XDR-TB in migrants, Norway has introduced regulations to secure the right for all illegal migrants to stay in the country while possible TB disease is being investigated or until its treatment is completed. Treatment is free and includes the cost of transport. For patients not covered by national or private insurance, the hospital and/or municipality where they are treated or residing is obliged to cover the cost of treatment.

Russian Federation

The patient-centred approach used in Tomsk *oblast's* TB programme was introduced with technical support from Partners in Health and financing from the Global Fund in 2004. Various strategies to address non-adherence by TB and MDR-TB patients have resulted in an overall decrease in the default rate from almost 28% to 8.9%. These strategies include enhanced social and psychological support throughout chemotherapy, and the development and introduction of various models of community-based treatment. The experience in Tomsk has been replicated in neighbouring areas of the Russian Federation and Kazakhstan.

2. Scale up access to testing for resistance to first- and second-line anti-TB drugs and to HIV testing among TB patients

Despite improvements in coverage of mycobacteriological culture and drug susceptibility testing, only 34% of estimated MDR-TB cases were notified in 2009. Member States need urgent investment in technology, infrastructure and human resources to scale up capacity and access so as to diagnose drug-resistant TB and monitor responses to treatment.

Under the guidance of WHO, the Global Laboratory Initiative has developed: (i) a guide for strengthening TB laboratories aimed at ensuring quality TB diagnostics in appropriate laboratory services in the context of national laboratory strategic plans; and (ii) a laboratory tool set to standardize laboratory methods, including standard operating procedures, equipment specifications, guidelines for procurement of laboratory equipment and supplies, training packages for microscopy and culture, and a costing/budgeting tool to facilitate supply chain management and stock control at country level *(10, 11)*.

WHO has also developed a policy framework for implementing TB diagnostics to facilitate implementation at country level.

2.1 Strengthen the TB laboratory network

Activity 2.1.1 The Regional Office will support the development of formal collaboration agreements between the TB Supranational Reference Laboratories Network and national TB reference laboratories in the Region. The collaboration agreements will form the basis for a strong partnership between the Supranational Reference Laboratories Network and national TB reference laboratories for the development of medium- and long-term national TB laboratory strategic plans for strengthening laboratory capacity for the diagnosis of MDR-TB and monitoring response to therapy in each of the 18 HPC by 2012.

Activity 2.1.2 The Regional Office, in collaboration with supranational reference laboratories, will prepare a guide for expanded and accelerated quality-assured new diagnostic technologies, including an automated rapid nucleic acid amplification test for mycobacterium tuberculosis (MTB)/rifampicin and a TB laboratory network for diagnosis and treatment monitoring of TB by 2012. Other rapid diagnostic tests not endorsed by WHO should only be implemented after their evaluation by the Global Laboratory Initiative or by laboratory experts in other settings.

Activity 2.1.3 The Regional Office and supranational TB reference laboratories, in collaboration with national TB reference laboratories, will develop a three-year TB laboratory development plan for each of the 18 HPC by 2013.

Activity 2.1.4 The Regional Office will support the Supranational Reference Laboratories Network in the provision of technical assistance to national TB reference laboratories to help accelerate the uptake of quality-assured WHO diagnostic technologies through new and existing funding mechanisms, including the EXPAND-TB project and the Global Fund, by 2012.

Activity 2.1.5 The Regional Office will support the Supranational TB Reference Laboratories Network in building human resource capacity through regular country visits to monitor the performance of laboratory networks and in the provision of technical assistance both in-country and through internships of one to two months in their supranational reference laboratories.

Activity 2.1.6 Member States and donors will prioritize funding for the introduction of new techniques for diagnosis of M/XDR-TB, including an automated rapid nucleic acid amplification test for MTB/rifampicin.

Activity 2.1.7 Member States will ensure that quality assurance schemes are in place for all levels of diagnostic testing in TB laboratory facilities which meet at least the minimum WHO biosafety requirements by 2013.

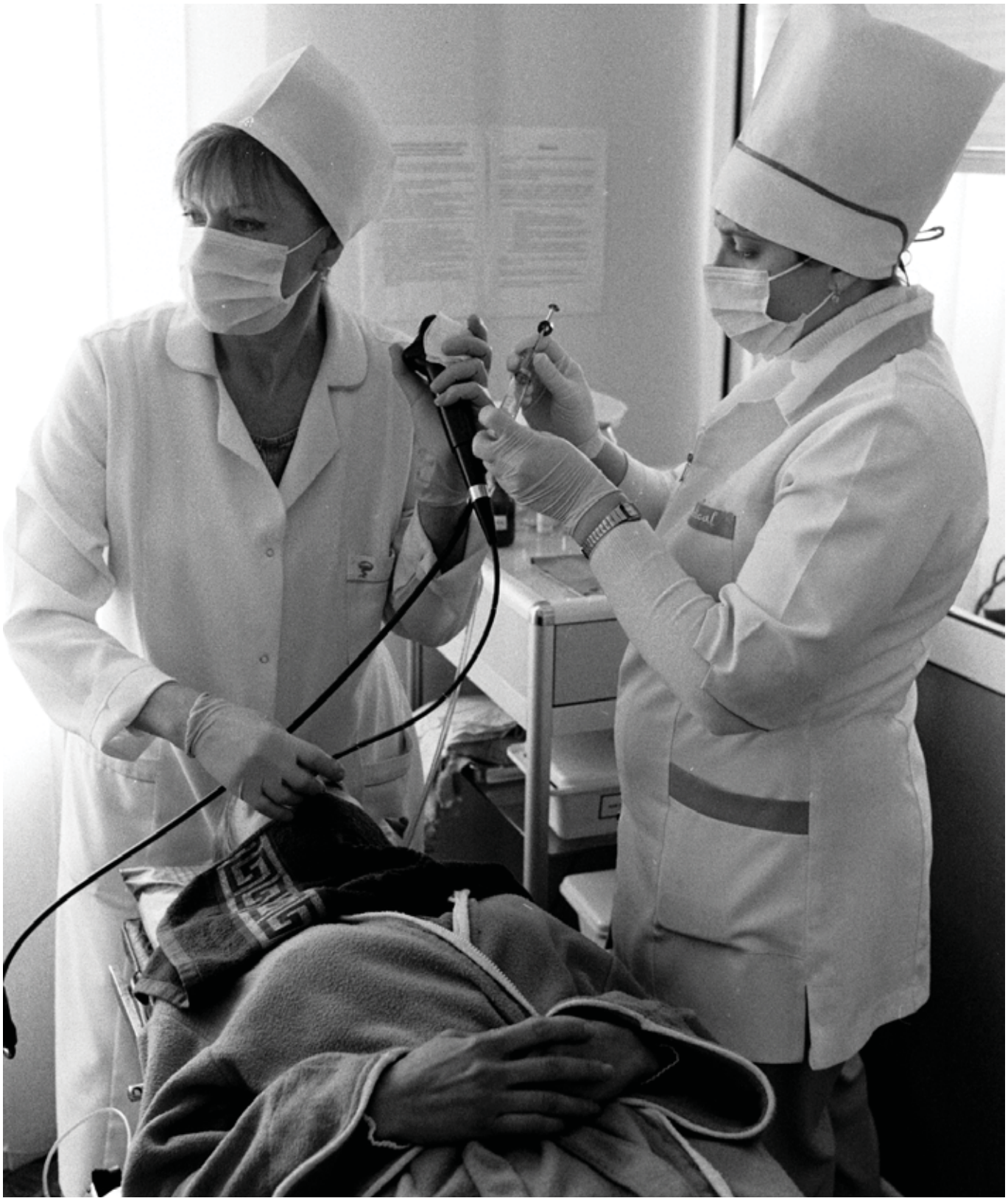
Activity 2.1.8 All HPC will ensure the availability of rapid tests endorsed by WHO, such as an automated rapid nucleic acid amplification test for MTB/rifampicin (Xpert MTB/rifampicin), using national resources as well as funds from the Global Fund, UNITAID and other development and technical agencies, including the United States Agency for International Development (USAID).

2.2 Diagnostic counselling and testing for HIV of all TB patients and for TB of all HIV patients

Activity 2.2.1 The Regional Office and other partners will provide technical assistance to HPC for collaborative TB/HIV activities based on routine monitoring and assessment.

Activity 2.2.2 Member States will ensure that personnel responsible for TB and M/XDR-TB care are trained in HIV counselling and testing by the end of 2012.

Activity 2.2.3 Member States will ensure that HIV counselling and testing are offered to all TB patients on an opt-out basis by the end of 2012.



3. Scale up access to effective treatment for all forms of drug-resistant TB

Currently only two thirds of the M/XDR-TB patients notified are reported to have access to appropriate treatment in the Region. The lack of appropriate treatment for MDR-TB patients leads to the spread of MDR-TB and the eventual amplification of drug resistance with the emergence of XDR-TB.

3.1 Ensure the uninterrupted supply and rational use of quality medicines

Activity 3.1.1 The Regional Office will support Member States and other partners with data collection to assist in the development of reliable estimates of second-line drug needs by the end of 2013.

Activity 3.1.2 The Regional Office will introduce to countries a generic indicator-based tool for conducting a continuing drug utilization review as part of routine programme performance monitoring by the end of 2012.

Activity 3.1.3 The Regional Office and partners will promote the WHO pre-qualification programme mechanism to ensure prequalification of at least all injectables, and request Member States to ensure the speedy registration of products already pre-qualified by WHO in countries by the end of 2012.

Activity 3.1.4 The Regional Office will assist countries with the development of new legislation and procedures for the procurement of medical supplies with an emphasis on quality assurance (with specifications for TB medicines) by 2014.

Activity 3.1.5 The Regional Office and partners will conduct gap analysis of pharmaceutical legislation and regulations and facilitate their improvement by 2012.

Activity 3.1.6 The Regional Office and partners will engage countries in the WHO Good Governance for Medicines (GGM) programme (five countries by 2014) and pharmacovigilance.

Activity 3.1.7 The Regional Office and partners will facilitate and promote the development of paediatric formulations of second-line anti-TB drugs by the end of 2012.

Activity 3.1.8 Member States will adopt and expand countrywide the use of first-line fixed-dose combination drugs in treatment of drug-susceptible TB by the end of 2012.

Activity 3.1.9 Member States will ensure capacity-building in planning, procurement and supply management of anti-TB medicines at all levels of the health care system according to WHO recommendations by the end of 2012.

Activity 3.1.10 Member States will develop European certification of all drugs to treat TB with first- and second-line drugs valid for all countries in the Region by the end of 2014.

3.2 Manage adverse events

Activity 3.2.1 The Regional Office will develop a regional generic guide for managing and recording adverse reactions and side-effects by mid-2012.

Activity 3.2.2 The Regional Office together with the partners will develop regional sources of unbiased drug information for prescribers and patients by the end of 2013.

Activity 3.2.3 Member States will ensure that measures to screen and/or diagnose and prevent or treat side-effects are available for all TB patients by mid-2012.

3.3 Develop new medicines

Activity 3.3.1 The Regional Office, in collaboration with the Stop TB Partnership, the Global Alliance for TB Drug Development and partners, will develop a long-term regional strategy for the development of a market in TB medicines by the end of 2013.

Activity 3.3.2 The Regional Office and Member States will facilitate research and development of new TB medicines, including paediatric formulations, hold sound clinical trials on a continuous basis and report its progress at Regional Committee meetings from 2013 onwards.

3.4 Scale up access to treatment

Activity 3.4.1 The Regional Office and partners, including WHO collaborating centres, will in close consultation with

Member States, develop a joint technical assistance plan for Member States in reaching universal access to treatment (including treatment of children) by mid-2012.

Activity 3.4.2 The Regional Office in collaboration with the Member States and other partners will develop a set of evidence-based criteria for surgery for M/XDR-TB patients by the end of 2012.

Activity 3.4.3 Member States will ensure that resources for universal access to treatment are available by 2012 and report on progress at Regional Committee meetings from 2013 onwards.

Activity 3.4.4 Member States will ensure that health systems have the institutional capacity to develop, implement, analyse and adapt TB policy; and manage and allocate resources towards effective universal access to treatment.

Activity 3.4.5 Member States will ensure that their TB and M/XDR-TB treatment guidelines are updated according to the latest available evidence and WHO recommendations by the end of 2012.

Activity 3.4.6 Member States will procure and make available quality-assured medicines for TB and M/XDR-TB treatment under direct observation of treatment (DOT) by mid-2012.

Activity 3.4.7 Member States will ensure adequate training, coaching and support of health care staff for scaling up the treatment of M/XDR-TB patients by the end of 2011.

Activity 3.4.8 Member States will ensure adequate support of health authorities at national and subnational level for scaling up treatment of M/XDR-TB patients by mid-2012.

Activity 3.4.9 Member States will ensure that surgery is available for eligible M/XDR-TB patients by mid-2013.

Examples of best practice

EXPAND-TB project

The EXPAND-TB project (EXPanding Access to New Diagnostics for TB), which was established in 2008, aims to accelerate the uptake of new TB diagnostic technologies (commercial liquid culture systems, rapid speciation and molecular-line probe assays, recently endorsed by WHO *(12)*) into adequate laboratory services in 27 recipient countries. Project partners include WHO, the Global Laboratory Initiative, the Foundation for Innovative New Diagnostics *(13)* and the Stop TB Partnership's Global Drug Facility *(14)*, with funding provided by UNITAID and other donors. During the first 18 months of the EXPAND-TB project, a wide range of activities was initiated in 23 of the 27 recipient countries, including laboratory needs assessments and gaps analyses, upgrades and renovation of laboratory infrastructure, training of staff, diagnostic policy reform and country validation of new technologies. In the European Region, this technology transfer has commenced in eight high MDR-TB burden countries (Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Tajikistan and Uzbekistan). The project will support countries with the routine diagnosis of MDR-TB patients and pave the way for eventual routine surveillance of drug resistance.

Georgia

Georgia launched its MDR-TB control project in 2007 with support from the Global Fund. WHO provided technical support in the framework of the Green Light Committee mechanism. With strong commitment on the part of the authorities, full engagement of highly motivated staff in the country and continuous support from WHO, Georgia moved towards integrated programmatic management of drug-resistant TB. Within two years, the successful project was expanded nationwide and the country attained universal access for MDR-TB treatment.

The Regional Office, together with other partners, trained health care staff in MDR-TB management and provided advice and technical support between the country visits. TB and MDR-TB clinical guidelines and operation manuals were updated. A regional training centre was established.

A supportive environment was created by the leadership of the national TB control programme, who played a key role in empowering health care staff and involving them in each step of the decision-making. Well-planned and implemented advocacy activities, as well as the involvement of the First Lady in TB control, made it possible to attract a high level of attention to M/XDR-TB so that it became a priority for the Ministry of Health as well as for the government as a whole. The government fully funded the construction work of a new TB hospital with state of the art infection control measures. An outreach programme was established to address the needs of special populations.

With technical support from the Supranational Reference Laboratory, WHO and Emory University, Georgia was among the first high MDR-TB burden countries (HMDRC) in the Region to put molecular diagnosis of MDR-TB into full operation. Since 2007, 1740 DR-TB patients have been enrolled into treatment with quality second-line drugs. In February 2011, 950 DR-TB patients were simultaneously under treatment.

4. Scale up TB infection control

The importance of TB infection control cannot be overemphasized. Several high-priority countries in the Region have not yet finalized their national TB infection control plans. Infection control in many inpatient and outpatient facilities dedicated to TB care in these countries is poor. Evidence of nosocomial transmission has been documented and the risk of developing TB among health care staff is often multiple times higher than in the general population. The risk of TB transmission in communal settings (such as penitentiary services) is even higher due to overcrowding and poor ventilation. In many Member States, health care workers are often not fully aware of airborne infection control measures.

4.1 Improve administrative and managerial aspects of TB infection control

Activity 4.1.1 The Regional Office and other partners will provide technical assistance to Member States to finalize national TB infection control action plans integrated in their national TB strategic plans or national infection control or health strategies by the end of 2012.

Activity 4.1.2 The Regional Office and other partners will develop a joint technical assistance plan for Member States to improve TB infection control by the end of 2012, including country visits, TB infection control risk assessments and staff training.

Activity 4.1.3 Member States will introduce or strengthen surveillance of TB infection and disease among health care workers by mid-2013.

Activity 4.1.4 Member States will ensure all health care facilities serving TB or suspect TB patients have a sound infection control standard operating procedure by the end of 2013.

Activity 4.1.5 Member States will develop and disseminate educational messages and materials for patients and health care workers by the end of 2012.

Activity 4.1.6 Member States will ensure contact-tracing of TB patients for early diagnosis of infection and disease by the first quarter of 2012.

Activity 4.1.7 Member States will include in-service and pre-service training of health care staff in TB infection control by the end of 2012.

4.2 Strengthen environmental measures for TB infection control

Activity 4.2.1 The Regional Office and partners will organize training of trainers in environmental measures, including engineering and facility design for airborne infection control, by the end of 2012.

Activity 4.2.2 Member States will conduct cascade training of responsible staff for environmental aspects of airborne infection control by the end of 2013.

Activity 4.2.3 Governments in high-priority TB Member States will ensure that environmental preventive measures are available in high-risk TB facilities and congregate settings by the end of 2013.

4.3 Ensure accessibility to personal protection measures

Activity 4.3.1 The Regional Office will share with Member States procurement specifications for TB infection control equipment by mid-2012.

Activity 4.3.2 Member States will ensure that individual respiratory protection programmes are in place and available for TB and M/XDR-TB services by the end of 2012.

Examples of best practice

Russian Federation

Vladimir *oblast* in the Russian Federation can be considered a model for improving TB infection control in a high TB/MDR-TB setting. With the assistance of the US Centers for Disease Control and Prevention, a core group of staff were trained in 2002. Dispensary staff then developed an infection control programme, which included administrative and engineering measures and respiratory protection. Three key administrative control measures included: the separation of patients according to sputum smear status and drug susceptibility testing; and limiting unnecessary access of staff and visitors to high-risk zones and transfer of patients from other facilities to the TB hospital immediately upon receipt of sputum smear-positive test results. The key engineering infection control measures included: updating and improving negative pressure ventilation systems to meet the current Russian and international standards; installing biosafety equipment; shielding ultraviolet germicidal irradiation fixtures that allow for non-stop usage; and use of specially designed sputum collection booths. The respiratory protection programme included staff training and fit testing, and use of certified respirators for 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 *oblast* TB dispensary (from 1083 to 166 new cases per 100 000 during the first five years of the programme and no new cases in 2008–2010). Funds from the *oblast* budget were allocated in 2005–2006 for reconstruction of the ventilation system and purchase of respirators. Infection control measures were an important part of the regional target TB control programmes (2004–2006, 2007–2009 and 2010–2012). Although it may not be possible to eliminate the risk for transmission of *M. tuberculosis* infection in all health care facilities completely, implementation of and adherence to the internationally recommended measures have dramatically reduced the risk of nosocomial transmission of TB. In October 2008, the Vladimir Centre of Excellence for Tuberculosis Infection Control was established. The Centre is a partnership including the Vladimir *oblast* administration, USAID, the US Centers for Disease Control and Prevention Division of Tuberculosis Elimination, the Central Tuberculosis Research Institute in Moscow and the WHO Country Office in Moscow, and is located at the Vladimir *oblast* tuberculosis dispensary. The Centre is involved in monitoring and implementing infection control measures and serves as a training hub for the Russian Federation and other Russian-speaking countries *(15)*.

5. Strengthen surveillance, including recording and reporting of drug-resistant TB and treatment outcome monitoring

Since 1 January 2008, the Regional Office and ECDC have jointly coordinated the collection of TB surveillance data in Europe. Their aim is to ensure a high quality of standardized TB data covering all 53 Member States in the Region. While much information has been collected in many countries, the data available for certain countries are still patchy and/or outdated. Implementation of the Action Plan will be monitored through a comprehensive monitoring and evaluation framework (Annex 2).

5.1 Strengthen surveillance

Activity 5.1.1 The Regional Office will prepare a monitoring framework for following up the Berlin Declaration by mid-2012.

Activity 5.1.2 The Regional Office and partners will conduct training and coaching of national programme managers of high-priority countries in monitoring and evaluation and using data for improving programmes' performance by the end of 2012.

Activity 5.1.3 The Regional Office and partners will assist HPC to establish and improve surveillance of drug-resistant TB, including resistance to second-line drugs, by March 2013.

Activity 5.1.4 The Regional Office and partners will organize training and support for surveillance staff and programme managers in ensuring the collection of minimum MDR-TB indicators by the end of 2012 *(16)*.

Activity 5.1.5 The Regional Office, together with partners and Member States, will develop a European profile of the social determinants (including gender) of M/XDR-TB and their distribution across European Member States to provide more specific evidence about the population groups most likely to have differential exposure and vulnerability to M/XDR-TB and examples of action that can be taken to address health equity by mid-2013.

Activity 5.1.6 Member States will ensure the categorization of TB cases based on drug susceptibility testing to facilitate appropriate treatment and cohort reporting by the end of 2012.

Activity 5.1.7 Member States will include measures to disaggregate and analyse M/XDR-TB data by sex, age, location (urban/rural) and other social determinants, such as level of education, socioeconomic quintiles and employment status, by the end of 2012.

5.2 Improve recording and reporting

Activity 5.2.1 The Regional Office will strengthen the monitoring mechanism for comprehensive follow-up of the Berlin Declaration by mid-2012.

Activity 5.2.2 The Regional Office and partners will finalize and promote electronic tools for recording and reporting, including the use of modern data transmission techniques such as the web, hand-held devices and satellite) by the end of 2013.

Activity 5.2.3 The Regional Office, in collaboration with partners, will assist Member States in the development of electronic systems to enhance recording and reporting systems with database structure compatible with the Regional Office/ECDC's electronic database (such as the use of open source solutions) by the end of 2013.

Activity 5.2.4 The Regional Office and ECDC will conduct annual meetings of TB surveillance focal points for coordination of surveillance.

Activity 5.2.5 Member States with high TB priority will conduct training and coaching of national TB programme managers in monitoring and evaluation and in using data to improve TB programme performance by the end of 2012.

Examples of best practice

In recent years a sustainable effort has been undertaken to move data management from paper-based to electronic systems. Of the 18 HPC in the Region, 13 now manage electronic data at national level using stand-alone *(7)*, web-based *(2)* and mixed databases. Armenia, Ukraine and Uzbekistan are implementing a comprehensive web-based TB data management tool for surveillance, reporting and recording TB and drug-resistant TB cases and monitoring their treatment outcome, managing laboratory results, and supplying and using TB medicines. In the Republic of Moldova, electronic data collected via a web interface over five years allowed for a detailed analysis of TB patient data and identification of the determinants of transmission and acquisition of drug-resistant TB.

6. Expand country capacity to scale up the management of drug-resistant TB, including advocacy, partnership and policy guidance

In order to use human and financial resources efficiently, it is essential to ensure the optimal management of TB control programmes/interventions. There are huge opportunities for improving partnerships and coordination and engaging national and international organizations, including civil society, in TB control. The care and management of patients who are not responding to any treatment has not been addressed in many settings. All HMDRC have finalized their summary MDR-TB response plans, although these plans need to be updated, endorsed and implemented by the Member States.

6.1 Manage programme efficiently

Activity 6.1.1 The Regional Office will assist HPC to update and finalize their national MDR-TB response plans by the end of 2012. The plans will include organigrams endorsed health systems and national TB programmes, with explicit roles and responsibilities (executive decrees and administrative orders), lines of authority and operational plans up to provider level. The plans will also ensure that the focus of the programmes is on all TB-relevant interventions, not merely those funded or implemented by the programmes (that is to say, including PHC, prison services, TB hospitals and general hospitals, non-governmental organizations and private services.).

Activity 6.1.2 The Regional Office, in coordination with Member States, will formalize the twinning of cities and TB and lung diseases programmes across the Region and facilitate collaboration and coordination among Member States by the end of 2013.

Activity 6.1.3 The Regional Office will develop and share a programmatic assessment checklist for health authorities in Member States and advise Member States on measures to improve the programmatic aspects of TB prevention, control and care by the end of 2012.

Activity 6.1.4 The Regional Office and WHO country offices, in cooperation with partners, will provide operational guidelines for implementing high-level political statements and measuring progress on a regular basis.

Activity 6.1.5 The Regional Office together with partners will improve programme management capacity (within and across both civilian and prison services) with modern training and coaching, particularly in the efficient use of resources, analysis and interpretation of data and application of new diagnostic and programme tools on a regular basis, and ensuring of continuity of care for patients transferred between the prison and civil systems on a regular basis.

Activity 6.1.6 The Regional Office will analyse successful models of programme management and draw up recommendations to be included as criteria in WHO's forthcoming programme certification exercise, including ISO 9001-certified project management standards, by the end of 2012.

Activity 6.1.7 The Regional Office and key partners will offer mentorship for poorly performing national TB control programmes from the end of 2012.

Activity 6.1.8 The Regional Office will build on the findings of the European Review Task Group looking at the social determinants of TB and M/XDR-TB by establishing a network among Member States to exchange promising practices in tackling the social determinants (particularly upstream determinants) of TB and M/XDR-TB, and to ensure an appropriate level of care for untreatable patients.

Activity 6.1.9 The Regional Office will create a platform to monitor the implementation of this document together with Member States and partners. A consolidated progress report will be presented annually at the national TB programme managers' meeting, starting from 2012.

Activity 6.1.10 All Member States will have dedicated M/XDR-TB patient management units or staff, as appropriate, by the end of 2012.

Activity 6.1.11 All HPC will develop, endorse and start implementation of their national MDR-TB response plans by the end of 2012.

Activity 6.1.12 Member States will ensure that external reviews will be undertaken of their national TB programmes/interventions every three to five years, led by the Regional Office and/or ECDC and including partners and civil society organizations for the transparent and objective assessment of gaps in their programmes.

Activity 6.1.13 Member States will ensure that representatives of patients and/or communities affected by the disease are included in programme planning and assessments of quality of services by the end of 2012.

Activity 6.1.14 Member States will use the Internet and other media to increase public awareness of TB and M/XDR-TB, reduce the stigma associated with the disease and emphasize the availability of treatment from 2011.

Activity 6.1.15 Health authorities will engage the TB provider network and/or programme in health system reform initiatives on a continuous basis.

Activity 6.1.16 Member States will establish palliative care mechanisms for M/XDR-TB patients who fail treatment by the end of 2012.

6.2 Develop human resources

Most Member States lack strategic plans for developing human resources for TB and M/XDR-TB control. In order to prevent and control M/XDR-TB effectively, there is a need for motivated and trained staff protected against TB infection and supported by a modern management mechanism. In some Member States, health care staff are unevenly distributed at different levels of service delivery. Most in-service training courses have not been based on practical needs or accompanied by on-the-job coaching for the acquisition of knowledge and skills and their practical application.

Activity 6.2.1 The Regional Office and partners will establish and/or improve the capacity of existing centres of excellence. The Regional Office will establish a mechanism for the accreditation of WHO collaborating centres by the end of 2012. WHO and partners will provide technical assistance to centres of excellence and enable them to provide technical assistance to provinces and countries they are to support from the end of 2012.

Activity 6.2.2 The Regional Office will finalize the adaptation and translation of training modules developed by staff from the WHO headquarters Management of Drug-Resistant Tuberculosis, Training for MDR-TB Referral Centre by the end of 2011.

Activity 6.2.3 The Regional Office will ensure that a virtual TB library and training materials in Russian are available and updated from 2012.

Activity 6.2.4 Member States will prepare and implement strategic plans for the development of human resources for the implementation of all components of the Stop TB Strategy by the end of 2013. These plans will include human resources policy, finance, education, leadership, job descriptions and workload assessment, and determine staff needs, supervision and monitoring, performance-based assessment and remuneration (both monetary and non-monetary) of the staff.

6.3 Give policy guidance

Expanding country capacity to scale up the management of drug-resistant TB will require leadership and action by national and subnational health authorities in different aspects of the core functions of health systems. These interventions will depend on the core functions. Member States, the Regional Office and partners will support institutional capacity-building and strengthening of health systems to undertake these core functions and, critically, to diagnose the specific nature of the problem in each country and develop related policy guidance for the response.

Activity 6.3.1 The Regional Office, in collaboration with partners, will assist Member States in providing guidance for referral systems between different levels of TB care by the end of 2013.

Activity 6.3.2 The Regional Office, in collaboration with partners, will provide technical assistance on health systems' capacity-building to optimize the health financing for TB control interventions by the end of 2013.

Activity 6.3.3 The Regional Office, in collaboration with partners, will advise on best practice regarding the scale-up and efficient management and distribution of health resources – notably human resources – by the end of 2013.

Activity 6.3.4 The Regional Office, in collaboration with partners, will provide technical assistance to improve institutional capacity for policy analysis, development, implementation and evaluation, as well as resource management (governance/stewardship) by the end of 2013.

Activity 6.3.5 The Regional Office, in collaboration with partners, will assist Member States in adopting/adapting international TB policies by the end of 2012.

Activity 6.3.6 Member States will ensure they have adopted/adapted the latest available evidence in their national TB control policies by the end of 2012.

Activity 6.3.7 Member States will ensure that the results of operational research and other studies are included in development of TB control policies on a continuous basis.

6.4 Ensure partnership and coordination

Activity 6.4.1 The Regional Office will use the successful model of the Health in Prison Project *(17)* to assist Member States in improving TB control in penitentiary services by the end of 2012.

Activity 6.4.2 The Regional Office will establish a mechanism for coordination and collaboration among national and international partners by the end of 2012.

Activity 6.4.3 The Regional Office and partners will advocate the continuous involvement of European research institutes in the development of new diagnostic tools, medicines and vaccines, and basic research on TB and drug-resistant TB.

Activity 6.4.4 The Regional Office and partners will assist Member States in establishing and strengthening their national Stop TB Partnerships by the end of 2013.

Activity 6.4.5 HPC will establish national Stop TB Partnerships and other relevant mechanisms to ensure the due coordination and concerted action by, and necessary funds from, all stakeholders including civil society, patients' associations and charities by the end of 2013.

Activity 6.4.6 Member States will ensure that there are sound collaborative mechanisms for improved diagnosis and treatment of TB and M/XDR-TB patients in prison services, refugee camps or other relevant settings and a continuum of care and services in the health services by the end of 2013.

6.5 Involve advocacy, communication and social mobilization (ACSM)/civil society

While the potential value of advocacy, communication and social mobilization (ACSM) is generally well understood by national TB programmes, there is frequently a lack of capacity to implement such activities. The first set of recommendations for enhancing action to confront the challenge of MDR-TB relates, therefore, to increasing the capacity of national TB programmes and their partners to implement action in these areas.

Activity 6.5.1 The Regional Office will facilitate the adaptation and development of ACSM materials appropriate to the Region and available in English and Russian by the end of 2013.

Activity 6.5.2 High-priority TB countries will develop national ACSM strategies and workplans by the end of 2012 if these do not exist, ensuring that they include particular reference to the challenges of MDR-TB.

Activity 6.5.3 Knowledge, attitude and practice surveys and needs assessments with a focus on MDR-TB will be undertaken in each country or subnational region to determine objectives for changing behaviour, target groups, advocacy needs and the foci for ACSM interventions by the end of 2013. The survey results will feed into such strategies and indicate directions for priority action.

Activity 6.5.4 Member States will identify and bring together civil society organizations with an interest in TB for the common planning of ACSM and MDR-TB activities by the end of 2012. This will include HIV organizations and may also mean many other agencies with social welfare and human rights aims, including professional associations of doctors, nurses, pharmacists and so on. Faith-based organizations will also be included: church- and mosque-based initiatives can provide powerful support for activities. Civil society and faith-based organizations and networks will be linked into national programmes.

Activity 6.5.5 The Regional Office and partners will organize training workshops for civil society organizations and national TB programme ACSM staff on multidrug-resistant aspects of TB and consequent ACSM needs at national and subnational region levels.

Activity 6.5.6 Member States with a high TB priority will review the needs of ACSM focal staff in the national TB programme in line with the ACSM workplan.

Activity 6.5.7 Member States and partners will support the development and engagement of patient advocates and treatment supporters on a regular basis.

Advocacy

A broad set of coordinated interventions designed to place TB high on the political and development agenda will foster political will to increase and sustain financial and other resources.

Activity 6.5.8 Member States will develop national TB advocacy plans by the end of 2012, with the aim of initiating policy changes and sustaining political and financial commitments.

Communication

All forms of the media will be used to inform, persuade and generate action among the whole population or targeted subpopulations about TB, and to generate awareness of the challenge of M/XDR-TB and thus the importance of prevention, increased and speedy detection and completion of treatment.

Activity 6.5.9 Member States will train health care staff in patient-centred care and intrapersonal communication skills on a regular basis to enable them to develop appropriate consultation skills and supportive attitudes.

Activity 6.5.10 Member States will develop communication materials such as roadside and health clinic posters, to be widely used by mid-2013.

Social mobilization

Communities and affected individuals will be actively engaged in the fight against TB and MDR-TB, and in speeding up detection and supporting patients through the long treatment periods, thus reducing the current high default rates among MDR-TB patients.

Activity 6.5.11 Member States, with the technical support of partners, will develop social mobilization plans based on the messages, target communities and areas identified by the needs assessments and knowledge, attitude, practice studies and mutual consultation by the end of 2013.

Activity 6.5.12 Member States will map the presence of relevant civil society organizations that are, or might become, interested in TB at national, subnational and local levels, and reach out to build working relations with those that appear the most active and relevant.

Activity 6.5.13 Member States will regularly assist local civil society organizations to work with their national TB programmes in devising and implementing effective plans and ensuring that in their own activities they act in alignment with national TB programme policies and priorities.

Activity 6.5.14 Member States will regularly support and encourage the creation of associations of current and past patients to increase public awareness.

Activity 6.5.15 Member States, in collaboration with partners, will assist with cross-border TB care, and encourage the creation of civil society organizations in migrant communities and support for those that already exist. They can do much to help increase awareness of TB and knowledge of local health services so that symptomatic individuals refer themselves appropriately.

6.6 Ensure ethics and human rights

Several opportunities have been identified where attention to human rights in TB care will also aid the scale-up of effective MDR-TB treatment.

Activity 6.6.1 The Regional Office will provide guidance to Member States in revising the frameworks for ethics and human rights for TB and other infectious diseases by the end of 2012.

Activity 6.6.2 The Regional Office and partners will conduct operational research on service models (needs of patients, cost and resources) for provision of palliative care by the end of 2012.

Activity 6.6.3 The Regional Office, in collaboration with partners, will develop indicators for patient-centred care by the end of 2012.

Activity 6.6.4 The Regional Office will issue guidance for Member States to develop their frameworks for compassionate use of medicines by the end of 2012.

Activity 6.6.5 The Regional Office and other partners will organize a regional conference on patient-centred care and human rights in TB and HIV by the end of 2013.

Activity 6.6.6 The Regional Office, Member States and partners will include ethics and human rights in the academic curricula for TB/MDR-TB training for all health staff by the end of 2012.

Activity 6.6.7 Member States will include clear instructions in their national TB plans and guidelines on how to organize service delivery, taking into account ethical and human right concerns and international recommendations and commitments.

Activity 6.6.8 By the end of 2012, Member States will establish palliative care for M/XDR-TB patients who fail treatment.

Activity 6.6.9 Member States will involve civil society organizations in carrying out client satisfaction assessments in TB services by the end of 2013.

Activity 6.6.10 Member States will ensure that mechanisms are in place to hear complaints or to impose sanctions when corruption or unethical practices occur by the end of 2013.

Examples of best practice

Netherlands

In the Netherlands, as in other low TB-incidence countries, MDR-TB is mainly a disease of foreign-born patients who acquired their infection abroad. The challenge is to identify (MDR-) TB cases early and to limit transmission. Furthermore, as in other countries, adequate treatment of all TB cases is important to prevent acquired MDR-TB.

About 1% of *M. tuberculosis* strains were multidrug-resistant between 1993 and 2009 in the Netherlands. In those 17 years, 187 MDR-TB cases were notified, of which 7 had an XDR-TB strain. One out of three MDR-TB cases was identified during screening, mainly through the screening programme of immigrants entering the country. In nine cases (5%), DNA fingerprinting and epidemiological cluster investigation revealed that the disease was caused by recent transmission in the country. In five cases, MDR-TB was acquired after previous treatment for (non-MDR) TB in the Netherlands.

The emphasis is on early identification of TB and MDR-TB disease through intensified and active case-finding. At the same time, adequate treatment, guidance and supervision is essential to prevent the development of acquired drug resistance. Continuation of treatment is guaranteed under the supervision of the municipal TB nurses. Patients receive psychosocial support, and the models of care adopted are based on patients' needs.

United Kingdom

A good example of ACSM is "Find & Treat" in the United Kingdom *(18)*.

TB cannot be effectively controlled in urban areas unless specific provision is made to find and treat the most vulnerable and socially excluded cases. The assumption that all patients will present promptly and complete treatment lasting a minimum of six months is no longer a basis for effective TB control *(18)*. Rates of TB continue to rise across London with one in six cases occurring among hard-to-reach groups: homeless people, problem drug and alcohol users and prisoners. These groups are at high risk of infectious drug-resistant forms of TB, delayed presentation, onward transmission and death *(18)*.

Find & Treat was established in October 2007 by the Department of Health to implement the recommendations of the Health Protection Agency's evaluation of the mobile X-ray unit *(18)* and to strengthen TB control in London among hard-to-reach groups.

A small multidisciplinary health and social care team, working alongside trained recent patients with personal experience of TB and homelessness, links the 30 TB treatment centres in London with most patients.

Homelessness is recognized as an independent risk factor for MDR-TB. One third of active cases with which Find & Treat works are at least mono-resistant, and 11% of these have MDR-TB. In the last three years, Find & Treat has been asked to trace over 225 active TB cases lost to mainline services, and has managed to find 75% of them and link them back into treatment.

Find & Treat also screens almost 10 000 homeless people and drug users for TB every year, using the mobile X-ray unit van. For the past six years, the unit has consistently detected a pulmonary TB rate of 250 per 100 000, with such cases being significantly less likely to be infectious at diagnosis compared to patients who present passively to mainline TB services. The multidisciplinary model of care that has been developed, spanning traditional administrative and geographic boundaries and working with over 200 different government and civil society units, is now an essential component of TB control in London. These achievements were only possible through strong advocacy, communication and social mobilization efforts.

7. Address the needs of special populations

The Regional Office and other partners advocate universal access to M/XDR-TB diagnosis and treatment, including for the most vulnerable groups such as people living with HIV, children and pregnant women, and socially disadvantaged groups including migrants, homeless, injecting drug users or alcoholics. Countries should include action for removing barriers to access to health care for these groups.

7.1 Improve collaborative TB/HIV activities

Activity 7.1.1 The Regional Office will document best practices and experiences in effective integration and service delivery models for TB/HIV/drug dependence services by the end of 2012.

Activity 7.1.2 The Regional Office and other partners will support training and education for HIV and TB health care professionals on a regular basis.

Activity 7.1.3 The Regional Office and other partners will support the revision of national TB/HIV policies by the end of 2012.

Activity 7.1.4 Member States will establish a functional TB/HIV coordinating mechanism to facilitate the delivery of integrated TB and HIV (and drug use/narcology) services within the same facilities, including in prisons, by the end of 2013.

Activity 7.1.5 Member States will develop directives to deliver antiretroviral therapy in TB dispensaries and TB treatment in AIDS dispensaries (or relevant/appropriate facilities) where these are lacking by the end of 2012.

Activity 7.1.6 All authorities under the ministries of health and justice in Member States will expand access to evidence-based harm reduction services, including TB and HIV prevention, diagnosis and treatment services for people living with or at risk of HIV, in particular people who use or inject drugs.

Activity 7.1.7 Member States will scale up the provision of TB prophylactic treatment in all AIDS dispensaries as a core HIV care intervention in line with internationally recommended evidence-based policies by mid-2013.

Activity 7.1.8 Ministries of health will ensure the availability of isoniazid in AIDS dispensaries as part of HIV care intervention by the end of 2012.

Activity 7.1.9 National TB and HIV programmes and dispensaries will actively engage with civil society partners to improve access to integrated TB/HIV and, where appropriate, harm reduction services for the most at-risk and vulnerable populations.

7.2 Strengthen MDR-TB control in prisons

Activity 7.2.1 The Regional Office, using the successful model of its Health in Prison Project, will assist Member States in continuously improving TB control in penitentiary services .

Activity 7.2.2 Member States will ensure that early diagnosis and effective treatment of M/XDR-TB are available in all penitentiary services across the Region by the first quarter of 2013.

Activity 7.2.3 Member States will establish mechanisms for the continuum of care for released prisoners receiving TB treatment by the end of 2012.

7.3 Improve access for hard-to-reach and vulnerable populations

Activity 7.3.1 The Regional Office and Member States will develop a special response for diagnosis and treatment of TB in children and accelerate the adoption of updated childhood TB guidelines by mid-2012.

Activity 7.3.2 By the end of 2013, the Regional Office and Member States will establish a mechanism for cross-border TB control and care which enables a continuum of treatment for migrant populations and people crossing national borders.

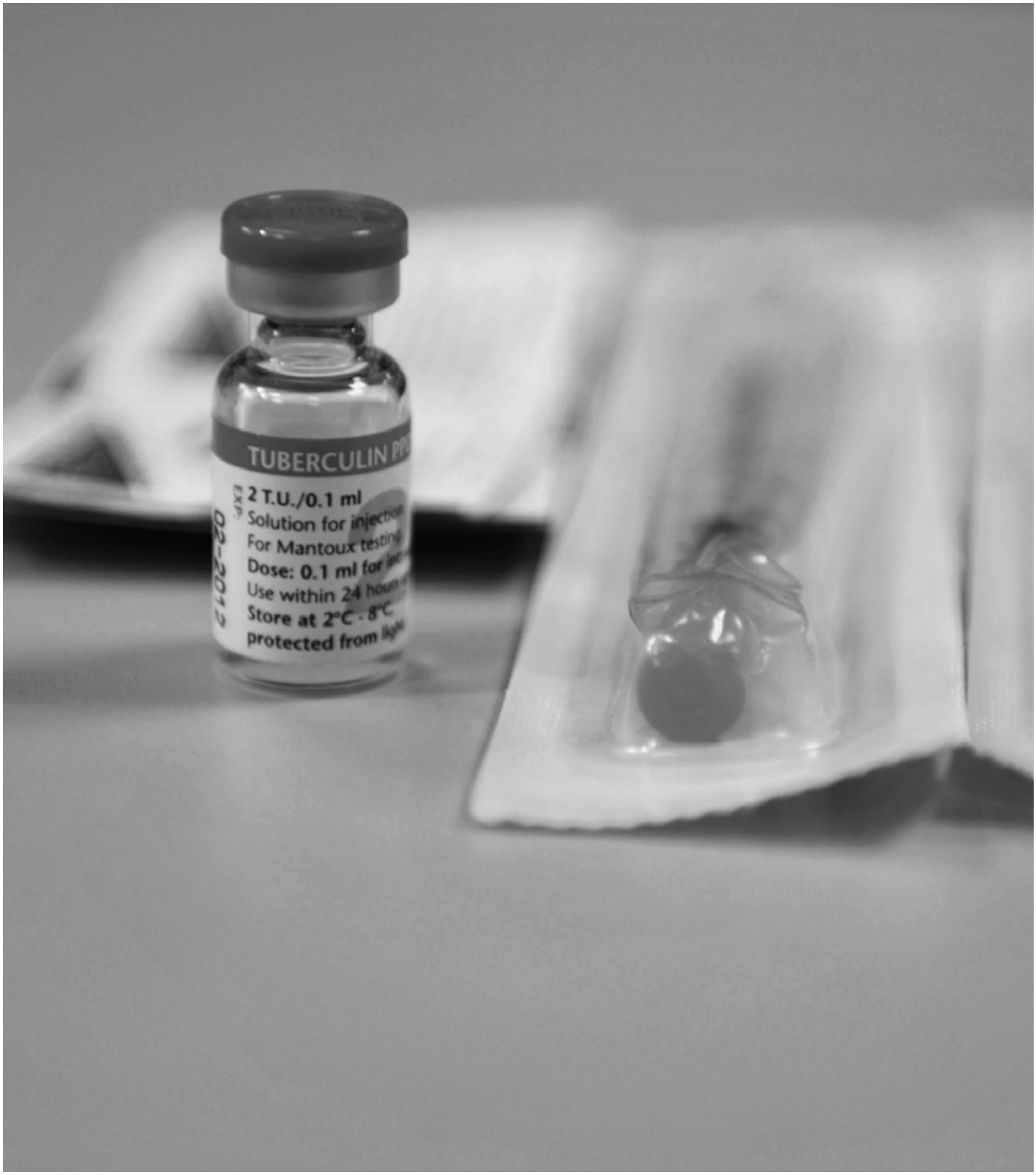
Activity 7.3.3 Member States will include and prioritize childhood TB in their national TB strategic or national health plans by the end of 2013.

Activity 7.3.4 Member States will improve access to TB prevention, control and care for hard-to-reach populations and vulnerable populations, especially migrants and homeless people and those with difficult lifestyles such as alcohol and drug users, by developing outreach programmes using patient activists, civil society organizations and community health care staff (as appropriate) to link with patients in their own social contexts.

Activity 7.3.5 Member States will ensure that TB services incorporate or refer to services that provide interventions for people who use drugs, including drug dependence treatment, by the end of 2013.

Activity 7.3.6 Member States will ensure that HIV services incorporate intensified TB case-finding, infection control and isoniazid preventive therapy by the end of 2013.

Activity 7.3.7 Member States will ensure that TB services incorporate HIV testing and counselling, co-trimoxazole preventive therapy and antiretroviral therapy by 2013.



Examples of best practice

Azerbaijan

The main medical department of the Ministry of Justice has been carrying out regular screenings for inmates and people on remand, starting from trial isolators in the framework of the TB control project in the penitentiary system. The compulsory diagnostic algorithm consists of a questionnaire and X-ray investigation. Sputum samples from suspicious TB cases are taken three times for microscopy and bacterial inoculation. Rapid diagnostic sensitivity tests are run routinely based on the latest diagnostic technologies. Suspected and/or confirmed cases of TB are immediately isolated in separate rooms and within several days (not later than a week) are transferred to a specialized treatment institution under the Ministry of Justice where all forms of TB, including drug-resistant TB, are treated. In this closed medical institution, treatment is available for all inmates and people under investigation without regard to sex, age, inside regime mode and conditions of punishment.

Estonia

Estonia has the second highest per capita alcohol consumption in the Region and there is a high prevalence of alcoholism among TB treatment defaulters and MDR-TB cases. In 2011, a demonstration project started with training of staff on AUDIT (alcohol use disorders identification test) and coordination between the national TB services and the psychiatric services offering counselling and treatment for alcoholism to patients undergoing treatment for TB.

Collaborative TB/HIV activities are being implemented, such as HIV testing of TB patients and TB screening among people living with HIV, co-treatment with anti-TB drugs, antiretroviral therapy and opioid substitution therapy if indicated, information for patients and training of doctors. These have resulted in earlier detection of both TB disease and HIV infection, a decreased default rate among HIV-infected TB patients and increased TB awareness among people living with HIV *(19)*.

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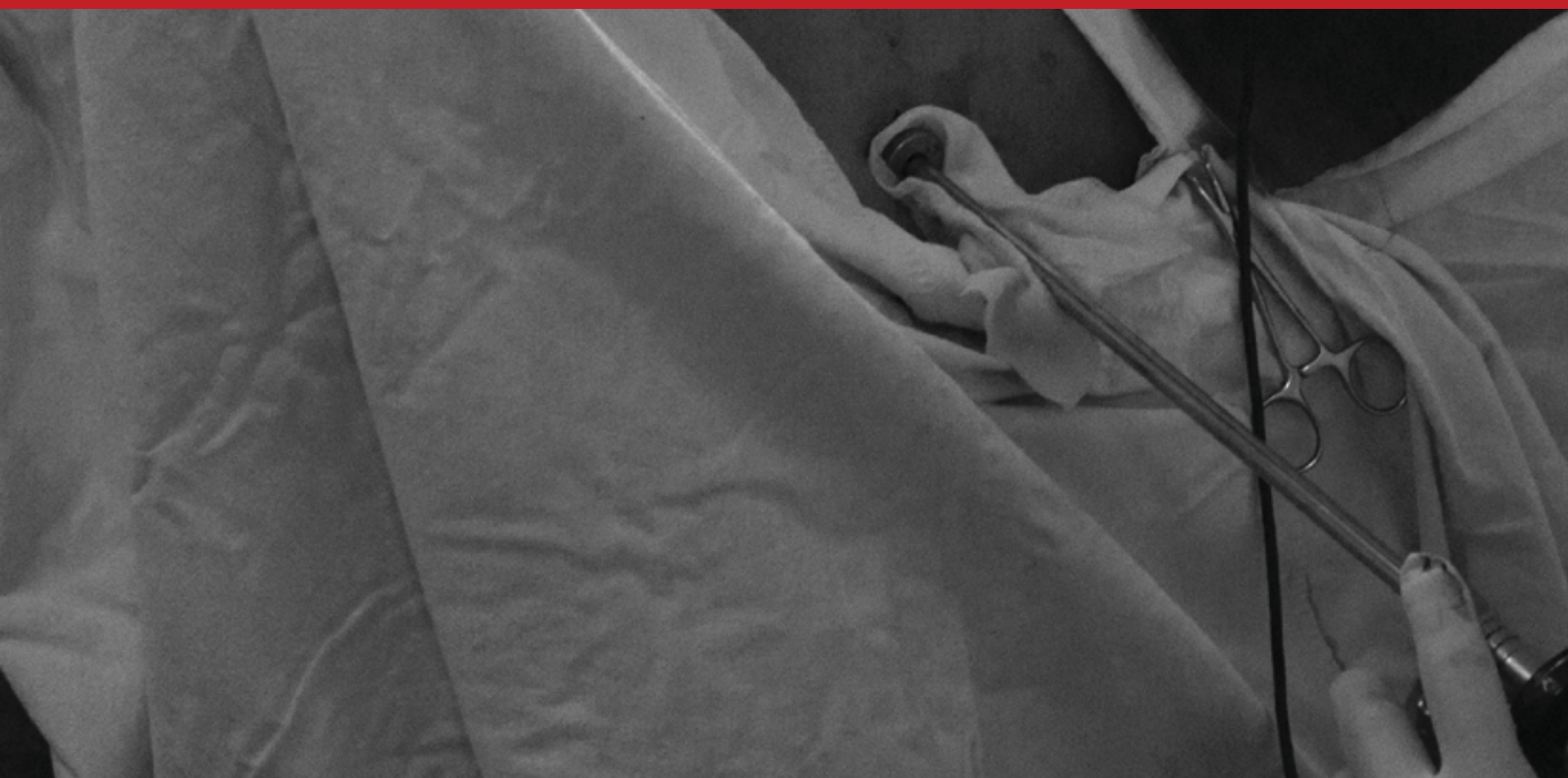

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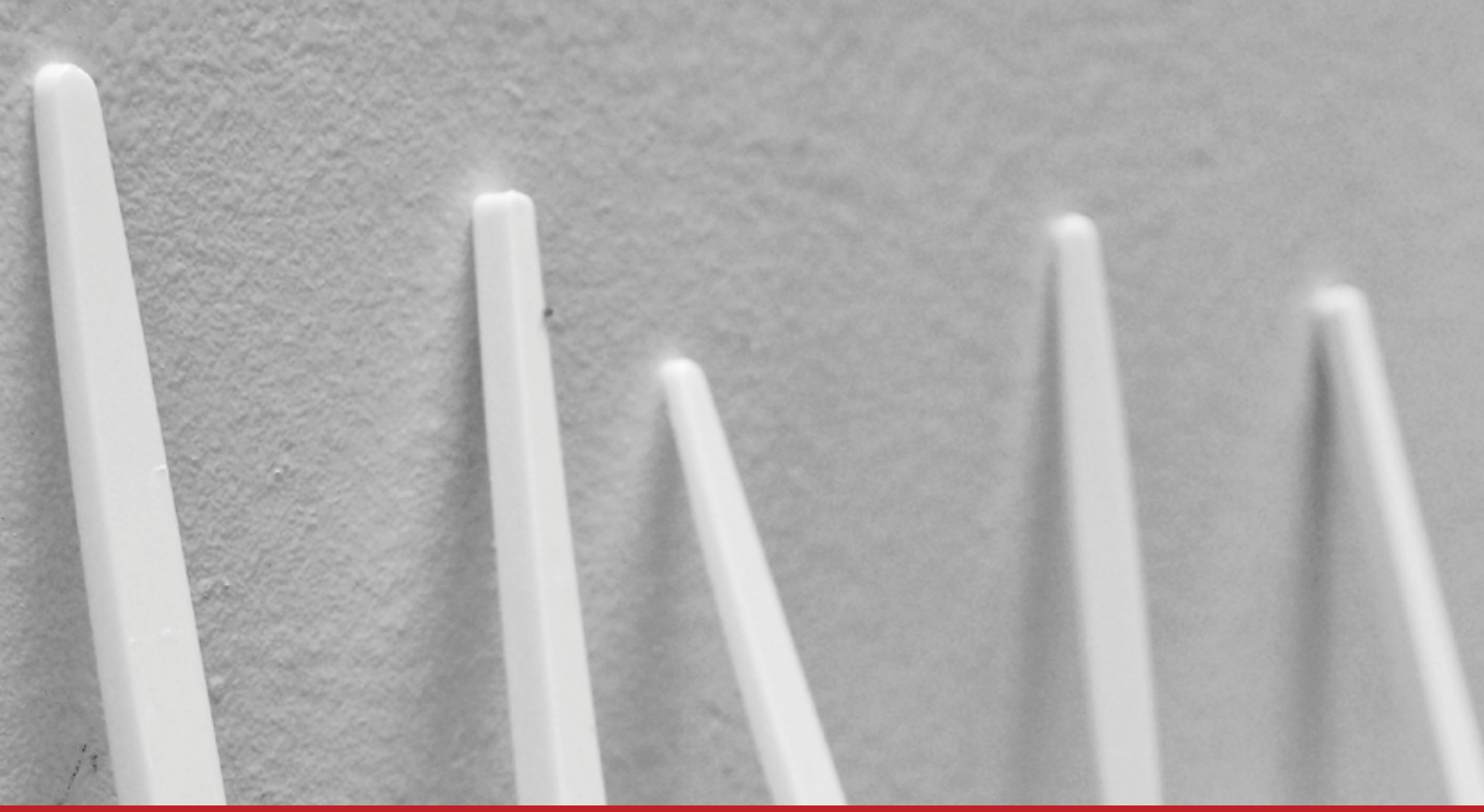


Annexes

Annex 1. Resolution EUR/RC61/R7 of the sixty-first session of the Regional Committee for Europe

Annex 2. Monitoring framework for follow-up of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

Annex 3. Areas of intervention under the Consolidated Action Plan to Prevent and Combat M/XDR-TB

Annex 4. Costs and benefits of implementation of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

Annex 5. Country profiles

Source: www.who.int/tb/data

Annex 1. Resolution EUR/RC61/R7 of the sixty-first session of the Regional Committee for Europe

Regional Committee for Europe	EUR/RC61/R7
Sixty-first session	
Baku, Azerbaijan, 12–15 September 2011	15 September 2011
ORIGINAL: ENGLISH	112567

The Regional Committee,

Having considered the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011–2015 [11] and the comprehensive version of the Action Plan;[12]

Recalling World Health Assembly resolutions WHA58.14 on sustainable financing for tuberculosis prevention and control and WHA62.15 on prevention and control of multidrug-resistant tuberculosis and extensively drug-resistant tuberculosis, the Berlin Declaration on Tuberculosis adopted by the WHO European Ministerial Forum and the Beijing "Call for action" on tuberculosis control and patient care;

Noting with concern that multidrug- and extensively drug-resistant tuberculosis (M/XDR-TB) has emerged as an increasing threat to public health and health security in the WHO European Region, with 20% of the global burden of MDR-TB in the WHO European Region and the vast majority of the countries in the Region reporting extensively drug-resistant TB (XDR-TB);

Noting further that of an estimated 81 000 MDR-TB patients in the Region each year, only about one third are notified (owing to the low availability of bacteriological culture and drug susceptibility testing) and less than half are reported to receive appropriate and adequate treatment,

» **ADOPTS the Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011–2015 and its targets of diagnosing at least 85% of estimated MDR-TB patients and successfully treating at least 75% of them by 2015;**

» **URGES Member States** [13]:

1. to harmonize as appropriate, their national health strategies and/or national M/XDR-TB response with the Consolidated Action Plan;
2. to identify and address the social determinants and health system challenges related to the prevention and control of M/XDR-TB, and in particular to adopt sustainable financial mechanisms, involve primary health care services and provide psychosocial support as appropriate;
3. to scale up access to early diagnosis and effective treatment for all drug-resistant TB patients, and to achieve universal access by 2015;
4. to scale up TB infection control and strengthen surveillance of drug-resistant TB and monitoring of treatment outcomes;
5. to expand their national capacity to scale up the management of drug-resistant TB, involving civil society organizations and other partners and sectors;
6. to address the needs of specific populations through the introduction of patient-centred initiatives and mechanisms and the provision of psychosocial support to patients as appropriate;
7. to closely monitor and evaluate implementation of the actions outlined in the Consolidated Action Plan;

» **REQUESTS the Regional Director:**

8. to actively support implementation of the Consolidated Action Plan by providing leadership, strategic direction and technical support to Member States;

11 Document EUR/RC61/15

12 Document EUR/RC61/Inf.Doc./3

13 And, where applicable, regional economic integration organizations

9. to facilitate the exchange of experiences and know-how between Member States by establishing and strengthening knowledge hubs, centres of excellence and WHO collaborating centres;

10. to make national and international partners more aware that TB and M/XDR-TB is a priority issue in the Region;

11. to establish a European StopTB partnership platform and/or related mechanisms to strengthen the involvement of national and international partners, including civil society organizations, in the prevention and control of TB and M/XDR-TB;

12. in collaboration with national and international partners, to establish adequate mechanisms, involving civil society organizations, communities and the private sector, among others, to assess progress in the prevention and control of M/XDR-TB at regional level every other year, starting from 2013, and to report back to the Regional Committee accordingly;

» **URGES civil society organizations, national and international partners and development agencies, and in particular the Global Fund to Fight AIDS, Tuberculosis and Malaria, the European Centre for Disease Prevention and Control and the European Commission, to fully support implementation of the Consolidated Action Plan.**

Annex 2. Monitoring framework for follow-up of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

The development of a monitoring framework is an essential component of any effective plan. The key to the development of successful indicators is the inclusion of measures that are broad enough to reflect all aspects of the ambitious plan set out, sufficiently specific to address the critical markers of success and adequately concise in order not to overburden national programmes. Taking these guidelines into account, an international task force was constituted under the leadership of the Regional Office, with membership across the Region and including international bodies, nongovernmental organizations and civil society representatives.

This framework, based on a detailed review of the Action Plan, provides a tool for monitoring international and national implementation. It outlines detailed elements for the assessment of specific interventions at the operational level, covering inputs, processes, outputs, outcomes and impact. All indicators identified in this framework reflect the stated goals of the Action Plan, allowing implementers, the community, donors and other stakeholders to track progress towards benchmarks and the eventual achievement of all objectives.

The indicators, while regional in scope, are designed to serve as a guide to the development or adjustment of comprehensive monitoring plans at country level.

There are 11 core indicators that allow for the monitoring of performance in the main areas and interventions in the Action Plan. The list of core measures is accompanied by a full list of indicators, which closely follows the structure of the Plan. Each group of activities is reflected in the framework by one or more indicators, assessed by the task force to represent the most accurate measure of performance of the group of activities. In addition, a baseline level for the indicator, desired target, assessment frequency, monitoring mechanism and data source are defined for each indicator/group of indicators. In most cases, the baseline levels were defined based on information provided by each country through the annual TB data collection process carried out by the Regional Office and ECDC. This annual data collection process has Region-wide coverage, is undertaken only once (thus avoiding duplication of efforts by countries and partners) and ensures a user-friendly mechanism for data collection. In a limited number of indicators among the full list, the absence of baseline information might be explained by the unavailability of these data and/or questionable reliability of the information available.

In order to assess the performance of interventions, countries will be grouped based on two main criteria: (i) a high or low burden of M/XDR-TB, and (ii) whether they are one of the 18 HPC to stop TB in the European Region. Analysis by country will be carried out to assess country-specific performance in preventing and combating M/XDR-TB.

The majority of the indicators, including the core set of 11, will be monitored annually. In addition to the Regional Office/ECDC annual data collection process, a periodic desk review will be carried out to monitor the activities that are not reflected in the joint TB data collection form. Extensive desk reviews will be performed at the beginning of the implementation of the Action Plan and at the end of the period when full implementation is expected. Furthermore, in-depth assessment of the country or external technical assistance reports will provide additional material to support the measurement of indicators. In the absence of these main sources of information, short interviews will be carried out with the managers of the national programme (or equivalent) to assess the performance of the interventions implemented as part of the Action Plan. Short-term impacts will be assessed in 2016–2018 when data on the outcomes of the MDR-TB cohorts will be available. The long-term impacts will be assessed several years later.

Only data approved by Member States will be used in monitoring the Action Plan. This framework would form the sole basis for monitoring, and available established mechanisms for information collection would be used and, where appropriate, strengthened in order to avoid duplication of efforts and to increase efficiency and effectiveness. The indicators outlined here should be integrated in the monitoring and

evaluation framework of national TB control programmes at country level. Moreover, impact indicators from the core group, such as prevalence of MDR-TB, should be reflected in the health system assessment framework in addition to those for the overall TB control area.

The full results of the assessment of performance of the interventions delivered as a result of the Action Plan will be presented via the joint Regional Office/ECDC TB surveillance and monitoring report. The report will consist of detailed analysis and interpretation of data based on the indicators as well as recommendations. Tables, graphs, maps and country profiles will also be presented. Progress in implementation of the Action Plan will be reported to the Regional Committee for Europe every other year, and the monitoring reports will be presented during the meeting of national TB programme managers/country focal points, which is open to stakeholders and civil society organizations involved in TB control in the Region.

Monitoring framework for follow-up of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

Area of intervention	Indicator	Baseline	Target	Frequency	Data source	Layers of analysis	Monitoring mechanism	Input-impact level
Core indicators								
3.4.5	Percentage of MDR among retreated TB cases	37%	29%	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine reporting	Impact
4.1.1	Proportion of notification of TB among health care workers to TB among general population	1.46	Decrease close to 1			18 HPC 15 HMDR		
3.4.2	MDR-TB detection rate among notified TB cases	34.5%	85%			53 Member States 18 HPC 15 HMDRC	Routine estimation	Outcome
2.1.8	Coverage of first-line drug susceptibility testing among notified previously treated TB patients (%)	41.1%	Close to 100%				Routine reporting	
1.2.1	Default rate among new laboratory-confirmed TB patients (%)	6.6%	5%					
3.4.8	Treatment success rate in cohort of MDR-TB patients in countries reporting at least one MDR-TB case (%)	57.4%	75%					
3.4.9	Death rate in MDR-TB patients cohort (%)	10.3%	10%					
3.4.10	Failure rate in MDR-TB patients cohort (%)	11%	10%					
3.4.11	Percentage of MDR-TB patients lost to follow-up (default, transfer out, not evaluated)	21.3%	5%					
3.4.7	Percentage of M/XDR-TB patients enrolled in treatment (in line with WHO recommendations) to all M/XDR-TB patients detected	61.8%	Close to 100%					Output
5.2.1	Number of Member States with electronic case-based data management at national level, at least for MDR-TB patients	Not available	53 Member States					
1. Prevent the development of M/XDR-TB cases								
1.1 Identify and address social determinants related to M/XDR-TB								
1.1.1	Number of Member States with a specific action on social determinants of M/XDR-TB in their national health strategies	Not available	53 Member States	Q3–2011	WHO Global TB database	53 Member States 18 HPC[a] 15 HMDRC[b]	Routine reporting	Impact
1.2 Improve patient adherence to treatment								
1.2.1	Default rate among new laboratory-confirmed TB patients (%)	6.6%	85%	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine reporting	Outcome
1.2.2	Number of Member States providing fixed-dose drug combinations to TB patients	11	18 HPC			18 HPC 15 HMDRC		Output
1.2.3	Number of Member States with no stock-out of first-line TB drugs at any level	15						
1.3 Increase efficiency of health financing for TB control								
1.3.1	Number of Member States reducing the gap in financing of core elements of TB control	Not available	18 HPC	Annually	WHO Global TB database	18 HPC	Routine reporting	Output

Monitoring framework for follow-up of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

Area of intervention	Indicator	Baseline	Target	Frequency	Data source	Layers of analysis	Monitoring mechanism	Input-impact level
1.4 Apply full capacity of PHC services in TB prevention, control and care								
1.4.1	Case detection rate of new and relapsed cases of TB (%)	78%	Increase	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine estimation	Outcome
1.4.2	Treatment success rate among laboratory-confirmed new TB patients (%)	70%	85%				Routine reporting	Output
1.4.3	Treatment success rate among previously treated TB patients (%)	44%	Increase					
1.4.4	Number of Member States with ambulatory TB care integrated into PHC system	13	18 HPC			18 HPC 15 HMDRC		
1.5 Consider management for M/XDR-TB contacts								
1.5.1	Number of Member States with a national policy for management of M/XDR-TB contacts	Not available	18 HPC	2015	National TB programmes	18 HPC	Desk review	Output
2. Scale up access to testing for resistance to first- and second-line anti-TB drugs and to HIV testing among TB patients								
2.1 Strengthen the TB laboratory network								
2.1.1	Percentage of drug susceptibility testing laboratories with external quality assurance according to international standards	61%	Close to 100%	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine reporting	Process
2.1.2	Percentage of drug susceptibility testing laboratories achieving at least 95% of proficiency for rifampicin and isoniazid measured through external quality assurance	96%	100%					Output
2.1.3	Number of Member States using WHO-recommended diagnostics for rapid molecular tests for routine diagnosis of drug resistance	Not available	53 Member States					
2.1.4	Percentage of all notified TB cases where culture was performed		Close to 100%					
2.1.5	Percentage of all notified TB cases confirmed by culture	47.3%	Increase					Outcome
2.1.6	Coverage of first-line drug susceptibility testing among all notified TB patients (%)	39.8%	Close to 100%					
2.1.7	Coverage of first-line drug susceptibility testing among notified new TB patients (%)	30.0%	Close to 100%					
2.1.8	Coverage of first-line drug susceptibility testing among notified previously treated TB patients (%)	41.1%	Close to 100%					
2.1.9	Coverage of second-line drug susceptibility testing among notified MDR patients (%)	36.9%	Close to 100%					

Monitoring framework for follow-up of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

Area of intervention	Indicator	Baseline	Target	Frequency	Data source	Layers of analysis	Monitoring mechanism	Input-impact level
3. Scale up access to effective treatment for all forms of drug-resistant TB								
3.1 Ensure the uninterrupted supply and rational use of quality medicines								
3.1.1	Number of Member States with no stock-out of second-line TB drugs at any level	15	18 HPC	Annually	WHO Global TB database	18 HPC 15 HMDRC	Routine reporting	Output
3.1.2	Number of Member States with paediatric formulations of anti-TB drugs in use	23	53 Member States			53 Member States 18 HPC 15 HMDRC		
3.2 Manage adverse events								
3.2.1	Number of Member States with national guidelines for reporting and managing adverse drug events in line with WHO recommendations	Not available	18 HPC	Q3–2011 Q1–2016	National TB programmes	18 HPC 15 HMDRC	Desk review	Output
3.3 Develop new medicines								
3.3.1	Long-term regional strategy for development of TB medicines market (including paediatric formulations) developed by 2012	No	Yes	2013	Regional Office	WHO European Region	Not applicable	Output
3.4 Scale up access to treatment								
3.4.1	Estimated incidence, all MDR-TB per 100 000 population	9.1	Decrease	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine reporting	Impact
3.4.2	MDR-TB detection rate among notified TB cases	34.5%	85%					Outcome
3.4.3	Percentage of MDR among all notified TB cases	20.5%	16%					Impact
3.4.4	Percentage of MDR among new TB cases	11.7%						
3.4.5	Percentage of MDR among retreated TB cases	36.6%	29%					
3.4.6	Percentage of XDR among detected MDR-TB cases	5.0%	Decrease					
3.4.7	Percentage of detected M/XDR-TB covered by treatment according to national guidelines that are in line with WHO recommendations	61.8%	Close to 100%					Output
3.4.8	Treatment success rate in MDR-TB patients cohort (%)	57.4%	75%					Outcome
3.4.9	Death rate in MDR-TB patients cohort (%)	10.3%	10%					
3.4.10	Failure rate in MDR-TB patients cohort (%)	11.0%	10%					
3.4.11	Percentage of MDR-TB patients lost from follow-up (default, transfer out, not evaluated)	21.3%	5%					
4. Scale up TB infection control								
4.1 Improve administrative and managerial aspects of TB infection control								
4.1.1	Notification rate ratio of TB among health care workers by TB among general population	1.46	Decrease close to 1	Annually	WHO Global TB database	18 HPC 15 HMDRC	Routine reporting	Impact
4.1.2	Number of Member States having endorsed a national plan for TB infection control	Not available	18 HPC					Output

Monitoring framework for follow-up of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

Area of intervention	Indicator	Baseline	Target	Frequency	Data source	Layers of analysis	Monitoring mechanism	Input-impact level
4.2 Strengthen environmental measures of TB infection control								
4.2.1	Percentage of TB hospitals with plans for infection control based on assessment	Not available	Close to 100%	Q3–2011 Q1–2016	National TB programmes	18 HPC 15 HMDRC	Desk review	Process
4.3 Ensure accessibility to personal protection measures								
4.3.1	Number of Member States with functioning respiratory protection programme in TB and M/XDR-TB services	Not available	18 HPC	Q3–2011	National TB programmes	18 HPC 15 HMDRC	Desk review	Output
5. Strengthen surveillance, including recording and reporting of drug-resistant TB and treatment outcome monitoring								
5.1 Strengthen surveillance								
5.1.1	Number of Member States with routine MDR surveillance among all TB cases	Not available	53 Member States	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine reporting	Output
5.1.2	Number of Member States with information available on origin of routinely notified TB patients							
5.2 Improve recording and reporting								
5.2.1	Number of Member States with electronic case-based data management at national level, at least for MDR-TB patients	Not available	53 Member States	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine reporting	Output
6. Expand country capacity to scale up the management of drug-resistant TB, including advocacy, partnership and policy guidance								
6.1 Manage programme efficiently								
6.1.1	Number of Member States that have developed, endorsed and started implementing their national MDR-TB response plans	Not available	18 HPC	Q3–2011 Q1–2016	National TB programmes	18 HPC 15 HMDRC	Desk review	Output
6.2 Develop human resources								
6.2.1	Number of Member States with TB component in national human resources plans	Not available	53 Member States	Annually	WHO Global TB database	18 HPC 15 HMDRC	Routine reporting	Output
6.3 Give policy guidance								
6.3.1	Number of Members States which have integrally adopted the Stop TB Strategy	Not available	53 Member States	Annually	WHO Global TB database	18 HPC 15 HMDRC	Routine reporting	Output
6.4 Ensure partnership and coordination								
6.4.1	Regional multi-stakeholders coordination committee established and sustainably funded to assist in scaling up response to MDR-TB	No	Yes	2012	Regional Office	WHO European Region	Not applicable	Output
6.4.2	Number of Member States with a national Stop TB Partnership or similar mechanism of coordination up and running with meaningful involvement of all stakeholders	Not available	18 HPC	Not available	Q3–2011 Q1–2016	National TB programmes	Desk review	

Monitoring framework for follow-up of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

Area of intervention	Indicator	Baseline	Target	Frequency	Data source	Layers of analysis	Monitoring mechanism	Input-impact level
6.5 Involve ACSM/civil society								
6.5.1	Number of Member States having conducted knowledge, attitudes and practice study/ies relevant to TB	14	18 HPC	Q3–2011 Q1–2016	WHO Global TB database	18 HPC 15 HMDRC	Routine reporting	Output
6.5.2	Number of Member States with a developed and fully funded national ACSM strategy and workplan	9						
6.5.3	Number of national Stop TB Partnerships, including patients' associations	Not available			National TB programmes		Desk review	
6.5.4	Number of Member States that financially support nongovernmental organizations active in TB control with specific emphasis on hard-to-reach populations		53 Member States			53 Member States 18 HPC 15 HMDRC		
6.6 Safeguard ethics and human rights								
6.6.1	Number of Member States with a patients' charter in place to ensure ethics and human rights	13	18 HPC	Q3–2011 Q1–2016	WHO Global TB database	18 HPC 15 HMDRC	Routine reporting	Output
6.6.2	Number of Member States providing palliative care for eligible M/XDR-TB patients	Not available		Annually	National TB programmes		Desk review	
6.6.3	Number of Member States having carried out client satisfaction assessments in the TB services							
7. Address the needs of special populations								
7.1 Improve collaborative TB/HIV activities								
7.1.1	Percentage of notified TB cases tested for HIV	81.5%	Close to 100%	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine reporting	Output
7.1.2	Number of Member States having endorsed TB/HIV care protocols	Not available	18 HPC	Q3–2011 Q1–2016	National TB programmes	18 HPC 15 HMDRC	Desk review	
7.1.3	Percentage of HIV among TB patients (new and relapsed)	3.8%	Decrease	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine reporting	Impact
7.1.4	Percentage of TB/HIV patients under antiretroviral therapy	21%	Close to 100%					Output
7.1.5	Percentage of TB/HIV patients under co-trimoxazole	18%	Close to 100%					
7.1.6	Detection rate of TB/HIV (notified to estimated)	59%	Increase				Routine estimation	
7.1.7	Treatment success rate among cases of TB/HIV co-infection (%)	Not available	Increase				Routine reporting	Outcome
7.2 Strengthen MDR-TB control in prisons								
7.2.1	Notification rate ratio of TB among prisoners by TB among general population	Not available	Close to 1	Annually	WHO Global TB database	53 Member States 18 HPC 15 HMDRC	Routine reporting	Impact
7.2.2	Coverage of prison population by national TB programme (%)		Close to 100%					Output
7.2.3	Treatment success rate among prisoners with new laboratory-confirmed pulmonary TB		85%					Outcome
7.2.4	Percentage of released prisoners continuing TB treatment in civil sector		Close to 100%	Q3–2011 Q1–2016	National TB programmes		Desk review	Output

Monitoring framework for follow-up of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

Area of intervention	Indicator	Baseline	Target	Frequency	Data source	Layers of analysis	Monitoring mechanism	Input-impact level
7.3 Improve access for hard-to-reach populations								
7.3.1	Established mechanism for cross-border TB control and care which enables continuum of treatment for migrant population	No	Yes	2013	Regional Office	European Region	Not applicable	Output
7.3.2	Number of Member States with outreach programmes targeting hard-to-reach populations	Not available	53 Member States	Q3–2011 Q1–2016	National TB programmes	53 Member States 18 HPC 15 HMDRC	Desk review	
7.3.3	Number of Member States including and prioritizing childhood TB in their national strategic plans							

Annex 3. Areas of intervention under the Consolidated Action Plan to Prevent and Combat M/XDR-TB

The areas of intervention under the Action Plan described below encompass a series of activities for which technical assistance from the Regional Office and/or partners will be necessary.

Problem	Proposed solutions	Major activities
Intervention 1. **Prevent the development of M/XDR-TB cases**		
In 2009, the proportion of MDR–TB among new TB cases in the Region was 11% and among retreatment cases 36%. XDR-TB notifications tripled and have been reported in many countries.	Social determinants related to M/XDR-TB should be identified and addressed, patient adherence to treatment improved and the full capacity of PHC services applied in TB prevention, control and care.	Social determinants related to M/XDR-TB should be studied, the best models of care using a patient-centred approach documented and strategies specified for integrating ambulatory treatment in PHC services.
Existing systems of TB financing in high-priority countries fund predominantly inpatient services, leaving only a small budget for additional activities such as training and outreach services.	Health financing for TB control should be made more efficient.	The cost–effectiveness of various interventions should be studied and the best funding mechanisms defined for efficient TB prevention and control.
There is no prophylactic treatment for individuals recently infected with or exposed to M/XDR-TB strains.	Prophylactic treatment should be considered to prevent M/XDR-TB among patients' contacts.	Possible regimens for prophylactic treatment should be studied and recommendations developed.
Intervention 2. **Scale up access to testing for resistance to first- and second-line anti-TB drugs and HIV testing among TB patients**		
Laboratory capacity for drug resistance testing is inadequate for first- and second-line drugs.	Both the Supranational TB Laboratory and national TB laboratory networks should be strengthened.	Human resource capacity should be built, quality assurance schemes developed and funding prioritized for novel rapid molecular diagnosis tests for all eligible MDR-TB patients.*
Voluntary counselling and testing for diagnosing HIV co-infection is poor and mortality substantially increases among HIV co-infected TB and M/XDR-TB patients.	Diagnostic counselling and HIV testing should be assured for all TB and M/XDR-TB patients.	Voluntary counselling and testing should be increased by training all responsible staff and offered to all TB patients on a provider-initiated and opt-out basis.

*A rapid test is defined as one which provides diagnosis within 48 hours of processing the specimen and can therefore influence the initial treatment regimen on which the patient is placed.

Problem	Proposed solutions	Major activities
Intervention 3. **Scale up access to effective treatment for all forms of drug-resistant TB**		
The unavailability of appropriate treatment contributes to the spread of MDR-TB, amplification of drug resistance and emergence of XDR-TB. In 2009, only 12% of all estimated prevalent MDR-TB cases received adequate treatment with quality second-line drugs.	An uninterrupted supply and rational use of quality medicines should be ensured, adverse events managed, new drugs developed and access to quality treatment scaled up.	All aspects of drug management should be improved, including capacity-building and legislation, and the WHO Good Governance for Medicines Programme should be expanded. A generic guide should be developed for managing and reporting side-effects and regional unbiased medicine information centres should be introduced. The use of new medicines should be studied and universal access ensured to quality treatment (including for children), using DOT for all TB and M/XDR-TB patients.
Intervention 4. **Scale up access to effective treatment for all forms of drug-resistant TB**		
Transmission of TB as airborne infectious disease is possible in all inpatient and outpatient settings where TB patients are present, but in many patient facilities in high-priority countries infection control is poor. The risk of infection in communal settings (such as the prison services) is even higher, due to over-crowding and poor ventilation. TB among health staff is a serious occupational risk.	Administrative and managerial aspects of TB infection control should be improved. Environmental measures of TB infection control should be strengthened, and accessibility ensured to personal protection measures.	National TB infection control action plans and sound infection control standard operating procedures should be developed, including educational and respiratory protection programmes. Infection control should be included in pre- and post-graduate training curricula and cascade training carried out in environmental measures. The availability of adequate numbers of quality respirators should be ensured and surveillance of infection and disease introduced among health care staff.
Intervention 5. **Strengthen surveillance, including recording and reporting of drug-resistant TB and treatment outcome monitoring**		
Since 2008, the Regional Office and ECDC have jointly coordinated the collection of surveillance data. Available data for certain countries are still patchy and/or outdated.	Surveillance should be strengthened and recording and reporting improved.	Data collection on programme performance and drug resistance should be improved and electronic recording and reporting systems introduced for surveillance and cohort analysis. Country representatives' capacity should be strengthened through training, inclusion in country programme reviews and participation in meetings of surveillance focal points.

Problem	Proposed solutions	Major activities
Intervention 6. **Expand country capacity to scale up the management of drug-resistant TB, including advocacy, partnership and policy guidance**		
Human and financial resources are not always used efficiently since TB control is often an isolated activity under ministries of health, and partnerships and national and international organizations, including civil society in TB control, are not fully utilized.	The efficiency of programme management should be ensured, policy guidance stimulated and effective national partnerships established.	Planning mechanisms and quality of performance should be improved in line with ISO 9001 programme management standards. TB control should be included in health system reform initiatives and other health systems funded to undertake TB programme implementation. The status of partnerships should be legalized and the roles of the different partners formalized, using existing successful models.
The uneven distribution of health care staff at different levels of service delivery is common in high-priority countries. Most in-service training courses are not based on practical needs, while often the pre-service training curriculum for TB and M/XDR-TB is outdated.	Human resources development plans should be initiated.	Human resources plans should be developed that include a standard set of references for quality and quantity of staff. Funding should be ensured for new competency-based training programmes for all aspects of M/XDR-TB, and the capacity of centres of excellence should be established and/or strengthened.
Regular political changes at national and subnational level hinder sustained political and financial commitment. The importance of TB prevention, early diagnosis and above all the completion of treatment is not well communicated to decision-makers or the general population.	Continuous advocacy is needed with politicians and decision-makers at national and subnational levels, and there should be stronger involvement of civil society and patients' associations.	A national ACSM strategy should be developed, based on needs assessments and knowledge, attitude and practice surveys and including sustained advocacy with decision-makers. All forms of the media should be used to generate awareness and action among the general public to deal with the challenge of M/XDR-TB.
In many high-priority countries, TB services are designed around providers rather than patients. Diagnostic procedures are often long and duplicative, the efficacy of the drugs used is uncertain, hospital stays are unnecessarily long with no infection control measures and with disruption to patients' social and working lives.	More attention should be given to ethics and human rights in TB control.	The International Standards for Tuberculosis Care and the Patients' Charter for Tuberculosis Care should be introduced. The capacity for palliative care for eligible M/XDR-TB patients should be strengthened. An ombudsman mechanism should be established to develop criteria for patient-centred care, client satisfaction assessments and hearing complaints or imposing sanctions when corruption or unethical practices occur.

Problem	Proposed solutions	Major activities
Intervention 7. **Address the needs of special populations**		
Vulnerable groups (such as children and pregnant women) and socially disadvantaged populations experience barriers to access to health care leading to continued transmission, late diagnosis and incomplete treatment.	Collaborative TB/HIV interventions should be improved, universal access advocated to TB, HIV and harm reduction services and access for hard-to-reach populations improved. Existing tools and programmes to respond to paediatric TB should be improved.	Functional integrated TB, HIV (and drug use/narcology) services should be established for people living with a risk for HIV (especially injecting drug users). Best practices should be documented on effective service delivery models, including isoniazid prophylactic treatment, and training in TB/HIV supported for all health care providers. Interventions should be developed to improve access to TB control, including outreach programmes, for hard-to-reach populations and a mechanism established for cross-border TB control and care for migrants. Interventions should be developed to respond to childhood TB, and TB paediatric programmes integrated into HIV and primary health care and maternal and child health programmes.
Communal settings, especially prisons, are a source for continuous transmission and development of all forms of TB. Inappropriate funding of services, insufficient training of staff and lack of collaboration with the civil health authorities have caused a major problem with TB and M/XDR-TB that extends beyond the prison walls in many high-priority countries.	M/XDR-TB control in prisons should be strengthened.	Early diagnosis (including new rapid methods) and effective treatment for M/XDR-TB should be established in all penitentiary services and a continuum of quality care provided for released prisoners.

Annex 4. Costs and benefits of implementation of the Consolidated Action Plan to Prevent and Combat M/XDR-TB

The WHO European Region needs over US$ 5.2 billion for the screening and treatment of M/XDR-TB patients in the years 2011–2015. The annual budget ranges between US$ 453 million for 2011 and US$ 1.7 billion for 2015. Around 96% of the total finances will be required for the 18 HPC. Thirty-eight percent of the financing will be required for the inpatient treatment of M/XDR-TB patients. The cost of treating an MDR-TB patient who completes 24 months of treatment is estimated at US$ 25 400 for HPC and US$ 56 300 for non-HPC in the Region.

Analysis has shown that the interventions described in the Action Plan are highly cost-effective.

The implementation of the Action Plan would lead to a direct gain of US$ 5 billion in the short term and US$ 48 billion in the long term. In addition, US$ 7 billion would be saved directly from the cost of caring for M/XDR-TB cases that would be prevented by the Plan. These costs only represent the impact of the Plan during the five years it is scheduled to run. Its implementation will also have an impact on preventing transmission and thus averting many more MDR-TB cases beyond 2015 that are as yet undetermined but will go far beyond this number. Furthermore, the estimated budget of US$ 5.2 billion is a conservative estimate, because it was based on the average cost of three months inpatient care for MDR-TB patients. Analyses of various costing scenarios have shown that with variations in inpatient care, the budget for implementation of the Plan could vary between US$ 3.7 billion and US$ 9.8 billion. Resource availability and gap analysis showed that, with the assumed increase in financing, the gap in funding the US$ 5.2 billion budget of the Plan will represent 13% of the needs. However, without the increase in funding, the gap will be 68% of the needs.

MDR-TB and XDR-TB require expensive screening and treatment interventions. M/XDR-TB is treated with a combination of second-line drugs. Patients infected with it often require inpatient care or a similar support system for the initial months of treatment, both to treat the disease and to manage the side-effects of the treatment. Screening for MDR-TB and XDR-TB also require resource-consuming investigations. Resistance to first-line drugs can be screened by molecular methods, such as the Xpert MTB/RIF assay or other WHO-recommended diagnostics for rapid molecular tests. Susceptibility to first-line anti-TB drugs can be screened by solid medium- or liquid medium-based culture methods. Screening needs to be scaled up in the European Region as only 34% of the estimated MDR-TB cases were notified in 2009.

The finances required to control MDR-TB at the global level are estimated to rise to US$ 7.1 billion for the five years 2011–2015 *(1)*. Although financing has been increasing since 2007, more will be needed to combat M/XDR-TB in proportion with changing epidemiological patterns. The bulk of the financing to combat M/XDR-TB in the next five years will be needed for the HPC.[1]

Several authors have taken different approaches to studying the cost of treating MDR-TB. Rajbhandary et al. *(2)* calculated the direct medical costs as well as the indirect costs of treating MDR-TB patients in the United States, including inpatient and outpatient costs and productivity losses of patients in their calculations. White & Moore-Gillon *(3)* calculated the direct medical costs of treating MDR-TB patients in a hospital in the United Kingdom, including the costs of drugs, therapeutic monitoring, provision of negative pressure facilities, nursing care and surgical interventions. Mahmoudi & Iseman *(4)* estimated the treatment charges for MDR-TB acquired through errors in treatment in the United States, and Burman et al. *(5)* converted these figures to costs by using a payment : charge ratio and including the productivity losses of patients taking a discount rate of 5%. Kang et al. *(6)* estimated the direct and indirect costs of treating MDR-TB for medically and surgically treated MDR-TB patients in a South Korean hospital. The patients in this study underwent a low number of inpatient (0–4) and outpatient (9–68) treatment episodes. Using a cohort study, Tupasi et al. *(7)* studied the direct and indirect costs of MDR-TB treatment on the DOTS-

1 Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Romania, Russian Federation, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan.

plus treatment strategy in the Philippines, using a unit cost-based approach to estimate the cost of treatment.

The Regional Office commissioned the Royal Tropical Institute in Amsterdam to estimate the costs for the implementation of Consolidated Action Plan to Prevent and Combat M/XDR-TB 2011–2015, on the basis of the expected achievements and benefits of implementing the Plan drawn up by the Office. The study was a collaboration between the Royal Tropical Institute in the Netherlands, the WHO Regional Office for Europe and WHO headquarters. The findings and methodology were peer-reviewed by Dr Peter White of Imperial College in London, United Kingdom.

Methods

The public health system perspective for budgeting and unit cost calculation was used for estimation of costs. Direct costs incurred by the public health care system were included. Indirect costs incurred by patients and society were excluded. Costs for stewardship, supervision and capacity-building were included. Using a unit-cost based approach for budgeting, the unit cost of screening for MDR-TB and XDR-TB and the unit cost of treating an M/XDR-TB patient were calculated. The number of patients screened for M/XDR-TB and the number of patients treated for M/XDR-TB were estimated based on a linear projection of available data on the transmission risk of TB and MDR-TB. The costs of subcomponents of MDR-TB screening and treatment were calculated based on the health care resource requirements and epidemiological data *(8)*. The unit costs of screening for HIV and treating HIV/MDR-TB co-infection were retrieved from existing data sources *(9, 10)*. Cost and epidemiological data were sourced from WHO/Europe, European Centre for Disease Prevention and Control (ECDC), the Foundation for Innovative New Diagnostics, UNAIDS and academic publications. Estimates were made of both an output-based and an input-based budget. The budget was established by including the complete treatment costs of all M/XDR-TB patients envisaged to be enrolled in 2011–2015, including treatment for those cases beyond 2015. Budgets were prepared for the 18 HPC and 35 non-HPC[2] separately to incorporate the vastly different unit costs and patient numbers between the two categories. As per standard practice, a discount rate of 0.03 *(11)* was chosen in estimating the budget and unit costs.

Estimation of the number of MDR-TB and XDR-TB patients

A constant annual rate of change was considered in estimating the total number of TB patients for 2011–2015. The Regional Office projected the patient numbers based on the historical trends in the number of TB cases in the last three years (2007–2009). In this model, the percentage of sputum smear-positive cases out of the total TB cases and the percentage of culture-positive cases out of the total TB cases would remain constant at 2009 values (45% and 60% in HPC and non-HPC, respectively *(12)*). The trend in the percentage of MDR-TB patients among all TB patients is based on the 2008–2009 trend (from 22.6% to 24.3% in HPC and assumed stable at 2% for non-HPC *(12)*). Owing to the limited availability of susceptibility testing for second-line drugs before 2008 and based on the limited data from 2008–2009, the percentage of XDR-TB among MDR-TB patients has been considered as 10% during the whole period of the Plan *(13)*. In the absence of representative data, the Regional Office estimated HIV prevalence among incident M/XDR-TB cases as 5.6% for HPC and 5.2% for non-HPC.

The Regional Office calculated the detection rate of MDR-TB for 2009 by dividing the number of diagnosed patients (27 765) by the total number of estimated MDR-TB patients (81 000). As set out in the Action Plan, the Regional Office assumed that the detection rate for MDR among new TB cases would increase linearly from 2009 through 2015 to reach the target of 85% by 2015. A similar approach was used for the estimation of the detection rate of XDR-TB patients, for which the Regional Office assumed that the detection rate would reach 50% by 2015. WHO's 2008 guidelines for the programmatic management of drug resistant TB *(14)* were used to estimate the second-line drug needs. To reach universal access, the Regional Office assumed that the percentage of diagnosed and notified M/XDR-TB patients that would undergo treatment would increase linearly from 62.7% (current treatment coverage) to 100% in 2015.

Screening for MDR-TB and XDR-TB

According to WHO's latest guidelines and the Action Plan, pulmonary TB suspects at high risk of MDR-TB are expected to be screened for rifampicin resistance using rapid diagnostic tests. The percentage of screened MDR-TB suspects would increase from zero to reach 30% by 2015. The Regional Office assumed that the percentage of culture-positive patients screened for first-line drug susceptibility using culture and drug susceptibility testing (DST) would increase from the 10% reported in 2009 to 100% by 2015. MDR-TB patients are expected to be screened for second-line drug resistance using a line probe assay, and second-line drug susceptibility using culture and DST. The Regional Office assumed that the percentage of MDR-TB patients screened using line probe assay and culture and DST would increase from 5.6% in 2009 to 50% in 2015. Also, it was assumed that the percentage of patients diagnosed with MDR-TB and screened for HIV infection would be 100%.

2 Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Israel, Italy, Luxembourg, Malta, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, the former Yugoslav Republic of Macedonia and United Kingdom.

Unit costs

The unit costs of treatment and diagnostics were calculated for HPC and non-HPC separately. The life-cycle cost perspective was used to calculate the unit costs of diagnostics. The cost of equipment was calculated taking a 10-year life-cycle of costs and throughput and a discount rate of 0.03. The annual maintenance costs of equipment were fixed at 5% of the total cost of equipment at delivery, except for the Xpert MTB/RIF assay, for which the Foundation for Innovative New Diagnostics has fixed the annual maintenance cost at 8% *(15)*. In order to account for excess capacity an idle rate of 10% for all equipment was considered. The cost of staff time was based on annual expenditure and throughput, for example, to estimate the average time to complete a stipulated diagnostic test. The total amount of staff time available for a year was calculated using 8 hours a day, 22 days a month and 11 months a year. Excess staff capacity was estimated at 15%. Staff salaries for diagnostics were obtained from WHO-CHOICE 2005 values for the Health Worker category *(16)*. Euro A values were used for non-HPC. The average of Euro B and Euro C values was used for HPC. The costs of materials were allocated directly. A wastage rate of 5% was considered for consumables. As per the WHO-CHOICE database values, the cost of delivery of diagnostic tests and equipment is 20% of the free on board cost, i.e. cost, insurance and freight/free on board ratio of 1 : 2 *(17)*. The costs of materials, consumables and equipment as well as the unit cost of a chest X-ray were retrieved from the planning and budgeting tool for TB control activities *(1)*.

The Regional Office considered the unit cost of MDR-TB treatment for a regimen of 6 months of intensive treatment and 18 months of continuation treatment on the basis of the dosage for a person of average size (60 kg). The calculation was made by estimating the average cost of WHO recommended MDR-TB treatment regimens (Z-Km/Cm-Lfx-Eto-Cs-PAS):[3]

XDR-TB patients will be treated with the maximum number of second-line drugs (Z-Cm-Mfx-Eto-Cs-PAS). The costs of diagnostics were based on the average number of laboratory tests a patient would undergo during the standard length of treatment. The cost of ambulatory care was based on the average number of outpatient visits during the standard length of treatment. The average cost for a ten minute outpatient visit was considered in a 50% population coverage setting for the calculation. The required data were retrieved from the WHO-CHOICE database *(16)*. The Regional Office estimated the "hotel cost" of inpatient care based on the percentage of patients hospitalized and the annual average length of stay. In line with the aim of the Action Plan to improve models of care and promote patient-centred approaches, the Regional Office assumed that MDR-TB patients would be hospitalized for three months and XDR-TB patients for one year, and that 80% of patients in HPC and non-HPC would be hospitalized. The relevant data were retrieved from the ECDC-WHO/Europe Joint Surveillance Database *(18)*. Since MDR-TB patients require sophisticated medical interventions and negative pressure ventilation rooms, the average cost of a secondary care hospital day is used for the calculation of inpatient hotel costs. As per the findings of Rajbhandary et al. *(2)*, the cost of therapeutics and diagnostics for the management of side-effects and care for M/XDR-TB patients during inpatient stays was taken as 31% of the total inpatient cost. For both ambulatory and inpatient unit costs, Euro A costs were used for non-HPC and the average of Euro B and Euro C costs for HPC.

3 Abbreviations used: capreomycin (Cm), cycloserine (Cs), ethambutol (E), ethionamide (Eto), isoniazid (H), kanamycin (Km), levofloxacin (Lfx), Moxifloxacin (Mfx), para-aminosalicylic acid (PAS), pyrazinamide (Z), rifampicin(R), streptomycin (S).

Modelling for calculation of expected achievements

To determine the expected achievements of the Action Plan, the targets for detection and treatment of M/XDR-TB patients defined in the Plan are used. Patient numbers and treatment costs are calculated separately for HPC and non-HPC and subsequently added together. Similarly, to determine the number of averted cases and lives saved, these numbers are calculated separately for MDR and XDR-TB cases and subsequently summed up.

To estimate the number of M/XDR-TB cases that could be averted in the Region through implementation of the Action Plan, the Regional Office applied the model of direct transmission of TB during the lifetime of the Plan only, thus excluding possible averted transmission from secondary and tertiary cases. Based on the Styblo model, a sputum smear-positive patient left untreated could lead to an average of 10–15 new infections each year. The lifetime risk of progressing from infection to active TB is about 10% on average (5% within five years, 5% thereafter). The Regional Office assumed that each untreated sputum smear-positive patient could lead to 1.25 new TB cases over one transmission cycle *(19)*. The estimated number of averted cases is calculated by subtracting the number of patients who are successfully treated or died under treatment from the number of patients who are spontaneously cured or died without any intervention. The number of M/XDR-TB cases that cure spontaneously is assumed to be 5% and the case fatality rate without intervention is assumed to be 30%, following the findings of Tiemersma et al. *(20)*. The number of averted cases was calculated separately for MDR-TB and XDR-TB cases.

The percentage of successfully treated MDR-TB patients used was assumed to be the same as reported by WHO for 2009 (57.4%) and then linearly increased to reach the target of 75% in 2015, and the TB fatality rate among detected cases and under treatment was assumed to be 10.1%, the same as recorded in 2009 *(12)*, and to remain stable for 2011–2015. The number of XDR-TB cases averted was calculated by using

the following variables: the number of XDR-TB cases would remain at 10% of MDR-TB cases according to the study of Devaux et al. *(13)*; and the treatment success and death rates among detected XDR-TB were assumed to be 51% and 20%, respectively. Since data on treatment success and death rates specific to the WHO European Region are lacking for XDR-TB cases, the average of these rates of four scientific publications on treatment outcomes of XDR-TB patients were used *(21–24)*.

The number of lives saved through implementation of the Plan was calculated as the difference between the projected number of MDR-TB deaths (mortality rate of MDR-TB patients under treatment multiplied by the number of MDR-TB cases) and the estimated number of TB deaths in the counterfactual scenario (no implementation of the Plan and assuming the TB epidemic would continue as in 2009).

Cost–effectiveness

The cost per DALY gained was calculated by dividing the cost per death averted by the average of DALYs gained per death averted *(25)*. The average of 21 DALYs gained per death averted was taken as a conservative estimate *(17)*. Following a programmatic approach, the cost per death averted amounted to the total budget divided by the number of deaths averted. Cost per DALY gained was determined by dividing cost per death averted by the average of DALYs gained per death averted. Cost–efficiency was determined by comparing the cost per DALY weighted by the estimated number of MDR-TB cases based on the average GDP, weighted by the respective country populations.

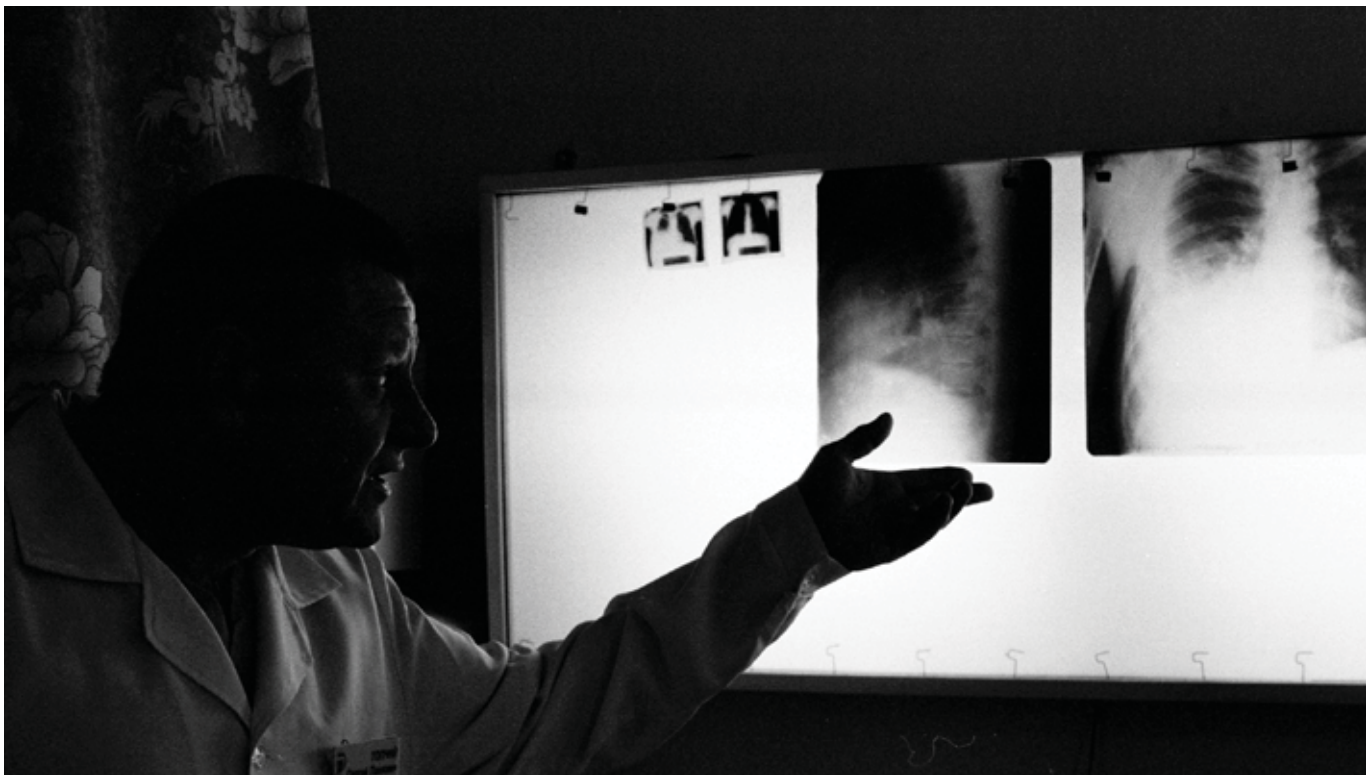
Economic gain

Multiplication of GDP per capita and DALYs gained constitutes the long-term direct economic gain of the lives saved in the period 2011–2015. The DALYs gained per deaths averted was determined by multiplication of the number of lives saved by the average of DALYs gained per live saved. The short-term direct economic gain up to 2015 was limited to the DALYs gained within the time frame of the Plan.

Additional indirect short-term gain was restricted to the saving from the cost of treatment of M/XDR-TB cases averted by implementation of the Plan up to 2015 (direct transmission events). To calculate these treatment costs, a treatment unit cost was derived from the total budget by dividing it by the number of cases enrolled in treatment. The long-term indirect gain from averting cases by stopping the chain of transmission was not determined, as this requires more detailed epidemiological transmission modelling.

Resources availability assessment

Since more than 90% of the cost of implementing the Plan is in HPC, the resources availability assessment for 2011–2015 focused on these countries. Three main sources of data were used to estimate the amount of resources available in the Region: grant applications to the Global Fund to Fight AIDS, TB and Malaria, the WHO Stop TB database and national summary TB response plans. The resources availability estimations were triangulated across three data sources. The Global Fund supported the Regional Office in assessment of the financial gap.



Country grant portfolios which include countries' consolidated proposals submitted to the Global Fund contain the information about the resources available for TB for the years of the proposal. Based on this information, the share of different sources (national, Global Fund and external sources) in the total TB response were determined and applied to the MDR-TB budgets when necessary. The figures related to the Global Fund's contribution to the MDR response in 2011–2015 were obtained from countries' budgets and workplans for the rounds approved by the Global Fund. The figures were adjusted to the 10% efficiency gain requested by the Global Fund from the countries for the years of the analysis. Since not all the HPC had Global Fund grant applications available, these applications were limited as a data source.

The WHO Stop TB database filled in by the countries was used as the source for the funds available for second-line drugs, MDR-TB management and laboratory work. They were totalled from various funding sources including governments, loans (World Bank), the Global Fund and other grants. These data were only partially available for 2011 and 2012. The laboratory component was included in the analysis of the funds available despite the relation to a broader TB response rather than specifically to MDR-TB. The rationale for including the laboratory component was that the costing of the resource requirements contains the section for screening for MDR-TB among TB patients. In addition to the above-mentioned sources, for two countries the budget requirements of the national summary MDR-TB response plans were used to determine the availability of resources.

Assumptions of resources availability forecast

As there are very limited data about the resources available specifically for MDR–TB from various funding sources, several assumptions were used for the estimations. The key assumption was based on the share of these three sources of funding in the overall TB response. As Global Fund resources are only committed for two years at the time of grant signing, country grant performances are reviewed to determine funds that may be available following a grant renewal assessment for a further three-year period of funding. For 2011 and 2012, estimates of the domestic public contribution (funds available in the national and subnational budgets) were mainly taken from the WHO database. The linear trend was used for the years for which no data were available. When country data were not available, a linear trend was used to estimate the missing values.

For each of the four costing scenarios, two resources availability scenarios (Option 1, without a funding increase, and Option 2, with a funding increase) were developed. Option 1 is based on the direct tracking of earmarked and expected funds available from different sources at country level (described above). In the Option 2 scenario all the resources available in 2011 were taken and a number of assumptions to forecast the availability of funds in 2012–2015 were applied. These assumptions were that:

- the Global Fund would increase its contribution up to 50% of the resources required in the eligible HPC by 2015;
- external partners other than the Global Fund would increase their annual share by 15%;
- national governments would increase their contributions by between 2% and 15% depending on the country.

Cost scenarios

All assumptions for the epidemiological projections and cost calculations of the baseline scenario are described in detail above (i.e. the estimated budget of the Action Plan). For the other three scenarios, exactly the same costing tool as developed for the baseline budget of the Plan was used but varied for the average length of stay in hospital and the costs for inpatient care.

- The low estimate: uses lower unit cost for inpatient care (US$ 27 per bed day compared to US$ 76 in the baseline scenario) and three months for the average length of stay (as in the baseline scenario).
- The intermediate estimate: uses the unit cost from the baseline scenario of US$ 76 and six months average length of stay in hospital (versus three months in the baseline).
- The high estimate: uses a higher unit cost for the average length of stay in hospital (US$ 114 per bed day) and eight months as the average length of stay in hospital.

Results

Benefits

The estimated number of MDR-TB cases emerging during 2011–2015 will be about 367 000 cases, of which 225 000 would be detected with implementation of the Action Plan. Fig. 4 in the main text shows the cumulative trends in cases

Table 4.1. **Unit costs of diagnostics (US$)**

Diagnostic test	HPC	Non-HPC
Microscopy (per slide)	1.0	2.0
Culture – liquid	27.5	34.4
Culture – solid	22.1	29.0
DST – liquid	131.2	230.7
DST – solid	46.6	62.2
Line probe assay	66.6	196.9
Xpert MTB/RIF	24.1	71.7

that have emerged, been detected, enrolled in treatment and successfully treated. Starting with 10 512 cases successfully treated in 2011 and increasing up to 45 567 cases in 2015, this yields in total, about 127 000 cases that will be treated successfully during the period of the Plan. In comparison to the steep increase in the number of successfully treated cases, a more gradual increase is expected in the number of patients to be enrolled in treatment of about 200 000 MDR-TB patients in total. Of the total detected MDR-TB patients in the WHO European Region, 99% are expected to be found in the HPC.

Costs

The budget for implementation of the Action Plan is US$ 5.2 billion. This includes treatment completion of the cohort of 2015 M/XDR-TB patients. The cost of treating an MDR-TB patient undergoing a standard treatment cycle of 24 months was calculated, and the direct cost of treating an MDR-TB patient, amounted to US$ 25 400 in HPC and US$ 56 300 in non-HPC. Inpatient treatment represented about 43% and 68% of the treatment cost for MDR-TB and XDR-TB cases, respectively.

Table 4.1 shows the unit costs of diagnosis calculated. The Xpert MTB/RIF assay appeared to be the least expensive diagnostic tool for the screening of first-line anti-TB drug resistance. This assay incurs a cost of US$ 24.1 and US$ 71.7 per screened patient in HPC and non-HPC, respectively. DST using solid culture is the least expensive diagnostic test for the screening of second-line drug susceptibility. DST on solid media costs US$ 46.6 and US$ 62.2 per drug in HPC and non-HPC, respectively (Table 4.1).

The net present value of the total financing required to implement the Action Plan is estimated to be US$ 5.2 billion. The annual budget for the Plan ranges between US$ 453 million for 2011 and US$ 1.7 billion for 2015 (Tables 4.2, 4.3).

HPC will account for around 96% of the total financing. Of the total budget of US$ 5.2 billion, US$ 4.9 billion are for HPC and US$ 135 million are for non-HPC. Up to 91% of the finances of the Plan will be required for the treatment of M/XDR-TB patients (see Table 4.2). The financing required for screening for MDR-TB and XDR-TB is estimated to account for 6.4% and 49.4% of the total costs in HPC and non-HPC, respectively. For the WHO European Region, on average, about 38% of the financing will be required for inpatient treatment of M/XDR-TB patients (Table 4.3).

Table 4.2. **Budget for screening and treatment of M/XDR-TB patients in the European Region, 2011–2015, per year (US$ million and in percentage)**

Budget item	2011	2012	2013	2014	2015	Total	%
Screening for MDR/XDR	45	60	76	93	111	385	7
HIV screening of MDR/XDR patients	1	1	1	1	2	5	<1
Treatment of MDR-TB	381	573	805	1 078	1 394	4 230	82
Treatment of XDR-TB	10	42	84	134	195	466	9.0
Additional costs for HIV treatment	2	3	4	5	7	20	<1
Stewardship expenditure	15	15	15	15	15	73	1
Total	**453**	**693**	**983**	**1 326**	**1 723**	**5 179**	**100**

Table 4.3. **Composition of the financial resources required for the Action Plan, 2011–2015, per year (US$ million and in percentage)**

Budget item	2011	2012	2013	2014	2015	Total	%
Drugs	91	142	203	276	360	1 072	21
Diagnostics	74	104	138	177	221	713	14
Ambulatory care	101	156	223	302	394	1 177	23
Inpatient care	155	250	367	505	667	1 943	38
Patient support costs	16	24	34	47	61	181	3
Additional costs for HIV treatment	2	3	4	5	7	20	<1
Stewardship expenditure	15	15	15	15	15	73	1
Total	**453**	**693**	**983**	**1 326**	**1 723**	**5 179**	**100**

Cost–effectiveness

The cost–effectiveness of implementing the Plan was assessed by two methods: calculating the costs per lives saved, and comparing the costs per DALY gained with GDP. The second method showed that the intervention was highly cost-effective (Table 4.4).

Economic gain

The economic gain from implementing the Plan was derived from saving 120 000 lives and from averting 263 000 M/XDR-TB cases.

The direct economic gain from saving 120 000 lives amounted to US$ 5 billion in the short term (DALYs gained up to 2015) and US$ 48 billion in the long term (Tables 4.5, 4.6).

The short-term indirect economic gain from averting 263 000 M/XDR-TB cases amounted to about US$ 6.9 billion (Table 4.7). The long-term economic indirect gain has not been determined, but will go far beyond this number because many future transmission events were not considered in this study.

Cost scenarios

The assessment of availability of resources and the comparison of the requirements for and availability of resources in this study were limited to the HPC in the European Region. Four scenarios were developed for costing the needs to implement the MDR-TB Action Plan for 2011–2015: the baseline and low, intermediate and high scenarios (Fig. 4.1, Table 4.8).

The costs of inpatient care influence the budget for implementation of the Action Plan significantly; whereas US$ 3.4 billion is required when these costs are low and time in hospital is limited to three months, US$ 9.8 billion is required when patients stay in hospital for eight months at a higher cost. It should be noted that the baseline scenario taken for the budget of the Plan, which includes three months inpatient care, was chosen because one of the aims of implementing the Plan is to shorten inpatient stays. However, current practice is commonly six months in hospital (equal to the intermediate scenario in this study with a total estimated budget of US$ 6.5 billion). The US$ 5.2 billion budget of the Plan should therefore be considered as a conservative estimate.

Resources available and gap analysis

Funds availability assessment (Option 1 – no increase in funding) showed that nearly US$ 1.6 billion will be available in the HPC to combat MDR-TB in the period 2011–2015 (Table 4.9). Comparing the costs of the baseline costing scenario to the resources available creates a financial gap of US$ 3.4 billion (68%) in this period (Table 4.10).

Figures for Option 2 (increase in funding according to assumptions detailed in the methods section) show that the resources available for the Action Plan vary depending on the costing scenario they are compared with.

Based on data about approved ongoing grants, for the baseline scenario in Option 1, the Global Fund's contribution will drop from 12% in 2011 to 2% in 2015. Despite a slight increase in governments' contributions in absolute figures

Fig. 4.1. Resources required for the implementation of the Action Plan for HPC, 2011–2015, for the four costing scenarios (US$ million)

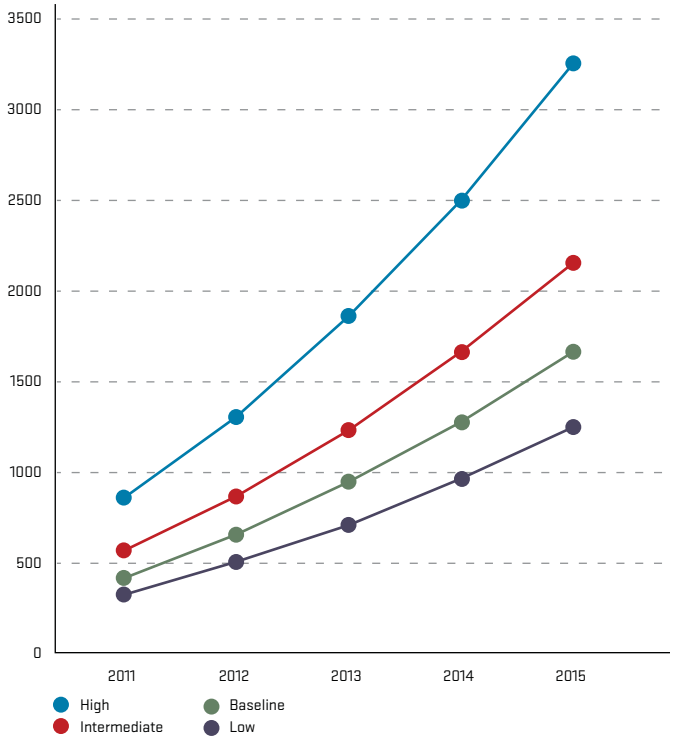


Fig. 4.2. Comparison of the financial gap in HPC for the baseline cost scenario and the two funding options

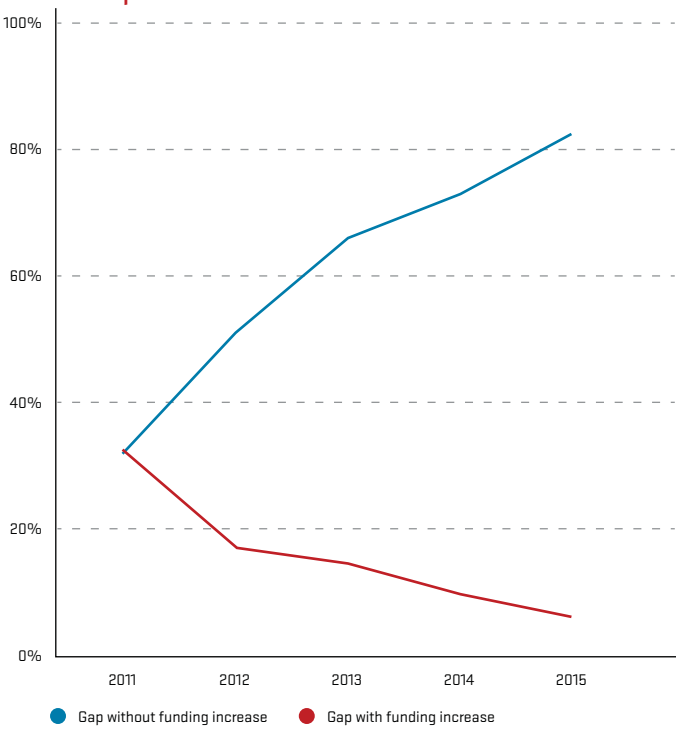


Table 4.4. **Overview of the cost-effective analysis of the Action Plan**

Region	Number of lives saved	Budget of the Plan (US$ million)	Cost per death averted (US$)	Average of DALYs gained per death averted (years)	Costs per DALY gained (US$)	GDP per capita (US$)	Assessment result
WHO European Region	120 677	5 179	42 916	21	2 044	24 346	very cost-effective
HPC	119 772	4 970	41 502	21	1 976	13 851	very cost-effective
Non-HPC	905	135	149 647	21	7 126	32 348	very cost-effective

Table 4.5. **Economic gain from lives saved 2011–2015 by implementation of the Plan (short-term direct impact)**

Region	Number of lives saved	Average of DALYs gained per live saved (years)	DALYs gained per deaths averted (years)	GDP per capita (US$)	Gain (US$ million)
WHO European Region	120 105	5	264 315	32 887	5 233
HPC	119 219	5	272 359	18 699	5 092
Non-HPC	885	5	3 210	43 704	140

Table 4.6. **Economic gain from lives saved 2011–2015 by implementation of the Plan (long-term direct impact)**

Region	Number of lives saved	Average of DALYs gained per live saved (years)	DALYs gained per deaths averted (years)	GDP per capita(US$)	Gain (US$ million)
WHO European Region	120 105	21	2 522 196	32 887	47 628
HPC	119 219	21	2 503 609	18 699	46 815
Non-HPC	885	21	18 586	43 704	812

Table 4.7. **Economic gain from M/XDR-TB cases averted up to 2015 by implementation of the Plan (short-term indirect impact)**

Region	Budget of the Plan (million US$)	Number of M/XDR-TB put on treatment	Unit cost per M/XDR-TB care (US$)	Number of M/XDR-TB cases averted	Gain (US$ million)
WHO European Region	5 179	198 898	26 038	263 441	6 859
HPC	4 970	197 600	25 156	260 767	6 559
Non-HPC	135	1 298	104 377	2 675	279

Table 4.8. **Resources required for the implementation of the Action Plan for HPC, 2011–2015, for the four costing scenarios (US$ million)**

Scenario	Average length of stay in hospital (months)	Cost per inpatient day (US$)	2011	2012	2013	2014	2015	Total
Baseline	3	76	427	660	942	1 276	1 664	**4 970**
Low	3	27	328	501	710	956	1 243	**3 739**
Intermediate	6	76	563	864	1 227	1 657	2 157	**6 470**
High	8	114	853	1 304	1 852	2 499	3 251	**9 760**

Table 4.9. **Resources available for MDR-TB in HPC, 2011–2015**
Option 1 – no increase in funding (US$ million)

Funding source	2011	2012	2013	2014	2015	Total
The Global Fund	53	78	76	82	35	323
Governments	236	245	243	261	253	1 238
External donors (excluding the Global Fund)	2	2	2	2	1	11
Total	**291**	**326**	**321**	**345**	**289**	**1 572**

Option 2 - with increased funding (US$ million)

Funding source	2011	2012	2013	2014	2015	Total
The Global Fund	53	124	215	355	532	1 280
Governments	232	419	582	785	1 015	3 033
External	2	4	6	10	15	37
Total	**287**	**547**	**803**	**1 150**	**1 562**	**4 350**

Table 4.10. **Resources needs and funding gap for M/XDR-TB in the HPC for the two funding options for the various scenarios, 2011–2015 (US$ million)**

		Option 1 – funding gap without increase in financing		Option 2 – funding gap with increase in financing	
Costing scenario	Need	US$ million	% of need	US$ million	% of need
Baseline	4 970	3 399	68	2 443	13
Low	3 739	2 167	58	1 456	0
Intermediate	6 470	4 898	76	3 656	31
High	9 760	8 188	84	6 309	47

(from US$ 236 million in 2011 to US$ 253 million in 2015), the share of this source of funding will be only 15% by the end of 2015 (Fig. 4.3).

If governments and the Global Fund ensure that they increase their contributions to the implementation of the Action Plan, the funding gap in the baseline scenario will decrease from 68% in 2011 to only 13% in 2015 (Table 4.9). The overall funding gap in Option 2 will remain relatively low and constant at an average level of 13% (Fig. 4.4). In Fig. 4.2 the financial gaps for the baseline scenario with and without increases in funding are compared.

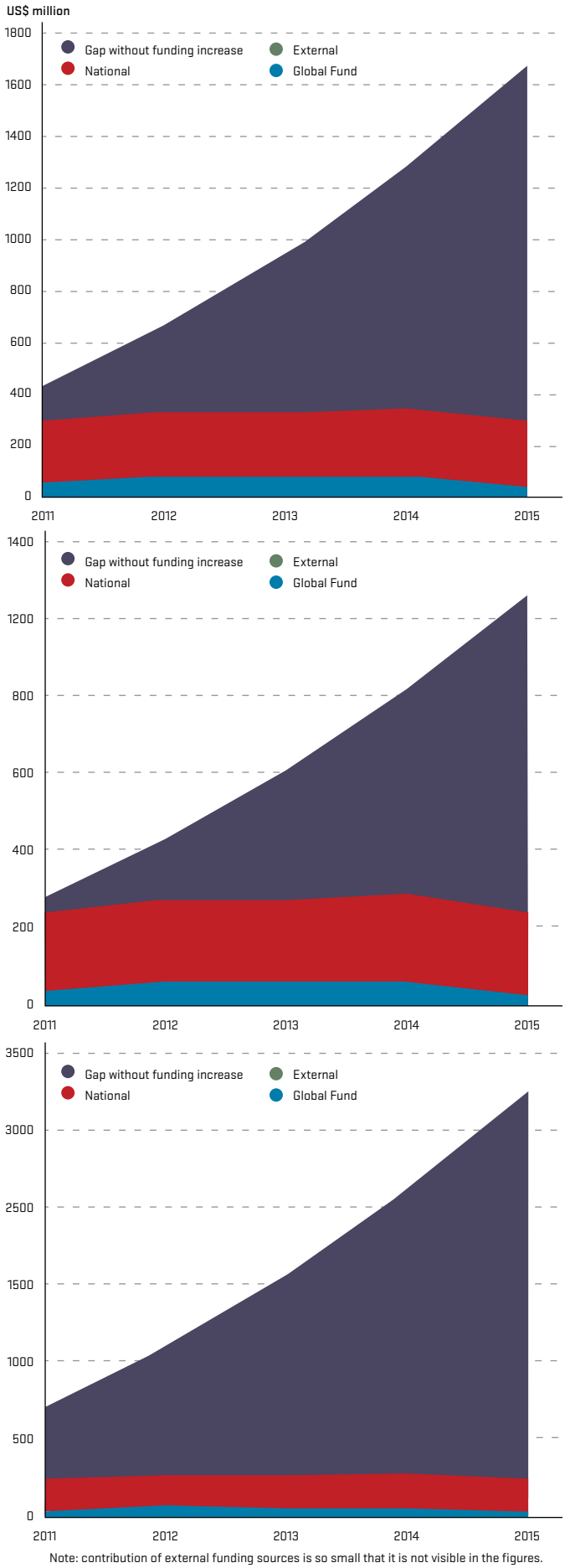
Comparing the resources available with the low estimate scenario creates a financial gap of 58% during 2011–2015. Owing to the low inpatient bed–day cost and only three months hospitalization for MDR-TB patients used to calculate a low estimate resource needs scenario, the contribution of governments is higher compared to the baseline costing scenario and covers 33% of the total resource requirements, even though the gap still remains high at over US$ 2 billion, or 58% of the resource needs (Fig. 4.3). In this costing scenario, if the availability of funds is increased according to the assumptions described above, the overall funding available will exceed the amount required (Fig. 4.4).

A comparison of the high estimate costing scenario with the resources available shows a financial gap of 84% during 2011–2015, making the cost of implementing the Action Plan the highest among the four scenarios. This means that maintaining a particular share of the funding structure will require a significant increase in the financial commitment of national governments (over US$ 2.9 billion in five years) and the Global Fund (US$ 2.2 billion in five years). Even if the countries and external donors significantly increase their budgets for responding to M/XDR-TB, it will not be enough to reverse the increase in the gap in the next few years.

Discussion

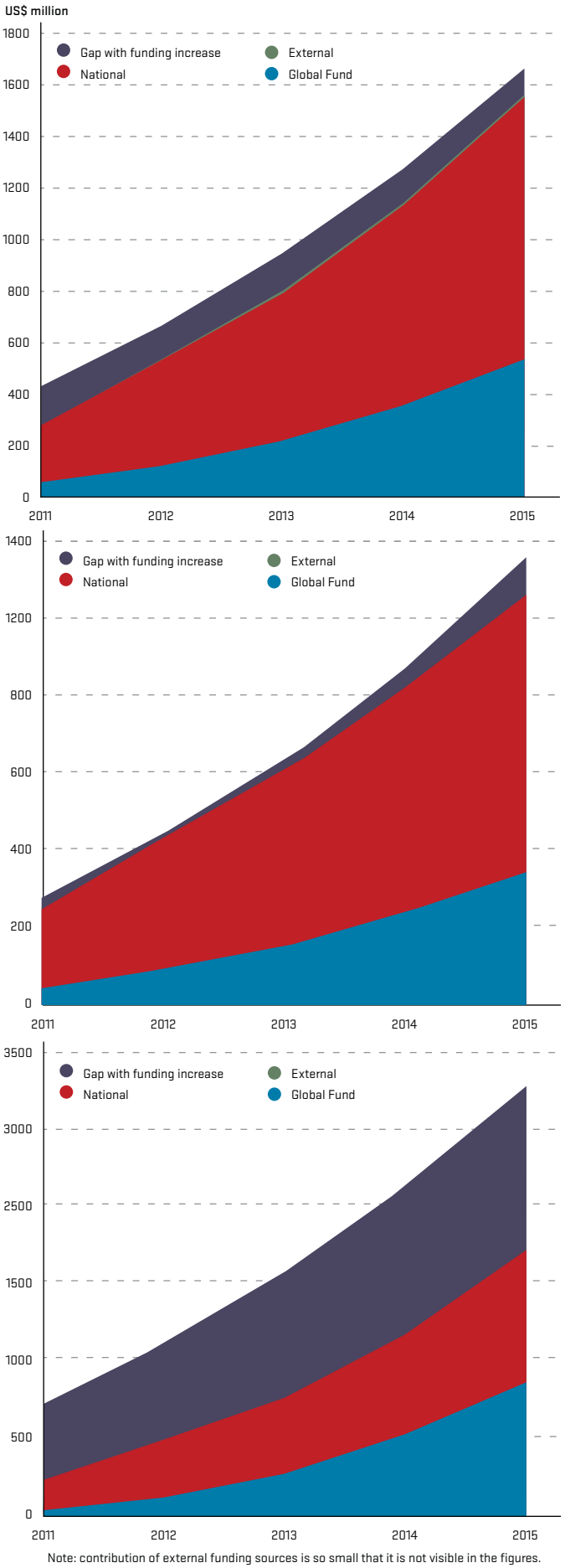
Within the framework of the Consolidated Action Plan to Prevent and Combat M/XDR-TB in the WHO European Region, it is aimed to contain the spread of drug-resistant TB by achieving universal access to prevention, diagnosis and treatment of M/XDR-TB in all Member States of the Region by 2015. The planned scaling-up of screening activities will

Fig. 4.3. Structure of the funding for the baseline (top), low (middle) and high (bottom) costs scenarios in HPC without funding increase, 2011–2015



Note: contribution of external funding sources is so small that it is not visible in the figures.

Fig. 4.4. Structure of the funding for the baseline (top), low (middle) and high (bottom) costs scenarios in HPC with funding increase, 2011-2015



Note: contribution of external funding sources is so small that it is not visible in the figures.

increase the number of patients diagnosed with M/XDR-TB in the Region, leading to a steep increase in resource requirements. The Region needs over US$ 5 billion for the screening and treatment of M/XDR-TB patients. The high expenditure for M/XDR treatment is largely driven by inpatient costs.

Cost-saving

The analysis of various costing scenarios shows that variations in inpatient care significantly influence the budget for implementation of the Plan. Between the low-cost and high-cost scenarios for inpatient care, the cost of implementing the Plan varies from US$ 3.7 billion to US$ 9.8 billion. Shortening inpatient treatment would thus reduce the costs for M/XDR-TB treatment in the Region. Since surgical treatment has shown results in certain settings *(26)*, the cost–effectiveness of such approaches in the Region should be ascertained. The vast majority of M/XDR-TB financing is required for the HPC, in particular the Russian Federation, which accounted for 53% of the total M/XDR-TB patients in the Region in 2009. Changes in criteria for hospitalization and adaptation of models of care with treatment in ambulatory services, day-care centres and home-/community-based treatment rather than hospitalization can bring down the costs significantly. Long-term resource savings in combating M/XDR-TB can only be achieved by preventing the emergence of M/XDR-TB cases. As the Xpert MTB/RIF assay is the least expensive test for rifampicin resistance and a proxy for MDR-TB, there is a need for further studies to document the cost–effectiveness of the test in comparison with culture methods.

Budget

The major element in the cost of implementing the Plan is inpatient hotel and diagnostic and treatment costs. In comparison to the estimates done for the MDR-TB Action Plan, White & Moore-Gillon *(3)* estimated the mean direct cost of managing an MDR-TB patient in the United Kingdom at £60 000 at 2000 prices, and Rajbhandary et al. *(2)* estimated the mean direct cost of treating an MDR-TB patient in the United States at US$ 45 000 at 2000 prices. To optimize the estimates of treating a MDR-TB patient, research is needed to fill the information gaps, and in particular to estimate inpatient treatment costs. A costing simulation model that incorporates screening rates, disease progression rates and unit costs from facility-based surveys could generate more robust cost estimates.

The calculated budget includes the costs of stewardship, supervision, capacity development, research, etc. Laboratory management costs and specimen transport costs are not included due to the non-availability of data and are likely to vary widely between countries. Owing to the high variation of criteria availability and cost in the countries, the cost of surgery (which is normally performed on 2–5% of M/XDR-TB patients) was not considered. The costs of active contact-tracing and testing of contacts were also excluded. The budget and unit cost estimates are prone to changes in efficiencies of screening for and treating M/XDR-TB patients as well as epidemiological trends in M/XDR-TB. The study was constrained by the limited availability of data. Based on the estimated patient numbers, an investment appraisal can be carried out to estimate the financing required for scaling-up diagnostic and treatment facilities. Facility surveys of laboratories and hospitals dedicated to M/XDR-TB patients need to be conducted to capture the data required for such an appraisal.

Expected achievements

Implementation of the Plan should result in 225 000 MDR-TB patients being diagnosed, 127 000 drug-resistant TB patients treated successfully, 250 000 cases of MDR-TB and 13 000 XDR-TB cases averted and 120 000 lives saved. The economic gain in lives saved by the Plan amounts to US$ 5 billion over the five years it will run. Additionally, US$ 7 billion will be saved on costs for detection and treatment of the M/XDR-TB cases averted which would have arisen and needed treatment in the absence of improved TB control provisions of the Plan.

These estimates of the number of lives saved, M/XDR-TB cases averted and consequent cost savings represent benefits restricted to predicted transmission events within the five-year time frame of the Plan and are thus an underestimation of its overall (future) benefits. Neither the number of lives that would be saved among those cases averted by the Plan, nor the number of lives that would be saved by the prevention of transmission by these averted and successfully treated cases, are included. As well as the limitations imposed by the absence of extended transmission dynamics modelling and the restricted time window to calculate the benefits, other limitations on the calculation of the expected epidemiological achievements include: (i) that no account was taken of the fact that M/XDR-TB cases are also averted by improved interventions for drug-susceptible and mono-resistant TB cases, and (ii) that consideration was not given to delays in detection or treatment because of the absence of data on these variables. The costs saved by the Plan are also a conservative estimate because of the limited time window used and because patients' out-of-pocket expenses were not taken into consideration. A future more in-depth analysis of the expected achievements of the Plan should ideally address these limitations and also consider modelling the lifetime of untreated patients, include improved estimates of undiagnosed cases, consider inappropriate treatment for TB/HIV co-infection and analyse the extent of TB transmission and costs of TB control in particular settings such as prisons.

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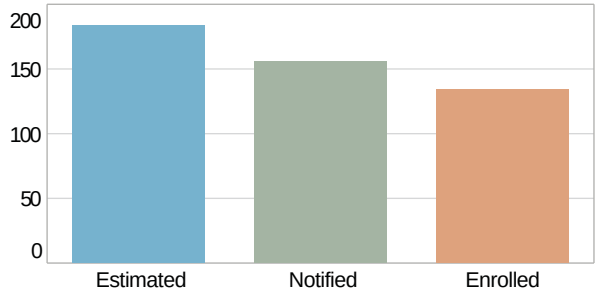
Annex 5. Country profiles

Armenia MDR-TB

Progress towards universal access:
Estimated MDR-TB cases among notified pulmonary TB, notified cases and cases started on treatment (as reported to WHO) 2009



Population (millions) 2009	3	

MDR-TB estimates of burden *		
% of new TB cases with MDR-TB	9.4 (7.3–12)	[DRS 2007]
% of retreatment TB cases with MDR-TB	43 (38–49)	[DRS 2007]
MDR-TB cases among incident total TB cases in 2008	480 (380–580)	
MDR-TB cases among new pulmonary TB cases notified in 2009	110 (85–140)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	74 (66–83)	

MDR-TB notified cases 2009	**New**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	80	76	156
MDR-TB patients started treatment			134

% of MDR-TB patients living with HIV	No representative data available
Odds of HIV-positive TB patient having MDR-TB over odds of HIV-negative TB patient having MDR-TB	No representative data available

Estimates of burden * 2009 (All forms of TB)	**Number (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding HIV)	0.38 (0.26–0.55)	12 (8.4–18)
Prevalence (incl HIV)	3.3 (1.3–5.6)	107 (43–182)
Incidence (incl HIV)	2.2 (1.8–2.7)	73 (59–88)
Case detection, all forms (%)	70 (58–85)	

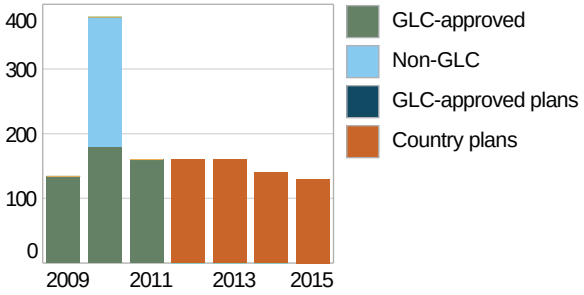
Number of laboratories	**2008**	**2009**	**2010**
Smear (per 100 000 population)	1.8	1.8	1.9
Culture (per 5 million population)	1.6	1.6	1.6
DST (per 10 million population)	3.2	3.2	3.2
LPA (per 10 million population)		0	3.2
Number of DST units for which external quality assurance was carried out			

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Borstel, Germany

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases who started treatment (2009) and projected numbers to treat



Treatment outcomes 2007 cohort	**GLC**	**Non-GLC**
Cohort size	57	
% Treatment success rate	53	
% Deaths	11	

Drug management 2009	
First-line drugs available in private pharmacies	Yes
First-line drugs available without prescription	Yes
Drug management 2010	
Second-line drug procurement issues	
Drugs provided to manage side effects	Yes

Stock-outs (at least 1 day) 2009	**Central level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs		

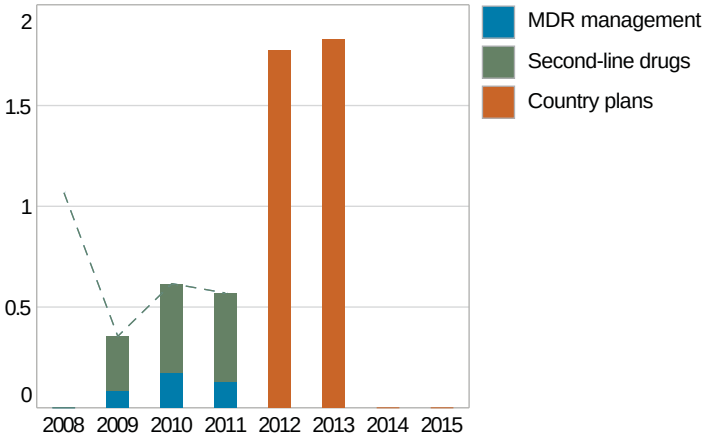
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, not including XDR
Training material developed	No
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out	Yes, started in 2010
in the scope of MDR-TB	Yes
National infection control plan	Yes
Tertiary hospitals with person in charge of TB infection control	0
TB notification rate (all forms) in health care workers (all staff) over rate in general population	0
Recording and reporting for MDR-TB in place	Yes Paper based
Representative survey/surveillance data on MDR-TB available	Class B routine surveillance data (2009); nationwide survey (2007)

Armenia (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, transport vouchers/reimbursement, counseling/ psychosocial support, hygiene packets, Education; support will be adapted to patient's situation	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	NTP
Prison care coordinated with NTP	Yes

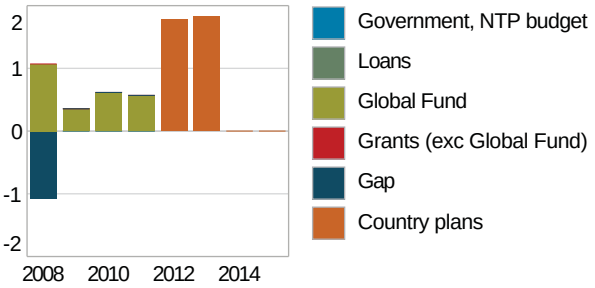
MDR budget (bar) and available funding (dotted line) (US$ millions)



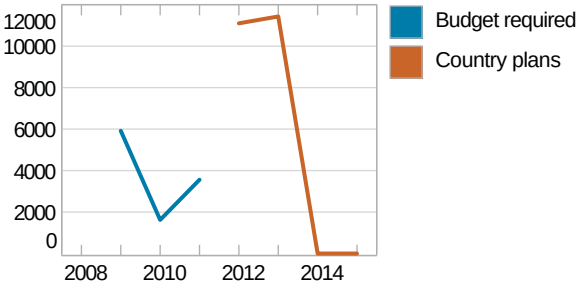
Financing (US$ millions)	2010	2011
Total NTP budget	7	6
MDR-TB financing component:		
second-line drugs budget	<1	<1
total MDR budget	<1	<1
available funding	<1	<1
funding gap	0	0
% of budget funded	100	100
% available funding from domestic sources		
% available funding from Global Fund	100	100

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Programme management: NTP and MSF share responsibilities

Performance in case finding/beginning of treatment: started in April of 2010

Laboratory capacity/quality: Mycobacterium growth indicator tube and Polymerase chain reaction are used

Qualified M/XMDR-TB treatment (human resources, facilities): Managed by committee on drug resistance, based on WHO recommendations. Specialists were/are trained on MDR-TB by international trainers. There is an MDR-TB department in the Republican TB Dispensary

TB infection control: TB infection control plan is finalized and approved by Ministry of Health in 2010

Financing: Current funding sources are NTP (Ministry of Health), Médecins Sans Frontières, Global Fund

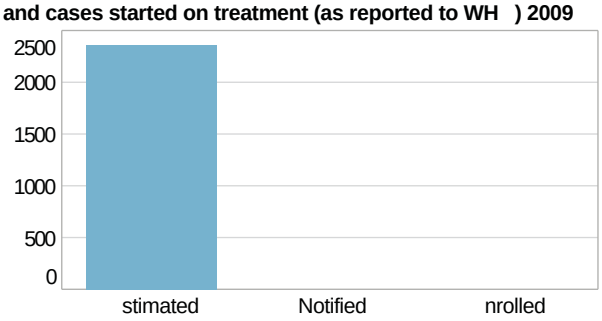
Bottlenecks in 2010

Recording and reporting: Technical assistance needed for new electronic system

Access to quality assured second line drugs: Weak drug management

Azerbaijan MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	9	

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	22 (19 26)	DRS 2007
% of retreatment TB cases with MDR-TB	56 (52 60)	DRS 2007
MDR-TB cases among incident total TB cases in 2008	4 000 (3 300 4 700)	
MDR-TB cases among new pulmonary TB cases notified in 2009	1 000 (880 1 200)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	1 300 (1 200 1 400)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB			
MDR-TB patients started treatment			

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	1 (0.73 1.4)	12 (8.2 16)
Prevalence (incl H)	15 (6.5 26)	172 (73 289)
ncidence (incl H)	9.7 (7.9 12)	110 (89 132)
Case detection, all forms (%)	75 (63 93)	

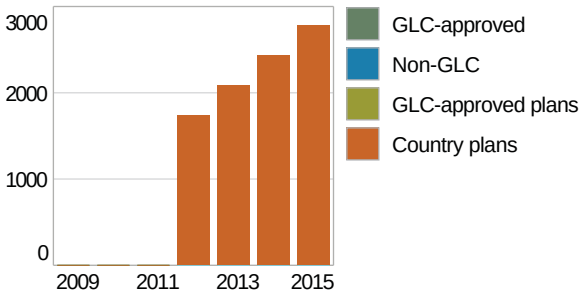
umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	0.8	0.8	0.8
Culture (per 5 million population)		1.1	1.1
DST (per 10 million population)		2.3	2.2
LPA (per 10 million population)			
Number of DST units for which external quality assurance was carried out			

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Borstel, Germany

First-line drug-sensibility testing routinely performed for: (no patient groups identified)

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	**on-**
Cohort size	
% Treatment success rate	
% Deaths	

Drug management 2009	
First-line drugs available in private pharmacies	No
First-line drugs available without prescription	
Drug management 2010	
Second-line drug procurement issues	Possibility to get waivers
Drugs provided to manage side effects	Yes

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	Yes	Yes
Second-line drugs	Yes	

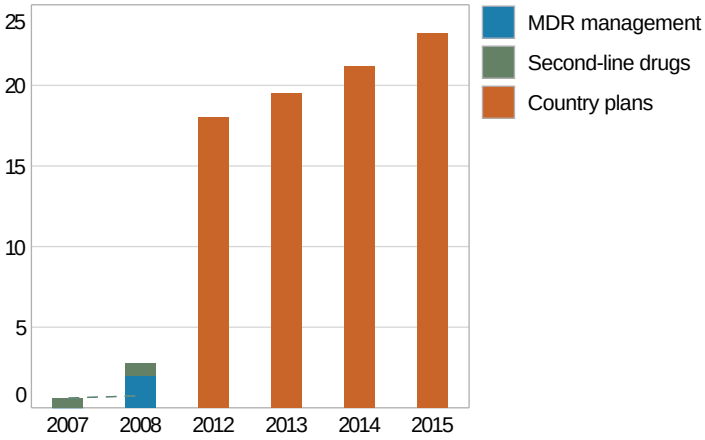
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	
Training material developed	
Training specifically for DR-TB conducted	
TB infection control national situation assessment carried out	
in the scope of MDR-TB	
National infection control plan	nder preparation
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	
Recording and reporting for MDR-TB in place	Partially Weak implementation of old electronic recording and reporting system, start of support to electronic system by WHO: 02/2011
Representative survey/surveillance data on MDR-TB available	Routine surveillance data not representative survey in the city of Baku (2007) nationwide survey planned for 2011

Azerbaijan (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, counseling/psychosocial support, hygiene packets; *transportation being considered (GFATM Round 7, 2007)*	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	Ministry of Health
Prison care coordinated with NTP	Yes

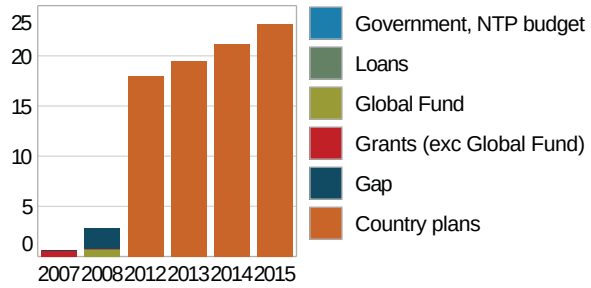
MDR budget (bar) and available funding (dotted line) (US$ millions)



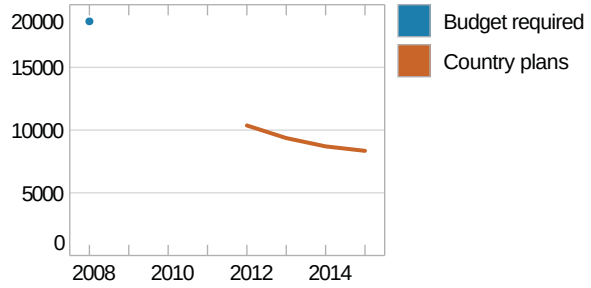
Financing (US$ millions)	2010	2011
Total NTP budget		
MDR-TB financing component:		
second-line drugs budget		
total MDR budget		
available funding		
funding gap		
% of budget funded		
% available funding from domestic sources		
% available funding from Global Fund		

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Performance in case finding/ beginning of treatment: Since the end of 2010, cultures are performed on all new patients and smear positive re-treatment patients. This allows quick identification of drug resistance and adequate treatment provision

Programme management: New TB control plan and strategy were approved for 2011-2015

Recording and reporting: With WHO support, TB data recording and reporting forms were revised and standardized. The latter will be in use from 2011

Laboratory capacity/quality: National Reference Laboratory was certified and quality assured in 2010 by Supra National Reference Laboratory. There are no human resources constraints. n 2010 four second-level laboratories were established at inter-regional level. National Reference Laboratory and third-level laboratory in the prison sector are fully equipped with reagents for culture and drug susceptibility testing to FLD

Qualified M/XMDR-TB treatment (human resources, facilities): TB doctors were trained on MDR management in WHO collaboration centres abroad in 2010

TB infection control: Guidelines on nfection Control were developed in 2010

Bottlenecks in 2010

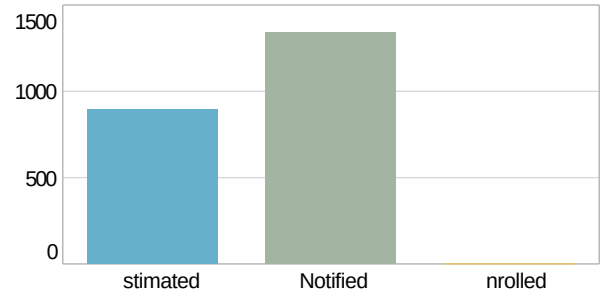
Laboratory capacity/quality: Limited laboratory capacity

Qualified M/XMDR-TB treatment (human resources, facilities): Limited human resource capacity to manage MDR-TB

Financing: Lack of funds for first line drugs - weak NTP commitment

Belarus MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	10

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	13 (0.0 25)	model 2008
% of retreatment TB cases with MDR-TB	42 (12 72)	model 2008
MDR-TB cases among incident total TB cases in 2008	800 (260 1 300)	
MDR-TB cases among new pulmonary TB cases notified in 2009	530 (0 1 100)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	370 (100 630)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	464	840	1 342
MDR-TB patients started treatment			0

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	0.51 (0.46 0.57)	5.3 (4.8 5.9)
Prevalence (incl H)	5.6 (1.3 9.9)	58 (14 103)
ncidence (incl H)	3.8 (3.1 4.5)	39 (32 47)
Case detection, all forms (%)	140 (120 170)	

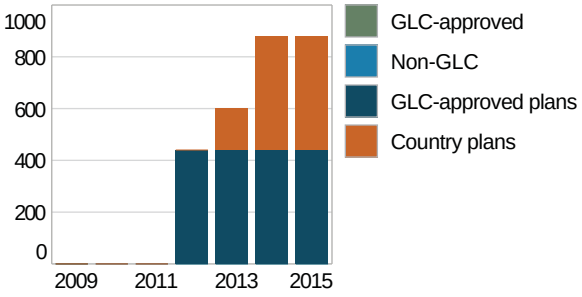
umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	15.5	1.6	
Culture (per 5 million population)	47.0	20.8	
DST (per 10 million population)	22.7	22.8	
LPA (per 10 million population)			
Number of DST units for which external quality assurance was carried out			

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Stockholm, Sweden

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	**on-**
Cohort size	
% Treatment success rate	
% Deaths	

Drug management 2009	
First-line drugs available in private pharmacies	
First-line drugs available without prescription	
Drug management 2010	
Second-line drug procurement issues	Strict customs regulations
Drugs provided to manage side effects	

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs		
Second-line drugs		

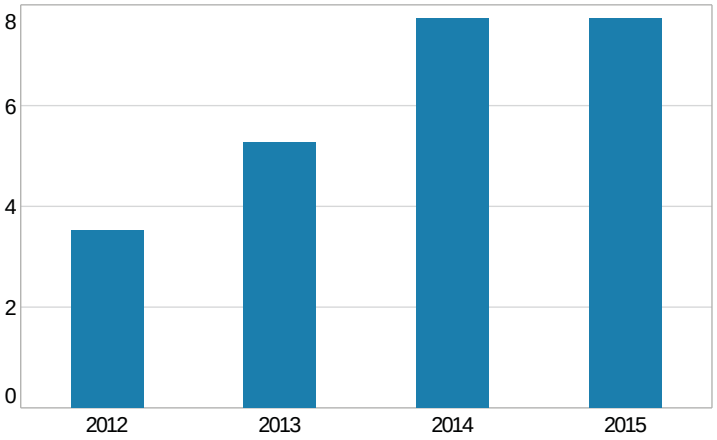
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	
Training material developed	
Training specifically for DR-TB conducted	
TB infection control national situation assessment carried out	Yes (2009)
in the scope of MDR-TB	Yes
National infection control plan	Yes
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	
Recording and reporting for MDR-TB in place	Yes lectronic
Representative survey/surveillance data on MDR-TB available	Class B routine surveillance data (2008) nationwide survey underway

Belarus (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, transport ouchers/rei burse ent, counseling/psychosocial support; e ploring possibility of special alcohol and drug abuse treat ent progra s for R T (200)	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	Ministry of Interior, Department of medical services for penitentiary system
Prison care coordinated with NTP	Yes

MDR budget (bar) and available funding (dotted line) (US$ millions)

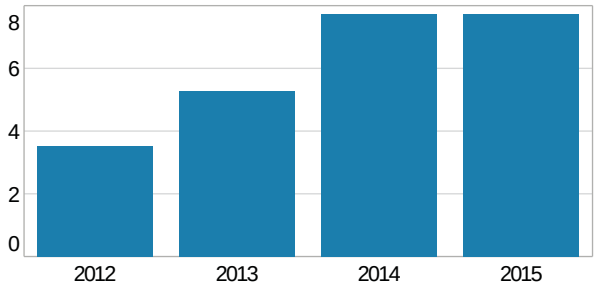


Progress since 2009 World Health Assembly resolution 62.15

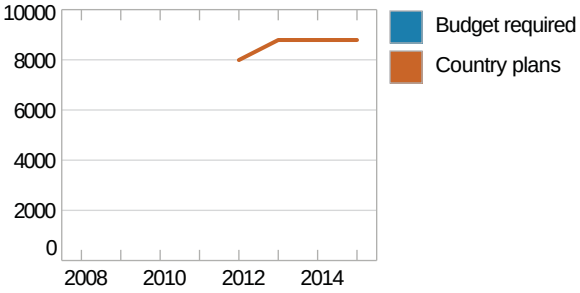
Financing (US$ millions)	2010	2011
Total NTP budget		
MDR-TB financing component:		
second-line drugs budget		
total MDR budget		
available funding		
funding gap		
% of budget funded		
% available funding from domestic sources		
% available funding from Global Fund		

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Bottlenecks in 2010

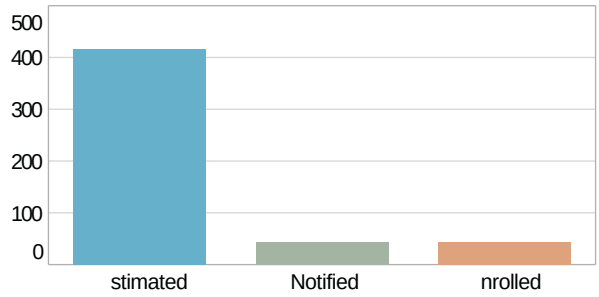
Qualified M/XDR-TB treatment (human resources, facilities): Limited human resource capacity for MDR-TB

Access to quality assured second line drugs: Decentralized drug procurement system is not efficient

TB infection control: Weak infection control

Bulgaria MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	8	

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	13 (0.0 25)	model 2008
% of retreatment TB cases with MDR-TB	42 (12 72)	model 2008
MDR-TB cases among incident total TB cases in 2008	460 (98 810)	
MDR-TB cases among new pulmonary TB cases notified in 2009	260 (0 530)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	160 (44 270)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	12	31	43
MDR-TB patients started treatment			43

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	0.25 (0.19 0.36)	3.3 (2.5 4.8)
Prevalence (incl H)	3.8 (1.2 6.6)	51 (16 88)
ncidence (incl H)	3.1 (2.7 3.6)	41 (36 47)
Case detection, all forms (%)	86 (75 100)	

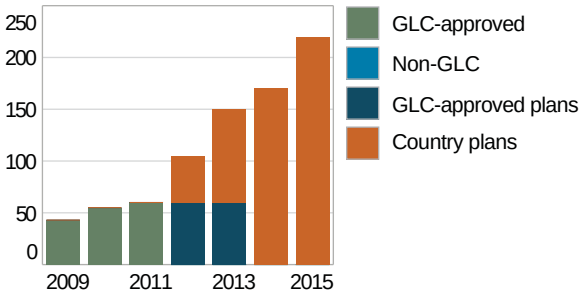
umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	0.5	0.5	0.5
Culture (per 5 million population)	21.7	21.9	20.0
DST (per 10 million population)	29.0	29.2	5.3
LPA (per 10 million population)		1.3	1.3
Number of DST units for which external quality assurance was carried out		1	1

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Rome, taly

First-line drug-sensibility testing routinely performed for: new cases, all retreatment cases, cases failing a retreatment regimen, cases that are contacts of MDR-TB cases

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	**on-**
Cohort size	76
% Treatment success rate	25
% Deaths	45

Drug management 2009	
First-line drugs available in private pharmacies	Yes
First-line drugs available without prescription	No
Drug management 2010	
Second-line drug procurement issues	Possibility to get waivers
Drugs provided to manage side effects	Availability of free ancillary drugs assured by hospitals during the intensive phase

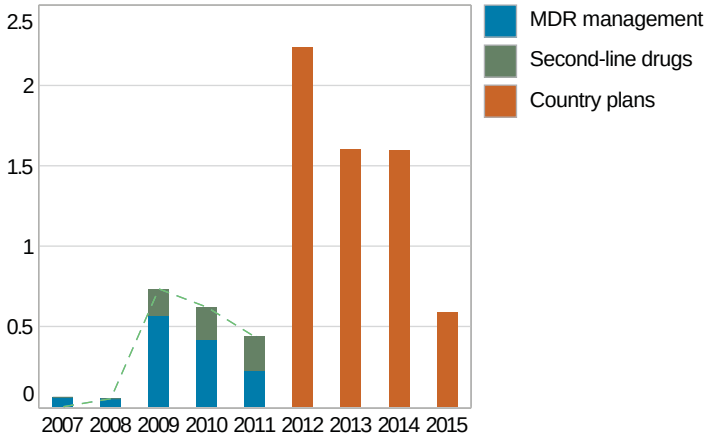
Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs	No	No

MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, including XDR
Training material developed	Yes
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out	Yes
in the scope of MDR-TB	Yes
National infection control plan	nder preparation
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	
Recording and reporting for MDR-TB in place	Yes lectronic
Representative survey/surveillance data on MDR-TB available	Class B routine surveillance data (2008) nationwide survey underway

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages; additional support needed to co er transport needs	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	Ministry of Health and Ministry of ustice
Prison care coordinated with NTP	Yes

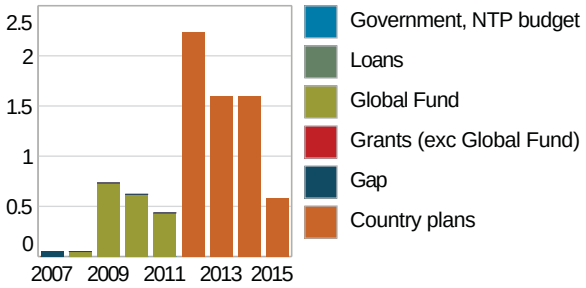
MDR budget (bar) and available funding (dotted line) (US$ millions)



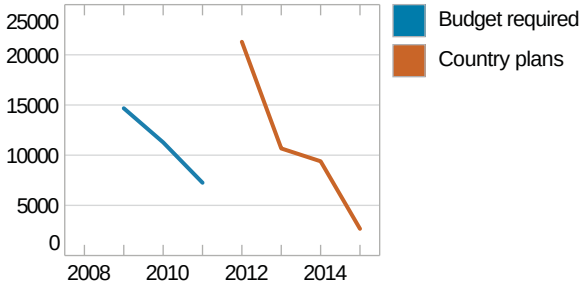
Financing (US$ millions)	2010	2011
Total NTP budget	17	16
MDR-TB financing component:		
second-line drugs budget	<1	<1
total MDR budget	<1	<1
available funding	<1	<1
funding gap	0	0
% of budget funded	100	100
% available funding from domestic sources		
% available funding from Global Fund	100	100

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Performance in case finding/ beginning of treatment: nvolvement of NGOs to support TB Health Facilities in active case finding and contact tracing to ensure early diagnosis for all TB cases, including MDR-TB.

Programme management: Monthly review of GLC cohort of MDR-TB patients by xpert Consilium. Algorithm for management of inpatient and outpatient treatment and care was successfully introduced.

Recording and reporting: Strengthened through the development of an lectronic Patient nformation System.

Laboratory capacity/quality: QA system for cultures and drug susceptibility testing for first-line drugs introduced in the end of 2010

Access to quality assured second line drugs: Second line drugs procured through GLC

nfection control: Will be strengthened through improving infection control plans regular supervision visits upgrade and maintenance of laboratory equipment and improvement of environmental control.

Financing: Public financing ensured to cover the costs for inpatient treatment for MDR-TB patients.

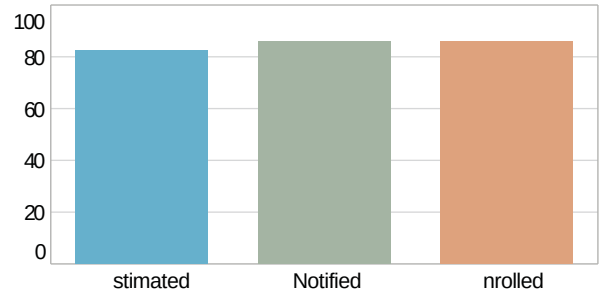
Bottlenecks in 2010

Qualified M/XDR-TB treatment (human resources, facilities): Need to increase the number of staff involved in MDR-TB management at central level and MDR-TB treatment sectors.

Other: nsufficient social support to MDR-TB patients

Estonia HIV MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	1	

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	22 (17 28)	DRS 2009
% of retreatment TB cases with MDR-TB	52 (39 65)	DRS 2009
MDR-TB cases among incident total TB cases in 2008	93 (71 120)	
MDR-TB cases among new pulmonary TB cases notified in 2009	48 (36 63)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	34 (26 43)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	54	32	86
MDR-TB patients started treatment			86

% of MDR-TB patients living with H	7.2 2009 routine surveillance
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	0.8 (0.2-2.1) 2009 routine surveillance

stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	0.044 (0.038 0.059)	3.3 (2.8 4.4)
Prevalence (incl H)	0.45 (0.13 0.77)	33 (10 57)
ncidence (incl H)	0.4 (0.36 0.47)	30 (27 35)
Case detection, all forms (%)	89 (77 100)	

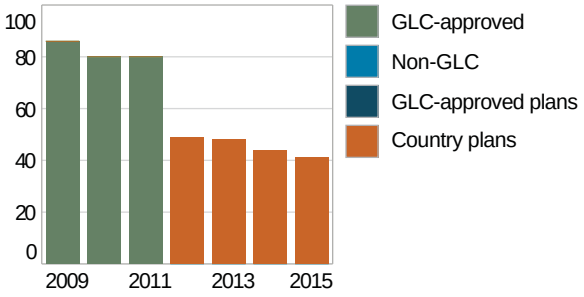
umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	0.6	0.6	0.6
Culture (per 5 million population)	7.5	7.5	7.5
DST (per 10 million population)	14.9	14.9	14.9
LPA (per 10 million population)		0	0
Number of DST units for which external quality assurance was carried out		0	0

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Solna, Sweden

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	**on-**
Cohort size	81
% Treatment success rate	57
% Deaths	14

Drug management 2009	
First-line drugs available in private pharmacies	No
First-line drugs available without prescription	No
Drug management 2010	
Second-line drug procurement issues	Possibility to get waivers
Drugs provided to manage side effects	Yes

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs	No	No

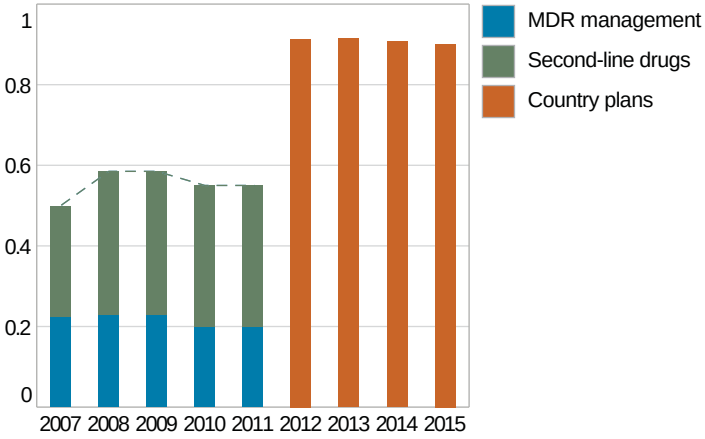
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, including XDR
Training material developed	Yes
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out	Yes (During joint WHO/ CDC/GLC country mission, August 23-27, 2010)
in the scope of MDR-TB	Yes
National infection control plan	No
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	0.8
Recording and reporting for MDR-TB in place	Yes lectronic
Representative survey/surveillance data on MDR-TB available	Class A routine surveillance data (2009)

Estonia (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, transport ouchers/rei burse ent, counseling, social support	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	Ministry of Health
Prison care coordinated with NTP	Yes

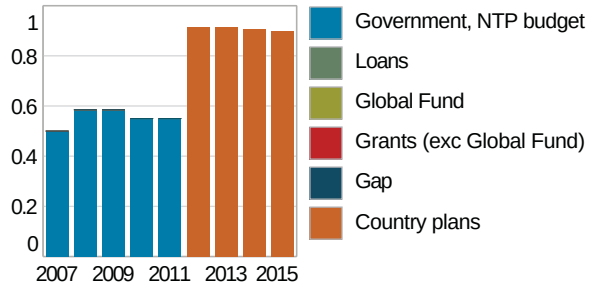
MDR budget (bar) and available funding (dotted line) (US$ millions)



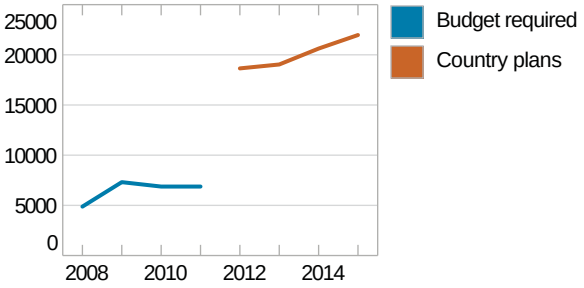
Financing (US$ millions)	2010	2011
Total NTP budget	<1	<1
MDR-TB financing component:		
second-line drugs budget	<1	<1
total MDR budget	<1	<1
available funding	<1	<1
funding gap	0	0
% of budget funded	100	100
% available funding from domestic sources	100	100
% available funding from Global Fund		

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Bottlenecks in 2010

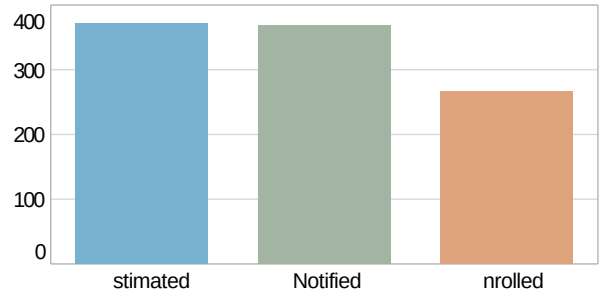
Qualified M/XDR-TB treatment (human resources, facilities): Limited access to some third line drugs (linezolid, clofazimine) for treatment of XDR-TB

TB infection control: Problems with management and isolation of XDR-TB cases after termination of specific TB treatment

Other: Limited palliative care limited counselling capacity for alcohol abusers and injecting drug users

Georgia MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	4

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	10 (8.9 12)	DRS 2009
% of retreatment TB cases with MDR-TB	31 (27 35)	DRS 2009
MDR-TB cases among incident total TB cases in 2008	670 (550 780)	
MDR-TB cases among new pulmonary TB cases notified in 2009	220 (170 280)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	160 (130 180)	

MDR-TB notified cases 2009	e	Retreat-ment	Total
Confirmed cases of MDR-TB	183	185	369
MDR-TB patients started treatment			266

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

stimates of burden 2009 (All forms of TB)	umber (thousands)	Rate (per 100 000 pop)
Mortality (excluding H)	0.21 (0.19 0.23)	4.8 (4.4 5.3)
Prevalence (incl H)	4.9 (1.1 8.7)	116 (27 205)
ncidence (incl H)	4.5 (4 5.1)	107 (94 119)
Case detection, all forms (%)	100 (93 120)	

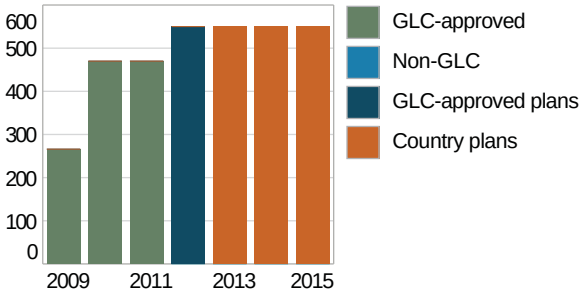
umber of laboratories	200	2009	2010
Smear (per 100 000 population)	0.7	0.7	0.7
Culture (per 5 million population)	2.3	2.3	2.4
DST (per 10 million population)	2.3	2.3	2.4
LPA (per 10 million population)		2.3	2.4
Number of DST units for which external quality assurance was carried out			1

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Antwerp, Belgium

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	on-
Cohort size	61
% Treatment success rate	38
% Deaths	20

Drug management 2009	
First-line drugs available in private pharmacies	Yes
First-line drugs available without prescription	Yes
Drug management 2010	
Second-line drug procurement issues	Product registration mandatory
Drugs provided to manage side effects	Yes

Stock-outs (at least 1 day) 2009	entral level	Peripheral level
First-line drugs	No	No
Second-line drugs	No	No

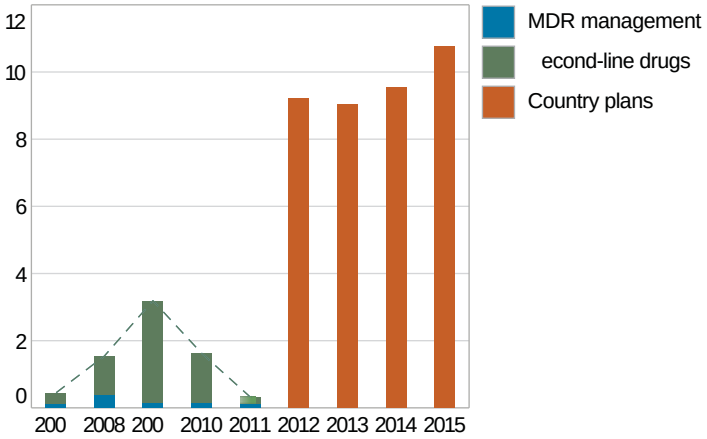
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, including XDR
Training material developed	Yes
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out	Yes (2008)
in the scope of MDR-TB	
National infection control plan	nder preparation
Tertiary hospitals with person in charge of TB infection control	0
TB notification rate (all forms) in health care workers (all staff) over rate in general population	
Recording and reporting for MDR-TB in place	Yes lectronic (web-based)
Representative survey/surveillance data on MDR-TB available	Class A routine surveillance data (2009)

Georgia (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, transport ouchers/rei burse ent, hygiene packets, counseling/psychosocial support, housing support, education, financial incenti es	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	MCLA, NTP
Prison care coordinated with NTP	Yes

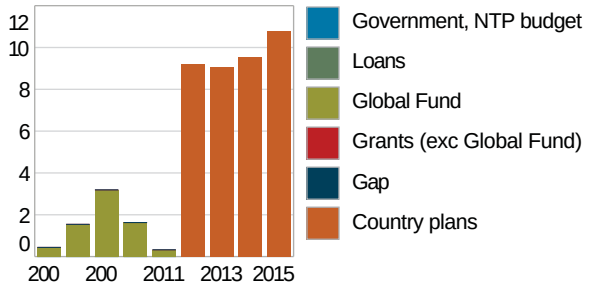
MDR budget (bar) and available funding (dotted line) (US$ millions)



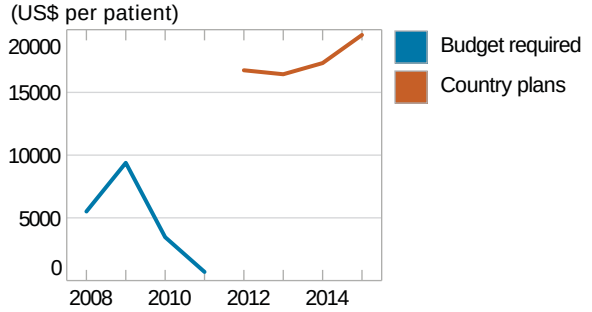
Financing (US$ millions)	2010	2011
Total NTP budget		8
MDR-TB financing component:		
second-line drugs budget	1	1
total MDR budget	2	1
available funding	2	1
funding gap	0	0
% of budget funded	100	100
% available funding from domestic sources		
% available funding from Global Fund	100	100

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

TB infection control: Improvement of infection control measures in penitentiary sector

Recording and reporting: Routine linkage of laboratory information drug management module

Bottlenecks in 2010

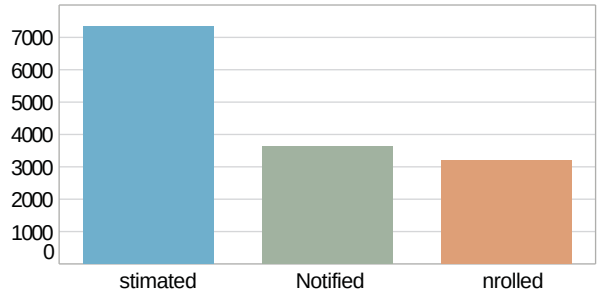
Performance in case finding/ beginning of treatment: Private health care involvement needs strengthening

Financing: Need to increase NTP staff salaries and patient incentives

Other: Outpatient care needs further strengthening

Kazakhstan MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	16

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	14 (11 18)	DRS 2001
% of retreatment TB cases with MDR-TB	56 (51 62)	DRS 2001
MDR-TB cases among incident total TB cases in 2008	8 100 (6 400 9 700)	
MDR-TB cases among new pulmonary TB cases notified in 2009	2 100 (1 600 2 600)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	5 300 (4 800 5 800)	

MDR-TB notified cases 2009	e	Retreat-ment	Total
Confirmed cases of MDR-TB	981	2 329	3 644
MDR-TB patients started treatment			3 209

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

stimates of burden 2009 (All forms of TB)	umber (thousands)	Rate (per 100 000 pop)
Mortality (excluding H)	3.5 (2.4 5.2)	22 (16 33)
Prevalence (incl H)	33 (11 57)	211 (69 367)
ncidence (incl H)	26 (21 30)	163 (136 192)
Case detection, all forms (%)	80 (68 96)	

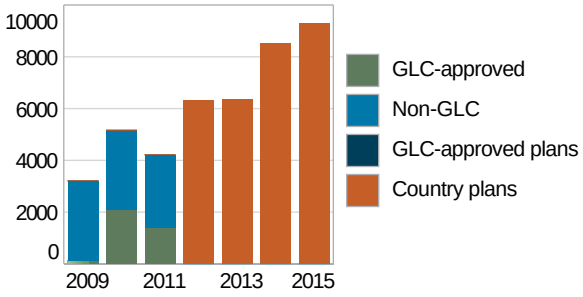
umber of laboratories	200	2009	2010
Smear (per 100 000 population)	2.9	2.9	2.9
Culture (per 5 million population)	6.8	28.5	28.2
DST (per 10 million population)	13.5	14.1	14.0
LPA (per 10 million population)			
Number of DST units for which external quality assurance was carried out			

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Borstel, Germany

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	on-
Cohort size	1609
% Treatment success rate	77
% Deaths	4

Drug management 2009	
First-line drugs available in private pharmacies	Yes
First-line drugs available without prescription	Yes
Drug management 2010	
Second-line drug procurement issues	
Drugs provided to manage side effects	

Stock-outs (at least 1 day) 2009	entral level	Peripheral level
First-line drugs	No	No
Second-line drugs	No	No

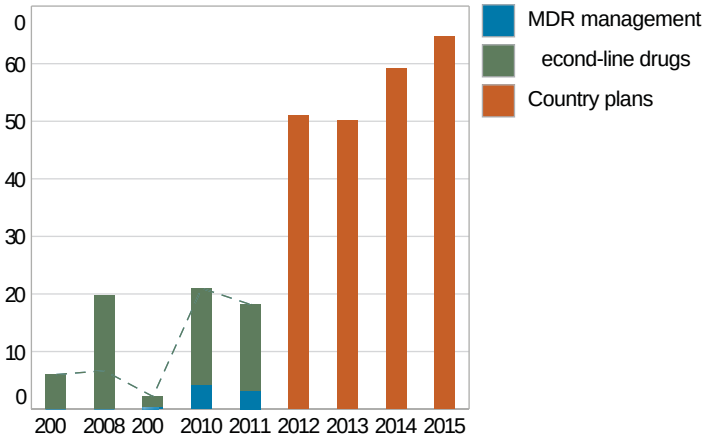
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	
Training material developed	
Training specifically for DR-TB conducted	
TB infection control national situation assessment carried out	Yes (2010)
in the scope of MDR-TB	Yes
National infection control plan	nder preparation
Tertiary hospitals with person in charge of TB infection control	18
TB notification rate (all forms) in health care workers (all staff) over rate in general population	7.5
Recording and reporting for MDR-TB in place	Yes Data collection paper based, entered in electronic data base
Representative survey/surveillance data on MDR-TB available	Class B routine surveillance data (2008) nationwide survey (2001)

Kazakhstan (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, transport ouchers/rei burse ent, hygiene packets, financial incenti es	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	Ministry of ustice
Prison care coordinated with NTP	Yes

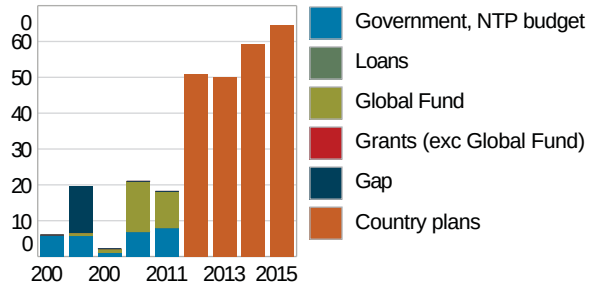
MDR budget (bar) and available funding (dotted line) (US$ millions)



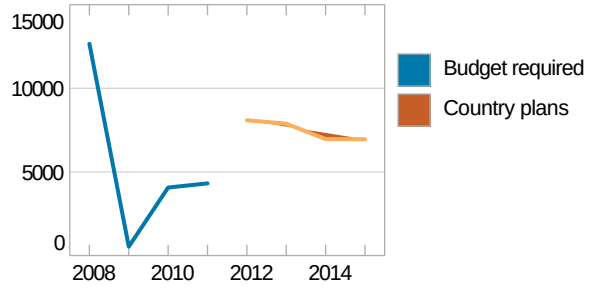
Financing (US$ millions)	2010	2011
Total NTP budget	265	1 6
MDR-TB financing component:		
second-line drugs budget	1	15
total MDR budget	21	18
available funding	21	18
funding gap	0	0
% of budget funded	100	100
% available funding from domestic sources	33	44
% available funding from Global Fund	6	56

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



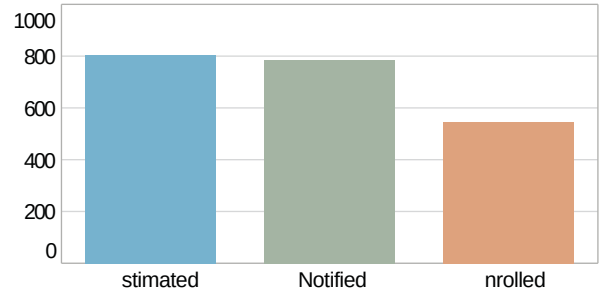
Progress since 2009 World Health Assembly resolution 62.15

Bottlenecks in 2010

Programmme management: Weak implementation capacity at the regional level

Kyrgyzstan MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	5	

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	13 (0.0 25)	model 2008
% of retreatment TB cases with MDR-TB	42 (12 72)	model 2008
MDR-TB cases among incident total TB cases in 2008	1 400 (350 2 400)	
MDR-TB cases among new pulmonary TB cases notified in 2009	480 (0 980)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	320 (90 550)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	225	161	785
MDR-TB patients started treatment			545

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	1.2 (0.84 1.8)	22 (15 32)
Prevalence (incl H)	13 (5.2 22)	236 (95 401)
ncidence (incl H)	8.7 (7.1 11)	159 (130 192)
Case detection, all forms (%)	66 (55 81)	

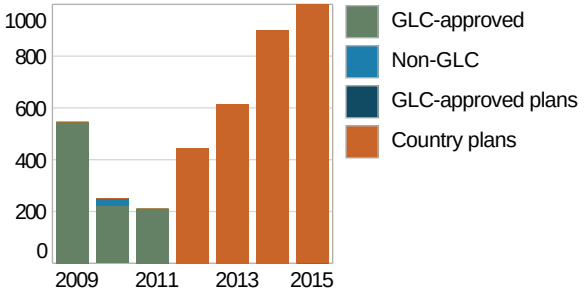
umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	2.3	2.2	2.2
Culture (per 5 million population)	12.0	10.0	8.1
DST (per 10 million population)	1.8	5.5	5.4
LPA (per 10 million population)			
Number of DST units for which external quality assurance was carried out			

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Gauting, Germany

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort on-	
Cohort size	132
% Treatment success rate	50
% Deaths	5

Drug management 2009	
First-line drugs available in private pharmacies	Yes
First-line drugs available without prescription	Yes
Drug management 2010	
Second-line drug procurement issues	Product registration mandatory
Drugs provided to manage side effects	

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs	No	No

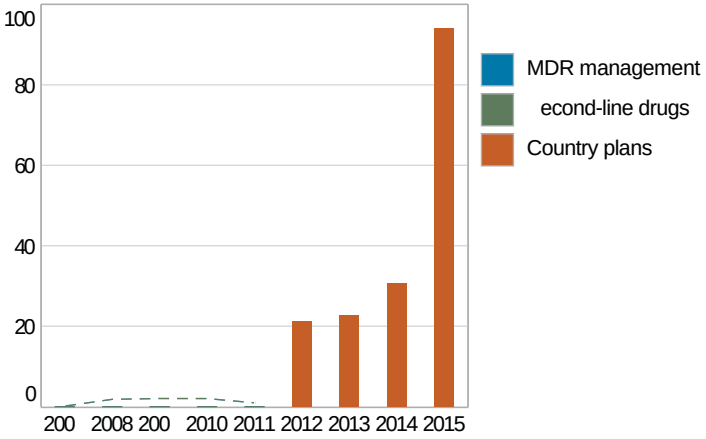
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, including XDR
Training material developed	Yes
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out in the scope of MDR-TB	
National infection control plan	No
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	
Recording and reporting for MDR-TB in place	Start of support to electronic system by WHO: 01/2011
Representative survey/surveillance data on MDR-TB available	No representative data available nationwide survey underway

Kyrgyzstan (continued)

Model of care for MDR-TB treatment 2010	
Hospitalisation of MDR for intensive phase	
Treatment (drugs and care) free of charge	
Patient support available (GLC projects)	Yes
Type of support: i ited food and transportation support	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	
Prison care coordinated with NTP	

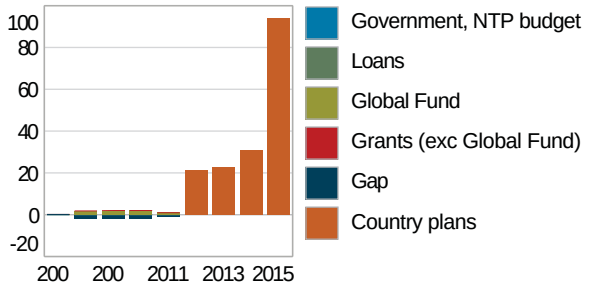
MDR budget (bar) and available funding (dotted line) (US$ millions)



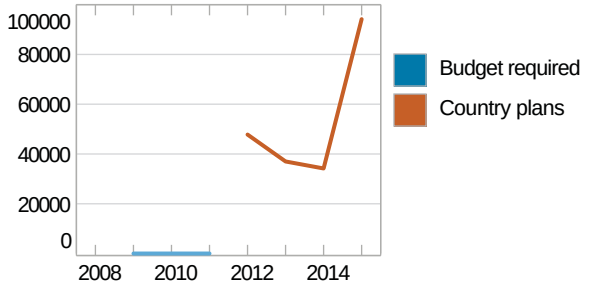
Financing (US$ millions)	2010	2011
Total NTP budget		
MDR-TB financing component:		
second-line drugs budget		
total MDR budget		
available funding	2	1
funding gap	1	1
% of budget funded		
% available funding from domestic sources		
% available funding from Global Fund	100	100

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Bottlenecks in 2010

Recording and reporting: Technical assistance needed for training in electronic MDR-TB data management

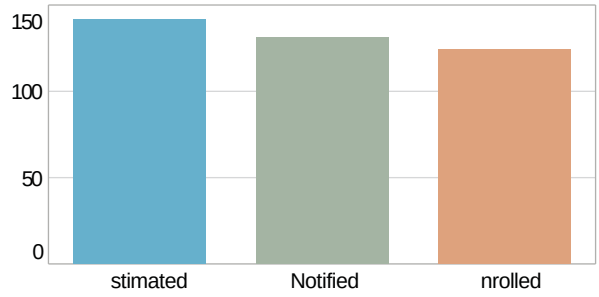
Qualified MDR/XDR-TB treatment (human resources, facilities): Limited human resource capacity

Access to quality assured second line drugs: National legislation regarding drug procurement

Other: nstable political situation

Latvia MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	2	

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	13 (11 16)	DRS 2009
% of retreatment TB cases with MDR-TB	36 (28 45)	DRS 2009
MDR-TB cases among incident total TB cases in 2008	170 (140 200)	
MDR-TB cases among new pulmonary TB cases notified in 2009	95 (78 120)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	47 (37 59)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	83	48	131
MDR-TB patients started treatment			124

% of MDR-TB patients living with H	24.6	2008 routine surveillance
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	1.9 (0.9-3.5)	2008 routine surveillance

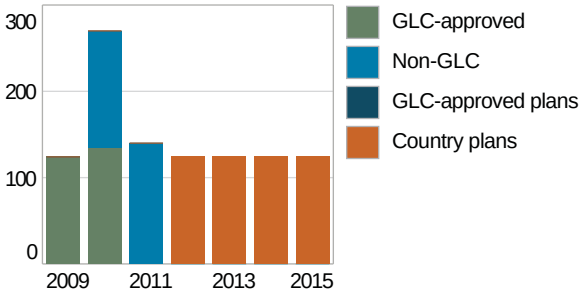
stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	0.098 (0.084 0.14)	4.4 (3.7 6.1)
Prevalence (incl H)	1.1 (0.28 1.9)	48 (13 83)
ncidence (incl H)	1 (0.88 1.1)	45 (39 51)
Case detection, all forms (%)	94 (83 110)	

umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	1.2	1.2	1.2
Culture (per 5 million population)	13.3	11.1	11.2
DST (per 10 million population)	4.4	4.4	4.5
LPA (per 10 million population)		4.4	4.5
Number of DST units for which external quality assurance was carried out		1	1

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	

First-line drug-sensibility testing routinely performed for: all patients

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	**on-**
Cohort size	99
% Treatment success rate	64
% Deaths	15

Drug management 2009	
First-line drugs available in private pharmacies	No
First-line drugs available without prescription	No
Drug management 2010	
Second-line drug procurement issues	Registration of SLD mandatory
Drugs provided to manage side effects	Yes

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs	No	No

MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, not including XDR
Training material developed	Yes
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out	Yes (1998)
in the scope of MDR-TB	Yes
National infection control plan	Yes
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	
Recording and reporting for MDR-TB in place	Yes Paper based at regions, electronic database at national TB registry
Representative survey/surveillance data on MDR-TB available	Class A routine surveillance data (2009)

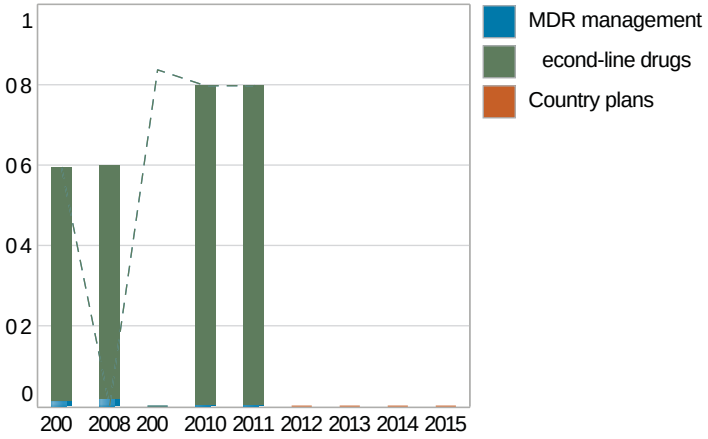
* Ranges represent uncertainty intervals

Latvia (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Transport ouchers	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	Ministry of Health and Ministry of ustice
Prison care coordinated with NTP	Yes

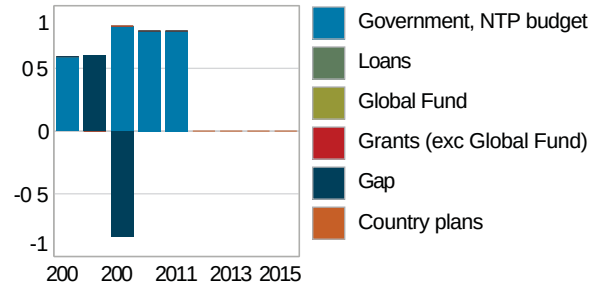
MDR budget (bar) and available funding (dotted line) (US$ millions)



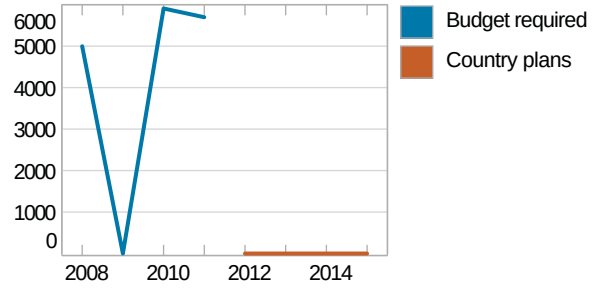
Financing (US$ millions)	2010	2011
Total NTP budget	5	5
MDR-TB financing component:		
second-line drugs budget	1	1
total MDR budget	1	1
available funding	1	1
funding gap	0	0
% of budget funded	100	100
% available funding from domestic sources	100	100
% available funding from Global Fund		

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)

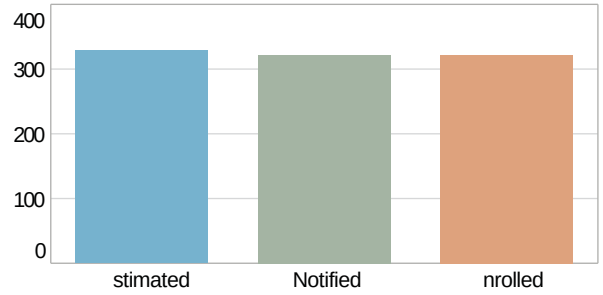


Progress since 2009 World Health Assembly resolution 62.15

Bottlenecks in 2010

Lithuania MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	3	

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	11 (8.8 13)	DRS 2009
% of retreatment TB cases with MDR-TB	52 (47 57)	DRS 2009
MDR-TB cases among incident total TB cases in 2008	330 (270 390)	
MDR-TB cases among new pulmonary TB cases notified in 2009	140 (110 160)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	190 (170 210)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	114	208	322
MDR-TB patients started treatment			322

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	0.3 (0.2 0.45)	9 (6.2 14)
Prevalence (incl H)	2.6 (0.98 4.5)	80 (30 137)
ncidence (incl H)	2.3 (2 2.7)	71 (61 82)
Case detection, all forms (%)	81 (70 95)	

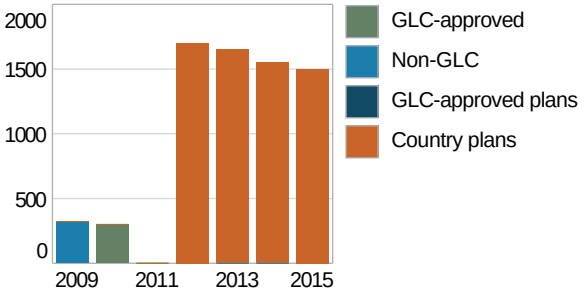
umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	0.3	0.4	<0.1
Culture (per 5 million population)	0	6.1	1.5
DST (per 10 million population)	12.0	12.2	12.3
LPA (per 10 million population)		3.0	3.1
Number of DST units for which external quality assurance was carried out		0	1

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Solna, Sweden

First-line drug-sensibility testing routinely performed for: new cases, all retreatment cases, cases failing a retreatment regimen, cases failing one or more retreatment regimens, cases that are contacts of MDR-TB cases

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	**on-**
Cohort size	188
% Treatment success rate	0
% Deaths	25

Drug management 2009	
First-line drugs available in private pharmacies	Yes
First-line drugs available without prescription	No
Drug management 2010	
Second-line drug procurement issues	Registration of SLD mandatory
Drugs provided to manage side effects	Yes

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs	No	No

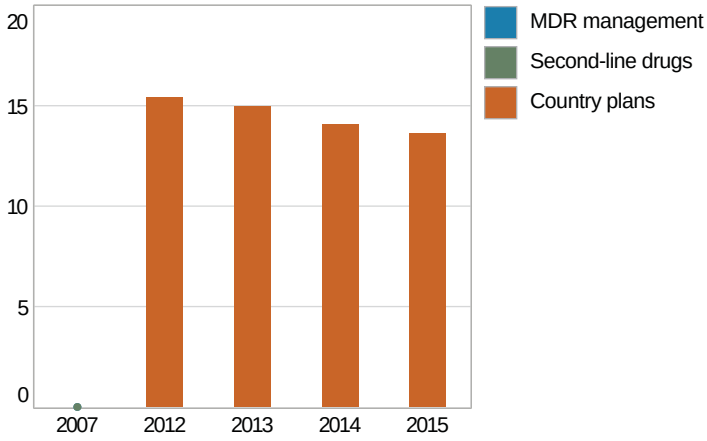
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, including XDR
Training material developed	No
Training specifically for DR-TB conducted	No
TB infection control national situation assessment carried out	Yes
in the scope of MDR-TB	Yes
National infection control plan	No
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	
Recording and reporting for MDR-TB in place	Yes lectronic reporting (national level) and paper-based reporting (regional level)
Representative survey/surveillance data on MDR-TB available	Class A routine surveillance data (2009)

Lithuania (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, hygiene packets	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	Ministry of ustice
Prison care coordinated with NTP	Yes

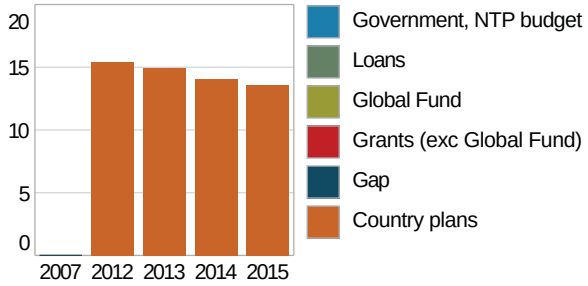
MDR budget (bar) and available funding (dotted line) (US$ millions)



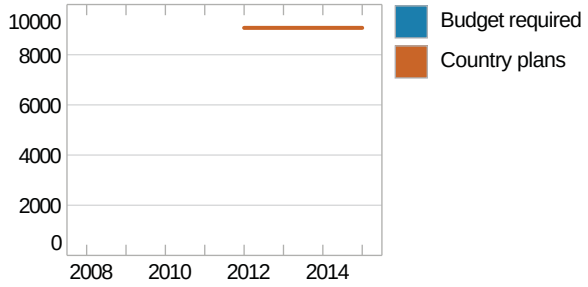
Financing (US$ millions)	2010	2011
Total NTP budget		
MDR-TB financing component:		
second-line drugs budget		
total MDR budget		
available funding		
funding gap		
% of budget funded		
% available funding from domestic sources		
% available funding from Global Fund		

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Recording and reporting: Recording and reporting system is organized well

Bottlenecks in 2010

Programme management: Lack of appointed manager and supervisors for TB control in the country

Laboratory capacity/quality: nsufficient quality control for drug susceptibility testing through national or supranational reference laboratory

Access to quality assured second line drugs: Supply interruptions due to the existing decentralized drug procurement system

Republic of Moldova MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009

Population (millions) 2009	4

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	19 (17 22)	DRS 2006
% of retreatment TB cases with MDR-TB	51 (49 53)	DRS 2006
MDR-TB cases among incident total TB cases in 2008	2 100 (1 700 2 400)	
MDR-TB cases among new pulmonary TB cases notified in 2009	650 (560 740)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	840 (810 880)	

MDR-TB notified cases 2009	e	Retreat-ment	Total
Confirmed cases of MDR-TB	289	780	1 069
MDR-TB patients started treatment			334

% of MDR-TB patients living with H	9.7 2009 routine surveillance
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	2.0 (1.4-2.9) 2009 routine surveillance

stimates of burden 2009 (All forms of TB)	umber (thousands)	Rate (per 100 000 pop)
Mortality (excluding H)	0.94 (0.65 1.3)	26 (18 37)
Prevalence (incl H)	9.5 (4 16)	264 (112 446)
ncidence (incl H)	6.4 (5.2 7.7)	178 (145 215)
Case detection, all forms (%)	68 (56 83)	

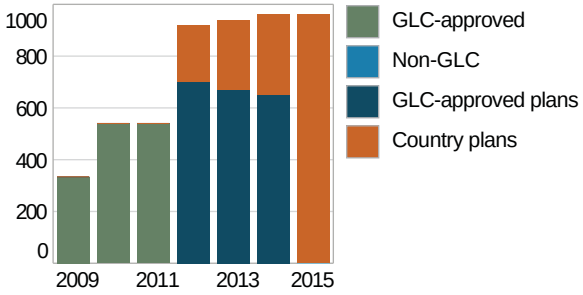
umber of laboratories	200	2009	2010
Smear (per 100 000 population)	1.6	1.6	1.7
Culture (per 5 million population)	5.5	5.6	5.6
DST (per 10 million population)	11.0	11.1	11.2
LPA (per 10 million population)		2.8	0
Number of DST units for which external quality assurance was carried out		0	0

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Borstel, Germany

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	on-
Cohort size	254
% Treatment success rate	52
% Deaths	8

Drug management 2009	
First-line drugs available in private pharmacies	No
First-line drugs available without prescription	No
Drug management 2010	
Second-line drug procurement issues	No
Drugs provided to manage side effects	

Stock-outs (at least 1 day) 2009	entral level	Peripheral level
First-line drugs	No	No
Second-line drugs	No	No

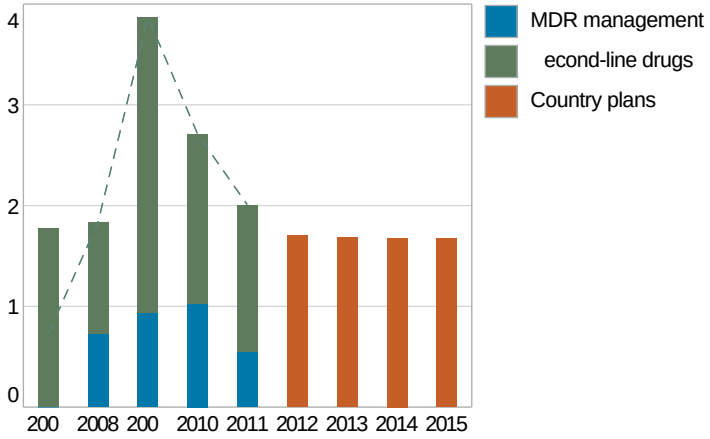
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, including XDR
Training material developed	Yes
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out	Yes
in the scope of MDR-TB	Yes
National infection control plan	Yes
Tertiary hospitals with person in charge of TB infection control	6
TB notification rate (all forms) in health care workers (all staff) over rate in general population	0.3
Recording and reporting for MDR-TB in place	Yes lectronic
Representative survey/surveillance data on MDR-TB available	Class B routine surveillance data (2009) nationwide survey (2006)

Republic of Moldova (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, transport ouchers/rei burse ent, hygiene packets	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	
Prison care coordinated with NTP	Yes

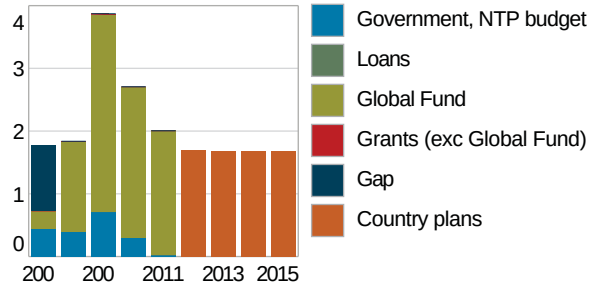
MDR budget (bar) and available funding (dotted line) (US$ millions)



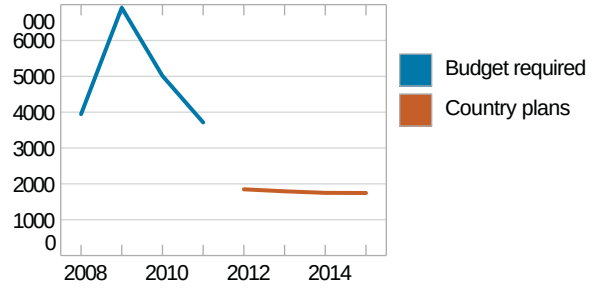
Financing (US$ millions)	2010	2011
Total NTP budget	5	4
MDR-TB financing component:		
second-line drugs budget	2	1
total MDR budget	3	2
available funding	3	2
funding gap	0	0
% of budget funded	100	100
% available funding from domestic sources	11	1
% available funding from Global Fund	8	

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Recording and reporting: No problem

Access to quality assured second line drugs: No problem

Bottlenecks in 2010

Performance in case finding/ beginning of treatment: Late diagnosis of MDR-TB

Programme management: Training for staff needed

Laboratory capacity/quality: Insuficient rapid tests for drug resistance to detect MDR- and XDR-TB

Qualified MDR-/XDR-TB treatment (human resources, facilities): Insufficient human resources

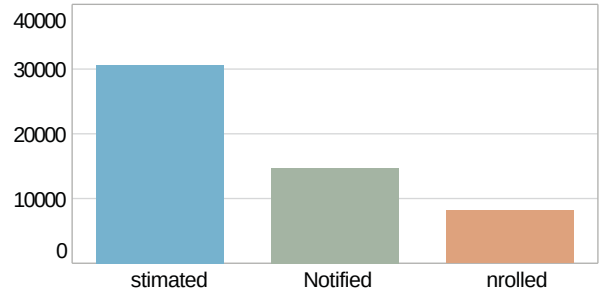
TB infection control: Training for staff revision of the National infection control Plan, mission for technical assistance focused on the environmental controls

Financing: Limited financial resources for MDR-TB

Other: Insufficient community involvement

Russian Federation TB HIV MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	141

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	16 (12 20)	DRS 2008
% of retreatment TB cases with MDR-TB	42 (38 47)	DRS 2008
MDR-TB cases among incident total TB cases in 2008	38 000 (30 000 45 000)	
MDR-TB cases among new pulmonary TB cases notified in 2009	17 000 (13 000 21 000)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	14 000 (12 000 15 000)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	5 816	2 314	14 686
MDR-TB patients started treatment			8 143

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	25 (17 37)	18 (12 26)
Prevalence (incl H)	190 (65 320)	132 (46 226)
ncidence (incl H)	150 (130 180)	106 (89 125)
Case detection, all forms (%)	84 (72 100)	

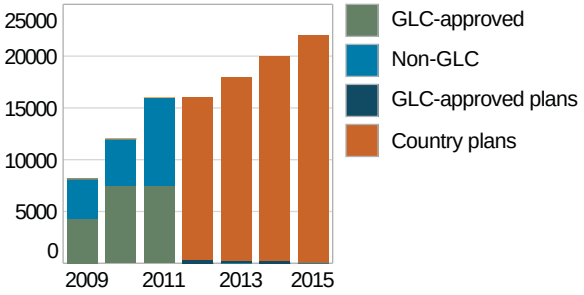
umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	2.8	2.8	2.8
Culture (per 5 million population)	14.0	14.1	14.1
DST (per 10 million population)	19.2	19.3	19.4
LPA (per 10 million population)			
Number of DST units for which external quality assurance was carried out			

National Reference Laboratory in 2009	No
Link to Supra-National Laboratory	Solna, Sweden (Russia does not have an official link to one SRL)

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	**on-**
Cohort size	
% Treatment success rate	
% Deaths	

Drug management 2009	
First-line drugs available in private pharmacies	Yes
First-line drugs available without prescription	Yes
Drug management 2010	
Second-line drug procurement issues	
Drugs provided to manage side effects	

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs	No	Yes

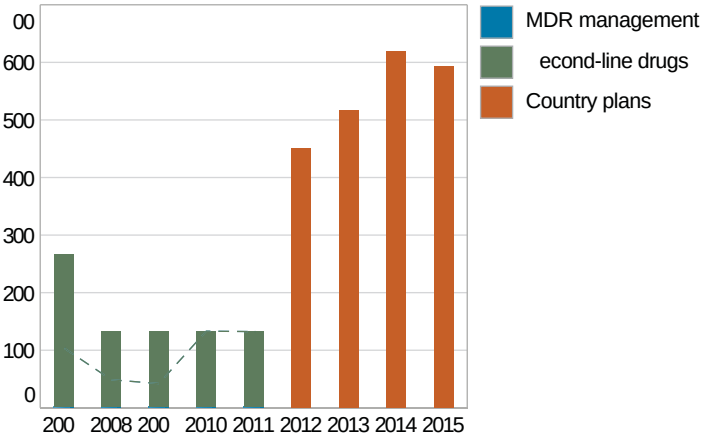
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	No
Training material developed	Yes
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out	No
in the scope of MDR-TB	No
National infection control plan	
Tertiary hospitals with person in charge of TB infection control	419
TB notification rate (all forms) in health care workers (all staff) over rate in general population	
Recording and reporting for MDR-TB in place	Yes Data collection paper based, entered in electronic data base
Representative survey/surveillance data on MDR-TB available	Class B national routine surveillance data (2009) Class A subnational surveillance data from 12 regions (2008)

Russian Federation (continued)

Model of care for MDR-TB treatment 2010	
Hospitalisation of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: iffering bet een regions/M R T ro ects	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	
Prison care coordinated with NTP	No

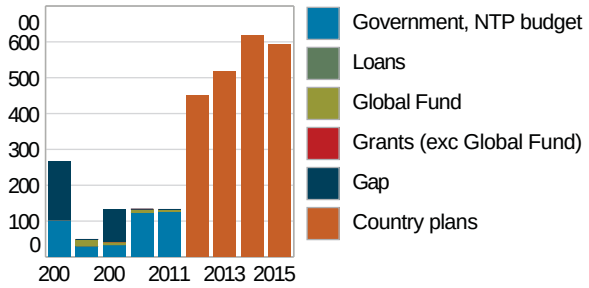
MDR budget (bar) and available funding (dotted line) (US$ millions)



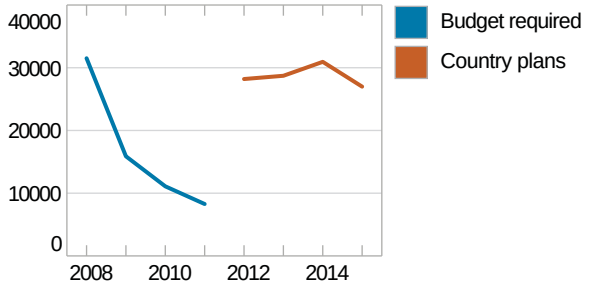
Financing (US$ millions)	2010	2011
Total NTP budget	1 258	1 2 8
MDR-TB financing component:		
second-line drugs budget	132	131
total MDR budget	133	132
available funding	133	132
funding gap	0	0
% of budget funded	100	100
% available funding from domestic sources	4	6
% available funding from Global Fund	6	4

WHO TB planning and budgeting tool used	Yes (200)

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Access to quality assured second line drugs: A new Law on drugs became effective on 1 eptember 2010 This law provides for equal conditions for every national and international manufacturer and introduces a maximum permissible deadline of 210 days for drug registration, regardless of the manufacturer s origin This will allow new effective drugs to come onto the Russian market more quickly

Bottlenecks in 2010

Programme management: Insufficient integration of TB control with health care system

Recording and reporting: lectronic recording and reporting under approval procedure in the Ministry of Health, currently some pilot projects Federal government budget for software modules but not for training

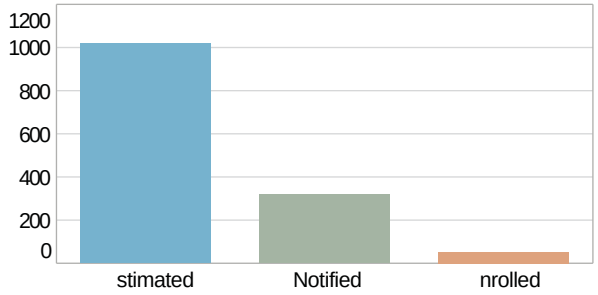
Qualified M/XMDR-TB treatment (human resources, facilities): Limited human resource capacity for MDR-TB

Access to quality assured second line drugs: Continuation of second line drugs supply for Green Light Committee approved and other regions - potential risk of discontinuation of Global Fund support

Other: xtensive hospitalization in some regions

Tajikistan MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	7

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	17 (11 24)	DRS 2008
% of retreatment TB cases with MDR-TB	62 (53 70)	DRS 2008
MDR-TB cases among incident total TB cases in 2008	4 000 (2 900 5 100)	
MDR-TB cases among new pulmonary TB cases notified in 2009	690 (470 990)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	330 (280 370)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	62	257	319
MDR-TB patients started treatment			52

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	3.4 (2.5 4.4)	48 (36 63)
Prevalence (incl H)	26 (12 42)	373 (173 610)
ncidence (incl H)	14 (11 17)	202 (164 243)
Case detection, all forms (%)	44 (36 54)	

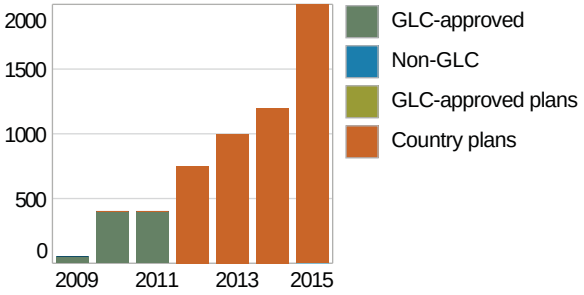
umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	1.5	1.4	1.4
Culture (per 5 million population)	1.5	0.7	2.1
DST (per 10 million population)	2.9	1.4	2.8
LPA (per 10 million population)		0	2.8
Number of DST units for which external quality assurance was carried out		0	2

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Gauting, Germany

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	**on-**
Cohort size	
% Treatment success rate	
% Deaths	

Drug management 2009	
First-line drugs available in private pharmacies	No
First-line drugs available without prescription	No
Drug management 2010	
Second-line drug procurement issues	Registration of SLD mandatory
Drugs provided to manage side effects	Yes

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs	No	No

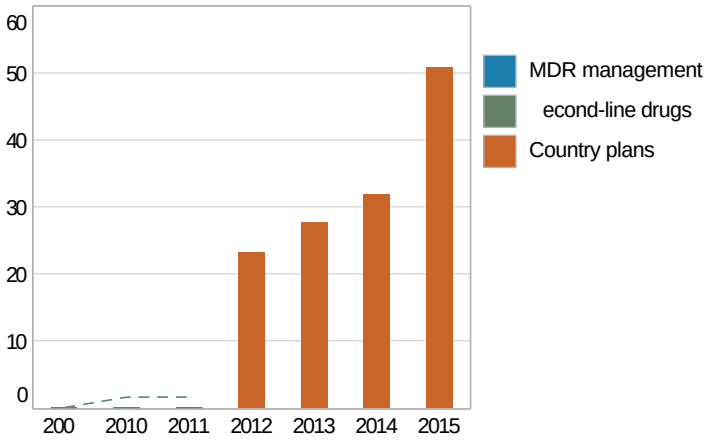
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, including XDR
Training material developed	Yes
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out	Yes (2009)
in the scope of MDR-TB	Yes
National infection control plan	nder preparation
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	16.8
Recording and reporting for MDR-TB in place	Yes Paper based
Representative survey/surveillance data on MDR-TB available	Routine surveillance data not representative survey in the city of Dushanbe and Rudaki district (2009) nationwide survey underway

Tajikistan (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, transport ouchers/rei burse ent	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	MOH, MO , International Organization, NGO-Caritas Luxemburg, NDP PI GFATM, Quality Health Care Project AID
Prison care coordinated with NTP	Yes

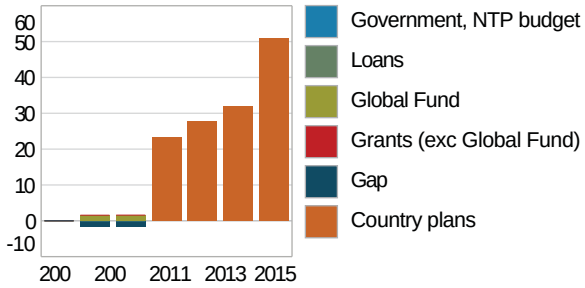
MDR budget (bar) and available funding (dotted line) (US$ millions)



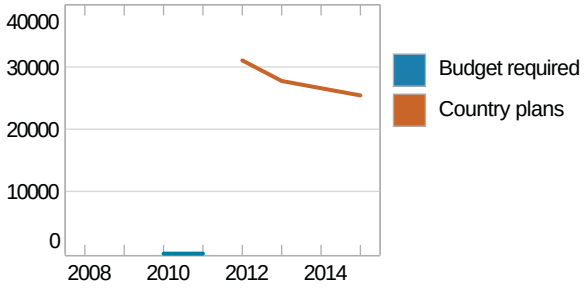
Financing (US$ millions)	2010	2011
Total NTP budget	0	
MDR-TB financing component:		
second-line drugs budget		
total MDR budget		
available funding	2	2
funding gap	1	1
% of budget funded		
% available funding from domestic sources		
% available funding from Global Fund	100	100

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Bottlenecks in 2010

Performance in case finding/ beginning of treatment: Weak integration with primary health care providers

Programme management: Weak health systems and integration with the health system, absence of electronic based data management system

Recording and reporting: Logistics Management Information ystem for second line drugs under development

Laboratory capacity/quality: Absence of electronic based data management system

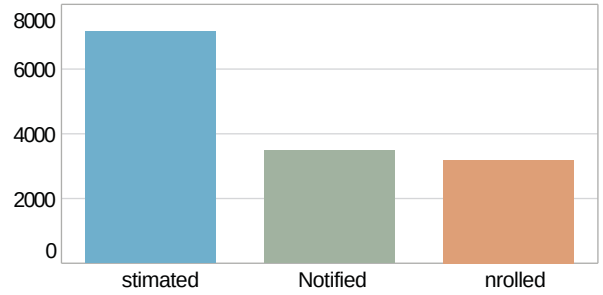
Qualified MDR/XDR-TB treatment (human resources, facilities): Limited human resource capacity for MDR, weak infection control, low adherance of MDR-TB patients, overloading and low motivation of primary health care personnel

TB infection control: Weak infection control in TB facilities

Financing: Weak public financing

Ukraine HIV MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	46

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	16 (14 18)	DRS 2006
% of retreatment TB cases with MDR-TB	44 (40 49)	DRS 2006
MDR-TB cases among incident total TB cases in 2008	8 700 (6 800 11 000)	
MDR-TB cases among new pulmonary TB cases notified in 2009	4 700 (4 100 5 400)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	2 400 (2 200 2 700)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	1 437	2 045	3 482
MDR-TB patients started treatment			3 186

% of MDR-TB patients living with H	23.8	2006 survey Donetsk oblast
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	1.5 (1.1-2.0)	2006 survey Donetsk oblast

stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	12 (7.9 18)	26 (17 39)
Prevalence (incl H)	59 (23 100)	130 (49 222)
ncidence (incl H)	46 (38 56)	101 (83 122)
Case detection, all forms (%)	78 (65 95)	

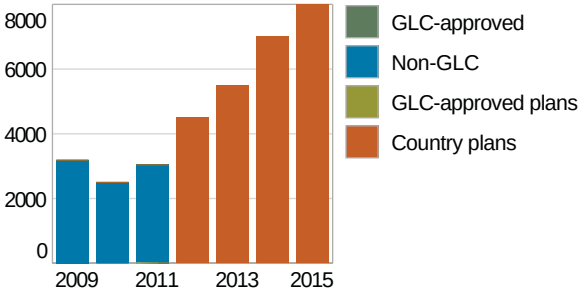
umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	4.1	2.2	1.8
Culture (per 5 million population)	11.6	11.3	11.3
DST (per 10 million population)	10.2	10.1	6.8
LPA (per 10 million population)		0	
Number of DST units for which external quality assurance was carried out			

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Riga, Latvia

First-line drug-sensibility testing routinely performed for: all patients

* Ranges represent uncertainty intervals

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort	**on-**
Cohort size	
% Treatment success rate	
% Deaths	

Drug management 2009	
First-line drugs available in private pharmacies	Yes
First-line drugs available without prescription	No
Drug management 2010	
Second-line drug procurement issues	Product registration mandatory
Drugs provided to manage side effects	Yes

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs	Yes	Yes

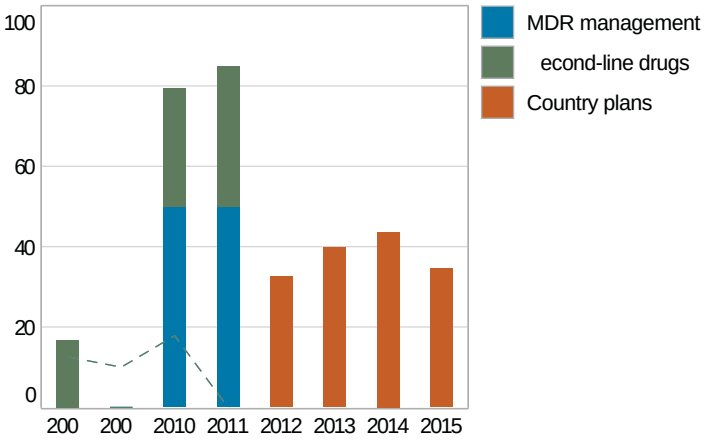
MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, including XDR
Training material developed	No
Training specifically for DR-TB conducted	No
TB infection control national situation assessment carried out	Yes (2009)
in the scope of MDR-TB	Yes
National infection control plan	nder preparation
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	1.1
Recording and reporting for MDR-TB in place	Yes lectronic
Representative survey/surveillance data on MDR-TB available	Class B routine surveillance data (2009) survey in Donetsk oblast (2006)

Ukraine (continued)

Model of care for MDR-TB treatment 2010	
Hospitalization of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: i ited support	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	
Prison care coordinated with NTP	Yes

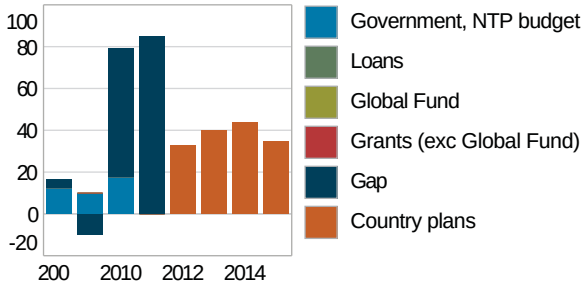
MDR budget (bar) and available funding (dotted line) (US$ millions)



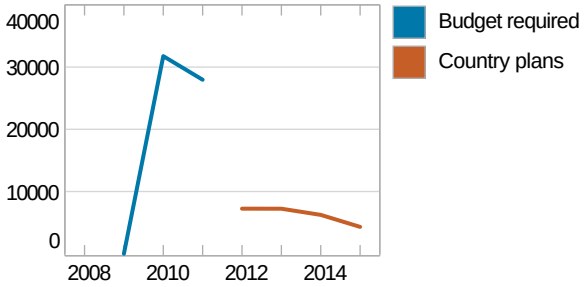
Financing (US$ millions)	2010	2011
Total NTP budget	203	211
MDR-TB financing component:		
second-line drugs budget	2	35
total MDR budget		85
available funding	18	
funding gap	62	85
% of budget funded	22	
% available funding from domestic sources	100	
% available funding from Global Fund		

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Bottlenecks in 2010

Programme management: Frequent changes of Ministry of Health management

Recording and reporting: Technical assistance needed for training in MDR-TB data management

Laboratory capacity/quality: Low laboratory capacity, quality assurance partly implemented

Qualified M/XMDR-TB treatment (human resources, facilities): Patient oriented approach is not implemented

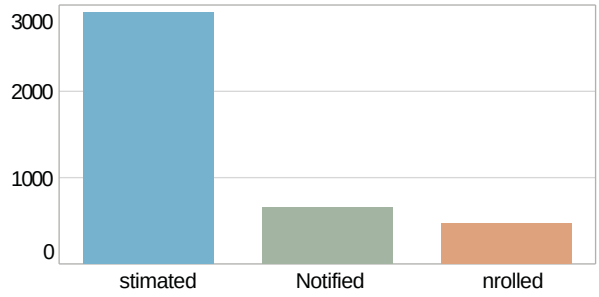
Access to quality assured second line drugs: Legislation on drug registration

TB infection control: Poor infection control

Financing: Lack of financing

Uzbekistan MDR-TB

Progress to ards universal access
stimated MDR-TB cases among notified pulmonary TB notified cases and cases started on treatment (as reported to WH) 2009



Population (millions) 2009	27

MDR-TB estimates of burden		
% of new TB cases with MDR-TB	14 (10 18)	DRS 2005
% of retreatment TB cases with MDR-TB	50 (36 64)	DRS 2005
MDR-TB cases among incident total TB cases in 2008	8 700 (6 500 11 000)	
MDR-TB cases among new pulmonary TB cases notified in 2009	1 700 (1 200 2 200)	
MDR-TB cases among retreated pulmonary TB cases notified in 2009	1 200 (880 1 600)	

MDR-TB notified cases 2009	**e**	**Retreat-ment**	**Total**
Confirmed cases of MDR-TB	115	539	654
MDR-TB patients started treatment			464

% of MDR-TB patients living with H	No representative data available
Odds of H -positive TB patient having MDR-TB over odds of H -negative TB patient having MDR-TB	No representative data available

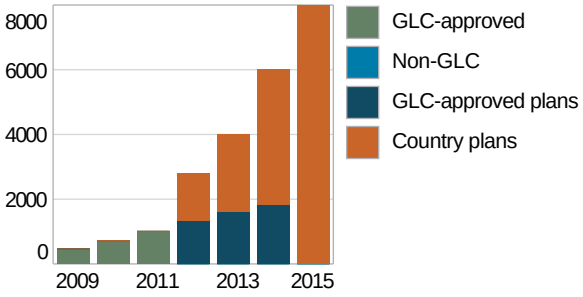
stimates of burden 2009 (All forms of TB)	**umber (thousands)**	**Rate (per 100 000 pop)**
Mortality (excluding H)	5.1 (3.8 6.7)	19 (14 24)
Prevalence (incl H)	63 (29 100)	227 (105 374)
ncidence (incl H)	35 (29 42)	128 (104 154)
Case detection, all forms (%)	50 (41 61)	

umber of laboratories	**200**	**2009**	**2010**
Smear (per 100 000 population)	1.1	1.2	1.1
Culture (per 5 million population)	0.4	0.4	1.3
DST (per 10 million population)	0.7	0.7	0.7
LPA (per 10 million population)		0.7	0.7
Number of DST units for which external quality assurance was carried out		2	2

National Reference Laboratory in 2009	Yes
Link to Supra-National Laboratory	Gauting, Germany

First-line drug-sensibility testing routinely performed for: new cases, all retreatment cases, cases failing a retreatment regimen, cases failing one or more retreatment regimens

MDR-TB cases ho started treatment (2009) and pro ected numbers to treat



Treatment outcomes 200 cohort on-	
Cohort size	330
% Treatment success rate	55
% Deaths	10

Drug management 2009	
First-line drugs available in private pharmacies	Yes
First-line drugs available without prescription	Yes
Drug management 2010	
Second-line drug procurement issues	
Drugs provided to manage side effects	Yes

Stock-outs (at least 1 day) 2009	**entral level**	**Peripheral level**
First-line drugs	No	No
Second-line drugs	No	No

MDR-TB management 2009	
Guidelines for programmatic management of DR-TB	Yes, not including XDR
Training material developed	Yes
Training specifically for DR-TB conducted	Yes
TB infection control national situation assessment carried out in the scope of MDR-TB	
National infection control plan	
Tertiary hospitals with person in charge of TB infection control	
TB notification rate (all forms) in health care workers (all staff) over rate in general population	0.2
Recording and reporting for MDR-TB in place	Yes lectronic
Representative survey/surveillance data on MDR-TB available	Routine surveillance data not representative surveys in the city of Tashkent (2005) and Republic of arakalpakstan (2002) nationwide survey underway

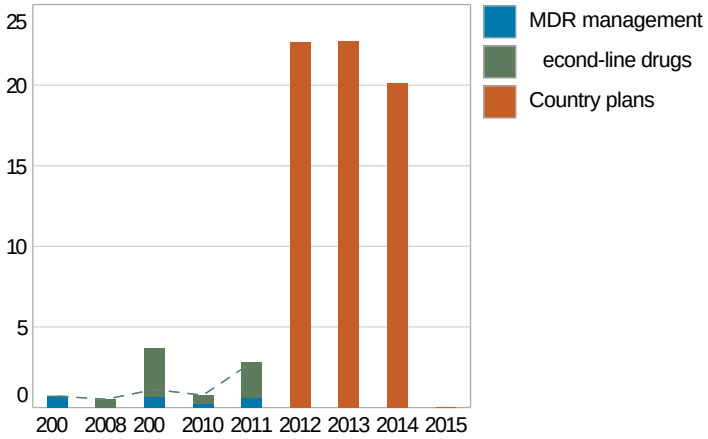
* Ranges represent uncertainty intervals

Uzbekistan (continued)

Model of care for MDR-TB treatment 2010	
Hospitalisation of MDR for intensive phase	Yes
Treatment (drugs and care) free of charge	Yes
Patient support available (GLC projects)	Yes
Type of support: Food packages, transport ouchers/rei burse ent, counseling/psychosocial support	

MDR-TB programme 2010	
MDR-TB expansion plan:	
approved by NTP/Ministry of Health	Yes
includes a budget	Yes
part of NTP	Yes
MDR-TB management programme part of NTP	Yes
Provider of MDR-TB care in prisons	
Prison care coordinated with NTP	

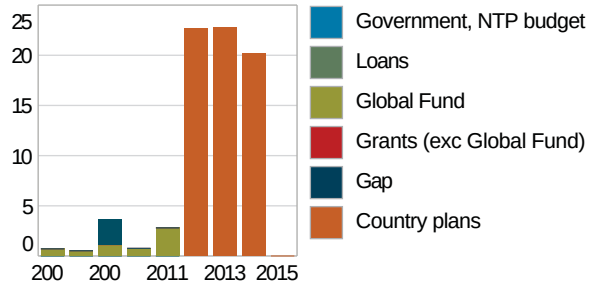
MDR budget (bar) and available funding (dotted line) (US$ millions)



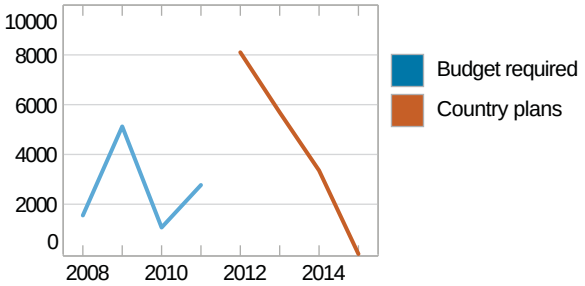
Financing (US$ millions)	2010	2011
Total NTP budget	13	1
MDR-TB financing component:		
second-line drugs budget	1	2
total MDR budget	1	3
available funding	1	3
funding gap	0	0
% of budget funded	100	100
% available funding from domestic sources		
% available funding from Global Fund	100	100

WHO TB planning and budgeting tool used

MDR budget by source of funding (US$ millions)



MDR-TB budget required per MDR-TB patient to be treated (US$ per patient)



Progress since 2009 World Health Assembly resolution 62.15

Bottlenecks in 2010

Programme management: Weak health systems and integration with the health system

Qualified MDR/XDR-TB treatment (human resources, facilities): Limited human resource capacity for MDR-TB

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.

The WHO European Region comprises 53 Member States:

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Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kazakhstan
Kyrgyzstan
Latvia
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