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## **Global Fund Special Study:**

***Factors that contribute to favourable MDR-TB treatment outcomes in Eastern Europe/Central Asia (EECA)***



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## List of abbreviations

AIDS	Acquired Immunodeficiency Syndrome
AZE	Azerbaijan
BLR	Belarus
CBO	Community-Based Organizations
CSO	Civil Society Organisation
DQA	Data Quality Assessment
DR-TB	Drug-resistant tuberculosis (i.e. all kinds of resistance patterns)
EECA	Eastern Europe and Central Asia ECDC
ECDC	European Centre for Disease Prevention and Control
FGD	Focus Group Discussion
FLD	First-line drug
FIFO / FEFO	“First in first out / first expired first out”
GLC	Green Light Committee
HF	Health Facility
HIV	Human Immunodeficiency Virus
IDU	Injecting Drug User
MDR-TB	Multidrug-resistant tuberculosis
MDT	Multi-Disciplinary Team
NTP	National TB Control Program
NGO	Non-Governmental Organization
PHC	Primary Health Care
PLWH	People Living With HIV
PR	Principal Recipient
RFP	Request For Proposal
rGLC	regional Green Light Committee
ROM	Romania
RR-TB	Rifampicin-resistant tuberculosis
SCIH	Swiss Centre for International Health
SLD	Second-line drug
Swiss TPH	Swiss Tropical and Public Health Institute
TJK	Tajikistan
TB	Tuberculosis
UKR	Ukraine
VOT	Video-Observed Therapy
WHO	World Health Organization
XDR-TB	Extensively resistant tuberculosis

# Executive Summary

## Background and objective

The Global Fund commissioned the Swiss Tropical and Public Health Institute (Swiss TPH) to perform a Special Study that has the title: “Factors that contribute to favourable MDR-TB treatment outcomes in Eastern Europe/Central Asia (EECA)”

In the WHO European Region (a proxy for the EECA region), a total of 40,698 MDR/RR-TB cases were started on second-line treatment in 2014 (49% of them were from Russia and 18% of them from Ukraine); 54% of them had successful treatment outcome (among the 2013 cohort, it was 52%). Also, there were 4,404 XDR-TB cases (50% of them were from Russia and 25% of them from Ukraine); they had a treatment success rate of only 29%.

Equipping TB programmes and patients who have drug-resistant TB (DR-TB) in such a way that good treatment outcome is possible is costly. However, the available TB budget, as reported to WHO, was approximately 2500 million USD in 2015, decreasing to approximately 1800 million USD in 2016 and 1600 million USD in 2017 for the European Region.

The objectives of this special study were:

- (1) To determine factors across the DR-TB continuum of care that contribute to successful treatment outcome, including among special patient groups
- (2) To assess effectiveness of different community engagement models into the success of program; and make recommendations for a sustainable community engagement model(s) in the region.

## Methods

This study used four approaches: (i) a desk review of existing documents on DR-TB care from the 20 countries of the EECA region; (ii) a Delphi survey among experts of DR-TB care; (iii) qualitative data gathering, i.e. interviews and focus group discussions (FGDs) with DR-TB programme providers and patients in five countries of the EECA (Ukraine, Romania, Belarus, Tajikistan, Azerbaijan); and (iv) quantitative data gathering (review of DR-TB patient charts regarding determinants of treatment outcome and data verification on recording and reporting) in these five countries. During the five country visits, TB programme staff, including staff working on TB-HIV and methadone programmes, at national, regional and health facility level were interviewed. Staff of non-governmental organisations (NGOs) were also interviewed. Interviews and FGDs with DR-TB patients were conducted.

## Key findings

### Findings from the desk review

In the desk review, 81 reports were reviewed (reports compiled from 2010 to 2016 plus one from 2017). Most reports were rGLC reports (n = 42), followed by reports from partner organisations (n = 13), National Programme Review reports (n = 9), and WHO country reports (n = 7).

Commonly mentioned marginalised patient sub-populations were: (i) prisoners in 66 reports; (ii) people living with HIV/AIDS in 63 reports; (iii) migrants in 35 reports; (iv) users of illicit drugs in 33 reports; and (v) homeless people, mentioned in 25 reports.

The frequency distribution of six constructed categories were established. The common categories were:

- *Recommendations* [almost one third of the statements (243/785; 31%) were recommendations]. One fourth (23.5%) dealt with issues that can be categorised as ‘programme management’ (e.g. “support the update and endorse the updated National Guidelines on DR-TB care”). Also common were recommendations related to the design or composition of the regimen and issues related to clinical management

- *Main challenges* (18%). The main topics were management issues in general and programme management as well as financial/management challenges. Also common were social support for patients and the problem of side effects.
- *Patient enhancers/enablers* (16%). The three main kinds of patient enablers were 'general social support' (e.g. financial allowance, payment of gas and electricity bills, disability pension, "psycho-social" support), 'food support' and 'money for transportation'.
- *Provider enhancers/enablers* (4%) are uncommon (mostly they referred to training and money for transportation). Healthcare workers play a crucial role in the treatment of DR-TB; thus, provider enhancers may be an important link that is often missing.

#### Findings from the Delphi survey

At the level of *individual DR-TB patients*, the five experts agreed that the two most important factors influencing favourable treatment outcomes are: (i) patients receiving rapid diagnosis allowing early beginning of adequate treatment; and (ii) patients receiving adequate social, financial and nutritional support. Furthermore provision of all medications, including medications for treatment of side effects, free of charge to DR-TB patients was perceived to be critical.

At the level of the *TB health worker* the experts' consensus highlighted the importance of health workers "understanding individual patients' needs, including work or education needs, and to consider those when providing care" and that the patient is treated with respect and empathy.

Regarding *new diagnostic tools* currently being assessed, there was an experts' consensus on the following points: There is a need for more investment in building lab networks and ensuring they are staffed and maintained; and (ii) not many NTPs have the vision on how to extend the lab network, how to promote access and progressively to whom, taking into account national budget constraints. In addition, it was emphasised that in many settings, there can be considerable delays from the time the sample is collected until result is reported and received by the treating clinicians.

Regarding new TB drugs and regimens currently being assessed, there was an experts' consensus on the following points: (i) adequate training of staff at all levels and provision of monitoring equipment is important; and (ii) there is a need to contextualize the possible risks of the new drugs with the current risks of the existing regimens.

#### Findings from the qualitative data gathering in the five visited countries

In the five visited countries, there were at the national level, overall 40 people interviewed, at the regional level, they were 76 and at the health facility level, they were 44.

In the five countries, the TB programme is vertical, though some integration into the PHC system is policy, with various degree of implementation. In all five countries, further involvement of PHC facilities is possible. In general, the TB and DR-TB patients are hospitalised, at least during the initial phase of treatment. In all five countries, the number of "TB hospital beds" has recently been reduced or is still being reduced to free some financial resources for other aspects of TB care.

The principle of directly observed therapy (DOT) is largely adhered to in the five countries, though less so in Romania. In all five countries, NGO workers provide home-DOT in some places. In all five countries, it was perceived that the stigma attached to tuberculosis is considerable.

In all five countries, the following were factors perceived to hinder successful treatment outcome: (i) side effects; (ii) the long duration of treatment; (iii) strained patient-provider relationship; (iv) patients' lack of comprehensive information about TB and its treatment at treatment start; and (v) stigma attached to TB. Factors that promote good treatment outcome



were less easily identified: in four or five countries, the following were such factors: (i) good patient-provider relationship; (ii) food as incentive; and (iii) home-DOT (treatment at home of patient).

#### Findings from the quantitative data gathering in the five visited countries

Data extraction on patient characteristics performed in the five visited countries yielded data from 212 patients (all of the 2013 cohort). 9.4% of them were HIV-positive, 65% had had previous TB treatment and one fifth had had at least one previous DR-TB treatment episode. One fourth (24.1%) had undergone MTB/Rif Xpert examination. Among the 212 cases, 22% had pre-XDR and 9% XDR at baseline.

Among the 191 patients with a definite treatment outcome, 58.6% had successful treatment outcome. Multivariate logistic regression analysis found three clear risk factors for poor treatment outcome: (i) homelessness; (ii) culture-positivity at two months of treatment; and (iii) having previously had treatment with second-line drugs.

Reported treatment outcome was gathered from 77 health facilities in the five countries, totalling 2079 cases of the 2913 cohort. The overall treatment success rate was 45.2%.

Data verification exercises revealed an almost perfect concordance: comparing records with reports of 12 health facilities, only one health facility had a discordance (of just one case).

#### **Conclusion and recommendations**

1. Uptake and scaling up of *new diagnostic tools and approaches and of new regimens* is crucial. The NTPs need to emphasise the importance of making these new tools available and push for comprehensive coverage.
2. In view of the seriousness of the challenge of side effects, it is important that ancillary drugs are reliably available and provided free of charge.
3. Most DR-TB patients of the EECA region are not eligible for the *short MDR regimen* based on the current WHO recommendation. There is a need to carefully balance the advantages and disadvantages of having a potentially less powerful but much more tolerable regimen. A short regimen reinforced with one or two new drugs (e.g. Bedaquiline) may be the way forward.
4. In the process of full involvement of the PHC level facilities and contributions from the community, each country accumulates experiences and lessons learnt. Therefore, the countries may benefit from an *exchange of experiences on these efforts to involve PHC facilities and communities in TB and DR-TB care*.
5. In view of the common *catastrophic costs* and impoverishing effect of having TB and especially DR-TB, improving the DR-TB treatment outcome in EECA countries may well mean more comprehensive support for a large proportion of the patients (including cash incentives) and his or her families.
6. Marginalised sub-groups such as *alcoholics and the homeless need comprehensive assistance*. It seems warranted to seriously consider having a formal *alcohol dependency treatment* programme for TB and DR-TB patients.
7. There is a trend of more *home-DOT*. The shift to this mode of treatment delivery should be closely monitored and the results evaluated, with scope for accompanying cost-effectiveness studies. Other approaches to facilitate better treatment outcome should also be explored, such as involving *cured patients in supporting DR-TB patients* on treatment, involving *psychologists and having patient group discussions*.

# 1 Overview, Objectives and Background

## 1.1 Overview regarding this study

The Global Fund commissioned the Swiss Tropical and Public Health Institute (Swiss TPH) to perform a Special Study that has the title: “Factors that contribute to favourable MDR-TB treatment outcomes in Eastern Europe/Central Asia (EECA)”

This Special Study used four approaches: (i) a desk review of existing documents on DR-TB care from the 20 countries of the EECA region; (ii) a Delphi survey among experts of DR-TB care; (iii) qualitative data gathering, i.e. interviews and focus group discussions (FGDs) with DR-TB programme providers and patients in five countries of the EECA (Ukraine, Romania, Belarus, Tajikistan, Azerbaijan); and (iv) quantitative data gathering regarding determinants of treatment outcome and data verification on recording and reporting in these five countries.

The main purpose of this study was to understand how to improve treatment success in EECA countries, considering the context of these countries. The findings of this study should assist the EECA countries in further shaping their TB programmes and the Global Fund and other partners on what kind of support is appropriate.

This report presents the overall findings and has annexed (Annex 5) the five individual country reports (as embedded files).

## 1.2 Objectives

The overall objective of this Special Study is the expansion of our knowledge regarding the factors that influence MDR-TB treatment outcomes in general, and amongst special groups, in order to enable the national TB programmes, in collaboration with the Global Fund and other partners to prioritise interventions for better treatment outcome among drug-resistant TB cases.

Objectives are two-fold:

- (1) To determine factors across the DR-TB continuum of care that contribute to successful treatment outcome, including among special patient groups
- (2) To assess effectiveness of different community engagement models into the success of program; and make recommendations for a sustainable community engagement model(s) in the region.

## 1.3 Drug-resistant Tuberculosis in the EECA region

The Global Fund mandated the Swiss Tropical and Public Health Institute (Swiss TPH) to conduct a study on factors that contribute to favourable MDR-TB treatment outcomes in Eastern Europe/Central Asia (EECA).

WHO does not have regional data for exactly these 20 countries. However, WHO has data on the so-called “WHO European Region” where nine of the world’s thirty high MDR-TB burden countries are situated. The following data refer to the WHO European Region [1,2].

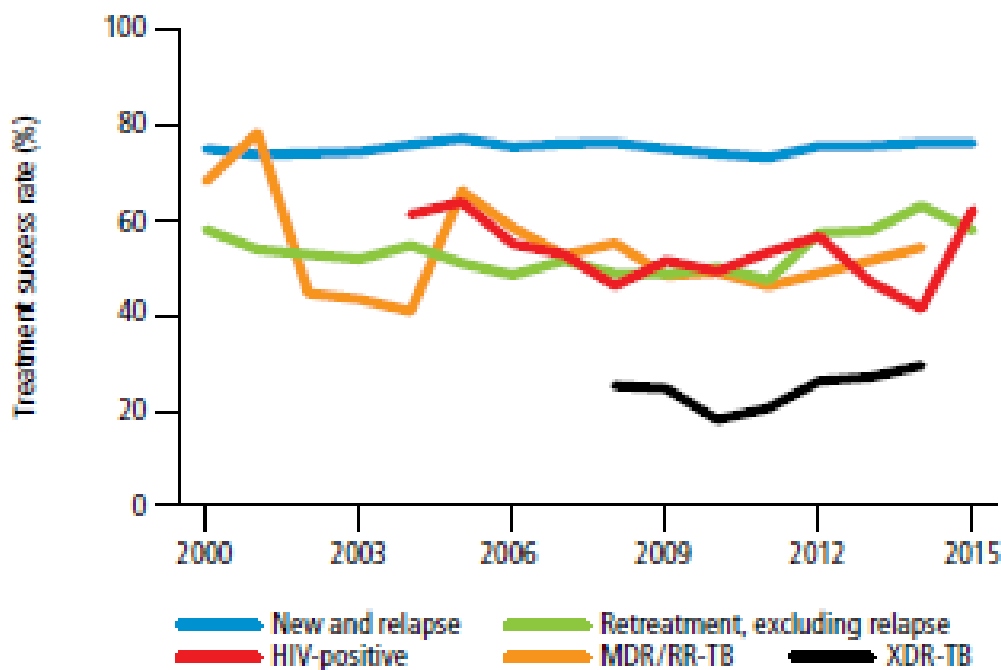
In 2016, the incidence rate of TB cases in the European Region was estimated at 32 per 100,000 (down from 36 per 100,000 in 2015), ranging from 2.1 per 100,000 in Iceland to 145 per 100,000 in Kyrgyzstan. In the same year, a total of 260,434 cases were notified (down from 297,448 TB cases in 2015); for 84% of them the HIV status was known (up from only 72% in 2015). Among those tested, 15% (24,871) were HIV co-infected. There was a strong preponderance of male cases in both years.

In 2016, an estimated 71,000 cases had RR/MDR-TB<sup>1</sup> among the notified pulmonary TB cases (down from 74,000 in 2015). It was further estimated that 19% of the new TB cases and 55% of the previously treated cases had MDR/RR-TB in 2016. In terms of diagnostic capacity, a total of 145,183 notified cases were tested for rifampicin resistance in 2016 (up from 138,048 in 2015); 50% of the new cases and 65% of the previously treated cases. Among these tested cases, 49,442 (34%) were found to have MDR/RR-TB. Only 13,994 of them (28.3%) were tested for resistance to second-line drugs; 3,114 of them had XDR-TB. A large proportion of these 3,114 detected XDR-TB cases, namely 38% (n = 1,195), were from Ukraine.

In 2014, a total of 40,698 MDR/RR-TB cases were started on second-line treatment; 54% of them had successful treatment outcome (among the 2013 cohort, it was 52%). Among the 40,698 cases were 4,404 XDR-TB cases; they had a treatment success rate of only 29%.

Figure 1 presents the treatment success rate of the various groups of tuberculosis patients in the European region; note that even among the new and relapse TB cases, the treatment success rate was consistently below 80%.

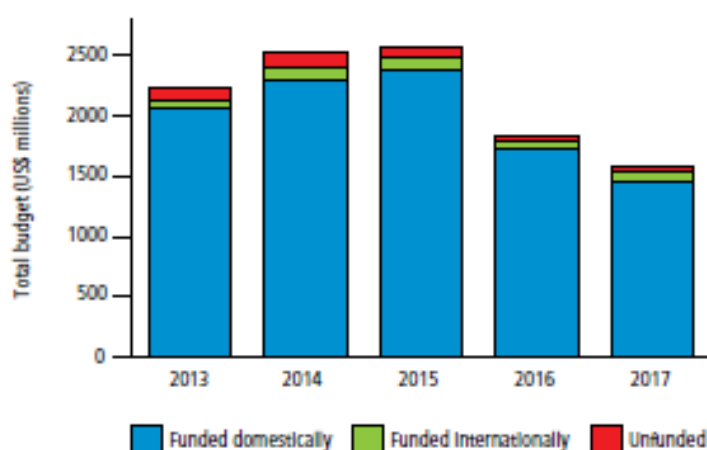
**Figure 1. The treatment success rate of the various tuberculosis patient groups in the European Region, 2000-2015.**



<sup>1</sup> MDR/RR-TB: multidrug-resistant TB and rifampicin-resistant TB. In general, this report uses the term DR-TB (drug-resistant TB). DR-TB includes all kinds of resistance patterns (e.g. rifampicin-resistant TB cases, poly-drug resistant cases and extensively drug-resistant TB cases).

Figure 2 presents the budget situation of the European region over the past five years. Note that the high-income countries of the European region are included in Figure 2; in some countries of the EECA, the unfunded proportion is much larger (for instance, in both Belarus and Romania, approximately 30% of the 2017 budget was unfunded<sup>2</sup>). Noteworthy is that approximately 85% of the domestically funded budget of 2017 is due to the budget of Russia (where there is only domestic funding). In other words, when one excludes Russia, the proportion of domestic funding in the European region would be substantially lower.

**Figure 2. Budget situation of the European Region in terms of TB care, 2013 to 2017**



Source: WHO 2017. *Global Tuberculosis Report 2017, Annex 3*

Russia is a key country within EECA: Looking at the years 2013 to 2015 and taking the mean shows that per year, there were approximately 41,600 DR-TB cases in the 20 countries of the EECA; 37% of these DR-TB cases were from Russia. Furthermore, by applying a carefully designed model, Sharma and colleagues (2017) forecasted that in Russia, the percentage of MDR-TB among incident TB cases will increase, reaching 32.5% by the year 2040. It is noteworthy that the model estimates that the proportion of MDR-TB case among all TB cases will be much lower in the other three examined countries (5.7% in South Africa, 8.9% in the Philippines and 12.4% in India) [3].

Table 1 presents the number of confirmed DR-TB cases, the estimated incidence of RR-TB cases and the case detection rate in the 20 EECA countries (data are from the WHO TB database).

<sup>2</sup> Information retrieved from <http://www.who.int/tb/country/data/profiles/en/>, countries Tajikistan and Belarus, accessed 5 November 2017.

**Table 1. DR-TB cases in the 20 EECA countries: confirmed cases, estimated incidence and case detection rate**

Number of confirmed DR-TB cases					Estimated incidence of rifampicin resistant TB, 2016	Case detection rate, 2016 *
2013	2014	2015	2016			
DR-TB high-burden countries						
Russian Fed.	13'521	15'585	17'132	27'363	63'000	43.4%
Ukraine	10'585	7'735	9'397	8'651	21'000	41.2%
Kazakhstan	6'411	5'877	6'497	5'817	7'000	83.1%
Uzbekistan	5'751	3'844	2'149	1'956	10'000	19.6%
Belarus	1'386	1'251	1'340	1'543	3'400	45.4%
Kyrgyzstan	1'191	1'267	1'116	1'236	4'800	25.8%
Azerbaijan	1'039	1'007	1'171	925	2'400	38.5%
Moldova	1'042	925	1'042	1'031	2'300	44.8%
Tajikistan	872	902	675	748	2'600	28.8%
Other countries						
Romania	627	577	576	536	890	60.2%
Georgia	406	441	418	401	780	51.4%
Turkmenistan	81	210	270	557	830	67.1%
Armenia	119	111	101	128	280	45.7%
Bulgaria	37	44	26	22	61	36.1%
Serbia	12	14	5	8	27	29.6%
Macedonia	2	3	5	2	6	33.3%
Albania	2	3	4	4	12	33.3%
Bosnia & H.	1	4	3	0	0	NA
Montenegro	0	2	1	0	0	NA
Kosovo	0 or unknown	0 or unknown	0 or unknown	0 or unknown	0 or unknown	NA

\* Number of confirmed cases divided by the estimated incidence of RR cases

It is noteworthy that only in Kazakhstan, Romania, Georgia and Turkmenistan was the case detection rate above 50% in 2016. The case detection rate was below 30% in Uzbekistan, Kyrgyzstan, Tajikistan and Serbia.

One common feature in many of the countries of the EECA Region is the reliance on hospitalised care for patients with drug-susceptible and drug-resistant TB. The systems of institutional staffing, payment and reimbursement created perverse incentives in many settings to hospitalize patients unnecessarily or for longer periods than required. The National TB Control Programmes (NTP) are increasingly aware of the need to reduce hospitalisation, and various projects support the NTPs. For instance, in September 2015 a US\$ 6 million grant agreement was signed between the Global Fund and the Centre for Health Policies and Studies as the Principal Recipient of a regional grant. This grant - supported by the WHO Regional Office for Europe and partners (e.g. the European Respiratory Society and the London School of Hygiene and Tropical Medicine) - covers eleven EECA countries (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of

Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan)<sup>3</sup>. The aim of the grant is to use a systems-based approach to improve TB treatment outcomes by removing health system barriers and scaling up health system reforms. The project complements country TB-specific and broader health reform efforts supported by USAID, the World Bank and others. Among the aims are minimizing TB patient hospitalization rates and average lengths of hospital stay.

## 2 Methodology

The study, designed by the Global Fund with inputs from WHO EURO, contained three approaches: (i) a desk review of TB and DR-TB documents from the 20 countries of the EECA region<sup>4</sup>; (ii) a Delphi survey among recognised TB experts in order to increase the evidence-base for the identification of factors contributing to successful MDR-TB treatment outcomes: and (iii) an in-depth review of activities in five countries that were visited, focussing on the care for DR-TB cases, especially to determine factors that contributed to successful treatment outcome. The study team visited the following five countries (between March and July 2017): Belarus, Ukraine, Romania, Tajikistan, Azerbaijan. For the five visited countries, ethical clearance was sought and obtained, facilitated through the national TB programmes.

### 2.1 Desk Review of DR-TB care in the EECA Region

#### 2.1.1 Documents reviewed

Retrieval of documents to be reviewed was done in collaboration with the Global Fund and WHO/EURO. All the documents that were made available to the study team were reviewed. The countries were requested to make TB and DR-TB documents available. With the exception of three countries (Turkmenistan, Russian Federation and Montenegro), there was at least one document made available. A large proportion of the reviewed documents were rGLC Europe reports. Other documents were programme reviews and partners' reports.

A preliminary search on PubMed for publications since 2008 on MDR-TB treatment outcomes for sub-regions ("eastern Europe", "central Asia") as well as for the five target countries of the study showed a result of 51 peer-reviewed articles. These documents were not systematically analysed but information drawn from them for better understanding the DR-TB situation in EECA countries and for enriching the conclusion/recommendations section.

#### 2.1.2 Data extraction

Apart from country and year of writing the document, the documents were reviewed to extract information into a prepared Excel data gathering tool regarding the following topics:

1. Sub-populations mentioned.
2. Enablers to help patient (not counted when mentioned only in the recommendations)
3. Enablers to encourage providers (not counted when mentioned only in the recommendations)
4. Main challenges that hinder treatment completion

<sup>3</sup> Information retrieved from <http://www.pas.md/en/TBRep> (accessed 5 September 2017) and page 99 of *WHO's Global Tuberculosis Report 2016*.

<sup>4</sup> As indicated by the Global Fund (Solicitation TGF-16-085), the following twenty countries are considered to comprise the EECA region: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Kazakhstan, Kosovo, Kyrgyzstan, Macedonia, Moldova, Montenegro, Romania, the Russian Federation, Serbia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

5. Recommendations related to treatment outcome
6. Remarks on treatment outcome
7. Other information that is meaningful regarding the topic of treatment and treatment outcome, including factors that further treatment completion.

For each of these overarching topics, the extracted information was categorized, using the following categories:

1. For sub-populations: migrants, prisoners, people living with HIV/AIDS, drug users, other sub-populations (e.g. homeless, alcoholics)
2. For enablers to help patients:
  - Food
  - Hygiene set or similar
  - Money for transportation
  - Money for other things
  - Help in housing
  - Formal meetings with peers
  - Regular coaching by social worker or similar staff
  - Regular coaching by psychologist
  - Ancillary drugs
  - Social support for patient (in general)
  - Community-based DOT / care
  - Other patient enabler
3. For enablers to encourage providers:
  - Offers for further training
  - Money for each cured TB patient
  - Money for transportation for visiting patients
  - Formal meetings with peers
  - Regular coaching by head of facility or social worker or similar staff
  - Training
  - Other provider enabler
4. For main challenges that hinder treatment completion:
  - Side effects of medicines
  - Poverty of patients
  - Daily travel to treatment
  - Strained patient-provider relationship
  - Programme management
  - Clinical management
  - Management, other
  - Financial challenge / issue
  - Financial and/or management challenge
  - Other challenges
5. For recommendations related to treatment outcome: the categories mentioned above plus:
  - Training
  - Design/composition of regimen
6. For remarks on treatment outcome: the categories mentioned above
7. For other information: the categories mentioned above

Furthermore, for each extracted item, the relevant passage from the source document (e.g. rGLC report) was moved (sometimes copy-pasted, sometimes in a slightly summarised form) into a column in the Excel file called “narrative”.

It is important to note that it was not always straightforward which category to assign to a statement. For instance, there was the following statement in a report: “Not all DR-TB patients receive treatment, there are short waiting lists in the regions”. It was decided to put this statement into the category “programme management”; it needs to be acknowledged that this statement can also be put into the category: “Financial challenge / issue”.

### **2.1.3 Data analysis**

Data were analysed to present what kind of topics and what kind of categories were prominent (mainly in terms of frequencies). Regarding patient enablers and provider enablers, a time-related analysis was performed, comparing two time frames: 2010 to 2013 and 2014 to 2016 to clarify if enablers were more common during the more recent years. Descriptive statistics were carried out in Excel and in R. Desk review data was also imported into R and counts and percentages were established. Graphics were produced in R and in Excel.

## **2.2 Delphi survey**

In order to increase the evidence-base for the identification of factors contributing to successful MDR-TB treatment outcomes, the study team conducted a Delphi survey among recognised TB experts (a Delphi survey consists of repeated rounds of key informants’ consultations among a group of stakeholders). Two rounds were made, performed between April and July 2017. After round two, there was some persisting disagreement between experts’ opinions, and this was considered as valid findings in the sense that they indicate areas with open questions (some of them might need further research).

### **Identification of experts**

Based on relationships that one of the research team had established over his twenty years of experience in the field of TB/DR-TB and TB control, a list of possible experts was drafted; efforts were made to recruit a group of experts with divergent background/views. The list was reviewed to have a group of experts with some heterogeneity in terms of field of expertise, geographical background and affiliation with an organisation. It was then decided to have a list of eight experts for the Delphi survey.

### **Round one**

Based on the vast knowledge, including field knowledge on DR-TB care, of one among the research team and also based on the findings of the desk review, a questionnaire was compiled. The questionnaire focussed on the twin questions of what can promote and what can hinder good treatment outcomes for DR-TB patients. Focus was also given to special sub-population groups/ marginalised population groups. In addition, a few specific questions were posed regarding new diagnostic tools (LPA second-line, Xpert Ultra, Xpert Omni) and regarding newly emerging regimens, including the new medicines Bedaquiline and Delamanid (the short MDR regimen was not mentioned specifically in round one).

This questionnaire was sent to the eight identified experts. Several reminders were sent, resulting in receiving filled-in questionnaires from five experts.

### **Round two**



Based on an analysis of the replies of the experts to round one, a questionnaire was built for round two. The experts were asked to score statements regarding their relevance. To each of the following topics, various statements were presented, and these statements had to be scored for level of relevance:

1. Factors **at the level of the MDR-TB Patient** which are important to promote successful treatment outcomes
2. Factors **at the level of MDR-TB patient's family and community (society)** which are important to promote successful treatment outcomes
3. Factors **at the level of the national TB programme in general** which are important to promote successful treatment outcomes
4. Factors **at the level of the TB health worker (doctor or nurse)** which are important to promote successful treatment outcomes
5. Various possible **actions to improve treatment outcomes**

In addition, the experts were asked to indicate their level of agreement regarding various statements referring to the new TB drugs (Bedaquiline, Delamanid), the short regimen and regarding various statements referring to new diagnostic tools (e.g. LPA second-line, Xpert Ultra, Xpert Omni).

Findings from both rounds are presented in the Results section.

## 2.3 Field visits to five countries

### 2.3.1 Overview of methodological approaches used

Both qualitative and quantitative methodologies were used to collect data for the study, as detailed below.

Qualitative approaches were:

- Key informant interviews at national and oblast level
- Provider interviews at health facility level
- Interviews with NGO workers
- Focus Group Discussions (FGDs) with DR-TB patients
- Interviews with DR-TB patients.

Quantitative approaches were:

- Treatment outcome of oblasts as collected at the oblasts
- Data verification: reported figures compared with a re-count done in the DR-TB registers of the visited health facilities
- An analysis of charts of DR-TB patients, cohort 2013 to describe the DR-TB patients and establish determinants of treatment outcome.

### 2.3.2 Study areas and sites

Table 2 presents the number of and names of the regions that were visited per country.

**Table 2. The number of regions that were visited in the five countries**

Country	Number and names of visited regions	
Ukraine	8	Kiev City, Kievskaya, Chernihivskaya, Chernivitskaya, Rivenenskaya, Dniprovskaya, Zaporijskaya and Kharkivskaya
Romania	6	Bucharest, Arges County, Dolj county, Olt County, Ilfov County, Iasi County
Belarus	3	Minsk City, Minsk Oblast, Grodno Oblast
Tajikistan	2	Hatlon Oblast, Sughd Oblast
Azerbaijan	2	City of Baku, Absheron Region

In each country, half of the visited regions were regions with the highest treatment success rate of the 2013 cohort and the other half were the regions with the lowest treatment success rate of the 2013 cohort. In Ukraine and Azerbaijan, this selection principle could not be fully adhered to due to security concerns (and in Azerbaijan also due to very small volume of DR-TB patients in some regions).

In each selected region, one peripheral (i.e. not at the level of the region) health facility was selected for observation and interviews with the health facility staff and community members (mostly NGO workers) if available. The main criterion for selecting these health facilities was the existence of community involvement. Apart from this, the volume of DR-TB patients was also considered where feasible.

From each country, ethical clearance was requested and a letter confirming the ethical clearance was received.

### 2.3.3 Study population I: key informants at national and oblast level

The study team carried out **Key Informant Interviews** with the main stakeholders at national and oblast level. Table 3 presents the type of key informants eligible for being interviewed; in each country, approximately 7 of these potential interviewees were interviewed.

**Table 3. People eligible to be interviewed at national and oblast level**

Where	Who
National level	TB in prison manager
National level	WHO Country TB officer if applicable
National level	Global Fund PR TB officer
National level	Chief National TB reference laboratory
National and oblast level	TB programme manager, including person in charge of pharmacovigilance
National and oblast level	Person in charge of TB of a major partner
National and oblast level	Medical supply manager
National and oblast level	Director health services
National and oblast level	HIV/AIDS programme manager
National and oblast level	Opioid substitution therapy programme manager
National and oblast level	Community care officer
National and oblast level	NGO representative
Oblast level	Physician treating DR-TB patients
Oblast level	Other healthcare staff treating DR-TB patients

### 2.3.4 Study population II: care providers at health facility level

Healthcare providers in charge of DR-TB patients and in some places the head of the health facility were interviewed, using semi-structured interviews that had undergone a peer review. NGO workers, when present, were also interviewed.

In addition, a tool guiding observations at the health facility was filled in; this tool also included a few questions to be posed to the relevant health facility staff.

### 2.3.5 Study population III: people affected by the disease

With the exception of Azerbaijan, at least one FGD with DR-TB patients currently still on treatment was performed. In Romania, the patient FGD was with DR-TB patients who had already completed treatment. While the FGD was on-going, notes were taken to capture the statements of the participant. It was decided not to voice-record the conversations because note taking was found to be sufficient. For the note taking the FGD question guide was used.

In all five countries, at least one DR-TB patient, some of them still on treatment, some already with successful treatment outcome, was interviewed. The responses of the patient were written down during the interview. In Belarus, this DR-TB patient who was interviewed was HIV-positive. In Romania, two were HIV-positive and in Azerbaijan one patient. Furthermore, in Romania, one of the interviewed patients was a migrant. Interviewing a prisoner was not feasible nor was identifying and interviewing DR-TB patients who had the treatment outcome “lost to follow-up”. Similarly, interviews with family members of DR-TB patients were not done. Table 4 presents the number of FGDs and patient interviews conducted per country.

**Table 4. Number of FGDs and patient interviews, respectively, performed in each country**

Activity	Ukraine	Romania	Belarus	Tajikistan	Azerbaijan
FGD	4	1	2	1	0
Patient interview	4	7	1	3	5

Note: The patient in Belarus was HIV-positive. Among the 7 patients in Romania, one was a migrant from Moldova and two were HIV+. In Azerbaijan, one of the five was HIV-positive (not disclosed, however, i.e. the research team was not informed which of the 5 was HIV-positive as the patient did not opt to reveal it).

### 2.3.6 Quantitative approaches

#### Treatment outcome of various health facilities

At each visited oblast, three health facility reports were reviewed to establish the treatment outcome of the 2013 cohort [treatment success, died, treatment failure, loss to follow-up, other treatment outcome (mostly transfer out)].

#### Data verification

In some of the visited health facilities (i.e. in two or three per visited country), the DR-TB register was examined to re-count the number of DR-TB cases of the cohort of 2013 and assess the treatment success rate. This was then compared with the treatment outcome (treatment success rate) of the 2013 cohort as reported. Mostly, these reports were seen at the oblast level. The purpose of this activity was to establish the accuracy of the reported treatment success rates.

#### Analysis of charts of DR-TB patients

At all the visited health facilities, a review of the DR-TB patient charts to describe the DR-TB patients and to have a database for establishing potential determinants of treatment outcome was

done. The DR-TB patients of the 2013 cohort were analysed. Healthcare workers were asked to allow the research team access to the patient charts or, if preferred by them, to bring us the patient charts of the 2013 cohort. In the latter case, the research team emphasised the need to not select certain patient charts but to bring either all patient charts (and the research team then randomly selected charts for data entering) or to randomly select between ten and fifteen patient charts. In two health facilities, there was some evidence that the patient chart selection was not done randomly: the patient charts reviewed from these two facilities all had “cure” as treatment outcome (seven from one health facility in Ukraine and eleven from one health facility in Tajikistan). Consequently, the treatment success rate as presented in chapter 3.4.7 is relatively high.

Efforts were exerted to extract data from at least ten patient charts.

Data extracted were various patient-related items (e.g. age, sex, body mass index), diagnostic results, disease-related items (e.g. disease location, co-morbidities), treatment related items (e.g. number of previous TB treatment episodes, mode of directly observed therapy), and treatment outcome. In Romania, an additional variable was extracted: whether or not the patient was under Global Fund-treatment (versus treatment under the NTP without support from the Global Fund)

Descriptive analysis was done using frequency distributions. Furthermore, a bi-variate analysis and a multivariate logistic regression analysis to determine if there were risk factors for unfavourable treatment outcome (or inversely expressed determinants of successful treatment outcome) were applied.

## 3 Findings

### 3.1 Findings from the desk review of reports on TB and DR-TB control

#### 3.1.1 Overview and vulnerable populations

In the desk review, 81 reports from 17 countries (including some reports from multi-country studies) were reviewed. These reports were written in the time span 2010 to 2017 (from 2017, there was only one report, an rGLC report). Most reports were rGLC reports (n = 42), followed by reports from partner organisations (n = 13), National Programme Review reports (n = 9), WHO country reports (n = 7) and one report from ECDC (European Centre for Disease Prevention and Control). Furthermore, there were another 9 reports of various origins. Approximately one fourth of the reports were from the time span 2010 to 2013; the remaining reports were from the years 2014 to 2017 (and a few reports had no date). Annex 1 provides an overview of the reviewed reports in terms of kind of report and year per country.

The following marginalised patient sub-populations were mentioned:

- Prisoners in 66 reports
- People living with HIV/AIDS in 63 reports
- Migrants in 35 reports
- Users of illicit drugs in 33 reports
- Homeless people, mentioned in 25 reports
- Other sub-populations that were mentioned more often than three times were: alcoholics, nine times; Roma, seven times; mentally ill people, four times; and refugees, also four times.

This indicates that while a focus on prisoners and people living with HIV/AIDS is common, other sub-populations are less strongly (migrants, users of illicit drugs and homeless people) or barely in focus. Table 5 presents the number of reports that mention the various sub-populations (by country). Annex 2 presents the various sub-populations per country per year, differentiating rGLC reports from other reports. The findings presented in Annex 2 indicate that in the years 2010 to 2011, mention of sub-populations was rare. No clear differences between rGLC and non-rGLC reports can be seen.

**Table 5. Number of reports that mention the various sub-populations, by country**

	Number of reports reviewed	Number of reports in which each sub-group is mentioned				
Country		<i>Migrant</i>	<i>Prisoner</i>	<i>Person living with HIV</i>	<i>Drug user</i>	<i>Others</i>
Albania	5	2	2	3	2	3
Armenia	4	3	3	3	3	0
Azerbaijan	4	1	4	3	0	0
Belarus	13	3	7	6	3	5
Bosnia & H.	1	1	1	1	0	0
Bulgaria	3	3	3	2	1	3
Georgia	8	2	8	8	6	7
Kazakhstan	2	2	2	2	0	1
Kosovo	3	0	3	3	0	0
Kyrgyzstan	4	3	4	3	3	2
Macedonia	1	0	1	1	1	1
Moldova	3	1	3	3	1	1
Romania	6	2	4	5	1	4
Serbia	3	3	3	3	2	3
Tajikistan	4	0	3	2	0	1
Ukraine	11	6	11	11	9	6
Uzbekistan	4	2	4	4	1	2
Several	3	1	0	0	0	1

Notes: 1) In addition, in two reports (one from Bulgaria and one from Romania), there was a vague mention of “Person living with HIV” and in one report (from Uzbekistan), a vague mention of “Drug user”.

2) When this study was started, there was no indication from a preliminary document review that the group ‘homeless’ could be very prominent; therefore, the group ‘homeless’ was part of the sub-population “Others”. However, the field visits to the five countries and the desk review made clear that ‘the homeless’ are an important sub-population (mentioned in 25 reports). Interestingly, the field visits also pointed at the importance of the group ‘alcoholics’. Alcoholics, were, however, mentioned in only 9 of the 81 reports that were reviewed.

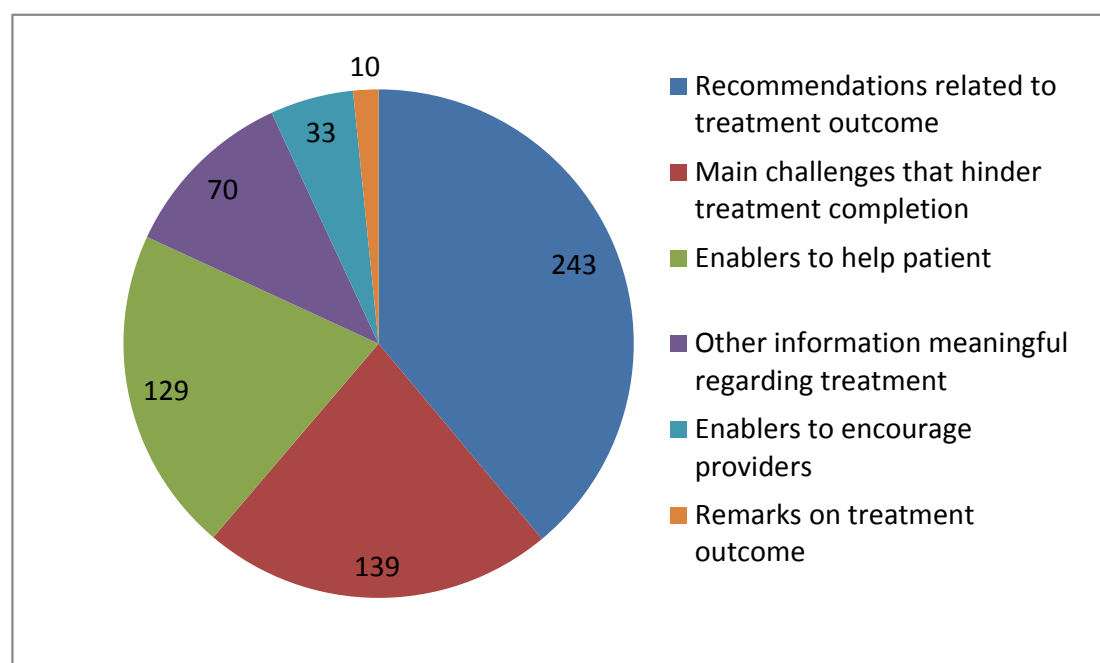
### 3.1.2 The various overarching topics

We identified 6 overarching topics (listed in descending order):

1. Recommendations related to treatment outcome
2. Main challenges that hinder treatment completion
3. Enablers to help patient
4. Other information meaningful regarding the topic of treatment and treatment outcome (including factors that further treatment completion)
5. Enablers to encourage providers
6. Remarks on treatment outcome

Figure 3 presents the frequency distribution of these main categories. Almost one third of the statements (243/785; 31%) were recommendations. Also common were statements identifying main challenges (18%) and statements referring to patient enhancers (16%). The figure indicates that large numbers of recommendations are commonly issued and that identification of challenges is also common. The findings indicate that patient enhancers are used and/or discussed though to a lesser degree. Provider enhancers are uncommon. Healthcare workers play a crucial role in the treatment of DR-TB, a treatment that is very challenging for the patients and, therefore, also poses as a challenge for the provider. Provider enhancers may be an important link that is often missing.

**Figure 3. Categorisation of statements: the six overarching topics**



### 3.1.3 Main challenges of the DR-TB programme hindering treatment completion

All in all, 139 challenges were mentioned in the analysed reports. Many of these challenges are contained in the recommendations written by the consultants. The recommendations were categorised into various topics. Table 6 presents the categories of challenges identified more than three times in the 81 reviewed reports. The main topics were management issues in general and programme management as well as financial/management challenges. Social support for patients was also very prominent. This indicates that technical and financial assistance to address management questions, including programme management issues, and to enhance patient support is warranted. The problem of side effects is also quite prominent. The challenge of side effects was

commonly mentioned during the field visits, e.g. during interactions with patients; see chapter 3.3.3 (e.g. Table 15 and Annex 3).

**Table 6. Common identified challenges to DR-TB care**

Category of challenges (identified in at least 4 reports)	N =
Management, other	19
Social support for patient in general	18
Programme management	17
Financial and/or management challenge	15
Other challenges	13
Side effects of medicines	11
Financial challenge/issue	8
Ancillary drugs (e.g. limited access)	7
Community-based DOT/care	6
Training	5
Strained patient-provider relationship	4
Money for transportation	4

Note: “Financial and/or management challenge” refers to challenges where money *and* management issues are the challenge while in “financial challenge/issue”, the focus is primarily on lack of money.

Examples of type of challenges (mentioned at least 7 times) are listed in Table 7. One of the presented examples regarding ‘Other challenges’ is stigma; however, in the desk review, only two references related directly to stigma were identified.

**Table 7. Examples of the various categories of challenges.**

Main topic of identified challenge	Examples
Management issues, other than typical programme management (n = 19)	Treatment interruption is often a result of adverse drug reactions and lack of communication between patients and carers.
	Equity is aimed to be for all patients. However, in practice, there is inequity in access to health care, with differences among various socioeconomic groups and between urban and rural areas
Social support for patient (in general) (n = 18)	There is no social support for the most vulnerable and poor TB patients to endure the long DR-TB treatment
	Limited prevention of loss of income and unexpected household expenditure that can plunge patients into poverty, especially socially vulnerable patients at higher risk of DR-TB
Programme management (n = 17)	Not all DR-TB patients receive treatment, there are short waiting lists in the regions
	Calculation and ordering of drugs should be changed according international recommendations.
Financial and/or management challenge (n = 15)	Consider prevention and control of TB and M/XDR-TB as a public health priority
	Ensure adequate financing and uninterrupted supply of drug procurement for FLD and SLD at all treatment sites
Side effects of the medicines (n = 11)	The main reason for treatment lost to follow up is related to medication side effects and the treatment regimen
	Limited access to diagnostics (including audiometry) for the side effects

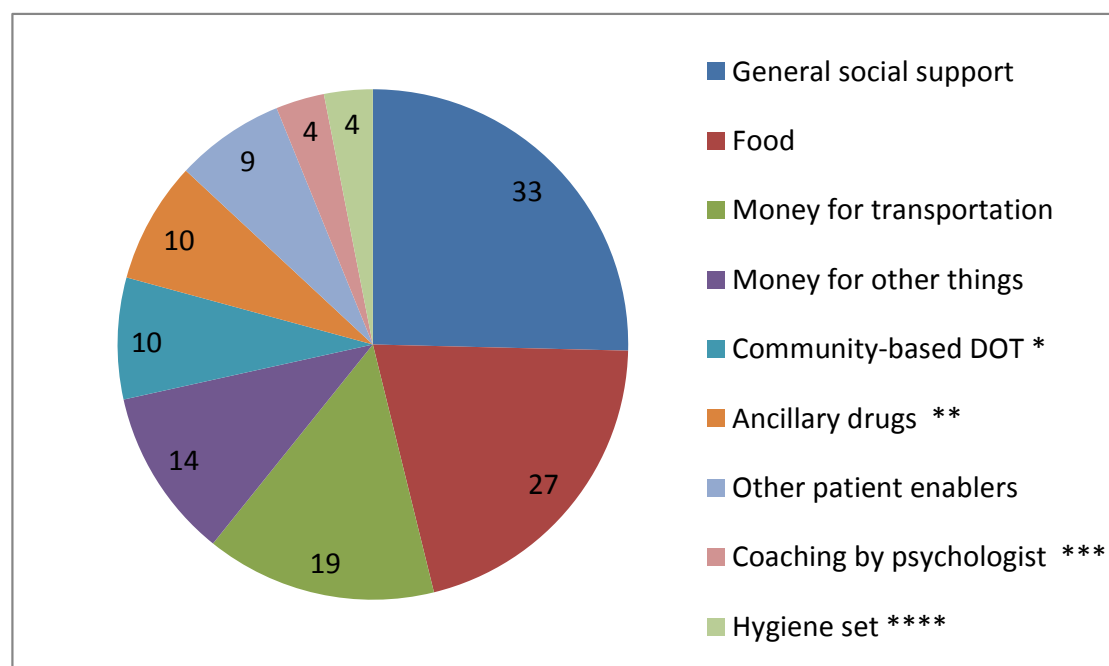
Main topic of identified challenge	Examples
Other challenges (n = 9)	It is minus 27 degrees Celsius outside, a lot of snow, and it is not possible for every patient to go out of the house to go and take the pills from the dispensary
	Migrant MDR-TB patients, e.g. students and workers from EU or non-EU countries, frequently return to their home country during the lengthy MDR-TB treatment.
	Patients go to several TB units for diagnosis and give a different name in each one –partly due to stigma surrounding TB and partly because they do not trust the result of the first lab they attended
Financial challenge / issue (n = 8)	There are several other funding gaps, which need to be addressed, such as social support to the TB and M/XDR-TB patients. The current support is for Global Fund supported programmes and not for other DR-TB patients
	The inability of patients on treatment to look for a job can result in loss to follow-up.
Ancillary drugs (n = 7)	Side-effects of SLD drugs are rarely and episodically recorded with no notes on management strategy. This may cause inappropriate management of side-effects as well as difficulties in forecasting budget for ancillary drugs
	Access to auxiliary drugs is very limited in all treatment facilities

FLD: First-line drugs; SLD: second-line drugs

### 3.1.4 Patient enhancers for supporting treatment

In total, there were 142 statements related to patient enhancers. Some of them were from description of the DR-TB care programme, others were part of an identified challenge or of recommendations. There were nine categories of patient enablers identified more than three times in the documents, presented in Figure 4.

**Figure 4. Common identified categories of patient enhancers**



\* In seven countries (Armenia, Belarus, Bosnia & H, Georgia, Kazakhstan, Tajikistan, Ukraine)

\*\* In nine countries (Belarus, Bosnia & H, Bulgaria, Kazakhstan, Kyrgyzstan, Macedonia, Serbia, Tajikistan, Uzbekistan)

\*\*\* In four countries (Armenia, Azerbaijan, Georgia, Ukraine)

\*\*\*\* In four countries (Armenia, Belarus, Kyrgyzstan, Serbia)



Social support included a wide range of material support (e.g. financial allowance, payment of gas and electricity bills, disability pension) and “psycho-social” support such as home visits for education and moral support and Video-Observed Therapy (we categorised this as “social support”).

As illustration, five examples of social support are presented here:

- From Uzbekistan (report of 2014): “The treatment adherence support (food parcels) are provided under Global Fund support. The patients whose body mass index (BMI) is under 19 receive additional food tailored to the needs of the patient”
- From Azerbaijan (report of 2014) “The involvement of CSOs in treatment follow-up project for ex-prisoners by providing social and psycho-social support has allowed the country to achieve very good management and cure rates”
- From Ukraine (report of 2016): “NTP civilian centre to develop ambulatory treatment plans to offer treatment close to the patient’s living place, using patient-centred care to improve adherence to treatment”
- From Armenia (report of 2011): “There is a polyvalent counselling team – psychologist, social worker, nurse”.
- From Armenia (report of 2011): “MSF-France is implementing the “Sputnik Initiative” as an option to increase adherence to treatment for those DR-TB patients abandoning treatment due to behavioural and social challenges. The Sputnik (“Fellow Traveller”) Initiative, first developed and implemented in Tomsk, Russian Federation, was very effective for a limited number of patients suffering from severe alcoholism who had socio-behavioural constraints affecting their treatment. A team of two nurses, a social worker and a driver deliver intensive home-based care to patients close to abandoning their treatment. At the time of the mission, there were seven patients on the Sputnik Initiative in Armenia (none of them suffering from alcoholism or drug addiction).”

These examples indicate that some patient enhancers are not costly but others are, for instance the “Sputnik approach” and involving an NGO for recently released prisoners for continuation of DR-TB treatment in the civilian health sector (see chapter 3.3.2, Azerbaijan).

A comparative analysis was done, comparing the years 2010 to 2013 with the years 2014 to 2016. In general, occurrence of patient enhancers in the documents was more common in the years 2014 to 2017. For instance, during the years 2010 to 2013, the documents about Kazakhstan, about Macedonia and about Uzbekistan did not refer to patient enablers but during the years 2014 to 2016, five different patient enablers could be identified for each of these three countries. Similarly, the documents about Kyrgyzstan did not mention patient enablers during the years 2010 to 2013 but mentioned six different patient enablers during the years 2014 to 2016. Table 8 provides the findings. The overall picture of the table clearly indicates that over the past years, more countries have implemented patient enablers.

**Table 8. Encountered patient enhancers per country during 2010 to 2013 and 2014 to 2016**

Country	2010 to 2013	2014 to 2016 *
Albania		Social support for patient (in general)
		Money for things other than transportation
Armenia	Money for transportation	Food
	Food	Hygiene package
	Regular coaching by psychologist	Covering the electricity and gas bill
	Social support for patient (in general) (twice)	Community-based DOT / care
	Community-based DOT / care	
Azerbaijan		Social support for patient (in general) (in two reports)
		Regular coaching by psychologist
Belarus	Social support for patient (in general) (twice)	Social support for patient (in general) (5 times)
	Money for transportation	Money for transportation (5 times)
	Money for things other than transportation	Formal meetings with peers (twice)
	Food	Food (3 times)
		Community-based DOT / care
		Ancillary drugs (for free in hospitals only)
Bosnia & H.	Community-based DOT / care	
	Ancillary drugs	
Bulgaria		Ancillary drugs (twice)
		Food (twice)
Georgia	Food	Money for things other than transportation (4 times)
	Money for things other than transportation	Money for transportation (3 times)
		Community-based DOT / care
		Regular coaching by psychologist
		Regular coaching by social worker or similar staff
Kazakhstan		Money for transportation (twice)
		Food (twice)
		Ancillary drugs
		Social support for patient (in general)
		Community-based DOT / care
Kosovo		
Kyrgyzstan		Food (twice)
		Ancillary drugs (twice)
		Money for transportation
		Social support for patient (in general)
		Hygiene set or similar
		Money for other things

Country	2010 to 2013	2014 to 2016 *
Macedonia		Food
		Ancillary drugs
		Money for transportation
		Social support for patient (in general)
		Hygiene set or similar
Moldova		Food (twice)
		Money for transportation
		Money for things other than transportation (twice)
		Social support for patient (in general)
Romania		Formal meetings with peers
Serbia	Social support for patient (in general) (twice)	Money for transportation
	Food	Food
	Hygiene set or similar	Hygiene set or similar
	Money for transportation	
	Ancillary drugs	
Tajikistan	Food (4 times)	Social support for patient (in general) (twice)
	Community-based DOT / care	Food
	Ancillary drugs	Money for things other than transportation (twice)
	Social support for patient (in general)	
Ukraine	Social support for patient (in general)	Food (twice)
	Community-based DOT / care	Money for transportation
	Regular coaching by social worker or similar staff	Regular coaching by psychologist
		Other patient enabler
Uzbekistan		Food (3 times)
		Money for things other than transportation (twice)
		Social support for patient (in general) (3 times)
		Money for transportation (twice)
		Ancillary drugs
Several countries		Food
		Other patient enabler
		Money for things other than transportation (twice)
		Money for transportation (twice)

\* From one country (Belarus), we have a report from a mission that took place in 2017.

Note: empty means there was nothing mentioned in the report(s) about patient enhancers for the given time span.

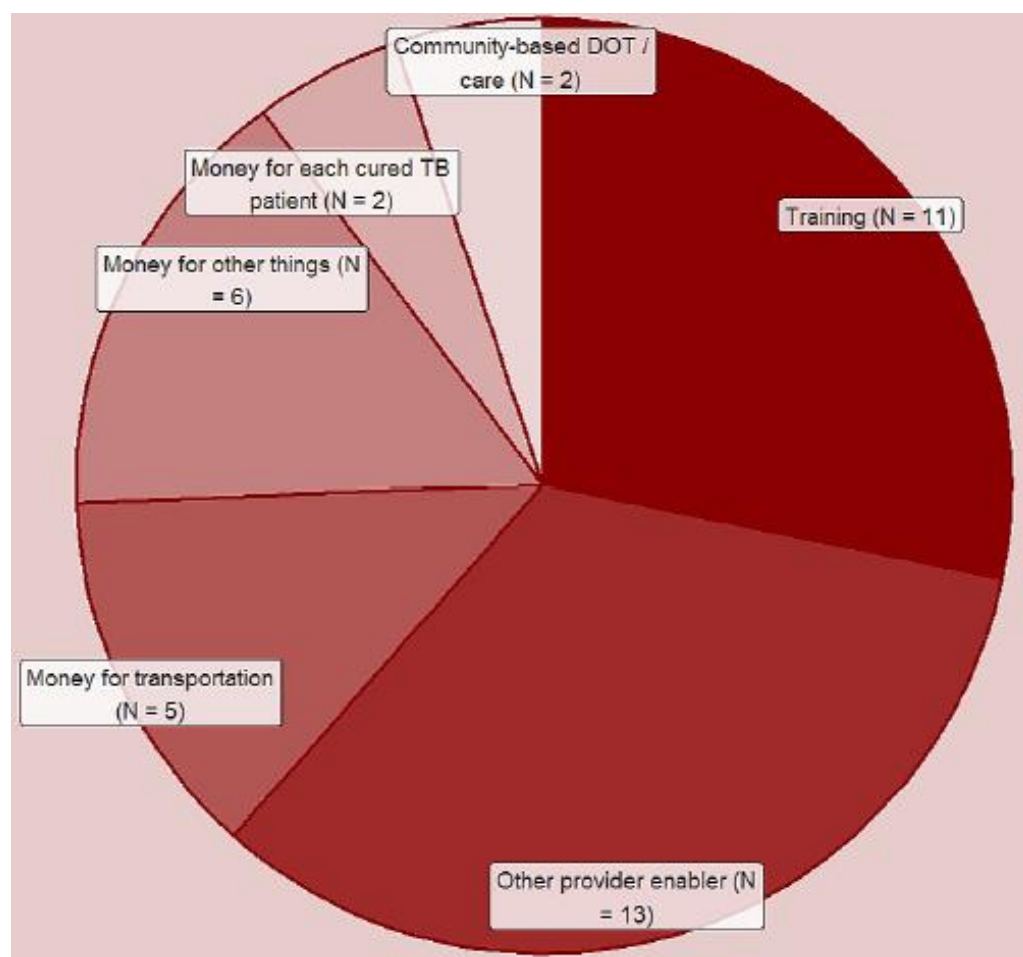
### 3.1.5 Provider enhancers for supporting treatment

In total, there were 42 identified statements related to provider enhancers (provider enablers). Some of them were from description of the DR-TB care programme, others were part of an identified challenge or of recommendations. There were six categories of provided enhancers identified more than once in the documents, presented in Figure 5. Common provider enhancers were training and a variety of different enhancers that are hard to be categorised (“Other provider enhancers”). An example of the latter is: “Consider motivation for PHC and other personnel involved in TB related activities during health insurance policy/state budget planning in the future” (Kosovo, 2015).

An example of a general financial incentive (“Money for other things”) is: “Oblast TB coordinators started to be paid based on the performance of programme indicators for management of DR-TB (performance-based model of incentive payments)” (Kyrgyzstan, 2014)

A typical example for training is: “A two-day training course was carried out on the use of new drugs, further training on the use of new drugs is needed for TB doctors countrywide” (Moldova, 2016).

**Figure 5. Common identified categories of provider enhancers**



A comparative analysis was done, comparing the years 2010 to 2013 with the years 2014 to 2016. In Ukraine, Azerbaijan, Albania and Tajikistan, there was no mention of provider enhancers in the reviewed documents. In general, occurrence of provider enhancers in the documents was more common in the years 2014 to 2016, similar to what was found regarding patient enablers (see Table 8). Table 9 provides the findings.

**Table 9. Encountered provider enhancers per country during 2010 to 2013 and 2014 to 2016**

Country	2010 to 2013	2014 to 2016 *
Albania		
Armenia		Other provider enabler Training
Azerbaijan		
Belarus	Money for other things Financial incentive Other provider enabler	Training (in 2 reports; twice in one of them) Financial incentive (in 2 reports) Other provider enabler Vehicle for community-based DOT / care
Bosnia & H.	Money for transportation Training	
Bulgaria		Training Financial incentive (in 2 reports; twice in both reports)
Georgia		Training Money for transportation Money for other things
Kazakhstan		
Kosovo		Non-specific incentive (in 2 reports)
Kyrgyzstan		Training Hygiene set or similar Performance-based incentive
Macedonia		Money for transportation
Moldova		Training Financial incentive
Romania		Money for each cured TB patient
Serbia	Money for transportation Training Formal meetings with peers	Money for transportation Training
Tajikistan		
Ukraine	None	None
Uzbekistan		Money for each cured TB patient Vehicles for community-based DOT / care

\* From one country (Belarus), we have a report from a mission that took place in 2017.

Note: empty means there was nothing mentioned in the report(s) about provider enhancers for the given time span.

### 3.1.6 Recommendations related to treatment completion

Of the 243 recommendations, 57 (23.5%) dealt with issues that can be categorised as ‘programme management’. Examples are: (i) “support the update and endorse the updated National Guidelines on DR-TB care”; (ii) “implement palliative TB care, including in the penitentiary system”; and (iii) “to support establishment stepwise infection control measures in Kiev City MDR-TB treatment facilities starting with administrative measures (patient separation, isolation)”. Also common were recommendations related to the design or composition of the regimen (e.g. “using bedaquiline and delamanid at the same time should be considered for XDR” and “urgently place an accelerated procurement order for Capreomycin”) and issues related to clinical management (e.g. “Consider establishing a DR TB hotline for doctors at the TB centres for support” and “Ensure provision of co-trimoxazole to HIV-infected TB and DR-TB patients”). Table 10 shows the frequency distribution of the various categories (foci) of recommendations.

**Table 10. Foci of the most common recommendations related to treatment completion**

Focus of recommendation	Number of recommendations with this focus
Programme management	57
Design/composition of regimen	30
Clinical management	26
Social support for patient (in general)	20
Various other, specific support for patients, e.g. food or psychological support	18
Management other than typical programme issues	18
Training	17
Ancillary drugs	14
Financial and/or management challenge	13
Community-based DOT / care	12

Foci of other recommendations identified less often were e.g. side effects and provider enablers. As can be seen in the table, apart from the question of the composition of the regimen, most recommendations refer to management issues, indicating a need for capacity building in terms of management, be it management of a programme or clinical management. Recommendations on training and ancillary drugs were also quite common.

A comparative analysis was done regarding the topics of the recommendations, comparing the years 2010 to 2013 with the years 2014 to 2016. For Albania and Kazakhstan, there were no documents with any mention of a recommendation related to treatment completion. While for the period 2010 to 2013, there were only three countries for which there were recommendations related to treatment completion, this number increased to twelve countries for the years 2014 to 2016. Table 11 provides the findings.

**Table 11. Topics of recommendations per country during 2010 to 2013 and 2014 to 2016**

Country	2010 to 2013	2014 to 2016 *
Albania		
Armenia		Other provider enabler
		Training
Azerbaijan		
Belarus	Other provider enabler (twice)	Training (3 times)
	Money for other things	Other provider enabler (twice)
		Community-based DOT / care
		Money for other things
Bosnia & H.	Money for transportation	
	Training	
Bulgaria		Money for other things (twice)
		Other provider enabler (twice)
		Training
Georgia		Money for transportation
		Money for other things
		Training
		Financial challenge / issue

Country	2010 to 2013	2014 to 2016 *
Kazakhstan		
Kosovo		Other provider enabler (3 times)
Kyrgyzstan		Training
		Hygiene set or similar
		Money for other things
Macedonia		Money for transportation
Moldova		Other provider enabler
		Training
Romania		Money for each cured TB patient
Serbia	Money for transportation	Money for transportation
	Formal meetings with peers	Training
	Training	
Ukraine		Other provider enabler
Uzbekistan		Money for each cured TB patient
		Community-based DOT / care
Several countries		Other provider enabler

\* From one country (Belarus), we have a report from a mission that took place in 2017.

## 3.2 Findings from the Delphi survey

### 3.2.1 Sub-populations, marginalised groups

The experts were asked in round one to mention sub-populations/marginalised groups that receive sufficient attention and those that receive insufficient attention in the general discourse on DR-TB (such as at conferences, expert meetings). There were various views about this, though most indicated that most sub-populations do not receive sufficient attention. One expert stated that migrant have recently received a lot of attention, and prisoners some attention. Another expert stated that apart from the average MDR-TB patient, aged approximately 15 to 44 years old who faces no other issues, none receive sufficient attention. Another expert said that only smear-positive pulmonary TB patients receive sufficient attention. Another expert stated the patients with an interest in their disease and a willingness to undergo treatment receive attention.

Consequently, the following groups were seen as receiving insufficient attention:

Expert A: Children, migrants, prisoners

Expert B: All groups except migrants and prisoners. He mentioned as neglected the “normal urban poor”, the homeless.

Expert C: Patients without an interest in their disease and willing to undergo treatment

Expert D: All patients that are not smear-positive pulmonary TB cases, especially children.

(Expert E had no replies to these questions).

### 3.2.2 Factors at the level of the MDR-TB patient and at the level of the patient's family and community promoting successful treatment

At the level of *individual DR-TB patients*, experts agreed that the two most important factors influencing favourable treatment outcomes are:

- Patients receiving rapid diagnosis allowing early beginning of adequate treatment
- Patients receiving adequate social, financial and nutritional support.

Experts also agreed that it is crucial that patients receive comprehensive information and education about disease, drugs, and treatment regimens and that they are being properly monitored by the health staff.

At the level of DR-TB patient's *family and community*, there was a consensus among experts that the most significant factor influencing treatment outcomes is that the economic situation of their family is not worsened by patient's illness or treatment.

Other important factors that ranked high included:

- Family and community providing welcoming, stable and strong support and care to patient
- Family and community treating the patient with respect and being empathetic
- Family and community receiving comprehensive information about the disease and the treatment.

### 3.2.3 Factors at the level of the national TB programme in general and at the level of the TB health worker promoting successful treatment

There was a consensus among the experts that it is critical that *the national TB programme* "provides all medications, including medications for treatment of side effects, free of charge to DR-TB patients."

The experts' assessment also highly valued that the national TB programme "manages well its data flow, including data collection and evaluation system, and is able to quickly change its intervention package based on the analysis of epidemiological indicators" and that the national TB programme "is able to ensure continuous and sufficient supply of drugs and other consumables". Slightly less highly valued were that the national TB programme is "flexible enough to allow individualised model of care and support, listening to the concerns of the patients, and allowing physicians to listen to and respond to the concerns of patients" and that the national TB programme manages well the decentralization of detection and treatment.

At the level of the *TB health worker (doctor or nurse)*, the experts' consensus highlighted the importance of health workers "understanding individual patients' needs, including work or education needs, and to consider those when providing care".

Other factors of note were that the health worker treats patients with respect and empathy, and that the health worker has "received proper training and possesses adequate knowledge about the medications and side effects (including therapeutic options)."

### 3.2.4 Other factors that promote successful treatment

Experts were asked to give their opinion on what would be additional relevant actions to improve treatment outcomes, and there was a general agreement that the most needed interventions are the provision of a potent regimen that can quickly render persons less infectious and lead to cure as well as the availability of dedicated and competent personnel in the TB health system.



The following was also seen as important, though to a lesser degree:

- When the short regimen is implemented and if there is a high proportion of MDR-TB with fluoroquinolone and/or 2<sup>nd</sup>-line injectable resistance, then assure effective rapid DST for these drugs and propose alternative standard regimens.
- Further implementation of active case finding and early detection, including comprehensive household assessments.
- Increase technical capacity of NTP managers and health workers on MDR-TB.

Table 12 summarises first and second-level ranking factors in the experts' consensus.

**Table 12. Factors seen as being of top importance to promote successful treatment outcome**

Level of influential factors	First ranking factors	Second ranking factors
Individual DR-TB patient	<ul style="list-style-type: none"> <li>• Patients receive rapid diagnosis allowing early beginning of adequate treatment</li> <li>• Patients receive adequate social, financial and nutritional support</li> </ul>	<ul style="list-style-type: none"> <li>• Patients receive comprehensive information and education about disease, drugs, and treatment regimens</li> <li>• Patients are properly monitored by the health staff</li> </ul>
DR-TB patient's family and community	<ul style="list-style-type: none"> <li>• The economic situation of their family is not worsened by patient's illness or treatment.</li> </ul>	<ul style="list-style-type: none"> <li>• Family and community providing welcoming, stable and strong support and care to patient</li> <li>• Family and community treating the patient with respect and being empathetic</li> <li>• Family and community receiving comprehensive information about the disease and the treatment.</li> </ul>
National TB programme	<ul style="list-style-type: none"> <li>• The national TB programme provides all medications, including medications for treatment of side effects, free of charge to DR-TB patients</li> </ul>	<ul style="list-style-type: none"> <li>• The national TB programme is able to ensure continuous and sufficient supply of drugs and other consumables</li> <li>• The national TB programme is flexible enough to allow individualised model of care and support, listening to the concerns of the patients, and allowing physicians to listen to and respond to the concerns of patients</li> </ul>
TB health worker (doctor or nurse)	<ul style="list-style-type: none"> <li>• The health worker understands individual patients' needs, including work or education needs, and to factors this in the provision of care</li> </ul>	<ul style="list-style-type: none"> <li>• The health worker treats patients with respect and empathy</li> <li>• The health worker has received proper training and possesses adequate knowledge about the medications and side effects (including therapeutic options).</li> </ul>
Additional relevant actions to improve treatment outcomes	<ul style="list-style-type: none"> <li>• Provision of a potent regimen that can quickly render persons less infectious and lead to cure, as well as the availability of dedicated and competent personnel in the TB health system</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of dedicated and competent personnel in the TB health system</li> </ul>

### 3.2.5 New diagnostic tools

Regarding the new diagnostic tools (e.g. LPA second-line, Xpert Ultra, Xpert Omni) currently being assessed, there was an experts' consensus on the following points:

- In many settings, there can be considerable delays from the time the sample is collected until result is reported and received by the treating clinicians (score of 9).
- There is a need for more investment in building lab networks and ensuring they are staffed and maintained (score of 8).
- Not many NTPs have the vision on how to extend the lab network, how to promote access and progressively to whom, taking into account national budget constraints (score of 8)
- In general, there is an underestimation of the following challenges: in many countries, a minor problem (e.g. fuel, electricity, technical problem, supply) can block the system (score of 7)
- There are financial constraints regarding the acquisition of these tools (score of 6).

There was however no expert consensus on the following points (i.e. for each of the following points, one expert did not agree: he or she was neutral):

- Is it problematic that people try to treat DR-TB without DST, i.e. the need for DST is underestimated? (score of 7 but one expert was neutral)
- Is there a burdensome challenge of having innumerable and partly conflicting or contradicting recommendations and suggestions of various consultants and funding agencies?
- Is there a need to digest and convert into constructive "pacification" the innumerable suggestions and recommendations of consultants and funding agencies?
- Do 2<sup>nd</sup>-line molecular DST need a platform that is easier to handle than LPA?

### 3.2.6 New TB drugs

Regarding the new TB drugs (Bedaquiline, Delamanid) and regimens currently being assessed, there was an experts' consensus on the following points:

- Adequate training of staff at all levels and provision of monitoring equipment is important (score of 9)
- There is a need to contextualize the possible risks of the new drugs with the current risks of the existing regimens (score of 9)
- Providers, program managers and policy makers need to stop restricting the use of new drugs/regimens (score of 8)
- The conservative TB community needs to learn how to embrace innovation and not just stick to tradition (score of 8)
- Providers and policy makers need to understand the evidence and recommendations so they stop thinking these drugs are "just for XDR" or that they are "dangerous" (score of 7)
- There is a need to digest and convert into constructive "pacification" the innumerable suggestions and recommendations of consultants and funding agencies (score of 7)
- There are in general real financial constraints in terms of acquisition of these drugs (score of 6).

There was however no expert consensus on the following points (i.e. for each of the following points, one expert either somewhat or strongly disagreed):

- Should older drugs should be used first before using the new ones, risking creating resistance to the new ones?
- Is there too much emphasis on “protecting drugs”?
- Is there justified fear about the consequences of expanding rapidly the use of these drugs in countries unable to manage them?
- Do patients need to be aware that these drugs exist and that there are options for their treatment and should they demand access to them?
- Are innumerable and partly contradicting recommendations and suggestions of various consultants and funding agencies a challenge?
- Is the fact that Bedaquiline is given to individuals not needing it necessarily, with incomplete resistant pattern evaluation, a challenge?

### 3.2.7 “Philosophy” and field experience shaping the opinions of the Delphi experts

While regarding many aspects of DR-TB care, the experts had similar views, it became clear that one expert (regarding some questions two experts) had opinions very much based on the notion that the patient and her or his situation is paramount. Thus, the statements “Patient is a member of the therapeutic team and participates in the choice of a model of care adapted to his/her needs” and “There is a need for more advocacy for MDR-TB and to increase the voice of TB patients and providers in public debate.” were seen as very relevant for this expert only. Similarly, this expert felt that concerns about the need to “protect” the new drugs from developing resistance were not warranted. This expert fully agreed with the statement “There is in general too much emphasis on ‘protecting drugs’” while the others only agreed partly and one expert strongly disagreed.

Regarding the introduction of the short regimen, there was only one expert who felt the following statement was highly relevant regarding improving the treatment outcome: “Seriously consider the adoption of the short regimen.” This was an expert with ample experience of use about the short regimen in Africa.

### 3.3 Qualitative findings from the field visits to the five countries

#### 3.3.1 An overview of the people interviewed in the five countries

Table 13 presents the activities performed in the five visited countries in terms of interviews.

Table 13. Number of various kinds of key informants interviewed in the five countries.

Where	Who	UKR	BLR	TJK	AZE	ROM
National level	Community coordinator			1		2
National level	NPT manager or NTP deputy manager			1	2	1
National level	Global Fund PR TB officer		1	1	1	2
National level	TB laboratory officer	1	1		1	
National level	TB/HIV officer	1	1			
National level	TB drugs manager	1		1		1
National level	NGO officer	2	1			3
National level	Methadone programme officer	1	1			
National level	Other	1	2	2	2	5 *
Regional level	Various TB programme staff (e.g. pharmacist)	14	3	4	3	6
Regional level	Clinical staff	12	1		2	5
Regional level	NGO representative	15	2			3
Regional level	Representative of HIV or TB/HIV programme	3				
Regional level	Representative of the methadone programme	2				1
Dispensary / HF	Various dispensary staff	9	2	5	6	7
Dispensary / HF	Other	3	3	4 NGO workers	2 NGO workers	3
Community		1	1	2	2	1

\* WHO TB officer, TB in prison manager, healthcare worker coordinator, Roma mediator, social worker.

#### 3.3.2 A description of the DR-TB programme in the five countries

The TB/DR-TB programmes in the four ex-USSR countries (Ukraine, Belarus, Tajikistan and Azerbaijan) are similar. Romania's DR-TB programme is different in some aspects.

In all five countries, the TB programme is vertical, though some integration into the PHC system is policy, with various degree of implementation. In all five countries, further involvement of PHC facilities is possible.

Also similar is that in general, the TB and DR-TB patients are hospitalised, at least during the initial phase of treatment when the patients are still smear- and/or culture-positive. In all five countries, the number of "TB hospital beds" has recently been reduced or is still being reduced to free some financial resources for other aspects of TB care. Still, financing per TB hospital bed prevails. Concurrently, ambulatory treatment is being promoted, in some of the five countries more than in others.

In Belarus and Romania, it was stated that there is a lack of clear legislation regarding TB care. Key informants in Romania indicated that at national, regional (county) and city level, laws and

regulations are not aligned, making coherent TB response challenging. Four challenges were mentioned in Romania: (i) TB patients without identification card cannot receive Health Card and, thus, not treatment; (ii) a law restricts applying DOT to family doctors and nurses, making alternative DOT impossible; (iii) laws on procurement and budgeting are counterproductive; (iv) in Romania, social benefits are provided in exchange for community work which is not feasible for TB patients. The research team was informed that a new law on TB care is currently being drafted.

In Belarus, Tajikistan and Azerbaijan, key informants stated that the budget has to be applied rigidly, thereby severely limiting flexible use of the available financial resources, i.e. use in response to occurring needs.

The principle of directly observed therapy (DOT), i.e. every drug intake is observed by a person while the patient swallows his or her medicines, is reportedly adhered to in the five countries, at least in general. In Romania, the “DOT principle” is not strictly adhered to: especially in TB dispensaries, DR-TB patients, at least some of them, are allowed to come to the TB dispensary only once or twice or three times a week, with intake of drugs being “self-administered” during the days of staying at home. Like in Romania, there is a law in Belarus that does not allow providing DOT through non-medical staff. In all five countries, NGO workers provide home-DOT (i.e. DOT at the home of the patient or in a few cases at the home of the NGO worker) in some places. This is seen as very helpful (in all five countries, a desire for “flexible DOT” was expressed) and the challenge is how to scale up this home-DOT.

In all countries, it was perceived that the stigma attached to tuberculosis is considerable. Thus, for some patients, it is problematic to every day go to their DOT site because it makes concealing their disease difficult. There were also reports of patients changing their DOT sites due to stigma. In Romania, the ethnic minority Roma is in general marginalised, and, therefore, Roma TB patients suffer from a “double stigma”.

In 16 health facilities (from the five countries), contact tracing was discussed; in 13 of them it was stated that this was always done (for TB and for DR-TB cases), either by the facility itself or by a staff from another facility, e.g. PHC centre. One health facility stated that this was commonly done but not always. In the two health facilities visited in Tajikistan, no contact tracing was done (doing the contact tracing would be the responsibility of the general PHC health service, not the TB system).

### **NGO involvement: the example of Ukraine**

In Ukraine there are a few NGOs that provide services to TB patients. The two biggest organizations that are active in all of the country are the *Red Cross of Ukraine* and the *All-Ukrainian Network of People living with HIV*. This TB/HIV NGO provides support for both TB/HIV patients and TB patients without HIV. In some of the eight oblasts visited by the research team, other local NGOs are involved, mostly HIV NGOs that were also doing activities for TB patients (“100% of Life” in Kharkiv, “Doroga jizni” in Dnipro). The patient organization “Ukraine against TB” has started active work in Kiev, participating in the development of TB control activities. “Ukraine against TB” works closely with the national TB programme, with a focus to promote ambulatory treatment

The Red Cross in Ukraine supports, using the Global Fund grant, DR-TB patients during treatment. The support includes enabling support, like payments for transportation, monetary payments that patients can use to cover some of their expenses. Food and hygiene sets and sometimes clothing are also given as incentive to come to treatment.

Another important help that NGOs provide is psycho-social consultation of the TB patients. Together with medical personnel it is determined that certain help is needed by the patient, a psychologist can

meet and conduct a consultation session or mediate a conflict with medical staff, or family or other patients. Social support by NGOs includes getting help with missing documents, or getting registration or application to state benefits (this is often facilitated by social workers). The mentioned kinds of support are financed mostly by the Global Fund, partially by local (oblast) funds and by other Red Cross funds.

Red Cross as well as other NGOs hire nurses as patient supporters. There is a law in Ukraine (as well as in most other countries in the region) that treatment of any kind can only be administered by a medical personnel (volunteers cannot provide DOT unless they are medical professionals). Therefore, Red Cross has to hire nurses to do the home-based DOT and patient support.

## **NGO involvement in the other four countries**

### Belarus

Red Cross Belarus provides psychosocial support to (DR-)TB patients; it organizes the consultation with the organization's psychologist if needed, and offers social adaptation assistance: help with getting documents and other necessary paperwork. Red Cross also helps with transportation to ensure the accessibility of treatment, especially for patients who reside far from the DOT site. Red Cross also provides small monetary incentives to patients as a reward to stay in treatment. All this work is done countrywide. Funds are provided by the Global Fund as well as Red Cross Societies from other countries. Their work touches much more facets of the treatment: e.g. it includes working with children with TB, psychological rehabilitation, social support packages, remote DOT through the use of video (Video Observed Treatment), even TB prophylaxis. Interviewed healthcare workers said that the involvement of the Red Cross has led to improved treatment outcomes. It was even said that among patients that are currently under the Red Cross care, no one has stopped treatment so far.

Another NGO, the Belarus NGO "Defeat TB together", is involved in the TB response in Belarus – but not directly in supporting treatment of TB patients. Its members are TB patients, doctors and nurses. The main focus for its work is advocacy towards the Ministry of Health to defend TB patients' interests. In the frame of the project TB-REP, a Global Fund grant that is a regional grant for the EECA region, "Defeat TB together" has recently become even more involved in TB care.

In addition, there are several NGOs involved in Belarus for the control of HIV/AIDS.

### Romania

The main role of NGOs in Romania in terms of TB care is to be a partner in an approach called *TB-specific Multi-Disciplinary Teams (MDTs)*. Chapter 3.3.3 describes this. The NGO involvement in TB treatment and care has led to a form of integrated support services for TB patients which is widely appreciated by patients and providers. NGO interventions are making up for the State inactivity in this field, and provide a much needed support to patients. However, the readability of Romanian NGO intervention in the TB field is difficult due to its multiple layers of interventions, multiple actors involved, and the partial geographical coverage of their actions which raises the question of equal access to care.

To a certain extent, NGO-led TB services developed parallel systems to public institutions: the NGO-supported social workers do not belong to the Ministry of Labour and Social Affairs and have no institutional linkage to the cadre of public social workers accountable to city halls. Collaboration between the two cadres of social workers takes place but seems to depend on personal initiatives.

Community-based support functions (social workers/psychologists; community health workers; peer supporters) each provide valuable services in their own areas but being funded and coordinated by

different NGOs as part of distinct projects, the collaboration and exchange of information between them is not automatic and seems to depend on personal relationships. They function as parallel systems.

### Tajikistan

There are several NGOs involved in TB and DR-TB care, ranging from screening contacts, TB infection control to monitoring of treatment. The research team was informed that there are 13 organizations, mostly in the field of HIV/AIDS. Two of these organisations (“EFEW” and “Red Tulip”) are active in the prison sector. Some of them provide psychosocial support to TB patients, provide payments to patients as an incentive to stay in treatment, help with transportation, help with getting documents and other necessary paperwork. However, this work is not yet countrywide. Financing for their operations is provided by the Global Fund as well as by local administrations.

### Azerbaijan

In Azerbaijan, there are several NGOs involved in health care, but just two are active in TB care. The first is an NGO called “Association of professional unit of Phtisiatrists and Pulmonologists” (APP). They offer support to the TB patients (mainly food support and psychosocial support). The second is called ‘Saglamliga Khidmat’. In order to solve the problem of TB treatment after discharge from prison, a grant was sought from the Global Fund. Thus, in March 2011, an NGO called ‘Saglamliga Khidmat’ (translated as Support to Health) launched the project for ex-prisoner TB patients. As a result of active involvement of ‘Saglamliga Khidmat’, the rate of lost to follow-up after release has been reduced to almost zero and the treatment success rate for new sputum smear-positive drug-susceptible TB patients has increased to 88%.

To summarise, NGOs are well represented and engaged in the TB response in Ukraine, Romania and Tajikistan; their role is more limited in Azerbaijan and especially in Belarus. Based on the findings gathered during the field visits and also based on document reviews, an assessment of the role of the NGOs in (DR-)TB care in the five visited country was made, see Annex 4.

### **Financing of the DR-TB care activities**

All five countries benefit from Global Fund support and support from other donors. The current Global Fund grants are soon coming to an end (e.g. UKR-C-AUA in the end of 2017, BLR-T-RSPCMT one year later and TJK-T-HOPE in March 2018). There are transition plans, and there is indication that further support from the Global Fund and (at least for Tajikistan, Ukraine and Romania) other donors is needed. From 2016 to 2017, the domestically funded proportion of the TB budget declined in Belarus and Tajikistan, increased slightly in Romania and increased markedly in Ukraine (no figures available for Azerbaijan).

### **Findings from the observations**

Observations were performed in 17 health facilities. Some of these health facilities were very small (one health facility, it was in Romania, had only 3 staff: one doctors and two nurses); others were very large (the largest three, two of them in Belarus and one in Ukraine, had more than 200 staff).

In 12 of the 17 health facilities, information was provided about the staff occupation rate, i.e. if all positions available are currently staffed. In three health facilities, all positions were occupied. In five health facilities, some positions were unoccupied (e.g. on one health facility, all 88 nurse positions were occupied but only 24 of 37 doctor positions; in a very small facility, the two doctor positions were occupied but only 3 of the 4 nurse positions). In two facilities (one in Ukraine and one in Tajikistan), there was a rather severe lack of staff: the facility in Kiev had staffed one of two doctor positions, four of eight nurse positions and three of six other staff positions. And the facility in

Tajikistan had staffed four of eight doctor positions, eleven of seventeen nurse positions; all seven positions for other staff were occupied. The research team was told that in most settings the challenge to fill these positions is mainly to find personnel willing to work in TB care. In some instances, limited resources of the health system are the prime challenge.

In all but five, smear microscopy was done. Table 14 presents the findings on available diagnostic tools.

**Table 14. Diagnostic tools in 17 health facilities of the five visited countries**

Diagnostic tool	Number of observed HFs that had this tool
Smear microscopy	12
X-ray machine	11
Xpert	6
LPA	3

All of the twelve facilities that had a laboratory (at least smear microscopy) stated that in terms of laboratory, there is no staffing problem. It was observed that in all twelve, the status of the equipment and the availability of the reagents were adequate.

In terms of infection control, the overall finding is that there were hardly any challenges: 16 of the 17 health facilities had standard precautions available in written form. The one dispensary without the standard precaution document stated that at the level of the hospital, this document would be available. And all facilities had water, soap, alcohol and gloves. Also, all the facilities had sharp boxes and removal was organised (e.g. regularly taken away to one central location for disposal).

In Romania, infection control can still be improved: TB departments do not always have the adequate measures of infection control implemented (isolation rooms, adequate circuits, separation of patients, ventilation, masks and respirators).

In one facility in Ukraine, it was noted that the UV light is switched on only *after* work because the type of UV lamp does not allow having it on while people are present. The research team did not systematically ask this question regarding presence of UV light and the quality of the UV lamp and can, therefore, not make a statement if this challenge of using potentially harmful UV lamps is common in Ukraine.

The drug management system was based on the pull-system (order-based) in all health facilities. The FIFO/FEFO rule (first in first out / first expired first out) was applied in eight health facilities (and in an additional three, this did not become clear).



### 3.3.3 Elements that hamper and elements that promote completion of treatment

Patients and providers were asked what hinders and what promotes successful completion of treatment. Table 15 presents factors believed to hamper successful treatment outcome.

**Table 15. Factors perceived to hinder or hamper successful treatment outcome**

Factor	Mentioned in all 5 countries	Mentioned in 4 countries	Mentioned in 1 to 3 countries	Remarks
Side effects	X			
The long duration of treatment	X			
Strained patient-provider relationship *	X			
Patients' lack of comprehensive information about TB and its treatment at treatment start	X			In TJK, providers suggested a "TB info booklet"
Stigma attached to TB	X			
Patients' need to work (they are the breadwinners) clashes with treatment		X		
Boredom while hospitalised			X	Patients requested WiFi and equipment allowing light physical activities, e.g. table tennis.
Low staff motivation (especially at PHC level)			X	
Co-morbidities			X	
Daily travel during ambulatory treatment / long distance to DOT site			X	
Poor attitude of patient			X	Mentioned by providers

\* In all five countries, there were statements that majority of the healthcare providers have good relational skills; what was often said is that good relationships are a big help on the road to cure. In other words, poor relational skills of the healthcare workers was not a commonly identified challenge.

In addition, a few other factors were mentioned. For instance, in Ukraine, patients stated that it was hard to be together with "heavy" patients, i.e. with patients who are very sick and die. And in Azerbaijan, providers mentioned that some patients feel cured and stop treatment. In general, across the five countries, the providers indicated that they understood the often very difficult situations of the patients and they were in favour of comprehensive patient support. Still, to a limited degree there were some statements indicating blaming the patients. However, this is understandable as some of the DR-TB patients are highly marginalised patients – some due to mental health issues. The behaviour of some of these patients is challenging, requiring a high degree of professionalism and positive attitude from the healthcare providers.

Many of the factors that promote successful treatment outcome were related to the factors hindering successful treatment outcome (i.e. they were addressing the obstacles). Table 16 presents factors seen to promote successful completion of treatment.

**Table 16. Factors perceived to promote successful treatment outcome**

Factor	Mentioned in all 5 countries	Mentioned in 4 countries	Mentioned in 1 to 3 countries	Remarks
Less side effects/more info on side effects/ good management of side effects			X	There was some perception that side effects could be managed better. And in many places of the five countries, the ancillary drugs are not for free.
Shorter treatment			X	
Good patient-provider relationship		X		
Food as incentive	X			In two countries, it was suggested that food should also be offered to the patient's family.
Home-DOT (treatment at home of patient)	X			
Training of family members on how to support patient well			X	Mentioned in Azerbaijan and Romania
Psychological support through psychologist			X	Seen as useful by the patients (useful for at least a few patients) in three countries (in an additional country, seen as useful by the providers).
Guided patient group discussions			X	
Video-observed therapy (VOT)			X	Only Belarus already has experience with VOT; Ukraine would welcome it. It was not specifically discussed in all countries.

Among the positive comments of patients regarding group discussions were: (i) “Yes, *mutual peer support is very important through personal relationships*” and (ii) “*Moral support from other patients means a lot and would be helpful*”.

Suggestions were made on how to facilitate successful treatment outcome, e.g. giving monthly a small amount of money to the patient and at the end of treatment a larger amount. Similarly, the DOT provider can also receive a financial incentive. It was also stated that more ambulatory treatment would help (though some providers expressed doubt if all patients would be able to manage ambulatory treatment).

Annex 3 provides an overview of the findings from the FGDs and interviews with patients in the five countries.

In Romania, there are in 6 counties (of a total of 42 counties, including Bucharest in the country) so-called Multi-Disciplinary Teams (MDTs); MDTs consist of a social worker, a psychologist and a doctor-pneumologist. With funding received from foreign aid, the NGO “Association for Supporting MDR-TB patients” hires social workers and psychologists dedicated to TB patients. These specialists are based in the TB department of county hospital and collaborate with TB health providers on case evaluation and risk assessment. Case evaluation assesses social status, co-morbidities, treatment and risk for non-adherence. Risk assessment classifies (DR-)TB patients into two groups: (i) Patients at average risk of defaulting – they receive DOT, counselling, social assistance (referral to other services), and invitation to participate to group support meetings led by

a psychologist. (ii) Patients at higher risk of defaulting – they receive DOT, social support, peer support (phone calls from cured patients), and so-called social tickets (worth approximately 20 US dollars) if adherent at the end of each month. Key informants commented that these social tickets, although of modest value, have proven to support treatment adherence among vulnerable groups.

Social workers and psychologists from the MDTs provide face-to-face and phone-based support in the hospital where they are based, in the other TB dispensaries of the county where they are based and occasionally do outreach support at patients' place of residence. Other forms of social support include food or transport vouchers, support for the establishment of missing documents, or for state benefit application, especially for medical pensions of TB patients. MDTs also refer patients to have DOT in dispensaries close to their place of residence.

The MDT can refer DR-TB patients to other NGO or NGO-led projects:

- the *Centre for Health Politics and Services* which trains Community Health Workers (community nurses) to be DOT supporters and provides social tickets to (DR-)TB patients living far from the dispensaries (in 5 counties);
- PARADA Foundation in collaboration with NGO ARAS (Romanian Association Against AIDS). ARAS provide harm reduction services for IDU (Injecting Drug User), rapid test for HIV and hepatitis, supports active identification of TB cases among IDUs, and introduce methadone substitution programme (in Bucharest and Ilfov);
- the national federation of associations of PLWHIV (UNOPA)
- Save the Children and ARAS collaborate to provide support to homeless TB patients. These two NGOs provide a full package of services to TB patients in Bucharest: IEC, training of peer supporters; calendar of screening, transport of suspect cases to dispensary for testing; counselling, juridical, DOT by peer supporters.
- Peer support is provided by the MDR-TB patient association ("Association for Supporting MDR-TB patients") since 2013. After discharge, MDR-TB patients in selected counties can receive phone-based support by former MDR-TB cases to facilitate successful treatment outcome.

### 3.3.4 Conclusions

All five countries are putting more emphasis on ambulatory care and provision of DOT that is patient-friendly. The involved NGOs provide important support. There is a need to assess in each country the cost-effectiveness of the various kinds of offered patient support schemes to provide evidence on how to make best use of the available resources.

During the field visits in the five countries, a complaint that in some or many instances/places the ancillary drugs are not for free was heard. This should be addressed.

In view of the partly high proportions of high-level drug resistance and in view of the unsatisfactory treatment outcome, there is an urgent need to make use of the new (and developing) drug regimens and to seriously consider making use of the so-called short MDR regimen (even though a large proportion of the DR-TB patients might not be eligible for the short MDR regimen).

## 3.4 Quantitative findings I: an analysis of charts of DR-TB patients

### 3.4.1 Introduction and demographic findings

Data extraction on patient characteristics performed in the five visited countries yielded data from 212 patients of the 2013 cohort. Most patients came from Romania and Ukraine (77 and 65 patients, respectively), followed by Azerbaijan (30), Tajikistan (23) and Belarus (17).

Most of the 212 patients were male (150; 71%). The median age was 41 years (range: 11 to 79 years). Almost half of the patients were married/living with a partner (for 39 patients, this information was not available). Most patients were unemployed when their TB illness began; only 52 (25%) were employed at that time.

### 3.4.2 Description of the sample: baseline medical and social data

The median bodyweight at baseline (i.e. the time when the DR-TB treatment recorded in the patient chart began) was 62 kilogrammes (kg). Thirty-seven cases (17.5%) had a bodyweight of less than 50 kg.

Almost all cases (209) had pulmonary TB (three had extra-pulmonary TB). Apart from 11 cases (5.2%), there was a clear record regarding HIV sero-status of HIV: twenty (9.4%) were HIV-positive and 181 (85.4%) HIV-negative. The proportion of HIV-positive cases was highest among the 65 cases from Ukraine (16 of 65; 24.6%), followed by Belarus (1 of 17) and Romania (2 of 77). In Azerbaijan, only one case was HIV-positive (1 of 30), and in Tajikistan none was HIV-positive.

Among 105 of the 212 cases, there was information (height and weight) to calculate the body mass index (BMI): nineteen (18.1% of the 105) had a low BMI, i.e. below 18.5 kg/m<sup>2</sup> and 81.9% a BMI of at least 18.5 kg/m<sup>2</sup>. Table 17 presents this information and also the chest X-ray findings and co-morbidity with diabetes mellitus (7.5% had diabetes mellitus).

**Table 17. Medical features at baseline of the 212 patients whose charts were reviewed**

Medical feature	Categories	Number	Percentage *
HIV status	HIV-positive	20	9.4%
	HIV-negative	181	85.4%
	Unclear	11	5.2%
At least 1 cavity in chest X-ray <sup>□</sup>	present	147	69.3%
	absent	61	28.8%
Bilateral disease with at least 1 cavity <sup>□□</sup>	present	76	36.5%
Co-morbidity diabetes mellitus <sup>□□□</sup>	present	16	7.8%
BMI <sup>\$</sup>	Below 18.5 kg/m <sup>2</sup>	19	18.1% of 105
	At least 18.5 kg/m <sup>2</sup>	86	81.9% of 105

\* of 212 if not indicated differently

□ For 3: not applicable (extra-pulmonary cases) and for one no result available

□□ For 4, this was not clear.

□□□ For 6, this was not clear.

\$ BMI not available for 107 cases.

The following “behavioural and social data” were extracted: smoking status, alcohol consumption and use of illicit drugs at baseline. Furthermore, history of detention and homelessness were extracted. Table 18 presents these findings.

**Table 18. Behavioural and social features of the 212 patients whose charts were reviewed**

Behavioural and social feature	Categories	Number	Percentage
Smoking at baseline	Yes	96	45.3%
	No	80	37.7%
	Unclear	36	17.0%
Alcohol consumption at baseline	Yes	64	30.2%
	No	128	60.4%
	Unclear	20	9.4%
Illicit drug use at baseline	Yes	11	5.2%
	No	178	84.0%
	Unclear	23	10.8%
History of detention (imprisonment)	Yes	23	10.8%
	No	187	88.2%
	Unclear	2	0.9%
Homeless in the past or at baseline	Yes	15	7.1%
	No	157	74.1%
	Unclear	40	18.9%

### 3.4.3 Previous treatment experiences

Information was available and extracted about the number of previous treatment episodes lasting for at least one month, the number of previous DR-TB treatment episodes lasting for at least one month and if patients had previously had a TB treatment whose outcome was “lost to follow-up”. Almost two thirds (34.6%) had had any previous TB treatment (lasting for at least one month). Among the 137 patients with previous TB treatment, 24.0% (33/137) had had a treatment outcome of “lost to follow-up”. Table 19 presents details.

**Table 19. Previous treatment experiences of the 212 patients whose charts were reviewed**

Previous treatment experience	Categories	Number	Percentage
Number of previous TB treatment episodes lasting for at least one month	0	75	35.4%
	at least 1	137	64.6%
	3 to 9	30	14.2%
Number of previous DR-TB treatment episodes lasting for at least one month <sup>‡</sup>	0	169	79.7%
	at least 1	42	19.8%
	3 to 7	10	4.7%
Had formerly had a TB treatment outcome “lost to follow-up”	Yes	33	15.6%
	No	169	79.7%
	Unclear	10	4.7%

<sup>‡</sup> For 1, this was not clear

### 3.4.4 Diagnostic results at baseline

At baseline, approximately two-thirds of the cases were smear-positive (64.6%) and 83% were culture-positive. Xpert MTB/RIF was applied to only 24.1% of the cases (one has to consider that the patient chart review was of the cohort of the year 2013). No sample underwent Xpert in Romania and in Azerbaijan. In Ukraine, 16.9% (11/65) underwent Xpert. In Tajikistan and Belarus, 100% of the cases underwent Xpert. Table 20 presents the diagnostic baseline findings in detail.

**Table 20. Diagnostic findings at baseline (212 cases)**

Bacteriology (at baseline)	Categories	Number	Percentage
Smear status at baseline <sup>‡</sup>	negative	69	32.5%
	scanty	4	1.9%
	positive	137	64.6%
Culture status at baseline <sup>\$</sup>	negative	20	9.4%
	a few colonies	7	3.3%
	positive	176	83.0%
Bacteriology at baseline	smear-positive <u>and</u> culture-positive <sup>£</sup>	120	56.6%
Result of Xpert MTB/RIF <sup>€</sup>	TB, RR	45	21.2%
	TB, no RR	2	0.9%
	not TB	1	0.5%
	Undetermined	1	0.5%
	Not done	161	75.9%

<sup>‡</sup> Smear status unclear for 2 cases.

<sup>\$</sup> Culture status unclear for 9 cases

<sup>£</sup> “scanty” and “a few colonies, respectively, were counted as positive.

<sup>€</sup> For 2 cases, the result was not clear.

The most common drug resistance patterns at baseline were resistance to RH (n = 34) and resistance to RH plus some other first-line drugs (n = 100). Forty-six cases had pre-XDR (21 had MDR-TB with resistance to a fluoroquinolone and 25 had MDR-TB with resistance to an injectable). And 19 cases (9%) had XDR-TB: 14 were from Romania, 3 were from Ukraine and two were from Azerbaijan<sup>5</sup>. Table 21 presents the findings in detail.

**Table 21. Drug resistance at baseline (212 cases)**

Bacteriology (at baseline)	Number	Percentage
Poly-drug resistance <sup>¶</sup>	3	1.4%
Resistance to rifampicin only	5	2.4%
Resistance to rifampicin and isoniazid (RH)	34	16.0%
Resistance to RH plus at least one other first-line drug	100	47.2%
Resistance to RH plus at least one fluoroquinolone	21	9.9%
Resistance to RH plus at least one injectable	25	11.8%
XDR-TB	19	9.0%
Other drug resistance or not clear	5	2.4%

<sup>¶</sup> Resistance to more than one first-line drug other than both isoniazid and rifampicin.

### 3.4.5 Diagnostic results at two months of treatment

After two months of treatment, one fifth (21.2%) was still smear-positive and one third (34.4%) was still culture-positive. Smear- and culture-positive were 15.1%. Table 22 presents these findings.

**Table 22. Diagnostic findings at baseline (212 cases)**

Bacteriology at two months of treatment	Categories	Number	Percentage
Smear status at baseline <sup>¶</sup>	negative	157	74.1%
	positive	45	21.2%
Culture status at two months <sup>\$</sup>	negative	118	55.7%
	positive <sup>€</sup>	73	34.4%
Bacteriology at two months	smear-positive <u>and</u> culture-positive <sup>£</sup>	32	15.1%

<sup>¶</sup> Smear status unclear for 10 cases.

<sup>\$</sup> Culture status unclear for 21 cases.

<sup>€</sup> Including 4 who had “a few colonies”.

<sup>£</sup> “scanty” and “a few colonies, respectively, were counted as positive.

<sup>5</sup> Belarus has a high proportion of XDR-TB patients; the reason that none of the patients whose charts were reviewed had XDR-TB is probably that the two facilities visited by the research team did not have XDR-TB patients. There are special facilities in Belarus for XDR-TB patients.

### 3.4.6 Hospitalisation and ambulatory care

Four fifth (81.1%) of the patients were hospitalised. The most common length of hospitalisation was 2 to 12 months. Table 23 presents the findings in detail.

**Table 23. Hospitalisation and its length in days**

Hospitalisation *	Number	Percentage
No hospitalisation	40	18.9%
Hospitalisation for up to two months	33	15.6%
Hospitalisation for two to twelve months	122	57.5%
Hospitalisation for more than one year	14	6.6%

\* For three cases, the number of days in hospital was not clear.

For most patients (78.5% of the 195 cases for whom this was applicable), the place of DOT (directly observed treatment) during ambulatory care was at a health facility; the second-most-common place was at the residence of the patient (10.3%). Table 24 presents the findings.

**Table 24. Place of DOT during ambulatory care**

Place of DOT *	Number	Percentage of 195
At a health facility	153	78.5%
At the place of a DOT provider	7	3.6%
At home	20	10.3%
A mix or other places	14	7.2%

\* For 17 cases, this was not applicable and for 1 case, no clear information was available.

Also examined was the question of *who* provided DOT. Because the place of DOT was mostly the health facility, the most common DOT provider was consequently a healthcare worker (76.9%). Table 25 presents the findings.

**Table 25. Provider of DOT during ambulatory care**

Provider of DOT *	Number	Percentage of 194
Health facility staff	150	76.9%
NGO worker	9	4.6%
Family member	18	9.3%
Other type of person	13	6.7%

\* For 18 cases, this was not applicable and for 4 cases it was not clear.



### 3.4.7 Treatment outcome

Among the 212 cases, there were 21 who were still on treatment when the patient chart review was done. These 21 were excluded from the treatment outcome analysis. Among the 191 patients with a definite treatment outcome, 58.6% had successful treatment outcome<sup>6</sup>. Table 26 presents the details of the treatment outcome.

**Table 26. Treatment outcome of the 191 cases with definite treatment outcome**

Treatment outcome	Number	Percentage of 191
Cured	107	56.0%
Completed treatment	5	2.6%
Died	24	12.6%
Lost to follow-up	14	7.3%
Failed treatment	37	19.4%
Other treatment outcome (e.g. transfer-out)	4	2.1%

In Romania, some of the extracted data were from patients under a Global Fund grant and others were under the care of the NTP without Global Fund support: there were twenty “Global Fund patients”; they had a treatment success rate of 75% (15/20) while the “NTP patients” had a treatment success rate of only 26.3% (15/57) ( $p = 0.0001$ ).

In Azerbaijan, all 30 patients whose patient charts were analysed were under treatment supported by the Global Fund; their treatment success rate was 76.7% (23/30).

An analysis regarding eight potential determinants of poor treatment outcome (i.e. treatment outcome other than “cure” and “completed treatment”) revealed five risk factors: see Table 27.

**Table 27: Determinants of poor treatment outcome**

Risk factor	Odds Ratio (95% confidence interval)	p-value	Sample size
BMI below 18.5 kg/m <sup>2</sup> :	<b>4.7</b> (1.5 to 15.2)	0.005	188
Bilateral disease with at least one cavity:	<b>2.4</b> (1.3 to 4.5)	0.003	191
Culture-positive at 2 months:	<b>3.1</b> (1.7 to 5.7)	0.0003	191
Had previous SLD treatment:	<b>3.8</b> (1.8 to 8)	0.0003	190
Homeless in the past or at baseline <sup>7</sup> :	<b>10.7</b> (2.3 to 49.1)	0.0002	190 <sup>8</sup>
History of detention:	<b>0.9</b> (0.3 to 2.4)	0.8	189
HIV-positive:	<b>1.4</b> (0.5 to 3.5)	0.5	180
Hospitalisation for > 120 days:	<b>1.02</b> (0.6 to 1.9)	> 0.9	184

<sup>6</sup> As mentioned in chapter 2.3.6, in two health facilities, there was some evidence that the patient chart selection was not done randomly; consequently, the found treatment success rate of 58.6% is most probably higher than the real treatment success rate.

<sup>7</sup> Only 2 of the 13 homeless patients had successful treatment outcome.

<sup>8</sup> In the sample of 190, 40 cases with status of “unclear” regarding homelessness were assumed not to be homeless. This probably resulted in a bias towards the null (i.e. the true odds ratio is likely higher than 10.7; the same remark is true for the odds ratio regarding homelessness in the multivariate analysis for which again “unclear” was assumed to be “no”).

In a multivariate model, four of the five significant risk factors plus sex and HIV status were included (BMI could not be included because of many missing values). Table 28 presents the results (the sample size was 170 as some variables had no or unclear information). Retained as clear risk factors for poor treatment outcome were culture-positivity at two months of treatment, having previously had treatment with second-line drugs, and homelessness.

**Table 28: Determinants of poor treatment outcome, multivariate analysis**

<b>Risk factor</b>	<b>Adjusted Odds Ratio (95% confidence interval)</b>	<b>p-value</b>
Male sex:	<b>0.9</b> (0.4 to 2.1)	0.9
HIV-positive:	<b>1.2</b> (0.3 to 3.9)	0.8
Bilateral disease with at least one cavity:	<b>1.7</b> (0.8 to 3.4)	0.17
Culture-positive at 2 months:	<b>2.5</b> (1.2 to 5.1)	0.01
Had previous SLD treatment:	<b>2.9</b> (1.3 to 6.9)	0.014
Homeless in the past or at baseline:	<b>9.6</b> (2.3 to 66)	0.006

### 3.5 Quantitative findings II: reported treatment outcomes

This chapter presents an analysis of the treatment outcome of various health facilities as reported, collected at the regions

All in all, the treatment outcome of 77 health facilities as seen at the reports in the regions was reviewed (cohort of 2013). The range of cases per health facility ranged from zero (in four health facilities) to 207 (a health facility in Dniprovsk Oblast of Ukraine, closely followed by a health facility in the same oblast with 202 cases). There were only four health facilities with cohort sizes of above 100, all of them in Ukraine. The overall total of the cohort was 2079. The overall treatment success rate was only 45.2%. The failure rate was 19.2%, the death rate 17.5% and 16.6% were lost to follow-up. Another 1.2% had another treatment outcome (transferred out, not evaluated) (Table 29).

**Table 29. Treatment outcome according to the health facility reports seen in the regions, by country**

<i>Country</i>	<i>Number of HFs</i>	<i>Cohort size</i>	<i>Treatment success</i>	<i>Died</i>	<i>Failure</i>	<i>Loss to follow-up</i>	<i>Other</i>
Ukraine	24	1355	32.3%	19.9%	18.2%	17.9%	1.3%
Romania, GF	18	32	84.4%	9.4%	3.1%	3.1%	0.0%
Romania, non-GF	18 (same)	102	27.5%	34.3%	16.7%	18.6%	3.9%
Belarus	6	312	46.8%	8.7%	26.0%	17.6%	1.0%
Tajikistan	6	130	57.7%	6.9%	21.5%	13.8%	0.0%
Azerbaijan	5	148	62.2%	13.5%	17.6%	6.8%	0.0%
<b>All 5 countries</b>	<b>59</b>	<b>2079</b>	<b>45.2%</b>	<b>17.5%</b>	<b>19.2%</b>	<b>16.6%</b>	<b>1.2%</b>

HFs: Health facilities; Note regarding Romania: the difference in the treatment success rate between the Global Fund and the non-Global Fund cohort is statistically significant ( $p < 0.001$ )

The comparison of the treatment success rate of the GF-supported patients versus the treatment success rate of the patients without GF support was marked: 84.4% versus 27.5% (very similar findings to what was found in the patient charts review (chapter 3.4.7)).

In three of the 77 reports, there was a small quality issue regarding the figures: when adding together the figures of the five treatment outcome categories, the sum should be equal to the cohort size; in two health facilities, there was a difference of 1 and in one, there was a difference of 6 (in the latter, a health facility in Ukraine, the cohort size in the report was 169, but the five treatment outcome categories added together resulted in only 163).

### 3.6 Quantitative findings III: data verification

In the five visited countries, data verification regarding treatment outcome was done in twelve health facilities. These exercises revealed a very good standard of reporting: In eleven of the twelve health facility, there was full concordance between reporting and re-counted figures. In one health facility there was slight over-reporting (13 instead of 12). Table 30 presents the findings.

**Table 30. Data verification in 12 health facilities: re-counted versus reported treatment success rate**

Country	Name of HF	Treatment success rate as found through the re-count in the DR-TB register	As reported?
Ukraine	Dnipro City TB Dispensary	52% (105/202)	Yes
	Zaporijie City TB Dispensary	38.2% (66/173)	Yes
	Kharkiv Rayon TB Department	55.7% (107/192)	Yes
Romania	Craiova Dispensary in Dolj	41.7% (5/12)	No. Cohort in report is 13
	Pitesti Dispensary in Arges	38.5% (5/13)	Yes
	Sector 2 Dispensary in Bucharest	25% (4/16)	Yes
Belarus	Minsk Oblast TB Dispensary	54.1% (205/379)	Yes
	Grodno Oblast TB Dispensary	48.3% (193/400)	Yes
Tajikistan	Khudjand TB Dispensary, Sughd (Kanibadam)	73.1% (19/26)	Yes
	Hatlon TB Dispensary (Yavan)	44.4% (12/27)	Yes
Azerbaijan	Sumgait TB Dispensary, Absheron	87.5% (28/32)	Yes
	City TB Dispansay #4, Baku	66.7% (28/42)	Yes

## 4 Discussion

Several factors believed to be impacting the treatment outcome were found:

1. In the Delphi survey, the experts stressed the importance of patients receiving **rapid diagnosis** allowing early beginning of adequate treatment. In the light of the high levels of drug resistance among large proportions of the DR-TB patients, access to rapid diagnostic tests that identify also resistance to second-line drugs is crucial.
2. Currently, DR-TB patients have to withstand the hardship of a **barely tolerable treatment** regimen for up to two years. The challenge of **side effects** was commonly identified, both in the desk review and during the country visits. During the field visits in the five countries, a complaint in some or many instances/places was that the ancillary drugs are not for free. In the Delphi survey, the experts perceived as important the availability of free ancillary drugs.
3. There are **shorter regimens** (lasting for only 9 to 12 months) which should be seriously considered. The desk review found recommendations regarding the introduction of the short regimen, and patients interviews in the five countries revealed a desire for shorter regimens. Also, an African-based expert in the Delphi survey recommended the short MDR regimen. However, not all DR-TB patients are eligible for the shorter regimen; WHO recommends that *“patients are tested for susceptibility or resistance to fluoroquinolones and to the second-line injectable agent used in the regimen before being started on a shorter MDR-TB regimen: patients with strains resistant to any of the two groups of medicines are to be transferred to treatment with a conventional MDR-TB regimen”* [4]. Balabanova and colleagues [5], Sotgiu and colleagues [6] and Lange and colleagues [7] have recently shown that a very high proportion of TB patients are non-eligible particularly in Eastern Europe (largely due to previous exposure to second-line TB drugs). Similarly, van der Werf and colleagues made the case that only 11% of DR-TB cases in the European Union are eligible for the shorter regimen [8]. However, in a reply to this, Haldal and colleagues counter-argued that more than 11% would in fact be eligible [9]. Work from Chee and colleagues in South East Asia indicated it is potentially a wider phenomenon that a large proportion of DR-TB patients do not meet current WHO eligibility criteria for the shorter regimen [10].
4. **Health care organisation:** In the five visited countries (and the desk review indicated that also in many of the other EECA countries), there are on-going efforts to shift care from more hospital-centred to ambulatory care. No solid evidence was found that ambulatory care results in better treatment outcome, but there is a common view that ambulatory care is preferable. It is important to carefully consider findings of recently conducted health system studies, such as the study by Vries and colleagues (2017) [11] where health system factors of Bulgaria, Austria, Spain and the United Kingdom were analysed. Using key informant interviews, the study found that the following healthcare system factors were perceived as key to achieving good treatment results for DR-TB patients:
  - Timely diagnosis of drug-resistant tuberculosis
  - Financial systems that ensure access to a full course of treatment and support for multidrug-resistant tuberculosis patients
  - Patient-centred approaches with strong intersectoral collaboration that address patients' emotional and social needs
  - Motivated and dedicated healthcare workers with sufficient mandate and means to support patients
  - Cross-border management of DR-TB

5. **PHC/community level activities** on health care provision are quite remarkable in the Central Asian countries (less so in Romania/Eastern Europe) where hierarchies are strictly withheld and civil society relatively underdeveloped. In Tajikistan, for example, the Ministry of Health has recently issued a Guideline formalising how interactions between PHC staff and communities should take place due to low levels of community empowerment, and uncertainties of roles, responsibilities and rights. Through its modality of support, that always strives to ensure the involvement of non-governmental and civil society organisations – the Global Fund is contributing to a wider, societal transformation that is underway in Central Asia.
6. The desk review, the country visits and the Delphi survey all pointed to the challenge of **material poverty** affecting substantial proportions of TB and DR-TB patients and to the need to provide patient support. The Delphi experts agreed that at the level of DR-TB patient's family and community, that the most significant factor influencing treatment outcomes is that the economic situation of their family is not worsened by patient's illness or treatment. And interactions with patients in the five visited countries indicated that an important reason for loss to follow-up is the precarious financial situation of the patient's family. Catastrophic costs due to the TB and DR-TB illness (costs are defined as catastrophic when they exceed 20% of an affected households' annual income) are common, as shown in a recent systematic review [12]. For instance, in a study in China, it was found that 70% of the TB patients and 80% of the DR-TB patients had catastrophic medical spending [13]. A study in Kazakhstan among 94 MDR-TB patients and 54 other TB patients found that the median estimated total costs for diagnosis and treatment during the current TB treatment episode was USD 3125 for the MDR-TB patients and USD 929 for the other TB patients [14]. During the field visits, the idea of providing cash incentives for patients for staying on treatment was expressed, and in two of the visited countries (in Belarus and Tajikistan), some NGOs offer cash incentives to patients (chapter 3.3.2).
7. **Home-DOT** (the treatment is brought to the patient's house every day) is increasingly being implemented, mostly through NGOs. A challenge is that in many of the EECA countries there is a law that restricts the administration of treatment to medical personnel. There is solid evidence (Cochrane review) from various countries that having DOT at home (instead of in a health facility) does not lead to a lower treatment success rate [15]. A systematic review found that community-based DOT resulted in a higher treatment success rate than facility-based DOT [16].
8. The findings of the Delphi survey, the five country visits strongly and indirectly also the desk review indicated that **comprehensive support** is needed for TB/DR-TB patients. In the five visited countries, the idea of making a psychologist available for the patients and of patients regularly having group discussions for mutual support were discussed with patients. However, findings from the patient interactions do not consistently confirm the importance of using psychologists to provide this support – albeit for a sub-section of patients, such support is likely crucial. The suggestion to have regular patient group discussion was largely perceived to be a good idea by respondents.
9. In the general "global TB community", there is good awareness of the need for additional **medical support (and partly also social support) for some sub-groups**, e.g. HIV-positive TB patients and TB patients that are struggling with illicit drug use. However, other sub-groups, e.g. **alcoholics and homeless people** receive less attention (as became clear through the desk review) and do not feature prominently in the general discourse of the decision makers of TB care (e.g. among the five experts of the Delphi survey, only one

mentioned the homeless and none the alcoholics regarding two questions on marginalised sub-populations). A systematic review provided evidence that alcohol consumption during multidrug-resistant tuberculosis treatment is a predictor for a higher rate of unsuccessful outcome [17]. Alcoholism is a major health threat in many of the EECA countries: in three of the five visited countries, the so-called pattern of drinking score was 3, in one it was 4 and in Ukraine it was 5 (the highest possible score) [18]. The country visits found NGOs offering special support for homeless people, and the analysis of the patient charts revealed a very low treatment success rate among the homeless.

10. The field visits in the five countries indicated that the **disease remains widely stigmatised**. In the desk review, the topic of stigma was barely mentioned (chapter 3.1.3), and in the Delphi survey, stigma was not specifically discussed. However, indirectly, stigma was referred to in the sense that the experts gave high priority to the following for furthering good treatment outcome: the patient's family and his or her community as well as the healthcare workers need to treat the patient with respect and show empathy.
11. WHO encourages programmes to **involve patients** in tuberculosis care [19,20]. In Romania, cured patients are involved in supporting DR-TB patients on treatment. A systematic review found that the following resulted in lower rates of "loss to follow-up" among DR-TB patients: (i) engagement of community health workers as DOT providers; (ii) the provision of DOT throughout treatment; (iii) smaller cohort sizes; and (iv) the provision of patient education [21]. The review did not identify the role of cured patients in supporting DR-TB patients on treatment. However, cured patients may be especially apt at providing patient education.

## 5 Conclusion and recommendations

1. Uptake and scaling up of **new diagnostic tools and approaches and of new regimens** is crucial. The NTPs need to emphasise the importance of making these new tools available and push for comprehensive coverage of the population regarding the new rapid diagnostic tests and of the patients regarding new regimens.
2. In view of the seriousness of the challenge of side effects, it is important that **ancillary drugs** are reliably available and provided free of charge.
3. Most DR-TB patients of the EECA region are not eligible for the **short MDR regimen** based on the current WHO recommendation. There is a need to carefully balance the advantages and disadvantages of having a potentially less powerful but much more tolerable regimen. A way forward may be a reinforced shorter regimen, rather than the conventional MDR-TB regimen. It is urgent that more patient-friendly DR-TB treatment regimens are made available.
4. A deep **understanding of health system issues and power structures in the country** is needed to optimally facilitate this on-going transition and to ensure that expectations are met in terms of the release of funds for support of TB patients and other patients at PHC level.
5. In the process of full involvement of the PHC level facilities and contributions from the community, each country accumulates experiences and lessons learnt. Therefore, the countries may benefit from an **exchange of experiences on these efforts to involve PHC** facilities and communities in TB and DR-TB care, thereby learning from each other.
6. In view of the common **catastrophic costs** and impoverishing effect of having TB and especially DR-TB, improving the DR-TB treatment outcome in EECA countries may well mean more comprehensive support for a large proportion of the patients and his or her families. The NTPs should lobby for greater intersectoral involvement and a comprehensive approach to TB care, including that care is covered by any health insurance systems and provided free of charge at the point of delivery. It may be worth implementing and assessing the provision of cash incentives to patients at several landmark points in time of their treatment as incentive to stay on treatment. In Belarus and Tajikistan, cash incentives are already in use; therefore, their effects should be assessed.
7. Regarding **alcoholism**, it seems warranted to seriously consider having a formal alcohol dependency treatment programme for DR-TB patients (and TB patients), especially during the first six months of DR-TB treatment (when most patients are hospitalised). It is important to be well informed about recent developments of TB and alcohol dependency treatment. Two resources are: (i) A trial in Tomsk: *Effectiveness of alcohol treatment interventions integrated into routine tuberculosis care in Tomsk, Russia* [22] (ii) a trial was started in Tomsk, Russia some years ago (results not yet published): *Training and Fidelity Monitoring of Alcohol Treatment Interventions Integrated Into Routine Tuberculosis Care in Tomsk, Russia: the IMPACT Effectiveness Trial* [23]. We did not find resources regarding the homeless and TB; there is a need to carefully document the effectiveness of the efforts of the various NGOs (e.g. in Ukraine) for the homeless DR-TB patients.
8. Marginalised sub-groups such as **alcoholics and the homeless need comprehensive assistance**. The work of Gelmanova and colleagues [24] in Tomsk City, Russian Federation on a patient-centred (DR-)TB treatment delivery program (called 'Sputnik') for 38 MDR-TB patients and 15 TB patients at high risk of abandoning treatment could be informative in this regard. The fact that the Sputnik project was very resource intensive should not lead to dismissing such special efforts for needy patients. In parallel, less costly approaches should also be explored.

9. There is a trend of more **home-DOT**. The shift to this mode of treatment delivery should be closely monitored and the results evaluated, with scope for accompanying cost-effectiveness studies.
10. Approaches to facilitate better treatment outcome should be explored, carefully considering the available evidence (e.g. the systematic review by Tozcek and colleagues [14]). The review did not identify the role of **cured patients in supporting DR-TB patients** on treatment. However, cured patients may be especially apt at providing patient education and moral support as well as at countering stigma. The experiences in Romania in involving cured patients should be carefully assessed and initiatives that engage cured DR-TB patients promoted. In some settings, it may be beneficial to also involve the religious sector.
11. The field visits indicated that **involving psychologists and having patient group discussions** could be helpful, though there was no consensus. The already existing experiences regarding these two potentially adherence-enhancing measures should be assessed and based on the results, these two interventions should or shouldn't be scaled up.
12. Some of the countries of the EECA are relatively well resourced and the Global Fund is increasingly nudging for **greater domestic funding**. Even in case the domestic funding would fully compensate for the diminished Global Fund funding, there are concerns expressed by MSF<sup>9</sup>: increased domestic funding may lead to parallel procurement streams which is inefficient and problematic as the quantities of DR-TB medicines required by an individual country often do not meet manufacturers' minimum order requirements. In view of the extensive needs for comprehensive support for substantial proportions of DR-TB patients, reduction of foreign funding may well be problematic, in particular in view of the vulnerability and relative voicelessness of the various sub-groups. All five visited countries benefit from Global Fund support and support from other donors. The Global Fund grants are soon coming to an end, while there are convincing indications that further support (at least for Tajikistan, Ukraine and even for Romania) would be needed. The way forward should be discussed and outlined between the Ministries of Finance and Health in the respective countries, the Global Fund and other donors - with the potential, long term costs of any deterioration in already highly unsatisfactory DR-TB treatment outcomes carefully considered. Whatever the funding considerations, one should not forget that there was a consensus among the "Delphi survey experts" that all **medications, including medications for treatment of side effects, should be provided free of charge**.
13. Lastly, to emphasise with regards to the 2<sup>nd</sup> recommendation on this list: all these mentioned interventions do not tackle a (or even the) main problem of DR-TB treatment – and that is the length and the toxicity of the treatment. The **development of better TB drugs and new regimens and its subsequent uptake and scaling up** is crucial. The NTPs need to emphasise the importance of making these new tools rapidly available.

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<sup>9</sup> Presented as a poster during the 2017 UNION conference in Mexico: Akerfeldt et al, *Threats to affordable quality second-line TB drugs in Eastern Europe and Central Asia as the Global Fund shifts to national procurement*. Int J Tuberc Lung Dis 21(11), Suppl. 2, November 2017, S393.



## 6 Annexes

**Annex 1. Number of reports reviewed per country and in which years**

Country	Number of rGLC	Number of other reports	Total number of reports	2010	2011	2012	2013	2014	2015	2016	2017	no year
Albania	2	3	5				✓		✓	✓		
Armenia	1	3	4		✓			✓		✓		✓
Azerbaijan	2	2	4				✓	✓		✓		✓
Belarus	3	10	13		✓			✓	✓	✓	✓	✓
Bosnia & H.	1	0	1				✓					
Bulgaria	2	1	3					✓	✓			
Georgia	3	5	8			✓	✓	✓	✓	✓		
Kazakhstan	2	0	2						✓	✓		
Kosovo	3	0	3	✓				✓	✓			
Kyrgyzstan	3	1	4					✓	✓			
Macedonia	1	0	1						✓			
Moldova	3	0	3					✓	✓	✓		
Romania	3	3	6					✓	✓	✓		
Serbia	3	0	3			✓	✓		✓			
Tajikistan	3	1	4			✓	✓			✓		✓
Ukraine	5	6	11		✓	✓	✓	✓	✓	✓		✓
Uzbekistan	2	2	4					✓	✓	✓		
Several	0	3	3					✓			✓	✓

**Annex 2. Mention of the various sub-populations in the rGLC reports and other reports per country**

	rGLC reports								Other reports								
Country	2010	2011	2012	2013	2014	2015	2016	2017	2010	2011	2012	2013	2014	2015	2016	2017	no year
Albania				H, O		M, P, H, D, O								M, P, H, D, O	none, none		
Armenia							M, P, H, D			M, P, H, D			M, P, H, D				none
Azerbaijan				P, H			P, H						M, P, H, O				P
Belarus					P, H, O		P, H, O	P, H		P; M, P, H, D, O			none; none	M, P, H, D, O; M, P, H, D, O; none; none; none			none
Bosnia & H.				M, P, H, O													
Bulgaria					M, P, possibly H, O	M, P, H, O							M, P, H, D, O				
Georgia					P, H, O	M, P, H, D, O	M, P, H				P, H, D, O	P, H, D, O	P, H, D, O	P, H, D, O	P, H, D, O		
Kazakhstan						M, P, H, O	M, P, H										
Kosovo	P, H				P, H	P, H											
Kyrgyzstan					M, P, H, D	P							M, P, H, D, O				
Macedonia						P, H, D, O											
Moldova					M, P, H, D	P, H, O	P, H										
Romania					P, H, O	P, H, O	H, O						possibly H		M, P, H, O		
Serbia			M, P, H, D, O	M, P, H, O		M, P, H, D, O											
Tajikistan			P, H	P, O			P, H										none
Ukraine		M, P, H	M, P, H, D	P, H, D, O	P, H, D		M, P, H, D				P, H, D; P, H, O		M, P, H, D, O				P, H, D, O
Uzbekistan						P, H	P, H						M, P, H, D, O				
Several													M, O				none

M: migrant; P: prisoner; H: person living with HIV; D: user of illicit drugs; O: other sub-population (including 'homeless'; the field visits to the five countries and the desk review made clear that 'the homeless' are an important sub-population, mentioned in 25 reports).

### Annex 3. Findings from patient interviews and FGDs in the five visited countries.

#### Tajikistan

Country	Respondent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
TJK	FGD participants	(i) Feel really exhausted to go every day; (ii) Understand that we need to go till the end; (iii) Have fear of dying.	(i) Believe that they will come back to normal; (ii) Not long until fully cured; (iii) Good relationships with nurses	(i) every day is the same – feel fed up; (ii) side effects make it even worse; (iii) indifference - nobody cares if you die or live	We want to survive, that's why we go for treatment	Maybe, but we do not have a psychologist	Opinions divided – some say it would be good, while others say they do not want to spend time with other patients and listen to their problems (“we have our own difficulties”)	(i) Need more good food; (ii) all are very poor – if only GF or gov't gave them something to make chance of survival higher; (iii) give patients tranquilizers and vitamins; (iv) divide the drug intake into several doses over the day; (v) individual support, e.g. someone comes and at least talks to them.
TJK	DR-TB patient 1 (male)	(i) One has to have a lot of patience; (ii) He did not have enough of patience, broke the treatment several times	(i) He received food package from GF; (ii) knowledge that this disease will be cured; (iii) family support is very important	(i) Some do not trust to doctors and think they will not get cured; (ii) not having family or close ones	Relationships with personnel – if the nurse is kind, I don't mind to come every day	Not really, it is a stranger to me, why should I listen to her or tell her my life? (ii) maybe for some it would make sense	No; we are all different and have different problems, not needed	TB nurse is the most important person to help adhere to treatment.
TJK	DR-TB patient 2 (female; well off; home-based DOT)	Not answered (she got treated at home with the use of community volunteer; but when she needed to go to see TB doctor, her husband took her there)	(i) it is temporary, long, but it will end some day; (ii) I got all the support. (iii) Medicine is potent and will kill the “germ”	(i) Side effects; I could not walk (ii) The thought: “maybe it is all a mistake and I take takes this strong medicine in vain”	N/A	Was not offered. I would talk to a psychologist if she was female like myself	N/A	She recommends to other patients: “Trust your doctors, they know best!”

Country	Respondent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
TJK	DR-TB patient 3 (male)	(i) I force myself; (ii) I tell myself that it is second time already to have TB so I need to get cured this time	(i) Treatment is available; (ii) relationships with personnel is good; (iii) father will support;	(i) Side effects (vomiting); (ii) afraid that this will not work; (iii) treatment is too long Too long	Desire to turn healthy and stop being “incapable”	(no clear reply). I was not offered, maybe because I did not have problems.	Yes, helpful. While I was hospitalised I talked to other patients, they explained a lot	My father gave great support, without him I would not have survived.
<b>AZERBAIJAN</b>								
AZE	DR-TB patient 1 (male)	Strong desire to get cured	(i) Felt much better after 5 months of treatments; (ii) Good relationship with nurses and doctors	(i) Side effects; (ii) Anxiety	Will to live	Did not talk to psychologist, but would have liked that	Is not sure about it.	(i) Find a good doctor, as apparently not all TB doctors are nice (he was lucky with his); (ii) Eat good food, especially meat, as more energy is needed to digest TB drugs.
AZE	DR-TB patient 2 (male)	Will do anything to get back to normal	(i) Trust (believe) in doctor; (ii) Has seen positive dynamics in treatment that reassured him	(i) Very long treatment process; (ii) Strong medication made him suffer more leg pain	Want to survive this ordeal, for his family and children.	No information on it.	Does not have an opinion about it.	Do not be afraid, it is difficult but can be done

Country	Respondent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
AZE	DR-TB patient 3 (male)	It takes discipline and good faith	(i) Felt that there is change for better; (ii) No side effects; (iii) Got social assistance, money from GF; (iv) Pension from Government; (v) Good relationships with personnel	(i) Distance to the DOT place; (ii) Side effects	N/A	Did not have consultation with psychologist	It could be good to talk to other patients, but many are shy, many get treatment in secret.	Need to persist; no matter how hard this may be – never stop the treatment.
AZE	DR-TB patient 4 (male)	Feel repulsion, but make yourself go to DOT point	(i) DOT site was good, with separate entrance; (ii) Good relationships with nurses; (iii) Received family support (brothers)	(i) Experienced side effects in the beginning of the course; (ii) Had many bad thoughts	Did not have to work during the treatment	Need to regain self-assurance, for that it is important to talk to professional psychologist	Did not know about it, and did not meet/ see other TB patients in ambulatory	Patient needs to eat good food – it is also like medicine.
AZE	DR-TB patient 5 (male)	(i) Severe side effect and deafness, which is what patient experienced; (ii) Repulsion to going	(i) Good attitude towards me; (ii) Considered and treated me as a person; (iii) Good food; (iv) Changed lifestyle	(i) Laziness; (ii) Feeling fed up; (iii) No trust that will recover, thinking this is the end; (iv) Side effects	Desire to live	Never talked to a psychologist	Maybe, never participated	Remove side effects!

**BELARUS**

Country	Respondent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
BLR	FGD 1 (in Minsk)	N/A	(i) Desire to be cured helps to endure difficulties of treatment; (ii) Positive and comforting atmosphere in surrounding condition, a friendly attitude from personnel; (iii) Experienced doctors (iv) Food is offered; (v) Support from family and friends (vi) moral support from co-patients (vii) support from the psychologist	(i) Far away from home; (ii) Long stay at hospital, long treatment (2 years); (iii) Morally difficult cause their children are at home (distance to family). (iv) Treatment lasting 2 years; (v) Side effects	(i) The medical information we have; (ii) Hope for cure and the normal life	Yes. We have one but not many of us requested the psychologist's support.	No clear answers.	(i) Many side effects; get treatment with "good" drugs; (ii) It is difficult to not doing anything, would be good to have some sort of distraction/entertainment during the treatment. (iii) In rural areas, transportation is not available, need to find support mechanisms. (iv) Financially difficult to stay out of work, no time for treatment.
BLR	FGD 2 (in Grodno)	N/A	(i) We are convinced that we will be cured; (ii) Doctors emphasize that we will be cured; (iii) Thorough information and explanation by the head of department, supportive medical staff who gives explanation and hope (patient refers to this as an individual treatment approach); (iv) need to overcome stigma	(i) Length of the treatment (ii) side effects	(i) Family; (ii) Hope to be cured and return home; (iii) Hope to go back to work	N/A	N/A	Friendly and polite attitude of staff is helpful
BLR	DR-TB patient	This patient was HIV-positive but the conversation with this patient did not yield meaningful information.						

Country	Respondent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
<b>ROMANIA</b>								
ROM	FGD 1	Quitting is not an option, important to avoid infecting other people, cannot imagine life secluded; fear of putting people in danger.	(i) Good relations with doctors; (ii) Health staff very convincing that treatment should be taken as prescribed; (iii) Good hospital conditions; (iv) Supportive work environment (medical leave); (v) Supporting family; (vi) Psychological support; (vii) Support from health staff to mitigate side effects	N/A	N/A	N/A	Yes, peer support is helpful.	Would be a good idea that each TB hospital has sport facilities but it depends on physical abilities of patients; and/or other activities to keep busy.
ROM	DR-TB patient 1 (male)	A strong will is needed but after a while it becomes part of the routine	(i) Concerns about family and children; (ii) Family support; (iii) Understanding that TB, even MDR can be cured; (iv) Friends support	(i) Duration of treatment (hearing it's 2 years was shocking); (ii) Side effects – panic and vomiting; (iii) Hospital condition; (iv) Family not receiving any support (feeling helpless)	N/A	Yes, receives help from psychologist, it helps to keep focus and not to get distracted by other things.	N/A	N/A

Country	Respon- dent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
ROM	DR-TB patient 2 (male)	N/A	(i) Good relationships with medical staff; (ii) Social workers and psychologist help very much	(i) hospital conditions are not good; (ii) Bad side effects	Family – the strongest factor for me!	Yes, psychologist help very much	N/A	(i) Difficult to stay with drug addicts and alcoholics; (ii) Financial situation pushes people to stop treatment;
ROM	DR-TB patient 3 (male)	N/A	(i) Strong will; (ii) Saw other TB patients dying; (iii) Close contacts die; (iv) Feel better at home	(i) Too many pills; (ii) Injections too painful; (iii) bad hospital conditions; (iv) Not receiving any kind of support;	(i) Other patients experience; (ii) Coma to agreement with himself	N/A	Does not find it useful	(i) Some patients were not aware of the dangers; (ii) Side effects – he had suffered hearing loss, but it is better to be deaf than dead! (iii) There are irresponsible patients: no matter what you give them, they will not come for treatment.
ROM	DR-TB patient 4 (male)	N/A	(i) Personal nature, strong person; (ii) Family support; (iii) Being in a group vs. being alone; (iv) fear of relapse; (v) psychological support	No support received by family	N/A	Yes, particularly when patient found out that he is HIV positive	N/A	DOT should be DOT. I know many patients who throw their treatment away, these people should be locked.
ROM	DR-TB patient 5 (male)	N/A	N/A	Not clear	N/A	Yes, received support from a psychologist (by phone), helpful to discuss feelings and emotions	Yes, received peer support and is now a peer supporter.	(i) Individual decision to take treatment or not. (ii) Financial incentives (for example in forms of “food tickets”) during duration of the treatment are important.



Country	Respondent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
ROM	DR-TB patient 6 (female)	N/A	(i) wanting to live; (ii) to have a baby; (iii) support from parents and husband, then doctors; (iv) Nice medical staff, nice hospital living conditions; (v) Legal protection to keep her job.	Was obliged by local commission to retire early (medical pension).	(i) Waiting time to take DOT in dispensary; (ii) Other patients in hospitals; (iii) feeling better after treatment; (iv) Well informed by provider at start of treatment.	N/A	N/A	(i) At beginning of hospitalization, the patient was not happy with the doctor but then requested another doctor; (ii) Had however a good collaboration with the nurse; (iii) Would have liked not be forced to retire early (medical pension), which made her inactive; (iv) Would like to provide advice to patients (as a volunteer), listen to them, share her own experience; (v) Willingness and awareness of patients is crucial.
ROM	DR-TB patient 7 (female)	N/A	(i) communication with other patients; (ii) taking care of each other; (iii) very strong family support; (iv) knowing that TB can be cured	N/A	N/A	Yes, received psychological support (very severe depressions)	N/A	(i) Medical retirement pension is very low; (ii) Patients drop out of treatment because they do not have any purpose/objective, anything important to fight for and no resources or support; (iii) Important to eat well when on a treatment like this, otherwise it affects immune system.
<b>UKRAINE</b>								
UKR	FGD 1	N/A	(i) wanting to live; (ii) family; (iii) going back to work; (iv) becoming normal again;	(i) pain; (ii) duration of the treatment; (iii) personal freedom; (iv) side effects	When you consider your or their lives, including your/their inner selves and their families and friends	Some receive psychological support, good to talk to professionals	Yes, mutual peer support is very important through personal relationships.	"Please invent something so that the treatment is not so long!"

Country	Respondent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
UKR	FGD 2	Difficulty to start new treatment	(i) "There is No choice"; (ii) Think about children, close ones; (iii) Care about other people too, don't want to infect others; (iv) Hope that treatment will help to feel better; (v) help to stop take drugs, drinking, smoking (not allowed in TB hospital)	(i) Afraid that other will know about the disease; (ii) Side effects – deafness, heart and liver failure	Hope to get disabled benefits Hopes to get good TB medicine Rehabilitation after the treatment Hopes that after the treatment is finished will find a job, return to "normal" life	Psychological help is very important during all phases, but especially: - beginning of treatment when side effects surface - at time of discharge where psychologic consolation is important.	Moral support from other patients means a lot and would be helpful (similar thing already available from church visitors)	-Allow to work via internet (to work in distance) -More rooms for personnel -More supplies for Medical personnel -Other drugs for side effects -Light sport activities, like table tennis or fitness exercises -Massage -Aquariums with fishes -Put in the hospital wending machine -Pharmacy -Washing machine -Better drugs for TB – with no side effects and stronger efficacy -Not to feel pain -Shorter treatment and more supportive treatment, physiotherapy.
UKR	FGD 3	Tired, want to have like a "vacation"	(i) Human factor - some want to get out of hospital but some want to stay as long as possible; (ii) Wanted to start treatment faster; (iii) Want to get cured; (iv) Want to be safe to others	(i) Shock and disbelief; (ii) Poor food in hospital; (iii) Conditions of patients; (iv) limited access to showers	Ambulatory treatment is better and easier	There is a psychologist, but no help. Relatives and friends are more important. Suggest self-support group with former patients.	May help just to have somebody for a conversation, but everybody has his/her own situation. Suggest self-support group with former patients.	- Cannot be in the same place with drug addicts and alcoholics, please separate the patients!; - No options – for improved stay (even by paying); - Finances – family should get financial support while patient is on treatment; - More money to get more food, because in hospital it is not enough; - No standard way/instructions for taking drugs; - The dose could be broken up to several doses; - Relationship with doctor – just one doctor, too many patients; - No "school for patients" – do not get information!

Country	Respondent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
UKR	FGD 4	We do not have such days; it is automatically in our minds. We are also concerned about our relatives. If we interrupt, there is no effect of treatment.	(i) Having kids, family; (ii) Thinking of parents, and children – avoiding their infection	Side effects (nausea)	N/A	Yes, patients are seeing a psychologist and it helps (depression, advice on continuation of treatment, prescription of medicine to calm down)	Do not have such group discussions but agree that it would be helpful.	Ambulatory treatment at home would be better to get cured (nicer atmosphere)
UKR	DR-TB patient 1 (male)	N/A	N/A	Side effects	N/A	N/A	N/A	(i) Improving hospital infrastructures (sanitary facilities, elevator); (ii) People should stop smoking in the toilet.
UKR	DR-TB patient 2 (male)	N/A	Life and the desire to live	Stressed to be hospitalised, but no challenges with regards to the treatment	N/A	Met a psychologist once, no opinion about it	N/A	(i) Less patients in the ward; (ii) More comfortable and better hospital equipment ( X-ray machine was old)
UKR	DR-TB patient 3 (female)	N/A	(i) Live and getting cured; (ii) Religion	Side effects	N/A	No need for it	N/A	(i) Better conditions in the TB hospital; (ii) Bigger food parcels

Country	Respondent(s)	Thoughts when not feeling like going for treatment	Thoughts and facts that <u>encourage</u> patients to go for treatment	Thoughts and facts that <u>discourage</u> patients to go for treatment	Factors, thoughts convincing the patients to take treatment	Would or is a psychologist helpful?	Would patient group discussions be helpful?	Ideas of patients / other remarks
UKR	DR-TB patient 4 (female)	Does not want other people to know about her disease	(i) Great that Sunday is day off; (ii) It is already end of the process, little time left; (iii) After I finish this, I will live like normal again!	(i) Side effects – stomach ache after taking treatment; (ii) Feeling very tired of doing same thing every day	She made a contract with herself – she promised not to drop the treatment and will come till the very end	(i) Psych. help was very much welcome, needed and appreciated; (ii) needed more attention, but only one psychologist and standard approach was used	(i) Even if there was such a thing she would not go there; (ii) She does not need to know other people's problems; (iii) Feels shy to go and discuss her issues with others, have to be expert, or psychologist	(i) Cannot work, even though feels strong, not infectious anymore (according to test results); (ii) Treatment cannot get more attractive, just need to make it more flexible – now TB patient needs to adapt his life for treatment, perhaps we could meet half way; (iii) If possible – not stay in hospital at all; (iv) Maybe more drugs given intravenously – as stomach gets destroyed.

N/A: no clear answer received or topic not discussed.

**Annex 4. Overview of an assessment of the NGO activities in reference to TB care in the five countries**

Criteria	Ukraine	Belarus	Romania	Tajikistan	Azerbaijan
<b>Main NGOs/CSOs active in (DR)-TB identified during field work</b>	<ul style="list-style-type: none"> <li>• Red Cross of Ukraine</li> <li>• All-Ukrainian Network of People living with HIV</li> <li>• Patient organization "Ukraine against TB"</li> <li>• Other local CSOs</li> </ul>	<ul style="list-style-type: none"> <li>• Republican public association "Defeat Tuberculosis Together"</li> <li>• Red Cross Belarus</li> </ul>	<ul style="list-style-type: none"> <li>• Romanian Angel Appeal Foundation</li> <li>• Centre for Health Policies and Services</li> <li>• Association of TB patients</li> <li>• The Association for Supporting MDR-TB Patients</li> <li>• ARAS (working with IDUs)</li> <li>• Salvati Copiii</li> <li>• Romanian Red Cross</li> </ul>	<ul style="list-style-type: none"> <li>• Coalition "Stop TB partnership, Tajikistan", Youth Led-NGO "Young generation of Tajikistan"</li> <li>• 13 organizations, mostly in the field of HIV/AIDS.</li> <li>• Two organisations ("EFEW" and "Red Tulip") are active in the prison sector.</li> </ul>	<ul style="list-style-type: none"> <li>• TB Azerbaijan Coalition, composed of several NGOs; "Saglamliga Khidmat", "Hayat", "Azerbaijan Red Crescent Society", "Unit of Professional TB doctors and Pulmonologists" and "Veremsiz Dunya" NGO</li> </ul>
<b>Levels of intervention of NGOs/CSOs</b>	<ul style="list-style-type: none"> <li>• Some have national coverage</li> <li>• Local CSOs work at oblast level or below</li> </ul>	<ul style="list-style-type: none"> <li>• Red Cross Belarus has national coverage</li> <li>• Mostly local work by CSOs</li> </ul>	<ul style="list-style-type: none"> <li>• Some work done centrally</li> <li>• Coverage of several regions</li> <li>• Overall very active NGO work</li> </ul>	<ul style="list-style-type: none"> <li>• No national coverage, Mostly local work by CSOs</li> </ul>	<ul style="list-style-type: none"> <li>• Mostly local work by CSOs</li> </ul>
<b>Type of support</b>	<ul style="list-style-type: none"> <li>• Participation in the development of TB control activities</li> <li>• Promotion of ambulatory treatment</li> <li>• Provision of psychological or social support to TB patients</li> </ul>	<ul style="list-style-type: none"> <li>• working with children with TB,</li> <li>• psychological rehabilitation</li> <li>• social support packages</li> </ul>	<ul style="list-style-type: none"> <li>• Political advocacy</li> <li>• TB and DR-TB care in an integrated response with the national TB programme</li> <li>• Community-based support through peer supporters, social workers and psychologists, multi-disciplinary team</li> </ul>	<ul style="list-style-type: none"> <li>• TB and DR-TB care including screening contacts, TB infection control and treatment monitoring.</li> <li>• Psychosocial support to TB patients</li> <li>• Incentive payment to patients</li> <li>• Support with transportation</li> <li>• Administrative support</li> <li>• Research</li> </ul>	<ul style="list-style-type: none"> <li>• Food support and psychosocial support</li> <li>• Advocacy with public authorities</li> <li>• Public awareness raising on TB</li> </ul>
<b>Provision of DOT</b>	Yes, home-based DOT through hired nurses	No	Home-based for children, otherwise in ambulatory	Yes, different models: (a) home-based DOT through trained volunteers, (b) health facility-based DOT through trained health workers	Not confirmed by data collection evidence

Criteria	Ukraine	Belarus	Romania	Tajikistan	Azerbaijan
<b>Target population/beneficiaries</b>	<ul style="list-style-type: none"> <li>• DR/TB/HIV patients and DR/TB patients without HIV</li> </ul>	<ul style="list-style-type: none"> <li>• DR/TB patients including children</li> </ul>	<ul style="list-style-type: none"> <li>• DR/TB patients</li> <li>• IDU</li> <li>• DR/TB patients with HIV</li> </ul>	<ul style="list-style-type: none"> <li>• TB patients</li> </ul>	<ul style="list-style-type: none"> <li>• DR/TB patients</li> <li>• TDR/B-affected former prisoners</li> </ul>
<b>Participation in national coordination body on TB</b>	<ul style="list-style-type: none"> <li>• Yes, NGO participation in national coordination body, including representatives of key population (e.g. MSM)</li> </ul>	<ul style="list-style-type: none"> <li>• No evidence found during country visit</li> </ul>	<ul style="list-style-type: none"> <li>• All main NGOs represented in the National Country Coordination mechanism</li> </ul>	<ul style="list-style-type: none"> <li>• Yes, NGO representation in the National Coordination Committee on TB, AIDS and Malaria</li> </ul>	<ul style="list-style-type: none"> <li>• NGO “Saglamliga Khidmat”, civil society partner for the TB Europe Coalition, is a member of the Country Coordinating Mechanism</li> <li>• Meetings are held between national TB-REP project coordinator, NTP, Parliamentarians and NGOs</li> </ul>
<b>Recipient of GF Grant funding (directly or indirectly)</b>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• Yes, indirectly</li> </ul>	<ul style="list-style-type: none"> <li>• Romanian Angel Appeal is Principal Recipient; many other NGOs receive funding from GF grant</li> </ul>	<ul style="list-style-type: none"> <li>Unclear, but other donors funding TB interventions</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>
<b>Overall Assessment</b>	NGOs are well represented and engaged in the TB response in Ukraine, and provide complementary services to the NTP in close cooperation with health providers	A small number of NGOs and CSOs provide limited social and psychological support. NGO involvement remains rather marginal in a centrally-controlled, national TB response.	NGOs are a major driving force in the national DR/TB response in Romania, filling many gaps of the public response. They have fostered the development of an advanced model of integrated care for DR/TB patients. The numerous NGO actors and NGO-funded services can lead to parallel systems and multiple layers of interventions. Of all case studies, it is the most effective involvement of NGOs in the TB response.	NGOs are well represented, active and frequent fund recipients or implementing partners of foreign aid donors in the field of TB or HIV. The integration of NGO TB work within the national response remains rather limited.	A small number of NGOs provide limited social and psychological support but they have formed a coalition which is a positive development towards greater coordinated action from civil society in the field of TB. Contacts are established with the national response system but no systematic or integrated collaboration was visible.

## Annex 5. Country reports

1. Belarus



2. Ukraine



3. Romania



4. Tajikistan



5. Azerbaijan



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