



Evaluation of CRG Barriers Among TB Key Populations in Armenia

TB Research and Prevention Center

Community
Rights
Gender

Evaluation of CRG Barriers Among TB Key Populations in Armenia

GRANT: “Key populations: Closing gaps in care” under the activity “Collect evidence on barriers to finding people with TB who are missed by national programs and who delay access to care through roll-out of (1) gender assessment, (2) legal and environment assessment, (3) data for key populations, (4) stigma assessment tools” within the Program “Advancing People-Centered Quality TB Care – From the New Model of Care Towards Improving DR-TB Early Detection and Treatment Outcomes”, financed by Global Fund to Fight AIDS, Tuberculosis and Malaria (Grant: QMZ-T-PAS)

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
CRG	Community, Rights, Gender
DOT	Directly observed therapy
DS TB	Drug-sensitive Tuberculosis
DR TB	Drug-resistant Tuberculosis
HIV	Human Immunodeficiency Virus
LTFU	Lost to follow-up
MDR TB	Multidrug-resistant Tuberculosis
MoH	Ministry of Health
NCP	National Center of Pulmonology
NCID	National Center for Infectious Diseases
NGO	Non-Governmental Organization
NSP	National Strategic Plan
NTP	National Tuberculosis Program
PHC	Primary Healthcare
PWTB	People with Tuberculosis
SNCO	State Non-Commercial Organization
TB	Tuberculosis
VOT	Video observed treatment
WHO	World Health Organization
XDR TBE	xtensively drug-resistant TB

EXECUTIVE SUMMARY

The community rights and gender (CRG) assessment carried out in Armenia with the aim to support the strengthening of national tuberculosis (TB) response through (1) providing qualitative and quantitative evidence on how belonging to certain key populations, gender, stigma, and the legal environment impact on vulnerability to TB infection, access to care, and treatment outcomes in Armenia, (2) developing recommendations based on the assessment findings to improve TB response with a greater focus on key populations and gender-sensitive care, (3) developing recommendations based on the assessment findings to strengthen the legal and regulatory framework for improved TB response.

The assessment methods included desk review, involvement of experts as core group members, multi-stakeholder consultations, application of qualitative and quantitative research design. A core group of TB experts included representatives of national counterparts, researchers, physicians, and civil society representatives. The core group provided TB expertise throughout the methods development, data analysis and stakeholders consultations. Two multi-stakeholder meetings were conducted to prioritize key vulnerable populations and finalize methodologies of the assessment.

For the qualitative part, the project team conducted 50 in-depth interviews (IDI) and six focus group discussions (FGD). The assessment part related to the [key populations](#) included (1) identified key populations, people living with HIV, migrants, homeless people. The data collection started upon receiving an ethics board approval of the research protocols and lasted three months.

Key findings related to [general PWTB](#) included: (1) lack of psychosocial services, especially for key and vulnerable populations, despite the political will and prioritization from the health authorities, (2) widespread stigma, especially in rural areas and among non-specialized healthcare providers. Key findings related to [homeless persons](#) included continued treatment interruption at outpatient care due to the lack of understanding of TB treatment, lack of psychosocial support, increased risk of new vulnerabilities and inadequate family relationships and support. In [migrant workers](#) key findings included reduced health-seeking behavior because of fear of deportation and lack of access to care, resulting in delay in seeking initial care for TB diagnosis. In people living with [HIV](#) key findings were delay in the initial diagnosis (TB and HIV) for populations presenting with HIV and TB symptoms simultaneously, as well as a need to strengthen information exchange between national TB and HIV facilities. A detailed overview of key findings and recommendations is presented in the research results section of the report.

Key findings and recommendations

Barriers, prioritized by stakeholders	Recommendations	Proposed actions
Recognizing Symptoms		
<p>PLHIV Delay in the initial diagnosis (TB and HIV) for people presenting with HIV and TB symptoms simultaneously.</p>	<p>Increase knowledge of joint HIV and TB symptoms manifestation among general primary healthcare workers and hospital physicians not affiliated with provision of services for HIV and TB populations to facilitate early diagnosis.</p>	<p>Conduct training on signs and symptoms of joint HIV and TB joint representation, as a part of the continuing medical education activities for healthcare professionals nationally. Job aid item targeting joint HIV and TB symptoms manifestation to be distributed at the primary healthcare facilities and hospitals targeting the frontline workers.</p>
Seeking care		
<p>Migrants Policy that stipulates deportation on the basis of TB status significantly affects TB control by reducing health-seeking behavior of migrant workers with known or suspected TB infection, causing delay in seeking initial care and TB diagnosis.</p>	<p>Advocacy of migrant health rights in host country</p> <p>Increase awareness about TB symptoms, health risks of delayed diagnosis and treatment of TB, and free TB care in Armenia among departing and returning migrants.</p>	<ul style="list-style-type: none"> - Community members who will be advocating about the health risks related to TB, patient's rights and will raise awareness of existing social, legal and health services for migrant workers in hosting countries. - Initiate an awareness raising campaign aimed to bring TB awareness, screening, and support information leaflets/ brochures at the points of departures and arrival to Armenia (bus stations, airports, etc.)
Getting accurate diagnosis		
<p>PLHIV Difficulties in accepting and coping with a new diagnosis of TB in addition to HIV.</p>	<p>Develop specific support for the HIV/TB co-infected individuals targeting acceptance and treatment of the disease.</p>	<p>Increase capacity of psychological support services through trainings within in-patient facilities (TB and HIV care facilities) with the focus on TB acceptance and treatment counseling.</p>

Beginning treatment		
No issues identified	N/A	N/A
Getting treatment adherence support		
Homeless <ul style="list-style-type: none"> Lack of patient's understanding of TB treatment in relation to treatment adherence at the beginning/during the disease; Lack of treatment adherence support; Lack of support during hospital treatment, including psychological counseling. 	Introduction of well synchronized multidisciplinary (health and social) services to promote treatment adherence at the beginning and throughout the treatment process.	Continuous support for treatment adherence at the beginning and throughout the treatment process <ul style="list-style-type: none"> Adequate medical counseling; Support and harm reduction to manage harmful alcohol or drug use; Increasing role and reactivity of existing psychological and social services in the delivery of care.
Migrants No information.	Procedure of official notification of NCP of Armenia about deporting of a TB patient should be developed/established.	NCP Armenia to request access about deportation reasons or health status of the deported citizens. Offer a free TB screening services to all citizen who were deported to country.
PLHIV Difficulties in getting information about all services available to PLHIV and lack of psychosocial support.	Focus the psychosocial support services within NTP (and other state agencies) to outpatient facilities to improve treatment adherence.	Design and launch an awareness raising campaign to increase knowledge on TB/HIV coinfection in PLHIV. Increase treatment adherence through introduction of psychological services component to the scope of the work of healthcare workers involved in DOT administration. Training of relevant NGOs, community-based staff, and peers to increase support for the treatment adherence.
Completing treatment		
Homeless <ul style="list-style-type: none"> Lack of social support from family and social circle for homeless people; Issues with ambulatory care: <ul style="list-style-type: none"> Not having permanent place to live is a barrier to 	Introduction of well synchronized multidisciplinary (health and social) services task force to strengthen treatment adherence at the beginning and	Develop a TB and homelessness task force which will map needs of homeless TB patients and advocate for relevant structural (health and social system level) changes.

<p>treatment compliance and adherence during outpatient treatment, as well as to follow-up.</p> <ul style="list-style-type: none"> - Continuous treatment interruption: once hospital treatment is completed, they return to their social environment where they continue harmful behavior (alcohol abuse, drug abuse) because of which they stop ambulatory treatment and become DR-TB patients 	<p>throughout the treatment process.</p> <p>Ensure that there is an available shelter for the homeless people after the hospital discharge.</p>	<p>The task force should advocate for modifying current infrastructure and services (ministry of work and social affairs; state nursing homes and care centers) to provide shelter and social support/protection for homeless people to admit PWTB during the ambulatory treatment phase when they are not infectious.</p>
<p>PLHIV</p> <p>Lack of information on completion of TB treatment by HIV specialists.</p>	<p>Strengthen information exchange between doctors managing TB and HIV treatment for the same patients.</p>	<p>Establish a joint TB HIV task force to develop information exchange mechanisms between TB and HIV services and clear pathways of the implementation of those mechanisms, to assure that information about 1) treatment duration, 2) treatment regimen, 3) changes in treatment duration and/or regimen and 4) end of the treatment is available to doctors managing TB and HIV.</p>
<p>Migrants</p> <p>Fear of deportation among migrant workers leads to further <i>treatment interruption</i>.</p>	<p>Ensure that no migrant with TB was lost to follow-up after deportation.</p>	<p>Procedure of official notification of NCP of Armenia about deporting of a TB patient should be developed/established.</p>
<p>Getting post-treatment follow-up</p>		
<p>Homeless</p> <p>Lack of patients' compliance – sputum smear test sampling.</p>	<p>Ensure patient compliance during follow-up.</p>	<p>Introduce monetary or social incentives for homeless patients with TB who are to undergo sputum smear test during follow-up: transportation costs reimbursed, and fixed amount of money paid for each smear sample.</p>
<p>Stigma</p>		
<p>General</p> <ul style="list-style-type: none"> • Lack of TB awareness and population-wide 	<ul style="list-style-type: none"> • It is necessary to increase the consciousness of the TB 	<ul style="list-style-type: none"> • NGOs active in TB community together with NTP may initiate

<p>stigmatization;</p> <ul style="list-style-type: none"> • Stigma and discrimination as barriers to seeking care. 	<p>community and the general society to change the existing belief that “TB is a lifelong sentence”.</p> <ul style="list-style-type: none"> • Patient-centered care and treatment modalities should be considered at a systemic level. 	<p>"awareness raising" campaign, involving people with TB and their family members to share their experiences, identify common issues, based on which the NGOs should organize and lead the changes of harmful stigmatization practices in general population.</p> <ul style="list-style-type: none"> • Develop awareness raising materials and distribute in channels used by the general population to assert the rights and reestablish the social value of people with TB. • NTP and MOH collaboration to modify current TB care practices to reduce TB stigma (introducing alternatives to DOT).
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Introduction

Over the last years, Tuberculosis (TB) notifications and mortality rates have been steadily decreasing in Armenia[1]. Since 2007, the reported average annual decline was 10.3%. In 2018, according to World Health Organization (WHO) data total TB incidence rate was 31 (CI:24-39), HIV-TB coinfection incidence rate was 3.2 (CI:2.2-4.4), rifampicin-resistant (RR)/multidrug-resistant (MDR)-TB incidence was 8.2 (5.5-11) per 100,000 population[2]. The estimated proportion of TB cases with RR/MDR TB during the same year was 20% (95% CI: 16-26%) among new cases and 44% (95% CI: 35-54%) among previously treated cases[1].

TB treatment success rate has also been improved since 2012, reaching about 80% in 2018. Despite these positive trends, the TB treatment success rate is still behind WHO's recommended target of 85%. One of the possible explanations for this is the high proportion of lost to follow-up patients (LTFU). Among all TB cases notified in 2017, the proportion of the LTFU was 12.6% in Armenia, which is the highest estimate in the WHO European Region[1]. Although reasons for LTFU are not much studied, anecdotal evidence suggests that part of the LTFU could be attributable to a large number of seasonal migrant workers interrupting their treatment to travel abroad, mainly to Russia and Ukraine.

While the country has made progress with regards to drug-sensitive (DS) TB, the rates of drug-resistant (DR) forms of TB continue to increase. In 2011, the incidence rate for RR/MDR-TB was 2.6 per 100,000 population while in 2018, it increased significantly, reaching 8.2 per 100,000 population. The significant fluctuations in rates of TB during 2015-2019 period are also suggestive of potential notification, diagnosis, and reporting issues and inconsistencies[1]. With the deployment of GeneXpert MTB/RIF testing in laboratory infrastructure since 2013, bacteriological confirmation of TB has improved significantly [3]. Nevertheless, over the last six years, the improvement in proportion of bacteriologically confirmed cases has lagged behind, only increasing from 49.8% to 58.1% [1].

The incidence rate of TB in children in the age group 0-14 is 2.7 per 100,000 population, with an average decline of 14.2% from 2008-2017[1]. TB estimates have also improved among prisoners; the incidence rate was 480.8 in 100,000 population in 2016[1]. The proportion of HIV co-infection among all TB patients was 8.5% in 2017, twice higher than what it was 2008. The TB treatment success rate in HIV associated TB population was 63% for the period 2013-2017[1].

The TB care in Armenia is implemented by the "National Center of Pulmonology (NCP)" NCSO (National Tuberculosis Program) under the supervision and coordination of the Ministry of Health since 2016. All TB services are free of charge in the country. There are 59 outpatient TB clinics and two TB inpatient facilities throughout the country. The laboratory services are being implemented through the National Reference Laboratory and 25 microscopy laboratories. Since

The proportion of new smear-positive TB cases registered under DOTS in a given year that successfully completed treatment, whether with bacteriologic evidence of success ("cured") or without ("treatment completed")

2013, the NCP uses a centralized electronic database “e-TB manager” for collecting data through all TB outpatient and inpatient clinics, for monitoring and evaluation, as well as for general surveillance and reporting purposes. The country follows the WHO recommended treatment guidelines for treating DS and DR TB patients.

The need for access to quality TB prevention, diagnosis, and treatment have been recognized by the country, with a special emphasis on vulnerable groups. However, Armenia has neither a national definition for TB vulnerable groups/key populations nor specific protocols for TB detection within them, therefore there is no routinely collected TB-related data for these populations.

The existing gaps and shortcomings highlight the need for a comprehensive nationwide assessment for addressing vulnerabilities and obstacles faced by the key populations, as well as developing a tailored approach to achieve universal access to TB care. To address this need, we conducted an assessment of the community, rights, and gender (CRG) barriers among TB key populations in Armenia using adapted tools and methods developed by the Stop TB partnership and building on experiences of other countries that have successfully conducted CRG assessments[4–10].

AIMS

The assessment aimed to support the strengthening of national TB response through:

- Providing qualitative and quantitative evidence on how belonging to certain key populations, gender, stigma, and the legal environment impact vulnerability to TB infection, diagnosis, and treatment in Armenia.
- Developing recommendations based on the assessment findings to improve TB response with a greater focus on key populations and gender-responsive services.
- Developing recommendations based on the assessment findings to strengthen the legal and regulatory framework for improved TB response.

RESEARCH QUESTIONS

The assessment pursued the following research questions:

1. Key populations
 - How does belonging to one or more of the selected key populations ([homeless people](#), [migrant workers](#), and [PLHIV](#)) impact the dynamics of TB vulnerability, diagnosis, and treatment?
 - What program delivery changes could be made to improve TB response for people belonging to the selected key populations ([homeless](#), [migrant worker](#), [PLHIV](#))?

2. Gender and Stigma ([general PWTB and selected key populations, including home less people, migrant workers, and PLHIV](#))
 - How do gender identity and stigma impact the social dynamics of TB vulner ability, care access, and treatment outcomes?
 - What program delivery changes could be made to improve gender respon siveness in the TB programming and reduce stigma?
3. Legal environment ([general PWTB and selected key populations, including home less people, migrant workers, and PLHIV](#))
 - How does the current legal environment impact access to TB-related healthcare, or increase vulnerability and create barriers to access TB-related healthcare?
 - What rights-based programmatic responses could be put in place to improve the TB response?

RESEARCH DESIGN

The assessment utilized a qualitative research design. In addition, we carried out quantitative analysis (a facilitated research activity) to explore the association between gender and TB treatment outcomes using the national-level data routinely collected by the National Center of Pulmonology.

The CRG assessment activities have been largely influenced by COVID-19 pandemic-related restrictions. Most of the qualitative interviews and focus group discussions were conducted online. The research team faced challenges related to recruitment and interview arrangements of the policymakers and health care providers who were entirely involved in COVID-related responses in the country. The research methods and processes are described in the sections below.

CORE GROUP

In addition to the research team, a core group was formed to facilitate, guide, and support the assessment inception, planning, development of the methods, data collection strategies, desk review, data analysis, and development of recommendation based on the assessment findings. The core group also led and conducted the process of key population prioritization, findings validation and action planning.

The core group members included representatives from the Ministry of Health (MoH), “National Center of Pulmonology” NCSO (National Tuberculosis Program), academic and research sector, Non-Governmental Organizations (NGO). The core group was formed in October 2020 and regular contacts and meetings were held with core group members depending on the stage of the assessment and expertise of the core group the research team was needed. A list of all core group members is presented in Appendix 1.

MULTI-STAKEHOLDER INVOLVEMENT

The assessment involved a broad range of stakeholders that contributed to finalizing the assessment methodologies and validating the preliminary findings of the assessment. These activities were mainly achieved through two large multi-stakeholder meetings that were purposefully organized to maximize stakeholder engagement.

DURING THE FIRST MEETING WE:

- discussed gender-responsive, human rights-based, and multi-stakeholder approaches in the implementation of TB care in Armenia,
- defined key vulnerable populations for TB in Armenia,
- endorse community rights and gender assessment methodologies for identified key vulnerable populations.

The first meeting was held on November 4th, 2020, with the participation of about 40 stakeholders, including representatives from the MoH, NCP executive team and physicians, the Global Fund to Fight AIDS, Tuberculosis, and Malaria in Armenia, regional TB ambulatory physicians, representatives of NGOs, researchers, etc. A list of meeting attendees is presented in Appendix 2.

DURING THE SECOND MEETING WE

- presented and discussed the findings of the CRG assessment with stakeholders,
- received stakeholders' feedback on the findings,
- validated the assessment results and recommendations with stakeholders,
- draft a plan of actions.

The meeting took place on May 14th, 2021, included 22 stakeholders, including representatives of MoH, NCP executive team and physicians, the Global Fund to Fight AIDS, Tuberculosis, and Malaria in Armenia, regional TB ambulatory physicians, representatives of NGOs, researchers, etc. A list of meeting attendees is presented in Appendix 3. Due to the COVID-19 related restrictions, the two multi-stakeholder meetings were held online.

DESK REVIEW

The research team and core group conducted a thorough review of the literature to identify information gaps, inform adaptation of the CRG instruments. The literature and document review included scientific publications related to TB and each of the key/vulnerable populations available from the literature; national plans, strategic documents, guidelines, laws, and orders related to the delivery and regulation of TB services in Armenia.

A detailed description of desk review methodologies, references, and results are presented in the sub-section Desk review results.

KEY POPULATION PRIORITIZATION

The Global Plan to Stop TB describes TB key populations as people who have increased exposure to TB due to where they live or work; people who have limited access to quality TB services; and people at increased risk because of biological or behavioral factors that compromise immune function[11].

TB is associated with poor socioeconomic status and legal, structural, and social barriers that hinder universal access of affected TB people to care. There is no definition of the country-specific key, vulnerable underserved populations, and there is no routinely collected data for these populations in Armenia. Only a few formal assessments have been conducted to assess the access to care and treatment outcomes among high TB risk populations in the country. (see Desk review results section) Therefore, defining the key, vulnerable underserved populations and understanding cultural influences and perceptions in access to TB care and disease management can enhance the knowledge about TB and help to reduce perceived TB-related stigma and its manifestations.

To comprehensively identify and define TB key populations in Armenia we conducted a large multi-stakeholder meeting (the first multi-stakeholder meeting as discussed in sub-section 3.4.2) and used Key population prioritization tool[8]. This special tool was developed by Stop TB Partnership and included a list of potential TB key populations based on recommendations from WHO and The Global Fund, including [people living with HIV, people with silicosis, miners, migrants, refugees, induced displaced people, miners, prisoners, people who use drugs, people with alcohol dependency, smokers, sex workers, LGBT, homeless, people with mental or physical disabilities, urban poor, rural poor, people with diabetes, children in contact with TB cases, community health/outreach workers, and elderly.](#)

PROCESS

During the first part of the multi-stakeholder meeting the following topics were presented to the stakeholders by Core Group members:

- the results of desk review (legal/human rights, gender, key populations, and stigma)
- success factors for TB programming (multi-stakeholder, human rights-based, gender-responsive, and evidence-based)
- CRG assessment approach
- Key population prioritization tool

In the second part of the meeting, all participants were divided into four groups (in online breakout rooms) for the key population prioritization process. In each breakout room, core group members applied the Key Population prioritization tool, which was adapted for online usage (Appendix 4).

For each potential key population, the groups in each breakout room scored the following six areas:

1. Estimated contribution of all TB burden (active TB cases of all forms) by that key population (1- Very Low, <1%, 2 – Low, 1-3%, 3 – Medium, 3-5%, 4 - High, 5-10%, 5 – Very high, >10%).
2. Whether the key population is faced with any environmental risks such as being in an over-crowded or poorly ventilated space (0-No, 1-Yes).
3. Whether the key population is faced with any biological risks such as reduced immunity or poor nutrition (0-No, 1-Yes).
4. Whether the key population is faced with any behavioral risks such as inhaling from or exhaling into one another's mouth or sharing smoking equipment (0-No, 1-Yes).
5. Whether the key population is faced with any legal and economic barriers to accessing services such as criminalization and poverty (0-No, 1-Yes).
6. Whether the key population is faced with any human rights and gender-related barriers to accessing services such as stigma and discrimination (0-No, 1-Yes).

The sum of the above six scores represented the combined score for the key population (maximum 10). Since we had 5 discussion groups the highest score was 50.

After going through all the key populations listed, the working group had a qualitative discussion based on which the key populations with the highest combined scores were prioritized for the current assessment.

RESULTS

As a result of the aforementioned steps, the following groups were selected as a key (vulnerable) group.

Selected key population	Score	Measurable Definition
Homeless people	40	People self-identified themselves as homeless
People living with HIV	42	People with HIV associated TB
Migrants	48	Work migrants who go for seasonal work to other countries

At the end of the meeting members of the core group summarized key population prioritization exercises and collected all feedback and suggestions on the assessment methods from the participants.

STAKEHOLDERS' INVOLVEMENT

Because of Covid-19 pandemic restrictions, the meeting was held online, which created technical obstacles for a larger representation of community members. However, NGO representatives who diligently work with TB population attended the meeting.

DATA COLLECTION

Overall, the project team conducted 50 in-depth interviews (IDI) and six focus group discussions (FGD). The data collection started on December 1st, upon receiving an ethics board approval of the research protocols and lasted three months.

Study population

The assessment part related to the key populations included the following population:

- People with TB (PWTB) (above 18 years old) who self-identified themselves as belonging to the following three selected key populations and affected by TB:
 - People living with HIV,
 - Migrants (work migrants),
 - Homeless people.
- PWTB Family members,
- Healthcare providers, policy and decision-makers involved in the TB response, key population experts, representatives of NGOs, TB researchers.

The assessment part related to the [general PWTB](#) included the following population:

- People with TB (PWTB) (above 18 years old) and their family members,
- Healthcare providers, policy and decision-makers involved in the TB response, gender and human rights experts, representatives of NGOs, TB researchers.

Facilitated research activity included all patients registered at the NCP who received care during the 2014-2018 period. The assessment was linked to the information on their TB treatment and socioeconomic information from their medical records.

SAMPLING

We conducted purposeful and snowball sampling. Key informants were selected through the help of NCP and core group members, whereas the general TB population and representatives of selected key populations were selected through NCP, NGOs, and regional outpatient TB facilities.

For the facilitated activity, we requested information on all registered patients at the NCP who received treatment during the 2014-2019 period.

Research sites

Most of the interviews were conducted online through conference calls or upon participants' request by phone. Only interviews with PLHIV and the FGD with migrant workers were conducted face to face. These interviews were conducted in the premises of the Real World

Real People NGO, where the NGO staff were able to create appropriate COVID-19 related safety measures to conduct the interviews. The FGD with migrant workers was conducted in the NCP, following all appropriate COVID-19 related safety measures.

Data collection team

The data collection team included three researchers who had knowledge in research methodology and experience in qualitative data collection. Additionally, a hospital TB physician was also involved in the study to conduct interviews with the homeless population. The research team was advised that homeless people trust their physicians the most and would feel uncomfortable speaking with someone new to them. We acknowledged that this might have caused inaccuracy of patients' narratives regarding their treatment experiences. However, to reduce potential psychological discomfort to the study participants, we involved a TB physician in the data collection process.

The research team conducted training with the data collection team. The training was composed of two main components (1) ethical conduct of research and (2) key principles of the interviewing. The topics for the ethics part included: participants' rights, interviewers' obligation to respect participants' individual autonomy, the process of obtaining informed consent, protection of privacy, and the maintenance of confidentiality of participants and acquired data. The topics for principles of data collection included: non-judgmental interviewing, ensuring participation of all interviewees (for FGD only), and transcription tips.

Research instruments

Overall, 11 consent forms and 23 semi-structured interview guides were developed for each subgroup of participants. The research team reviewed STOP TB partnership tools [4–6,8], as well as instruments that were used for CRG assessments in the countries with similar TB-related epidemiological and socio-political context. Relevant questions were selected and adapted to the local context. In addition, the team developed new questions based on the results of the desk review. The research tools broadly captured the dynamics and experiences of TB infection, diagnosis, care access, and treatment completion from the perspectives of TB-affected individuals (patients and family members); healthcare providers; and stakeholders (including civil society advocates and government representatives).

The team pre-tested the study instruments and processes and made appropriate modifications of the assessment protocols before the main data collection. Besides, interview guides continued to be modified along with the progression of the data collection and preliminary analysis of the study findings.

Interviewing methods

Interviewing methods included:

- **In-depth interviews** – the interviews were conducted with PWTB and their family members. IDIs were more suitable for individuals who were not feel comfortable speaking in a larger group.
 - **Key informant interviews** – included representatives of the Ministry of Health, NCP (High level policy/decision makers, healthcare providers), Global Fund, NGOs, TB researchers.
- **Focus group discussions** – the discussions were conducted with PWTB. Focus groups helped to understand individuals' collective experiences and understand opposite experiences.
- **Facilitated research activity** - we conducted a quantitative analysis of the NCP database to assess the relationship between gender and TB treatment outcomes.

Most of the interviews and FGDs were audio-recorded, and only during a few interviews or FGDs when participants did not provide a consent for being recorded, notes were taken. All audio recorded interviews were transcribed for analysis. In addition, data collectors documented their impressions from the interviews. This information was analyzed along with the transcripts as the interviews' latent content.

Table 1 provides an overview of interviewed participants, including information on the study population, interviewing methods, and recruitment criteria.

STUDY RIGOR

To enhance the research rigor, we assured triangulation between data sources and methods of data collection. A diverse group of participants (key population, healthcare workers, representatives of the Ministry of Health (MoH), NCP, Global Fund, and NGOs) and settings (geography: urban, rural; facilities: healthcare settings and NGO premises) assured the triangulation of data sources. IDIs, FGDs, interview notes, research audit trail ensured triangulation of data collection methods, improving the trustworthiness of study findings. Moreover, enrolling participants from such diverse settings and locations increased the generalizability of the results and conclusions.

DATA ANALYSIS

For the qualitative part of the assessment, we applied deductive content analysis with an unconstrained matrix. The deductive content analysis was based on the TB journey, which includes the following stages: Recognizing symptoms, Seeking care, Getting accurate diagnosis, Beginning treatment, Getting treatment adherence support, Completing treatment, and Getting post-treatment follow-up.

In the Research Results section we present our results and recommendations separately for each key population and general PWTB. Within each key population, we identified qualitative categories that are related to a specific TB journey stage or were inductively derived from the analysis and are related to many TB journey stages. In addition, for each key population, we present findings related to gender, stigma, and legal barriers. For general PWTB we present the results related to gender, stigma, and legal barriers.

For the quantitative part of the assessment (facilitated research activity), we performed separate analyses for the DS and DR TB populations. Associations were assessed between gender and all other factors (TB type, comorbidities, history of imprisonment, behavioral factors including drug abuse and alcoholism). The gender variable in the database was binary (male and female options) thus this analysis covered only the biological sex of the patients (and not all genders). Chi-square test or Fisher Exact test (for cases where the number of observations was low) were used to check the associations between the gender and other categorical factors. For the continuous variable (age) Student's t-test was used as the distribution was normal. The significance level was set to $p < 0.05$.

ETHICS

The study protocols were reviewed and approved by the Ethics Review Committee, of the Healthcare Research & Development Initiative of Armenia. Study protocols were compliant with the international guidelines of ethical conduct of the research. Before enrolment into the study, all participants provided their consent. The consent form included information about the research team, study aims, participants sampling process, description of procedures after involvement in the study, participant rights, protection of confidentiality and anonymity of the data, as well as contact information of study team and Ethics Committee. Audio recordings were not transferred via the internet and were destroyed after the completion of the data analysis and validation. No identifiable information was collected from participants or requested from the NCP or other authorities.

DESK REVIEW RESULTS

Key Populations

According to Stop TB Partnership Global Plan to END TB key populations are defined as people who are vulnerable, underserved or at-risk of TB infection and illness [12]. There is 30+ group of populations that could care such vulnerability depending on a specific country context[13].

We aimed at identifying all publications related to Tuberculosis and TB key populations in Armenia. For that we conducted broader scope PubMed search and identified all publications that contain “Armenia” and “Tuberculosis” and “(key population)” in the entire manuscript (query - Tuberculosis AND Armenia AND “Key Population’s name”). We have summarized our findings and search strategies for all key populations, including for those for whom information is lacking in the Table 1. Below we summarize review for the key populations for which we have identified more data.

People Living with HIV

The available literature suggests having positive HIV status as an important factor associated with the unsuccessful TB treatment outcome in Armenia. In a cohort of TB patients with complex resistance profiles, about 36% of patients were HIV-positive[14]. Moreover, findings from a retrospective cohort study involving 1022 new TB cases, suggested TB patients living with HIV to have higher odds of unsuccessful treatment outcomes compared with HIV negatives (OR 1.9, CI [1.09–3.22])[15]. Another retrospective study compared the DR-TB treatment outcomes of HIV-positive and HIV-negative patients treated with an WHO-based individualized regimen. According to the study results, older age and not receiving ART were found to be associated with unsuccessful TB treatment outcomes in HIV-positive patients[16].

Migrants

About 6.5% of Armenian population are migrant workers, and there is no official referral system between the National TB Program and their counterparts in host countries of work in Armenia. According to International Organization for Migration report in 2019, Armenia is considered an emigration country, with migration mostly (90%) to the Russian Federation[17]. It appears, that migrant workers with TB who experienced treatment delays, dropped out of therapy, or had therapy interrupted were likely to increase the period of infectivity and spread TB to other persons, and were at higher risk for developing MDR-TB[18]. A cross-sectional survey of migrant workers, who worked outside Armenia for more than three months during the period from 2008 to 2011 and had a diagnosis of TB, revealed that over 30% of study participants worked in the regions of Russian Federation. Moreover, according to the same study findings, the time between first diagnosis and first treatment was about 5-times longer for those who were diagnosed in the host country than those who were diagnosed in Armenia. This difference may indicate the time of infectivity and the time for development of more

advanced TB. In addition, those who received treatment in the host country of work were 3.9 times more likely to have unfavorable treatment outcome than those who received treatment in Armenia[19].

Smokers

A retrospective cohort study identified higher odds of unsuccessful treatment outcomes among TB patients who smoked during treatment, adjusted for age, gender, anatomical site and alcohol consumption. In addition, smokers who started smoking at age 15–20 years old had a higher risk of Pulmonary TB compared to non-smokers[15]. The prevalence of smokers is high in Armenia. According to STEPS survey in 2018 in Armenia, of 2380 households included in the study, about 27,9 % of respondents in the 18-69 age group and every second men (51.5%) were considered smokers[20].

People with Diabetes

A cohort study including TB patients with diabetes and TB patients without diabetes registered in NCP, identified higher odds of having TB treatment failure among TB patients with diabetes (OR 8.99 CI [2.51–32.23]) compared to TB patients without diabetes, regardless of weight and sputum smear status[21]. According to The World Bank data, estimated prevalence of diabetes in Armenia (referred to the percentage of people aged 20-79 years who have type 1 or type 2 diabetes) was 6.1% as of 2019[22].

Children

Upon review, only two articles reported studies relevant to the topic. One of the studies reported increased incidence of tuberculosis among children aged less than 18 years. However, the reporting period was 1993-2003, which appeared not relevant in the context of current TB situation in Armenia[23]. A prospective cohort study showed that children in close contact with patients with DR-TB or in contact with very contagious patients had an increased risk of prevalent latent TB infection. Although none of the children developed TB disease during a 2-year follow-up period, several epidemiological concerns in DR-TB are emerging from these findings[24].

Elderly

In general, older age was associated with unsuccessful treatment outcomes, specifically in HIV co-infected patients and those with diabetes[16,21].

The current assessment is the first formal step toward defining and exploring key populations in Armenia. The project findings enhanced and improved NCP's understanding of TB response and sufficiency in relation to the key, vulnerable underserved populations.

GENDER

Available literature on gender aspects of TB for Armenia is limited (Table 2). Based on 2019 Global TB report the ratio between the men and women was approximately 3.5 to 1 (78% and 22% respectively) among new and relapse cases in age group 14 years and above[25]. According to the last Armenia's Epi review [1] the country has the highest sex ratio in the WHO European Region. During the 2013-2017 period male to female ratio ranged from 3.1-3.5, being highest in 2017. As the incidence and prevalence of TB is declining significantly in recent years the issues related to key populations are becoming more apparent. It is possible that the proportion of migrant workers is increasing and almost all of them are male. This may be the reason behind the increase of the ratio. Other potential reason may be the composition of the key vulnerable populations (e.g. HIV positive TB patients), which may be predominantly from male population.

However, no formal evaluation ever assessed such high proportion of male infected by TB compared to women in the Armenian population. Among all other indicators, the treatment outcome results disaggregated by gender are not routinely available. In addition to our knowledge, no evaluation ever looked at gender specific case-detection and treatment delivery concerns in Armenia. Even though the country has a good database (centralized electronic database, "E-TB manager") with sufficient data to be analyzed, the gender aspects of TB seem to be neglected in Armenia.

The assessment revealed the gender specific aspects of TB care delivery in Armenia, identify gaps and propose activities to reduce gender-related barriers in diagnosis and the provision of care.

STIGMA

Two publications were identified regarding stigma and TB in Armenia. These two publications were interrelated, one was a protocol of a trial where people-centered tuberculosis care was compared with the standard directly observed therapy describing the overall approach and the second one was the results of the trial[26,27]. In this study the stigma was measured in both study arms at the baseline and at the 4-5months follow up, using modified Van Rie stigma scale ranging from 0 (no stigmatization) to 27 (high stigmatization). In intervention and control groups respectively at the baseline the scores were 0.4 (SD – 1.6) and 0.9 (SD – 3.2), and at the follow up those were 0.7 (SD – 3.1), and 0.6 (SD – 2.7). All scores are indicating exceptionally low stigma levels.

Besides the PubMed search, other documents related to TB and stigma in Armenia were identified and reviewed. According to Extensive review of tuberculosis prevention, control and care in Armenia report [3], one of the challenges in the TB care system of Armenia was that there are not enough young doctors in TB practice and one of the reasons for that was the stigma or fear of becoming infected with TB. This was based on visits and interviews with the Ministry of Health and Yerevan State Medical University. Another analysis the TB control

system in Armenia in both the civilian and penitentiary sectors found that stigma and fear existed in general public, as well as healthcare workers. The stigma has contributed to the delayed utilization of TB services, adverse social consequence and as a result contribute to the spread of the TB. The report recommended awareness campaign as a part of effective TB control measures[28]. In addition, Demographic Health Survey (2005) [29] revealed that about 20% of respondents do not want to disclose their family member's TB status. The report also provides qualitative quotes related to respondents' description of TB stigma.

Apart from these, the eleven review and systematic review papers related to "Tuberculosis" and "Stigma" were identified and reviewed. However, none of the manuscript contained information about stigma in Armenia.

As can be observed from this review issues of TB stigma are not well explored in Armenia. Only a couple of research reports describe and quantified the stigma concept within the TB population. Moreover, the results from the study [27] that reports very low stigma are contradicting to the findings of Demographic Health Survey [29], which indicates that further exploration of the topic is needed to understand the situation. To sum up, none of scientific studies embarked on understanding of the root causes and providing a targeted intervention to address stigma-related barriers.

LEGAL FRAMEWORK

Country's Legal Framework and Patient Rights

Constitution of the Republic of Armenia defines right to Healthcare as following:

"Everyone shall, in accordance with law, have the right to health care. The law shall prescribe the list of free of charge basic medical services and the procedure for the provision thereof. (Article 85)" And according to the Article 29, "discrimination based on sex, race, skin color, ethnic or social origin, genetic features, language, religion, world view, political or other views, belonging to a national minority, property status, birth, disability, age, or other personal or social circumstances shall be prohibited" [30].

The law on medical assistance and services to population defines legal base for provision of medical services and population rights of receiving medical services. In addition to the core concepts, it defines right of a person to demand "confidentiality of the fact of visiting a doctor, of his or her health condition, as well as of the information revealed during examination, diagnosis and treatment, except for the cases prescribed by the legislation of the Republic of Armenia" and service providers to maintain the confidentiality [31].

Legal framework for TB

Treatment of TB and MDR-TB, including regimens with new TB drugs, is free of charge for the citizens of Armenia, irrespective of race, ethnicity, age, and gender. Access to treatment is equal for every diagnosed person with TB, irrespective of place of residence in the country.

Initiation of treatment is possible, at a patient's choice, either in a hospital or at their place of residence. However, most persons with TB initiate treatment in hospital settings and the decision on treatment model is often taken at the central level (NPC). The following legal documents serve a basis for provision and regulation of TB services in Armenia.

- 1) [Order of the Government of the Republic of Armenia \(31.03.17 N 13-N\) on establishment of sanitary rules and hygiene norms in the Republic of Armenia](#) – key document that specifies prevention, epidemic surveillance, detection and diagnosis, examinations, contact tracing, treatment, follow-up for the TB care.
- 2) [Tuberculosis Management Clinical Guide](#) – was developed in 2019 based on WHO recommendations and systematic review of the literature.
- 3) [Requirements for the delivery of TB care within the framework of free, state-guaranteed medical care and services](#) – was first developed in 2013, and currently being updated by the NCP and MoH. The requirement specifies that:
 - a. TB services are free of charge for the entire population (irrespective of age and socioeconomic status) at all levels of care (including in-patient, outpatients care facilities). Special procedures assuring equal and accessible TB care for detained TB populations are also defined in the requirement.
 - b. Preventive treatment is being implemented for
 - i. PLHIV (all age groups) without any symptom of TB or TB diagnosis
 - ii. Contacts (below 15 years old) of drug sensitive smear positive TB population
 - c. Home treatment modality and VOT is available for approved list of PWTB
- 4) [National Strategic Plan of TB, 2021-2025](#)
 - a. Objective 3. By 2025, transform the response to tuberculosis into a more equitable, law-based and focused on the needs of the most vulnerable populations to reach at least 90% of them with appropriate services.
 - b. Objective 4. By 2025, close the TB prevention gap in populations most at risk by accelerating access to TB testing and providing preventive treatment to all eligible people.
 - i. High-priority target groups:
 1. Children (<15 y.o.),
 2. People living with HIV,
 3. People with concomitant diseases (viral hepatitis, diabetes, mental disorders),
 4. Injecting drug users,
 5. Incarcerated people and ex-prisoners,
 6. Homeless,
 7. Labor migrants,
 8. Health care personnel,
 9. TB contacts (particularly in remote and rural areas),
 - ii. Target subgroups:
 1. People with all forms of TB under treatment,

2. People with latent TB infection,
 3. Children < 5 y.o. and <15 y.o.,
 4. People with biological, social, and other risk factors for unfavorable outcomes.
- 5) [Decision of the Government of the Republic of Armenia \(No 1937-N of 24 December 2003\) "On approving the procedure for allocating subsidies and grants from the State Budget of the Republic of Armenia to legal entities"](#) - allows for provision of grants on competitive basis to any organization, including the NGOs. To test this mechanism in practice the "National Center for AIDS Prevention" of the Ministry of Health announced a tender in 2019 for awarding grants TO NGOs for HIV prevention activities among KPs, as well as care and support activities of PLHIV in accordance with requirements of the above-mentioned governmental decree.

The capacity building activities for NGO representatives are irregular and the partnership and cooperation between the governmental and Non-Governmental actors of the HIV and TB National Strategic Programs are not well-coordinated. The discussions held with the medical staff, NGOs, community representatives and other partners revealed a strong need for cooperation between different actors involved in ACSM activities and the development of performance monitoring frameworks with well-defined guidance and indicators for social and peer support.

The involvement of NGOs in the area of TB is much less, limited mainly to ACSM activities, and psychosocial support to the TB patients, due to scarce number of NGOs in that field. The coordination between stakeholders (NPC and NGOs) has been poor, too. In the past, the NTP/NPC used to liaise with the local and international NGOs, such as Positive People Armenian Network (PPAN), AIDS Prevention Union, Armenian Red Cross Society (ARCS), Doctors without Borders and Mission East Armenia to at least partially implement the ACSM plan. Currently, the list of involved NGOs has been significantly shrunk to ARCS only, with involvement of a new player in the field – White Chamomile NGO – since 2020.

ARCS NGO has been traditionally involved in ACSM activities, namely – provision of psychological and social support to both drug-sensitive and drug-resistant TB patients on outpatient treatment, as well as educational and public awareness campaigns to reduce stigma and discrimination. Along with the mentioned routine activities, they also organize "2nd birthday events" for TB patients who have already successfully completed the treatment – by celebrating the end of long-lasting treatment together with the PHC TB medical staff and TB patients still on treatment in the outpatient setting. The purpose of this event is to motivate both the medical staff and particularly the TB patients to adhere to treatment. ARCS also mobilize migrants and their family members to PHC facilities for HIV testing.

White Chamomile NGO signed a contract with NCP in mid-2020 and since then is engaged in the following activities: provision of educational and psychological-social support to MDR-TB patients enrolled on modified short treatment regimens (mSTR) under Operational Research conditions. In parallel, they provide support for clinical management of MDR-TB to peripheral TB doctors dealing with patients on mSTR. Quite a novel activity on pharmacovigilance (PV) with doctor-to-doctor training and counselling is another area this NGO performs at present. Additionally, they support in data collection for MDR-TB/HCV co-infected patients in close cooperation with the social worker permanently based at NCP. In the nearest future, another form of support will be provided to peripheral TB medical staff when introducing video-supported treatment (VST) of TB, mostly – in the form of support for utilization of the mobile and/or web-based application.

For prisoners, there is a consortium of NGOs (Coalition to Stop Violence Against Women, Against Legal Outrage NGO, Pink Human Rights Defender NGO, New Generation NGO, Rights Protection without Borders NGO, Helsinki Citizens' Assembly-Vanadzor, Support and Development Mission NGO) with the mandate of Ministry of Justice (MOJ) who are conducting monitoring visits to all criminal-execution institutions throughout the country. While the main purpose of these visits is to reveal any violations of human rights, there are also a couple of components covered by the program – HIV and TB-related questions – in connection with the human rights and the right to healthcare. However, the mentioned consortium has no signed contracts with NCP.

For the upcoming three years and in the framework of the future Global Fund grant, a number of new activities are planned with involvement of NGOs. Specifically, ARCS (or any other selected NGO) will start on with TB systematic screening in key populations (namely – migrants) through WHO standard questionnaire and motivational counselling. It is planned that they will accompany those who are found of having more than 2 symptoms to mobile X-Ray units and/or nearest health care facility for further examination. For the migrants optimized case finding will be introduced too, aimed at motivating “index” TB cases to bring their close contacts to screening. A similar component will be utilized for TB screening of PWID by another NGO already involved in HIV preventive activities among this key population group – the NGO Real World Real People.

Finally, based on the current assessment, an Action Plan will be developed with a focus on removing CRG barriers among TB-affected people.

The engagement of NGOs in implementing specific interventions may build linkages to various prevention and treatment services for people released from prison. Medical and non-medical staff capacity building and awareness raising among staff and inmates with regards to health threats should be regularly conducted.

If necessary, prison specific Information, Education and Communication materials must be developed. So far, CSO involvement in service provision in Armenia has been ensured through funding from external sources, mainly the GF, but also some other donors, such as the Elton John Foundation. For sustainable transition, CSOs should continue their role under government funding.

The Transition Preparedness Assessment report revealed that the existing legislative base in Armenia is conducive for social contracting, particularly the above-mentioned Decision of the Government of the Republic of Armenia No 1937-N of 24 December 2003 “On approving the procedure for allocating subsidies and grants from the State Budget of the Republic of Armenia to legal entities”. Social contracting is practiced in other sectors and was applied in practice in 2019 in the health sector for the selection of NGOs. Yet, the decree requires some revisions to facilitate the process of selection of NGOs, while the Ministry of Health lacks detailed standards for preventive (non-medical) activities and methodology for the estimation of cost of services, which are essential for adequate social contracting. Nevertheless, the mechanism proved to be effective in the year 2021 when the Government committed to allocate relatively big amount to National Center of Infectious Diseases for HIV preventive activities among KPs through contracted NGOs.

RESEARCH RESULTS

Key Population - Homeless

Overall, five homeless PWTB (all were males) and six providers were interviewed, including hospital and outpatient TB facility physicians, NGO representatives, an NCP administration representative. A TB physician interviewed all five patients while they were hospitalized in the NCP. All patients were with a history of recurrent TB (including DR-TB patients) and shared similar experiences of becoming homeless.

Recognizing TB symptoms and knowing where to get help

Homeless PWTB reported being able to recognize TB symptoms and were aware of available TB services and related healthcare facilities.

“Fever, weakness, cough, sore throat: if it is there, I should go to the doctors, get examined, to see if I am really sick or not.” IDI (TB patient).

However, all patients in the study population had a TB infection history and were not referring to their first TB episode while sharing their TB journey story. Thus, it was challenging to distinguish whether the TB knowledge among patients was adequate at the very beginning of the TB journey.

TB treatment Initiation

In general, all our respondents mentioned having an easy access to TB diagnostic and treatment services. Providers mentioned two ways through which homeless people get access to TB services: directly approaching the NCP, or being referred by an outpatient / emergency care physician. Those with a previous history of TB infection directly approach the NCP or a particular hospital/outpatient TB facility physician. While those with presumptive TB usually are referred by polyclinics or get to the hospital on an ambulance.

“When the disease progresses, the complaints become life-threatening or someone around them notices, then they go to a medical facility or call an ambulance.” IDI (TB physician).

Few participants in both groups (patients and providers) mentioned that lack of appropriate identification documents (national ID, passport, registration address) is one of the barriers among homeless people for accessing TB services, especially at the outpatient level. However, the majority reported, *“no patient is out of care because of that (missing documents) issue”*. One of the physicians said, *“If a person comes to us, National Center of Pulmonology, and he comes with a suspicion of tuberculosis, the diagnosis and treatment are carried out without even having a passport.”*

Lack of treatment adherence support and continuous treatment interruption

Continuous treatment interruption was found as the most serious problem faced by homeless people with TB, particularly at the outpatient TB care. The study revealed four descriptive categories related to continuous treatment interruption among homeless people and highlighted potential underlying reasons in this vulnerable population. The categories are the following:

1. *Lack of understanding of TB treatment*
2. *Lack of psychosocial support*
3. *Increased risk of new vulnerabilities*
4. *Inadequate family relationships and support*

None of the interviewed patients reported any side effects leading to treatment discontinuation. However, the lack of treatment adherence support throughout the TB journey and especially at the beginning of the treatment appears to have a major role in continuous treatment interruptions, thus increasing risk of development of DR and MDR TB. These findings were triangulated across hospital and outpatient TB facility physicians, NCP administration and NGO representatives.

1. *Lack of understanding of the importance of TB treatment*

Most of the interviewed patients mentioned, that they were unaware of the nature of the disease and did not recognize the consequences of treatment interruption at the beginning of the disease. One of the patients said, *“When 10 years ago I got sick, they [TB doctors] either did not explain it [TB disease] well or I did not have a good idea of what TB is.”* Lack of medical counseling at the beginning of the treatment was an issue for all participants.

2. *Lack of psychosocial support*

Both providers and patients highlighted the social support services are limited and include: a) small financial support covering travel expenses for ambulatory treatment, and b) programs providing food and clothing during the hospital stay and occasionally during ambulatory visits.

Gaps in social support services were reported especially for the period after hospital discharge (outpatient level and after treatment completion), and included a lack of sustainable, targeted support after hospital discharge, and lack of state programs to solve the employment and permanent living place/shelter issues. As it was mentioned by one of the interviewed TB physicians, *“The main problem is what happens with the patient after discharge. When they know that they have to be discharged, saying from my own experience, they are getting extremely aggressive, that is, “why are you discharging me, I will go and stay homeless again, my tuberculosis will get worse, I will interrupt... [the treatment]””*.

"...I do not know what I will do, where I will go. I have no place to stay. Before I got sick, I used to drive a taxi, rent a house with that money, or stay at an acquaintance's house... Now, I cannot stay in the house of any acquaintance. If they know I have TB, they will not accept that..." IDI (homeless TB patient).

Apparently, being homeless, lack of financial resources and lack of social support after hospital discharge forces patients to continuously search for work. After finding work, it becomes difficult for them to make daily/weekly visits outpatient TB facility and comply with the treatment regimen, resulting in continuous treatment interruption.

"Because I had a problem with living place, money, I left my treatment halfway after being discharged [from hospital]. Instead of getting treatment, I was working. I was a cattle breeder, mainly being in the mountains." IDI (homeless TB patient).

"...they have to be registered [in an outpatient facility], to be in the registered area in order to use that outpatient services, the main question comes here: for example, one can be registered in an outpatient facility at a particular region (marz), but work in another region. In that case it is difficult to go to another region to get the medicine on daily basis, so they usually leave the treatment halfway." IDI (TB physician).

It appears that, no formal social support services exist specifically for homeless people living with TB. According to the law, people with TB or HIV cannot be admitted to elderly homes or other institutions that provide social support. Moreover, there are no other formal shelters for them. All participants were aware of the only center (NGO) providing shelter and support for homeless people. However, respondents noted that some of homeless people do not obey existing *"strict religious principles"*, *strict rules for "no alcohol, no smoking, not allowed to leave the shelter"*, thus *"stay out"* of care, as there are no alternatives. The need for a shelter for homeless people, where they can stay for the duration of the outpatient treatment phase, was a recommendation triangulated across all stakeholders.

"I wish there would be a place for patients like us, where we could stay after discharge, but it would not be like a prison..." IDI (homeless TB patient)

In general, all participants were satisfied with the services provided at hospitals (during inpatient treatment), emphasizing the *"kindness"*, *"supportiveness"* and *"willingness to help"* of medical personnel. However, patients were concerned about social isolation, treatment in a closed setting, and related psychological issues. One of the patients said:

"I would like a psychologist to help us with our treatment. Now, when we talked [refers to an interviewer], I told everything, I feel relieved." Another patient told, "I received psychological support only from my physician..."

The need for psychological support was observed indirectly as well:

"I have unbelievably bad feelings now; I feel like I am aging faster than I should be. During the last 10 years, I missed my dear ones [կարոտ] and went through family breakdown. I even cannot communicate with my former social network." IDI (homeless TB patient).

3. *Increased risk of new vulnerabilities*

The pattern of TB journey of homeless people was also remarkable because of its potential for a vicious circle. The socio-behavioral and environmental vulnerabilities lead to physical/health vulnerability, which in turn worsen their socio-behavioral and environmental vulnerabilities, resulting in a self-perpetuating mechanism. Subsequently, homeless people are at risk of *"never completing treatment"* and developing DR-TB, apparently having a significant share of country's TB burden.

All participants reported that they became homeless after their TB diagnosis. One of patients shared his personal story about becoming homeless after contracting TB as a migrant worker. This indicates the other side of the above-mentioned vicious circle, when a socioeconomic and environmental vulnerability (e.g. migrant work) triggers health vulnerability (e.g. developing a TB), thus resulting in another social vulnerability (becoming homeless).

Majority of participants in both patient and provider categories did not report any behavioral problems during the hospital stay. However, treatment interruption at the outpatient level was perceived to be linked to harmful behavior (e.g., alcohol abuse) among the homeless population. This finding was consistent across all respondents.

"... until now, I have been receiving treatment at the hospital 3-4 months, then have been leaving my treatment incomplete after discharge. Meanwhile, I stay at different places. There are people who drink [alcohol] around me. We drink together. Mainly for these reasons I stopped my treatment." IDI (homeless TB patient).

"They have a different [low] compliance ... [low treatment adherence due to harmful behavior and social vulnerability]." IDI (TB physician).

Once hospital treatment is completed, patients return to their social environment where they are at a higher risk to continue their previous harmful behavior, resulting in treatment interruption at the continuation phase and developing DR.

“The whole problem starts right after the discharge, the serious problem. The patient is discharged, there is no place to stay, and of course, if the patient is in a bad social condition, bad habits start, injecting drugs, abusing alcohol, etc... he does not take medicine. Tuberculosis progresses along with the risk of disease spread...” IDI (TB physician)

4. *Inadequate Family relationships and support*

Family relationships and support were important aspects in understanding the treatment interruption. Most of the participants avoided talking about their relations with family members, stating that TB *“ruined families”* and *“ruined relations with surroundings”*.

Lack of support from the family and relatives was also perceived to worsen the financial burden and shelter-related issues for homeless people struggling with TB. Some of the participants reported being *“forced to interrupt ambulatory treatment”* because of losing the financial support or temporary shelter provided by their relatives. Thus, they were continuously changing location for living place, or because of handling irregular/odd jobs, and could not afford daily visits to the ambulatory anymore.

Physicians and social workers also mentioned the role of support from family in the social and health rehabilitation of these patients. As a social worker said, *“... it is very important when a person recovers, changes his life, we find his relatives, we help the family to reunite.”*

Lack of patient compliance during post-treatment follow-up

Interestingly, not much information was received regarding post-treatment follow-up, which most probably is related to the above-explained issue of *“never completing treatment”*. However, physicians highlighted a lack of patient compliance for regular laboratory check-ups:

“We have a patient who avoids tests (sputum test) from the 3rd to the 4th month, they say we do not have it [sputum] to give.” IDI (TB physician)

Perception of TB and Stigma

Perception of TB among homeless people was extremely negative in terms of its overall impact on life, generally distinguished as a disease that leads to social isolation and significantly affects life. One of the participants said, *“A person living a normal life became a homeless person. [Because of TB]”*

Most participants in both groups (providers and patients) did not perceive any considerable differences in TB journey with regards to gender. Whereas perceived TB stigma and discrimination were highly dominant among homeless TB patients. Most of homeless

participants in the study reported instances of being treated differently by their surroundings and even family members. They also experienced that they were “*unwanted*” or had a feeling that others are “*annoyed*” by their TB diagnosis.

“I felt that after that [TB diagnosis] my wife was avoiding me. She did not want me to spend too much time with my family...” IDI (homeless TB patient).

“I didn’t tell anyone [about TB], as I knew they [family and relatives] wouldn’t let me be around, neither then, nor now.” IDI (TB patient)

Interestingly, among the TB care providers (TB physicians, NCP administration, NGO representatives, etc.) stigma and discrimination were not present in the open context. Moreover, all stakeholders and patients shared the same perception of complete acceptance and supportive attitudes by the TB care providers.

“There is no discrimination by the medical staff, even the opposite: our staff provided them with clothes, money for transport was provided if they did not have.” IDI (TB physician)

However, there were few observations in the hidden context that were indicative of alienating attitude towards homeless people with TB.

LEGAL BARRIERS

One of the major legal barriers is that law prohibits PWTB to be admitted to elderly homes or other institutions providing social support. The need of advocacy to change the law and open up the existing structures – elderly homes or other institutions providing social support – to homeless people on effective anti-TB treatment, was a recommendation triangulated across all stakeholders.

We have contradicting findings regarding homeless people’s access to other health services. Some of the providers thought there are no issues, whereas others, including homeless TB patients, mentioned that lack of appropriate identification documents (national ID, passport, registration address) was a major barrier for accessing TB as well as other health services.

“It is already a problem for the doctor, although our director [of polyclinic] says that no patient should be left out of the treatment [because of documents issue], it is already a problem from the legal point of view, opening a medical record form [anketa] for him [homeless patient] and providing care.” IDI (TB physician)

In addition, lack of appropriate identification documents was also mentioned by the providers as a barrier to state social support services, such as disability pension.

One of the providers mentioned: “Because they [homeless TB patients] have issues with documents, along with several debts to bank [loans], they are not getting the full amount of money [disability pension and other official social support]”.

Further, it appears that knowledge and perception of “patient’s rights” are incomplete or even inadequate in some cases among the homeless people with TB.

“That [speaking about patient’s rights] is the most wrong thing. What rights? You have to do whatever they say. Here people live even better as they do at home. Such a good food, warm place... If everything is ok, then why should I claim for rights?” IDI (homeless TB patient)

RECOMMENDATIONS

The following recommendations were developed based on triangulated findings of this study:

- To provide structured psychosocial support to homeless people through health education, individual and group counselling, support in every day life situations throughout the course of treatment but especially at the start of the treatment, focusing on:
 - Importance of treatment adherence
 - Support and harm reduction to manage harmful alcohol or drug use
 - Increasing role and reactivity of existing psychological services within NTP in the delivery of care
 - Adequate medical counseling to ensure the patient understands the disease, and that they are at the center of decisions about their treatment and care.
- Shelter for homeless people: Advocate for current structures providing shelter and social protection for homeless people to admit PWTB during the ambulatory treatment phase when they are not infectious. Considering the financial and technical feasibility, this was acknowledged as the most realistic intervention for the solution of shelter issue for homeless PWTB. As the aforementioned advocacy assumes changes in legal regulations, involvement of key stakeholders such as NCP, relevant ministries and representatives of other social protection infrastructures is anticipated. This will not only meet the homeless needs for a secure living place and enhance their social protection but also will have a significant contribution to other forces targeting continuous treatment interruption.

	TB Journey	Findings/obstacles	Recommendations
1	Recognizing symptoms	All patients in the study population had a TB infection history, and reported being able to recognize TB symptoms and were aware of available TB services and related healthcare facilities.	N/A
2	Seeking care		N/A
3	Getting accurate diagnosis	No Issues.	N/A
4	Beginning treatment	Hospital treatment no issues at all – can be referred from outpatient facilities or directly come to the hospital and be admitted.	N/A
5	Getting treatment adherence support	Lack of patient's understanding of TB treatment in relation to treatment adherence at the beginning/during the disease. Lack of treatment adherence support. Lack of support during hospital treatment, including psychological counseling.	Continuous support for treatment adherence at the beginning and throughout the treatment process <ul style="list-style-type: none"> • Adequate medical counseling; • Support and harm reduction to manage harmful alcohol or drug use; • Increasing role and reactivity of existing psychological services in the delivery of care.
6	Completing treatment	Lack of social support from family and social circle. Issues with ambulatory care: <ul style="list-style-type: none"> - Not having permanent place to live is a barrier to treatment compliance and adherence during outpatient treatment, as well as to follow-up. - Continuous treatment interruption: once hospital treatment is completed, they return to their social environment where they continue harmful behavior (alcohol abuse, drug abuse) because of which they stop ambulatory treatment and become DR-TB patients. 	<ul style="list-style-type: none"> • Advocate for current structures providing shelter and social protection for homeless people to admit PWTB during the ambulatory treatment phase when they are not infectious.
7	Getting post-treatment follow-up	Lack of patients' compliance – sputum smear test sampling.	

KEY POPULATION - MIGRANTS

Overall, nine IDIs and three FGDs were conducted with eighteen participants, including migrant workers with diverse TB treatment outcomes (2 females and 8 males), migrant worker's family members, NCP administration, high-level decision/policy makers, NGO representatives, migration expert, and TB physicians at the outpatient level. All patients were diagnosed with TB in Armenia and had a history of migrant work in the Russian Federation (RF).

In the local context of TB, all participants meant RF while talking about the host country. In general, we observed that migrant workers' vulnerability to TB origins in the home country and pass over every stage of their migrant journey - during transit to host country, in the host country, and upon returning home. This vulnerability stemmed from different factors, such as poverty, poor living conditions, lack of social, financial, and legal risk protection. Those factors are relevant to both home and host countries.

Fear of deportation and treatment interruption (refers to all TB journey steps)

Our review showed that in RF entry permit and deportation procedures of non-citizens diagnosed with TB are regulated by law. According to the law, people with TB are denied entry and work permits and are subjected to deportation. Deportation based on TB status significantly affects TB control by reducing the health-seeking behavior of migrant workers with known or suspected TB infection, causing a *delay in seeking initial care for TB diagnosis*.

Fear of deportation among migrant workers can also lead to *treatment interruptions*, increasing the risk for developing drug resistance, thus adding to the burden of TB in host and home countries.

"In RF, TB is included in the list of special disease category, and those who do not have a residence permit are at risk of deportation if diagnosed with TB...thus they [migrants with TB symptoms] delay in seeking medical care as long as possible..." IDI (high-level decision/policy maker)

"I was diagnosed there [in RF] ... I was contacted though phone while being in Russia and was told to leave [leave from RF], otherwise they would have to send me and my family members back to Armenia [deport]. I informed that I had already bought the tickets and planning to leave for treatment voluntarily." IDI (migrant worker with TB)

These findings were triangulated across high-level decision/policymakers and NCP administration representatives, a migration expert, TB physicians, and TB patients. Details of these findings and their discussion are presented below.

The majority of migrant workers do not hold any legal status in the host country (particularly in RF) and are not covered by health insurance. Although they still can access to paid/private services, they hardly utilize such services because of financial constraints.

“The problem is that they are not insured. But they can use paid services regardless of their citizenship.” IDI (migration expert)

Thus, migrant workers do not seek care as long as they do not experience severe symptoms. As they develop severe disease, they seek care or are transferred to hospital via ambulance. In this case, inpatient TB care at a hospital is provided free of charge. Once the hospital treatment is completed and the patient is discharged, a patient is subjected to deportation. Here the issue of treatment interruption is also related to the differences in treatment regimens in the host vs native country and lack of *“legal document on the treatment received in the host country...”*, as one of TB physicians mentioned.

“None of them [migrant workers diagnosed with TB] have an official document on treatment received, no information on treatment history: as we understand, patients do not keep the epicrisis/discharge letter provided in Russia, or even prefer to hide it. Subsequently, here (in Armenia) the treatment and everything starts again.” (High-level decision/policy maker)

In case when TB is diagnosed in Armenia, treatment interruption occurs at the point of outpatient treatment. After completing treatment in the hospital and feeling slightly better, most of the patients abandon their treatment and leave for work again.

“After discharge from the hospital, patients do not reach the ambulatory care, they leave for Russia...we have a problem to keep those patients engaged in treatment...” (NCP admin. representative)

“There are cases of lost to follow up because after being discharged patients may leave immediately [to Russia]. No contacts of patients, we even do not have the opportunity to explain them the importance of not interrupting ... When they come back, they are already drug-resistant.” (NGO representative)

In Russia, because of fear of deportation, they prefer to hide their disease and not receive any treatment. Hiding the disease adds to the TB burden, as people have a higher chance of developing drug resistance due to the long treatment interruption. Those who by any means receive/continue TB treatment in host country may also be under the higher risk of developing drug resistance and there are different treatment regimens in Armenia and RF (discussed above)). Further, when the TB related health condition worsens, they leave their job to return to Armenia. Subsequently, losing job adds to their social vulnerability.

“Issues emerge at the point when patients leave in the middle of treatment...they interrupt the treatment [in Russia] ... and when back [to Armenia], they are mostly drug resistant. Here [in Armenia] they need some time to resume the treatment, e.g., because they cannot find the doctor in the polyclinic... obviously, that additional delay affects the overall effectiveness of treatment.” (NGO representative)

Lack of cross-country collaboration in TB treatment (refers to all TB journey steps)

Another reason for treatment interruption is the lack of cross-country collaboration. It appears that there is no official agreement or collaboration between TB program in Armenia and programs in any other countries, including Russia. Moreover, there is no formal or informal communication channels between TB programs in Armenia and Russia. As the treatment regimens and overall guidelines differ between Armenian and Russian NCPs, lack of appropriate communication between these institutions complicates the follow-up and continuity of care among migrant populations.

In general, once a migrant worker with TB diagnosis returns from Russia to Armenia and seeks care (National Center of Pulmonology or outpatient facility), Armenian NCP makes efforts to obtain information on patient's previous treatment history and medical records. However, as the NCP administration representative highlighted, *"those are individual cases, Armenian site initiatives, but no formal agreement with any country exists."* Similarly, when a migrant worker diagnosed with TB in Armenia travels to Russia, there are no mechanisms or legal regulations to assure treatment continuation. As explained by a government representative, *"the only choice is to provide patients with take-away medications with approval of National Center of Pulmonology SNCO director..."*

However, providing supply of medication by the home country for the entire period of migrant work is not feasible. First, the law limits the number of medications allowed for a cross-country transfer. Second, some of the drugs that are included in the standard treatment regimen in Armenia are not registered/approved in Russia, and transportation of those drugs can be result in legal persecution. In addition, as a government representative mentioned, *"...no outpatient facility physician would take responsibility to follow-up such patients who receive treatment with drugs that are not registered ..."*

As reported by government and NCP representatives, a discussion has been recently initiated between NCPs of Armenia and Russia, and negotiations were made for the establishment of cross-country regulations of TB care among the migrant population. The procedure was hindered by the COVID -19 pandemic. The government representative mentioned that in May, 2021 a discussion was held between the MOH representatives of European Economic Union (EEU) countries. The legal regulations regarding TB/HIV status and deportation remained unchanged. However, there was a recommendation addressing opportunity of TB treatment continuation after acute inpatient care, emphasizing that migrant TB patient may continue their treatment in the host country, particularly in RF, if they are eligible to pay or provided with funding from other reliable sources. This was perceived as a *"window for future discussions"* by the government representative.

DEEP DISCRIMINATION, STIGMA, AND UNEMPLOYMENT

Besides the issues identified in TB treatment, the study findings suggest stigma, self-stigma, and deep discrimination as another major concern in this vulnerable population. All patient-participants shared similar stories about losing jobs and becoming socially isolated after they contracted TB. Some of them described their state as *“got disgraced”, “lost everything”, “feeling guilty”*. One of the participants faced hard psychological pressure because of the feeling of guilt that he transmitted infection to his child and wife. All participants expressed deep concerns regarding the unemployment issue.

“I am no longer employed because I was hospitalized for tuberculosis. They [people] say, “He came, oh, this man came, go away from him...”. This means that you have registered us everywhere and everyone already knows that we have this disease, and this is a disgraceful condition. One may get influenced by this attitude and feel even worse...” IDI (TB patient)

“...You have tuberculosis, you are contagious and that’s it...” IDI (migrant PWTB)

LEGAL BARRIERS

The legal status is identified as one of the most important determinants of access to appropriate health services for migrant workers. In the context of TB and labor migration, one of the most robust findings in respect to human rights was that non-citizens who were diagnosed with TB were subjected to deportation from the host country. This is also relevant to the most popular destination (Russian Federation) among migrant workers in our study. However, those TB patients requiring emergency care receive the needed services before their deportation.[32]

In the context of the local legal environment, there is a gap in the assurance of human rights and protection of migrant workers. As the migration expert said, *“There is no single word about the protection of those who leave (migrant workers): you just pack up and leave Armenia.”*

Absence of national universal definition of migrant workers

Different governmental, non-governmental, and international organizations have different definitions and collect different types of data regarding migrant workers or labor migrants in Armenia.

“There is an issue with statistics: different sources publish different numbers because the methodology of counting is not universal.” (Migration expert)

"...I have not come across a clear definition [of migrants] in Armenia, though I have tried to find out who is considered as migrants..." (NCP admin. representative)

In general, according to the migration expert, UN definitions of migrants and migration process are used in Armenia. As for the local TB context, some of the stakeholders perceived migrants as *"those who go abroad for seasonal/interim job,"* mostly to Russian Federation.

"I cannot say by definition, ... might be people (migrants) who work abroad, time to time visiting family on vacation, then return to work." IDI (TB physician)

The absence of a clear definition of migrant workers or labor migrants in Armenia leads to inconsistency in statistics and results in underestimation of the scope of the problem. Lack of such a national, universal definition causes inaccuracy in the identification of migrants and subsequently leads to misclassification. As a government representative mentioned, *"...one may self-report as a migrant, while he just studies abroad... so, is he a true migrant?"* These findings were triangulated between high-level decision/policymakers and NCP administration.

RECOMMENDATIONS

Based on the study findings, we developed several recommendations to contribute to the strengthening of TB control and prevention measures for this vulnerable population, and address the identified issues and gaps in TB related services provided to migrant workers in Armenia.

1. Initiate an awareness raising campaign aimed to bring TB awareness, screening, and support information leaflets/ brochures at the points of departures (bus stations, airports, etc.)
2. Active migrant (community members) in RA who will be advocating about the health risks related to TB, patient's rights and will raise awareness of existing social, legal and health services for migrant workers in RA and hosting countries.
3. Collaboration – Considering the role of collaboration between NCPs of Armenia and host countries, particularly RF, it is of high importance to develop strong and sustainable instruments for coordination and monitoring of TB services for migrant workers.
 - Considering legal barriers that were described in the results, and that due to, law constraints the procedure of deportation cannot be suspended, a procedure should be developed to officially notify the NCP of Armenia about the arriving TB patient. This will enable adequate follow-up and care organization for migrant TB patients.
 - One of the feasible options for the collaboration is the following: all migrant workers diagnosed with TB in the Russian Federation should have the opportunity to continue receiving treatment in RF regardless of their legal status, meanwhile the Republic of

Armenia will be responsible to compensate of all treatment-related expenditures of those patients.

	TB Journey	Findings/obstacles	Recommendations
1	Recognizing symptoms	No issues	N/A
2	Seeking care	Deportation on the basis of TB status significantly affects TB control by reducing health-seeking behavior of migrant workers with known or suspected TB infection, causing delay in seeking initial care for TB diagnosis. However, none of respondents mentioned issues with getting accurate diagnosis.	<ul style="list-style-type: none"> - Initiate an awareness raising campaign aimed to bring TB awareness, screening, and support information leaflets/ brochures at the points of departures (bus stations, airports, etc.) - Community members who will be advocating about the health risks related to TB, patient's rights and will raise awareness of existing social, legal and health services for migrant workers in hosting countries.
3	Getting accurate diagnosis		
4	Beginning treatment	No issues	N/A
5	Getting treatment adherence support	No information	Procedure of official notification of NCP of Armenia about deporting of a TB patient should be developed/established
6	Completing treatment	Fear of deportation among migrant workers leads to further treatment interruption	Procedure of official notification of NCP of Armenia about deporting of a TB patient should be developed/established
7	Getting post-treatment follow-up	No information	N/A

KEY POPULATION - PLHIV

Overall, two FGDs and an IDI with 13 PLHIV (7 males and 6 females) were conducted. In addition, IDIs (12) were conducted with family members (four), care providers including NCP and NCID physicians (three), NGO representatives (two) and NCP administration, high-level policy/decision-maker (three) The patients included in the study were in different stages of treatment.

All patients' and their family members' interviews were conducted among beneficiaries of RWRP NGO. Thus, we would like to acknowledge that these participants are more likely to be aware of social and other support programs available for PLHIV, have higher knowledge of both TB and HIV, have higher coping mechanisms, value social support and cooperation during the treatment, largely utilize existing psychosocial support services, and have a higher treatment adherence. In all interviewed PLHIV and their family member, we have observed the above-mentioned characteristics.

RECOGNIZING SYMPTOMS, SEEKING CARE, AND GETTING AN ACCURATE DIAGNOSIS

Many of the study participants were first diagnosed with HIV and then TB. Therefore, emerging TB symptoms were captured by HIV physicians. Then they were referred to the TB facilities from the National Center of Infectious Disease (branch responsible for HIV surveillance and AIDS prevention). Since the HIV screening is offered to all newly diagnosed TB population, in some cases HIV diagnosis proceeds the TB diagnosis. In addition, there is TB physical NCID who routinely monitors for TB symptoms based on the WHO guidelines.

Since this is a routine procedure and healthcare workers providing care in HIV and TB field are aware of the increased risk of co-infection, we did not detect any issues in recognizing symptoms (by healthcare providers) in a group of participants who already had one of the infections.

In a few cases, TB and HIV were diagnosed simultaneously. In this light, TB, and HIV symptoms interwind, which made accurate diagnosis more difficult. Often patients changed multiple providers and tried different treatment modalities before being referred to TB or HIV facilities. One of the participants mentioned about his primary healthcare physician that *"s/he was so happy that after two years of struggle they were able to finally make a proper diagnosis"*.

A family member of a patient simultaneously diagnosed with TB and HIV mentioned that the initial symptoms were not recognized by healthcare workers, and only after a couple of failed treatments (including hospital treatments) one of the providers referred the person to the TB hospital for a checkup, where patient's TB and HIV was diagnosed. Two other participants shared a similar history.

BEGINNING TREATMENT

Family members did not mention any obstacles and were highly satisfied with hospital treatment and follow-up treatment.

In general, all PLHIV and their family members were satisfied with hospital treatment. In particular, they highlighted the support of the staff.

“I am incredibly happy with the doctors, nurses and paramedical staff, we became friends... I was treated very well; I am very pleased with them” (PLHIV).

“Everything surprised me. I’m just amazed at the reception, the attitude from the staff.” (PLHIV family member).

As a result, patients have trust in the physicians and the treatment. Hence, after the recurrence of the TB, the patients were ready to initiate the treatment and go on the same journey again.

“When it happened again, to be honest, I was very “happy”, because I knew how to treat myself, I was already a professional... of my own free will, I went to the hospital.” (PLHIV).

DIFFICULTIES OF THE DIAGNOSIS ACCEPTANCE AND THE TREATMENT

The participants commented that the acceptance of the TB diagnosis was very difficult for them, especially after HIV. Some of them mentioned having no actual knowledge regarding TB.

“I somehow managed to cope with HIV, but when they said tuberculosis, it ruined everything. I had hard times these days, I refused to be treated, I refused lab tests, I refused everything ...” (PLHIV)

Furthermore, most of the study participants were worried about their family members, particularly for their children and grandchildren.

“I was worried for my family members, grandchildren, and children. We interacted every day and I was worried to infect them. I was not thinking about myself as much as I did for the children, I was very worried, I still have that anxiety.” (PLHIV)

Major obstacles for this key population during the treatment were side effects, which led to the interruption of ARV treatment.

However, according to our participants, the professional approaches demonstrated by the physicians at the NCP and NCID were sufficient to overcome the mentioned challenges in diagnosis and treatment.

GETTING TREATMENT ADHERENCE SUPPORT AND POST-TREATMENT FOLLOW-UP: ROLE OF NGOS

In addition to satisfaction from the entire process of the treatment, the participants have emphasized the role of NGOs as well. The NCP administration and high-level policy/decision-makers highlighted the importance of NGOs and psychosocial support in the context of patient-centered care delivery for the TB population.

According to the study participants, NGOs have a crucial role in the life and treatment journey of PLHIV. It is difficult for patients to find out about social services they can use through government agencies. The affected population even considers it to be pointless to turn to their community social workers due to stigma. As an NGO representative stated:

“TB/HIV patients avoid going to their regional social service office, from which they do not get anything but stigmatization and discrimination. moreover, people seldom go there because they are certain that they will be stigmatized.”

As a rule, the patients learn about NGOs through the NCID. NGO representatives have routine visits to the NCID and NCP to provide information about their services. Moreover, when a patient is sputum smear-positive and the NGO staff do not have an opportunity to meet the patient in person, they stay connected with patients' family members.

Other important benefits for the patients, resulting from the NGOs operations include:

- Establishing new community network, getting to know, and freely interacting with each other (*“Quite a good society has been formed among people living with HIV, they are in friendly relations, they inform each other.”* NGO representative)
- Provision of peer-to-peer TB counseling.
- Receiving psychosocial support (*“It is also important to have psycho-social counseling at the NCP, or if there is one then to develop it further. I have never heard of patients using such a service there. They need it very much. In other words, they should not wait for an NGO to come and help, because the NGO may not be there tomorrow.”* IDI, NGO representative).

The NGOs also help people to receive official disability status. Sometimes these patients need other medical services (e.g. MRI). These services are not included in the basic benefit package or the clinics cannot provide these services (set quantity is available for a period which may be all used up), so the NGO helps to schedule a visit to another clinic to get these services. According to the same NGO representative, if there is no NGO, then patients would never know about all services available to them (governmental and/or non-governmental).

STIGMA AND GENDER

Perception of the stigma among our participants was controversial. In two cases patients reported total harmony and understanding of the process of diagnosis and treatment. There was no “internal” stigma in the family. They supported each other during the challenging time of the treatment but did not disclose information about the illness in the community.

“I am a strong person in general, I showed that everything will be good... I still support as much as I can.” (PLHIV family member).

On the other hand, in some cases, family members did not speak with patients for a while after learning about TB. Lack of support from the family and relatives resulted in patients' self-isolation.

“...I refused the tests, I refused everything, after demanding I was transferred to a separate room so that I would not have contact with anyone.” (PLHIV)

This self-stigmatization was more common among women. Women were afraid of being separated from society, from their neighbors, or family.

“Women are much more vulnerable to these (TB and HIV) diseases. Men seem to be forgiven by society but women are not. Women can even be abused in their families”. (NGO representative).

“Many times, such people (TB associated HIV population) are not accepted in the community, they are even treated very badly. There are some families where mothers-in-law treat their daughters-in-law unbelievably bad, even when they knew that their daughters-in-law got the infection from their son”.

Other than these, to the question of whether gender plays any role in their TB journey all participants (men and women) mentioned that the stigma is related to their disease only and has nothing to do with their gender.

Some of the interviewees mentioned that the situation related to the stigma, in general, has improved over time, and now the situation is much better in recent years.

It is worth mentioning that in PLHIV the TB is the main cause of the stigma. HIV does not add to TB-related stigma. HIV patients facing stigmatization mainly from physicians (dentists, surgeons), while more discrimination and isolation from the community is added because of TB. One of the patients said, *“I was diagnosed with HIV 5 years ago and I did nothing, I traveled all over Europe..., but when they said tuberculosis, it ruined everything”.*

One of the causes of stigma reported by the participants is lack of confidentiality in the small rural communities of Armenia. The care provider visit is often noticed by neighbors

and this information gets disseminated and everyone may know that the person has a disease. An NGO representative mentioned that patients tend to change their registration address in order not to be recognized as a TB “infection carrier” in the community. This way they can receive drugs freely and no one would recognize them in the new care facility and community.

“...People very often avoid going to their local polyclinics for getting disability status or support, so that they (workers in a local facility) do not know about their TB/HIV status in their local polyclinics.” NGO representative).

It should be noted that all participants, including the HIV-associated TB population and NGO representatives, strongly highlighted that there is no stigmatization caused by the attitude of the medical personnel involved in the provision of TB and HIV services. However, stigma and discrimination towards people with TB is a barrier at the stage of seeking medical care outside of TB and HIV facilities.

One of the study participants, a woman with HIV-associated TB, reported significant stigmatization while receiving post-partum care at the maternity clinic (one of the largest specialized maternity clinics in Yerevan). Right after the delivery, a staff member involved in cleaning services approached the participant and questioned what kind of disease she had. Then, the same was done by nurses, who questioned from where and how the participant got the diseases. This was noted by a physician who gave a warning to the nurses. Later during the care, nurses demonstrated stigmatizing behavior, such as cleaning their pen (supposedly after the patient used it). Besides nurses, the clinic administration demonstrated a stigma towards the patient. The patient was forced to move to a separate ward, which was a paid service.

Some of the NCP experts believed that major efforts are needed to increase the expertise of the medical workers in general (outside of TB and HIV care systems) and to decrease the stigma and discrimination. *“...the stigma is always born from the fear of the medical staff, from the point of view of infection; the higher the awareness, the less the fear is.”* (NCP physician).

“Quality training should be provided (to medical experts outside of TB and HIV care systems). The training should be carried out by competent specialists in the field, not by the national institute and by people who are just completing some projects and who do not even know the field.” (NGO representative).

Legal barriers

In general, no major findings were observed in the legal field. Even though in some cases the patients seemed to be unaware of their rights, they were satisfied with the interaction with the physicians and the treatment, and they did not feel that their rights were ever violated.

“I do not know their rights, I do not understand they have a right or no, but they are human beings. My husband’s rights were never violated.” IDI (TB/HIV patient’s family member).

"I can not answer what the patient's right is. His [participant's husband] right was not violated during the treatment." IDI (TB/HIV patient's family member).

All provider-participants thought that there is no problem related to the legal environment, only the NGO representative mentioned that there are some not clear statements for receiving social support payment or allowance from the government. NGO and other sources provide different information to patients, and so it takes time and resources to get the allowance.

OTHER FINDINGS

Unawareness about TB preventive treatments

None of the participants reported any knowledge about TB preventive treatment for HIV population nor they recalled being administered one. One of the reasons that some of them were simultaneously diagnosed with TB and HIV, those were not eligible for any TB preventive treatment.

Loss of workplace

Some of the stakeholders and the patients themselves noted that the temporary disability negatively affects patients' lives during and after the treatment. Patients do not want to stay jobless but there are no opportunities for them.

"There should be some kind of support. If you have a profession and HIV and/or TB, and it [HIV/TB] does not allow you to work, then you cannot improve your lifestyle without a job, it is not possible in any way. Maybe because of the bad living conditions it (TB) will be repeated for the third or fourth time". (PLHIV)

"I do not say that every time they provide financial help, such people (patients) should be provided with jobs so they can feel comfortable". (PLHIV)

Strengthening information exchange between NCP and NCID

Healthcare workers both from TB hospital and AIDS dispensary mentioned that there is no issue in communication and coordination of activities related to the management of TB HIV co-infection. However, they also highlighted that up-to-date and timely information exchange is needed for proper registration of the end of TB treatment, dose adjustments. The providers stated that an integrated electronic health information system that will allow information transfer between NCP and NCID will make the medical care of the same patients more productive.

"It would be good if we get automatic notification about the end of TB treatment. But currently the patient comes and informs us about that, however they may not understand if that is not the end, or they may not be able to tell in time. There are cases when we tell patients that we should change the dose of the drug (ARV treatment) as soon as you stop taking rifampicin for

TB, but they forget to say that they have already completed the course of TB treatment and we do not change the dose in time. Epicrisis is brought by the patients from TB treatment facilities, but it would be much faster and more efficient if we receive it by e-mail and did not wait until the patient brought it...and that is an additional hassle for them.”
IDI (NCID physician).

RECOMMENDATIONS

The following key recommendations are proposed to improve the care for HIV associated TB population:

- Increase capacity of psychosocial support services within NTP (and other state agencies), outpatient facilities and in relevant NGOs to improve diagnosis acceptance and treatment adherence.
- Increase awareness about TB and HIV among healthcare professionals not related to provision of services to HIV and TB populations, as well as general population to reduce stigma and discrimination.
- Increase knowledge of joint HIV and TB symptoms manifestation among general primary healthcare workers and hospital physicians not affiliated with provision of services for HIV and TB populations to facilitate early diagnosis.
- Strengthen information exchange between doctors managing TB and HIV treatment for the same patients and ensure that information about 1) treatment duration, 2) treatment regimen, 3) changes in treatment duration and/or regimen and 4) end of the treatment is available to both sides.

	TB Journey	Findings/obstacles	Recommendations
1	Recognizing symptoms	Delay in the initial diagnosis (TB and HIV) for populations whom HIV and TB symptoms interwind. Difficulties in accepting and coping with a new diagnosis of TB in addition to HIV.	Increase knowledge of joint HIV and TB symptoms manifestation among general primary healthcare workers and hospital physicians not affiliated with provision of services for HIV and TB populations to facilitate early diagnosis. Increase capacity of psychological support services within NTP, outpatient facilities and in relevant NGOs to improve diagnosis acceptance and treatment adherence.
2	Seeking care		
3	Getting accurate diagnosis		
4	Beginning treatment	No issues – satisfied with services that were provided in Armenia.	N/A
5	Getting treatment adherence support	Difficulties in getting information about all services available to PLHIV and lack of psychosocial support.	Increase capacity of psychosocial support services within NTP (and other state agencies), outpatient facilities and in relevant NGOs to improve diagnosis acceptance and treatment adherence.
6	Completing treatment	Lack of information on completion of TB treatment by HIV specialists.	Strengthen information exchange between doctors managing TB and HIV treatment for the same patients and ensure that information about 1) treatment duration, 2) treatment regimen, 3) changes in treatment duration and/or regimen and 4) end of the treatment is available to both sides.
7	Getting post-treatment follow-up	No issues	N/A

GENERAL PWTB - GENDER

Overall, 12 in-depth interviews were conducted with general PWTB (3 females and 4 males) and their family members, gender and human rights experts, hospital, and outpatient TB facility (rural and urban) physicians, TB researchers and an NGO representative.

Overall, the study did not identify specific TB journey gaps concerning gender. Few aspects of gender influence on the TB journey were reported by several stakeholders, including gender and human-rights experts, TB researchers, and physicians. All agreed that being female adds to the likelihood of being stigmatized especially in rural communities. Cultural beliefs and social norms were frequently highlighted as underlying reasons for such stigmatization.

“I can remember one case when a woman in the family was ill, and only her mother knew about it (TB). The reason for this secrecy was that there was the fear of being expelled from the house and sent back to her father’s house if anybody from family got to know [her diagnosis] ...” IDI (TB researcher)

“Sex-related issues are mainly among young girls, for example, they try to be careful, so no one knows [about TB] ... if a young woman or a girl does not want to come, [daily visits to ambulatory for DOT] she should not be forced...” IDI (TB physician)

“I think women are more tolerant compared to men, as they are more knowledgeable about the disease, and more educated in general. Men are more likely to suffer from aggressive stereotypes than women” IDI (Gender expert)

Gender experts mentioned that society lacks an understanding of gender as a psychosocial concept. Most participants while talking about gender referred to biological sex, and only a few expressed complete understanding of the term.

On the other hand, women were perceived to have higher treatment adherence. This was explained by the assumption that women are more educated and have more “flexibility” and “tolerability” towards health-related challenges during their lifetime.

“Men find it harder to believe that they can carry the disease. Probably because women are more educated, they trust doctors, specialists, and treat diseases more scientifically [means consciously].” (TB physician)

Interestingly, the qualitative results were consistent with quantitative findings, indicating better treatment outcomes among women compared to men. Unadjusted analysis revealed that females have lower odds of unfavorable treatment outcomes compared to males. Even though the majority of the study respondents in the patient category were men, no specific barriers in TB care or lack of support were discussed for them. Literature suggests that several behavioral

factors, such as smoking and alcohol consumption are associated with low treatment adherence and LTFU outcome.[33] In our cohort, females had significantly lower smoking and alcohol consumption rates compared to males. In addition, there is anecdotal evidence that the majority of migrants in Armenia are males, which may explain a higher proportion of LTFU among males in quantitative analysis. The results of the quantitative analysis are presented in Appendix 5.

RECOMMENDATIONS

Further research with a larger sample size and data collection in various rural areas will help to deeply explore and identify the gender related barriers to TB care.

GENERAL PWTB - STIGMA

Overall, one FGD and fifteen IDIs were conducted with PWTB who have diverse treatment adherence and outcomes (4 females and 2 males), family members of PWTB, gender and human rights experts, hospital, and outpatient TB facility (rural and urban) physicians, high level decision/policy makers, TB researchers and NGO representatives. In general, all participants indicated a high level of stigmatization towards TB in the society, although several stakeholders perceived that stigmatization against TB has been on a decline in the last decade.

All participants mentioned that TB stigma and discrimination are prevalent among those living in small rural communities as well as those a low education and low TB awareness levels. An emphasis was put on the perceived TB stigma among non-TB healthcare providers. The DOT regimen was perceived as one of the important determinants of perceived stigma among TB patients, especially in rural areas.

LACK OF TB AWARENESS AND POPULATION-WIDE STIGMATIZATION

Most of the participants in both categories, patients, and providers, mentioned that one of the causes of TB stigmatization might be lack of awareness about TB, including poor knowledge of TB transmission and its curability among the general population as well as among non-TB healthcare providers. These findings were triangulated across PWTB and all other stakeholders.

“During the data collection, we saw other doctors of the same polyclinic opening the TB cabinet door with a napkin. This is when the disease is not transmitted in such way...” IDI (TB-researcher)

“There were cases when non-TB healthcare professionals refused to provide services when got to know about diagnosis [TB]...” IDI (NGO representative)

"I was refused for a checkup by our polyclinic radiologist who performed ultrasound scan..." IDI (PWTB)

"I called to order a taxi [while being at NCP hospital], they asked whether I am a patient, I told them the truth, and they said they refuse to provide services to patients, but not to patient's caregivers...." IDI (PWTB)

All participants mentioned the role of education in the tolerant attitudes of society towards TB patients. It was perceived that a higher educational level in the society helps to mitigate TB stigma as educated people show more willingness to be tolerant. This was particularly highlighted in the context of *"somewhat decrease in TB stigma"* during the last decade.

"Of course, there are differences in perceptions [of TB], especially depending on the level of education [of people]." IDI (NGO representative)

"During the last 15 years, I would say there is an improvement [in TB stigmatization], as people are more educated and thus more tolerant..." IDI (hospital physician)

STIGMA AND CULTURAL BELIEFS

Overall, TB stigma and discrimination were linked to the perceptions and cultural beliefs and cultural beliefs about TB, such as TB is a *"disease of poor people"*, *"typical for prisoners"*, and was mentioned as more prevalent in rural areas. A human rights expert mentioned that there are *"social stereotypes about the disease"*, for example, that a female with good morals will not get infected, only men can get infected.

This phenomenon was explained by the fact, that in small rural communities there are very close relationships between families, and *"everyone knows each other"*, thus there is a challenge in maintaining the confidentiality of the diagnosis.

"Our communities are small, e.g. Maralik, where the population is twenty or thirty thousand people, everyone knows each other and one has been claimed to have TB (toqakht in Armenian), of course that person has to move to a bigger city so that his information won't be disclosed..." IDI (Human-rights expert)

In this context, young women and girls were more likely to be affected by stigma and discrimination. Particularly, there was a strong interface between TB and morality.

"It is especially observed in rural communities, when women are diagnosed (with TB), people start to ask questions: from whom she was infected, how and where? ... I think this is also a problem of our society and culture." IDI (NGO representative)

STIGMA AND DISCRIMINATION AS BARRIERS TO SEEKING CARE

Stigma and disease-based discrimination were perceived by the providers as the main obstacles during TB journey of patients. Being stigmatized by society and trying to avoid discrimination, people living with TB are unintentionally changing their attitudes towards seeking care and prefer to hide their disease.

Patients' stories unveiled *fear of stigmatization and self-stigmatization*, whereas only a few actually experienced discriminations. In all patient stories, we observed similar experiences, such as *"sense of disvalue", "status loss"* at the hands of the society or even close community. The stigmatizing attitudes caused them to be perceived as *"undesirable"*, hiding their disease, and withdrawing from interpersonal relationships.

"Why to tell everyone? ... Imagine if one is a "normal" human, is smart, he will understand, but if one is ignorant, he would be so afraid that would get blood sugar increased [an Armenian metaphor to express extreme fear]. When you say something to an ignorant person, he may turn it into gossips.... Why should everyone know that I have tuberculosis?" IDI (PWTB)

In addition, the role of DOTS regimen in relation to perceived stigma in TB patients should be considered. Almost all stakeholders mentioned that DOTS regimen *"creates unnecessary tension especially for those living in small, rural communities"* and provokes disease-hiding behaviors among TB patients, thus adding to the risk of treatment interruption.

As one of the participants with TB research experience mentioned that more patient-centered treatment approaches (in addition or instead of classic DOT administration) should be developed to decrease potential stigma in rural communities.

On the other hand, patient trust toward hospital TB health care professionals was high. Patients' attitudes towards them were predominantly positive and grateful. As one of the patients mentioned:

"I am satisfied with everyone, with the attitude of all the doctors. I tell the doctor that when she is leaving, we (all patients) feel like orphans. It is safer for the patient when the doctors are there. The patient becomes somewhat like a child." IDI (PWTB)

Overall, our findings suggested TB stigma being shaped not only by social/interpersonal attitudes and cultural beliefs but also influenced by institutional and community norms. Thus, the recommendation on practice and policy implications should be driven accordingly.

RECOMMENDATIONS

1. The role of community engagement should be foregrounded – raising awareness and increasing the knowledge in TB transmission and curability are of importance for

sure, but raising awareness is not enough. It is necessary to increase the consciousness of the TB community and the general society to change the existing belief that “*TB is a life-long sentence*”.

2. Patient-tailored treatment modalities should be considered at a systemic level.

GENERAL PWTB – LEGAL

Our interviews with PWTB showed that the respondents were largely unaware of their rights.

Our desk review showed that “*Requirements for the delivery of TB care within the framework of free, state-guaranteed medical care and services*” mandates providers to inform TB population. However, during the interview with a high-level/ policy decision maker we found that no formal and universal leaflet covering patients’ rights, treatment modalities or any other information that would facilitate patients informed involvement into the TB journey exists. There are several leaflets that are currently functional. However, none of them cover all TB population and provide all necessary information. Currently, the information about the TB is accessible for TB population through the following channels:

- Information leaflet provided at the hospital reception to everyone. The leaflet was developed by the MoH. The leaflet specifies that TB treatment is free of charge.
- Leaflet for multidrug resistant TB population – specifies type of TB regimen, possible adverse events. The leaflet was first developed and deployed in 2005. The leaflet was functional until 2019.
- Informed consent form for TB population on Bedaquiline and Delamanid, with detailed description of all possible side effects. This consent form was developed in 2013 and is currently functional. However, the consent language has not been updated to be in line with suggested language and usage for TB communication[34].
- Informed consent upon entering to an operational research related to the new short TB treatment regimens (multicounty WHO research). This is developed and deployed since 2020.
- Information leaflet for patients receiving Video-observed treatment (VOT) Thus, there is a need to inline current practice with the existing policies and provide more guidance to NCP in the National Strategic Plan.

Another legal barrier that we have identified that is related to National Strategic Plan (draft for 2021-2025). The current draft has a list of high priority target groups, which is a solid step towards drawing greater attention to the TB vulnerable populations. However, the vulnerable groups do not have a formal definition. For example, it is not clear who will be considered as labor migrants etc. In addition, specific surveillance, and monitoring mechanisms to be implemented by NCP are not defined or suggested in the National Strategic Plan.

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Tables

Table 1. Research methods and participants

Study population category	Method	# of interviews	Recruitment by	Participants/ Inclusion criteria	Interview media	# of participants
Homeless	IDI	5	Core group	Homeless TB patients undergoing hospital treatment. To include those who are at the recurrent treatment/ have chronic TB	In person (NCP)	5
Homeless	KII	2	Core group	NGO Representatives	Online	2
Homeless	KII	1	Core group	NCP staff	Phone call	1
Homeless	KII	1	Core group	Hospital Physician (NCP)	Online	1
Homeless	KII	1	Core group	Outpatient TB facility physician	Phone call	1
Homeless	KII	1	Core group	NCP administration, high level policy/decision maker	Online	1
Migrant	FGD	1	Core Group	Migrant workers with diverse TB treatment outcomes	In person - NCP	3
Migrant	FGD	2	Core Group	Migrant workers with diverse TB treatment outcomes	Online	6
Migrant	IDI	1	Core Group	Migrant workers with diverse TB treatment outcomes	Phone call	1
Migrant	IDI	3	Core Group	Migrant workers family members	Phone call	3
Migrant	KII	1	Core Group	NGO Representative	Online	1
Migrant	KII	1	TBRPC	Migration expert	Online	1
Migrant	KII	1	Core Group	NCP administration, high level policy/decision maker	Online	1
Migrant	KII	1	TBRPC	TB expert Russian Federation	Online	1
Migrant	KII	1	TBRPC	High level policy/decision maker	Online	1

Study population category	Method	# of interviews	Recruitment by	Participants/ Inclusion criteria	Interview media	# of participants
PLHIV	FGD	2	RWRP	PLHIV diverse stage of disease, TB treatment adherence and outcomes	In person	12
PLHIV	IDI	1	RWRP	PLHIV diverse stage of disease, TB treatment adherence and outcomes	In person	1
PLHIV	IDI	4	RWRP	PLHIV Family members	In person	4
PLHIV	KII	2	TBRPC	National Center for Infectious Diseases (physicians in charge of treatment of population with HIV associated TB)	In person - NCID	2
PLHIV	KII	2	TBRPC	NGO representatives	Online	2
PLHIV	KII	1	Core group	NCP administration, high level policy/decision maker	In person - NCP	1
PLHIV	KII	1	Core group	Hospital physician (NCP)	Online	1
PLHIV	KII	1	Core group	High level policy/decision maker	Online	1
PLHIV	KII	1	Core group	High level policy/decision maker	Online	1
Legal	IDI	2	Core group	High level policy/decision maker	Online	2
Gender, Stigma, General PWTB	IDI	2	Core group	PWTB with diverse TB treatment adherence and outcomes, diverse residence urban/rural	Phone call	2
Gender, Stigma, General PWTB	IDI	1	Core group	Family members of PWTB	Phone call	1
Gender, Stigma, General	FGD	1	Core group	PWTB with diverse TB treatment adherence and outcomes,	Online	3

Study population category	Method	# of interviews	Recruitment by	Participants/ Inclusion criteria	Interview media	# of participants
PWTB				diverse residence urban/rural		
Gender, Stigma, General PWTB	IDI	2	TBRPC	Gender expert, human rights expert	Online	2
Gender, Stigma, General PWTB	IDI	2	Core group	Hospital Physician (NCP)	In person, online	2
Gender, Stigma, General PWTB	IDI	1	Core group	Outpatient TB facility physician (urban)	Phone call	1
Gender, Stigma, General PWTB	IDI	2	Core group	Outpatient TB facility physician (rural)	In person, online	2
Gender, Stigma, General PWTB	IDI	3	TBRPC	TB Researchers	In person, online	3
Gender, Stigma, General PWTB	IDI	2	TBRPC	NGO representatives	online	2

Table 2. Key population search in PubMed

People Living with HIV	14 publications/3 relevant ((Tuberculosis) AND (Armenia)) AND (HIV), no filters applied
People with Silicosis	No publications were identified. ((Tuberculosis) AND (Armenia)) AND (silicosis), no filters applied
Miners	No publications were identified. ((Tuberculosis) AND (Armenia)) AND (miners), no filters applied
Migrants	8 publications/4 relevant
Refugees	1 publication, ((Tuberculosis) AND (Armenia)) AND (refugees)
Internally Displaced People	No publications were identified. ((Tuberculosis) AND (Armenia)) AND (Internally Displaced People)
Nomadic Populations	3 publications identified, 2 of which were relevant to the search topic. ((Tuberculosis) AND (Armenia)) AND (nomadic population)
Prisoners & Detainees	No publications were identified. ((Tuberculosis) AND (Armenia)) AND (Prisoners) – 3 not relevant ((Tuberculosis) AND (Armenia)) AND (Prisoners & Detainees)
People Who Use Drugs	10 publications, none of which were relevant to the search topic. ((Tuberculosis) AND (Armenia)) AND ((People Who Use Drugs) OR (drug abusers))
People with Alcohol Dependency	<u>3 publications were identified, none of which provided relevant information for Armenia.</u> ((Tuberculosis) AND (Armenia)) AND (Alcohol)
Smokers	2 publications were identified, of which one was relevant. ((Tuberculosis) AND (Armenia)) AND (smoking)
Sex Workers	1-Not relevant to Armenian context ((Tuberculosis) AND (Armenia)) AND (sex workers)
Lesbian, Gay, Bisexual & Transgender	No publications were identified. ((Tuberculosis) AND (Armenia)) AND (Lesbian, Gay, Bisexual, Transgender) ((Tuberculosis) AND (Armenia)) AND (LGBT)
Indigenous Populations	4 publications were identified, of which none were relevant to the search topic. ((Tuberculosis) AND (Armenia)) AND (Indigenous Populations)
Homeless	2 publications, none of which relevant. ((Tuberculosis) AND (Armenia)) AND (homeless)

People with Mental or Physical Disabilities	Three (3) publications were identified. The review of available texts did not provide relevant information in Armenia context. ((Tuberculosis) AND (Armenia)) AND (Mental or Physical Disabilities)
Urban Poor	No results for each separately, but 6 results (none relevant) for the search: ((Tuberculosis) AND (Armenia) AND (poor))
Rural Poor	
People with Diabetes	5 publications were identified. Of these, one publication was a relevant topic. ((Tuberculosis) AND (Armenia) AND (diabetes))
Children	20 publications identified through search: ((Tuberculosis) AND (Armenia) AND (children)), limited for time interval 2000-2020.
Elderly	24 publications through search: ((Tuberculosis) AND (Armenia) AND (elderly)), limited to English and time interval 200-2020.
Hospital Workers	2 publications identified, none of which were relevant ((Tuberculosis) AND (Armenia) AND (Hospital Workers)).
Prison Workers	1 publication identified, not relevant ((Tuberculosis) AND (Armenia) AND (Prison Workers)).
Refugee Camp Workers	No publications were identified.
Community Health/ Outreach Workers	No publications were identified.
Hospital Visitors	No publications were identified.
Prison Visitors	No publications were identified.
Peri-prison Communities	No publications were identified.
Peri-mining Communities	No publications were identified.
Sex Worker Clients	1 publication was identified: same as for sex-workers, not relevant.
People Who Use Drugs Family Members	No publications were identified.
Miners Family Members*	No publications were identified.
People at Risk of Zoonotic Tuberculosis	No publications were identified.

*Search for: Family Members – 6, not relevant

Table 3. Stigma in relation to TB search in PubMed

People Living with HIV	2 publications/2 relevant (Armenia) AND (Tuberculosis) AND/OR (Discrimination) OR (human) right(s)
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Appendices

Appendix 1. Core group composition

Name	Position	Institution	Role in the multi-stakeholder meeting
Ohanna Kirakosyan	Field Coordinator Armenia	Médecins du Monde - France; Doctors of the World - International NGO	Presenter, TB doctor, TB expert
Serine Sahakyan	Research Associate	American University of Armenia	Presenter, TB expert, public health researcher
Lilit Samsonyan	N/A	N/A	Presenter
Lilit Gevorgyan	TB physician	National Center of Pulmonology (National Tuberculosis Program)	TB expert (diagnostics, management, care, adherence)
Naira Sergeeva	Program Coordinator	Ministry of Health, TB HIV Program	Core Group Member
Dzovinar Melkom Melkomian	Independent consultant	Strategic Development Agency	Presenter, public health researcher

Appendix 2. List of the first multi-stakeholder meeting attendees²

Name Surname	Position/Institution	Role in the multi-stakeholder meeting
Lilit Khachatryan	TB & HIV Grant Programs Coordinator/ Global Fund to Fight AIDS, TB and Malaria	Medical Coordinator/Adviser/Core Group Member
Hakob Achemyan	Consultant in NCP Armenia	Medical Coordinator/Adviser/Core Group Member - Presenter
Naira Sergeeva	Program Coordinator/Ministry of Health, TB HIV Program	Medical Coordinator/Adviser/Core Group Member - Presenter
Ohanna Kirakosyan	Field Coordinator Armenia/Doctors of the World - International NGO	TB doctor, TB expert/Core Group Member
Lilit Samsonyan	Research associate/TB RPC	Adviser/Core Group Member
Serine Sahakyan	Research Associate/AUA	TB expert, researcher/ Core Group Member
Mamikon Hovsepyan	Managing Director/Pink Armenia, NGO	Human Rights Defender and LGBT activist
Lusine Musheghyan	Research Associate/AUA	TB expert, researcher
Lilit Gevorgyan	Physiatrist/NCP	TB expert (diagnostics, management, care, adherence)
Narine Siradeghyan	Psychologist/NCP	TB and mental health expert; treatment adherence
Anush Khachatryan	Head of M&E Department/NCP	TB expert, researcher
Aelita Sargsyan	Epidemiology Team Lead, Real World Data Analysis/Clinchoice Armenia	Public Health Specialist
Ofelya Petrosyan	TB Doctor/Doctors Without Borders	Adviser/Core Group Member
Dzovinar Melkom Melkomian	Veterinary consultant/Strategic development Agency	Public Health Specialist, Veterinary doctor - expertise in Mycobacterium bovis (Bovine Tuberculosis) in Humans
Karapet Davtyan	Consultant/International Organizations	Public Health Specialist, TB researcher
Ruzanna Grigoryan	Consultant/International Organizations	Public Health Specialist, TB researcher
Naira Khachatryan	Advisor to the Director/NCP	TB expert, researcher
Loris Russo	Physiatrist/Vanadzor Medical Center	TB expert (diagnostics, management, care, adherence)
Armida Zaxaryan	Psychologist/Red Cross Armenia	TB and mental health expert; treatment adherence
Nelli Nersisyan	TB expert/ Red Cross Armenia	TB and mental health expert; treatment adherence
Anahit Harutyunyan	Managing Director/Positive People in Armenia, NGO	Experience in working with TB HIV patients

² Names of some of the attendees are missed.

		adherence
Nelli Nersisyan	TB expert/ Red Cross Armenia	TB and mental health expert; treatment adherence
Anahit Harutyunyan	Managing Director/Positive People in Armenia, NGO	Experience in working with TB HIV patients
Narek Galstyan	Public Health Specialist/Ministry of Health	Public Health Specialist
Arman Avchyan	Social worker/NCP	Social worker
Nairuhi Safaryan	Managing Director/Real World, Real People, NGO	Contribution with experience working with TB HIV population
Hayk Davtyan	President of TBRPC, NGO	Core staff
Kristina Akopyan	Project Coordinator/TBRPC NGO	Core staff
Arpine Abrahamyan	Researcher/ TBRPC NGO	Core staff
Ani Petrosyan	Researcher/ TBRPC NGO	Core staff
Nonna Turusbekova	Project expert	TB expert, Consultant
Cristina Celan	Project manager/PAS center	Project manager/PAS center

Appendix 3. List of the second multi-stakeholder meeting attendees³

Name Surname	Position/Institution	Role in the multi stakeholder meeting
Lilit Khachatryan	TB & HIV Grant Programs Coordinator/ Global Fund to Fight AIDS, TB and Malaria	Medical Coordinator/Adviser/Core Group Member
Hakob Achemyan	Consultant in NCP Armenia	Medical Coordinator/Adviser/Core Group Member - Presenter
Naira Sergeeva	Program Coordinator/Ministry of Health, TB HIV Program	Medical Coordinator/Adviser/Core Group Member - Presenter
Ohanna Kirakosyan	Field Coordinator Armenia/Doctors of the World - International NGO	TB doctor, TB expert/Core Group Member
Lilit Samsonyan	Research associate/TB RPC	Adviser/Core Group Member
Serine Sahakyan	Research Associate/AUA	TB expert, researcher/ Core Group Member
Lilit Gevorgyan	Physiatrist/NCP	TB expert (diagnostics, management, care, adherence)
Narine Siradeghyan	Psychologist/NCP	TB and mental health expert; treatment adherence
Anush Khachatryan	Head of M&E Department/NCP	TB expert, researcher
Aelita Sargsyan	Epidemiology Team Lead, Real World Data Analysis/Clinchoice Armenia	Public Health Specialist
Ofelya Petrosyan	Physiatris/Doctors Without Borders	Adviser/Core Group Member
Dzovinar Melkom Melkomian	Veterinary consultant/Strategic development Agency	Public Health Specialist, Veterinary doctor - expertise in Mycobacterium bovis (Bovine Tuberculosis) in Humans
Karapet Davtyan	Consultant/International Organizations	Public Health Specialist, TB researcher
Naira Khachatryan	Advisor to the Director/NCP	TB expert, researcher
Nelli Nersisyan	TB expert/ Red Cross Armenia	TB and mental health expert; treatment adherence
Nairuhi Safaryan	Managing Director/Real World, Real People, NGO	Contribution with experience working with TB HIV population
Hayk Davtyan	President of TBRPC, NGO	Core staff
Kristina Akopyan	Project Coordinator/TBRPC NGO	Core staff
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³ Names of some the attendees are missed.

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Cristina Celan	Project manager/PAS center	Project manager/PAS center

APPENDIX 5. RESULTS OF FACILITATED RESEARCH ACTIVITY (QUANTITATIVE PART)

For the drug sensitive TB cohort, the factors were age, region (Lori region), treatment outcome (Lost to Follow Up [LTFU]), TB type (Relapse and Treatment After LTFU), Hepatitis C, Alcoholism, and Smoking. Females were three years younger on average. Proportion of females is higher in Lori region compared to Yerevan (Odds Ratio [OR] 1.71). Females are having less LTFU outcome compared to males (OR 0.69). The proportion of females is significantly lower in Relapse and Treatment After LTFU (which is supported by the previous association with treatment outcomes) categories compared to the new category (OR 0.59 and 0.44 respectively). Females were considerably less in groups with Hepatitis C (OR 4.94), Alcoholism (OR 16.42) and Smoking (OR 29.62). No female patient was registered in prison.

For the DR cohort the factors were Age, treatment outcome (LTFU, Failed), Registration year (2017), Localization (Extrapulmonary), TB type (Relapse, Other), Hepatitis C, and Smoking. Females were eight years younger on average. Females are having less LTFU, and Failed outcomes compared to males (OR 0.49 and 0.39 respectively). For some reason proportion of females dropped significantly in year 2017 (OR 0.57). Proportion of extrapulmonary cases is higher in females (OR 2.92). The proportion of females is significantly lower in Relapse and Other (which is supported by the previous association with treatment outcomes) categories compared to the new category (OR 0.47 and 0.29 respectively). Females were considerably less in groups with Hepatitis C (OR 14.1), and Smoking (OR 9.39). No female patient was registered in prison and none with alcoholism, drug abuse or psychiatric disease. The subset of patients with missing DR type was different as well (OR 3.22).

Association with the treatment outcomes (LTFU) may be due to the factor that more males are ceasing the treatment for migration (seasonal work) however the data were not sufficient to check this correlation/association.

Current data is not sufficient to check the associations between all the genders and the other factors.

Association between gender and other factors for the cohort of drug sensitive TB patients registered in Armenia from 2016 to 2019.

Characteristics	Total N=2723,		Female N=640,		Male N=2083,		Odds Ratio/ Mean Difference	95% CI	p value	
	n/mean	%/SD	n/mean	%/SD	n/mean	%/SD				
Outcome	Success	2179	80%	530	24%	1649	76%	Reference	-	-
	Lost To Follow Up	304	11%	55	18%	249	82%	0.69	[0.51, 0.94]	0.016
	Failed	58	2%	12	21%	46	79%	0.81	[0.43, 1.54]	0.524
	Death	176	6%	41	23%	135	77%	0.94	[0.66, 1.36]	0.76
	Not Evaluated	6	0%	2	33%	4	67%	1.56	[0.14, 10.89]	0.638
Nationality	Foreign	28	1%	9	32%	19	68%	Reference	-	-
	Armenian	2695	99%	631	23%	2064	77%	0.65	[0.29, 1.43]	0.278
Region	Yerevan	972	36%	210	22%	762	78%	Reference	-	-
	Aragatsotn	87	3%	15	17%	72	83%	0.76	[0.42, 1.35]	0.34
	Ararat	224	8%	52	23%	172	77%	1.1	[0.78, 1.55]	0.6
	Armavir	211	8%	53	25%	158	75%	1.22	[0.86, 1.72]	0.266
	Artsakh	87	3%	24	28%	63	72%	1.38	[0.84, 2.27]	0.198
	Gegharkunik	184	7%	44	24%	140	76%	1.14	[0.79, 1.65]	0.488
	Kotayk	225	8%	61	27%	164	73%	1.35	[0.97, 1.88]	0.07
	Lori	203	7%	65	32%	138	68%	1.71	[1.23, 2.38]	0.001
	Shirak	247	9%	54	22%	193	78%	1.02	[0.72, 1.42]	0.93
	Syunik	149	5%	35	23%	114	77%	1.11	[0.74, 1.68]	0.604
	Tavush	90	3%	19	21%	71	79%	0.97	[0.57, 1.65]	0.913
	Vayots Dzor	33	1%	6	18%	27	82%	0.81	[0.33, 1.98]	0.638
	Foreign	11	0%	2	18%	9	82%	0.81	[0.08, 3.94]	1
	Urban	Rural	877	32%	209	24%	668	76%	Reference	-
Urban		1839	68%	429	23%	1410	77%	0.97	[0.8, 1.18]	0.772
Missing		7	0%	2	29%	5	71%	1.28	[0.12, 7.88]	0.674
Registration Year	2016	849	31%	195	23%	654	77%	Reference	-	-
	2017	755	28%	183	24%	572	76%	1.07	[0.85, 1.35]	0.55
	2018	634	23%	151	24%	483	76%	1.05	[0.82, 1.34]	0.702
	2019	485	18%	111	23%	374	77%	1.00	[0.76, 1.3]	0.973
Localization	Both	103	4%	25	24%	78	76%	Reference	-	-
	Extrapulmonary	679	25%	214	32%	465	68%	1.44	[0.89, 2.32]	0.137
	Pulmonary	1941	71%	401	21%	1540	79%	0.81	[0.51, 1.29]	0.379

Characteristics	Total N=2723,		Female N=640,		Male N=2083,		Odds Ratio/ Mean Difference	95% CI	p value	
	n/mean	%/SD	n/mean	%/SD	n/mean	%/SD				
TB Type	New	2162	79%	546	25%	1616	75%	Reference	-	-
	Relapse	438	16%	73	17%	365	83%	0.59	[0.45, 0.77]	<0.001
	Treatment After Failure	40	1%	9	23%	31	78%	0.86	[0.41, 1.82]	0.691
	Treatment After LTFU	54	2%	7	13%	47	87%	0.44	[0.2, 0.98]	0.039
	Other	29	1%	5	17%	24	83%	0.62	[0.18, 1.66]	0.394
HIV Test	Negative	2342	86%	561	24%	1781	76%	1	-	-
	Positive	200	7%	39	20%	161	81%	0.77	[0.54, 1.1]	0.155
	Missing	181	7%	40	22%	141	78%	0.9	[0.63, 1.3]	0.573
Diabetes	Yes	117	4%	29	25%	88	75%	1		
	No	2606	96%	611	23%	1995	77%	0.93	[0.6, 1.43]	0.738
CVD	Yes	127	5%	32	25%	95	75%	1		
	No	2596	95%	608	23%	1988	77%	0.91	[0.6, 1.37]	0.645
Hepatitis C	Yes	99	4%	6	6%	93	94%	1		
	No	2624	96%	634	24%	1990	76%	4.94	[2.15, 11.33]	<0.001
Psychiatric Disease	Yes	111	4%	20	18%	91	82%	1		
	No	2612	96%	620	24%	1992	76%	1.42	[0.87, 2.32]	0.164
Drug Abuse	Yes	7	0%	1	14%	6	86%	1		
	No	2716	100%	639	24%	2077	76%	1.85	[0.22, 85.01]	1
Alcoholism	Yes	104	4%	2	2%	102	98%	1		
	No	2619	96%	638	24%	1981	76%	16.42	[4.41, 137.72]	<0.001
Prison	Yes	27	1%	0	0%	27	100%	1		
	No	2696	99%	640	24%	2056	76%	Inf	[2.12, Inf]	0.001
Smoking	Yes	462	17%	6	1%	456	99%	1		
	No	2261	83%	634	28%	1627	72%	29.62	[13.17, 66.61]	<0.001
Age		44	18	41	19	44	18	-3 (+/- 1)	[-4.54, -1.18]	<0.001

Association between gender and other factors for the cohort of DR-TB patients registered in Armenia from 2016 to 2019.

Characteristics	Total N=827,		Female N=142,		Male N=685,		Odds Ratio/ Mean			
	n/mean	%/SD	n/mean	%/SD	n/mean	%/SD	Difference	95% CI	p value	
Outcome	Success	465	56%	95	20%	370	80%	1	NA	NA
	Lost To Follow Up	161	19%	18	11%	143	89%	0.49	[0.29, 0.84]	0.008
	Failed	66	8%	6	9%	60	91%	0.39	[0.16, 0.93]	0.028
	Death	81	10%	12	15%	69	85%	0.68	[0.35, 1.3]	0.24
	Not Evaluated	54	7%	11	20%	43	80%	1	[0.49, 2.01]	0.992
Nationality	Foreign	22	3%	5	23%	17	77%	1		
	Armenian	805	97%	137	17%	668	83%	0.7	[0.24, 2.46]	0.564
Region	Yerevan	257	31%	42	16%	215	84%	1	NA	NA
	Aragatsotn	35	4%	4	11%	31	89%	0.66	[0.16, 2.02]	0.622
	Ararat	82	10%	17	21%	65	79%	1.34	[0.71, 2.51]	0.361
	Armavir	99	12%	17	17%	82	83%	1.06	[0.57, 1.97]	0.85
	Artsakh	26	3%	5	19%	21	81%	1.22	[0.34, 3.57]	0.781
	Gegharkunik	33	4%	4	12%	29	88%	0.71	[0.17, 2.17]	0.8
	Kotayk	74	9%	9	12%	65	88%	0.71	[0.33, 1.53]	0.38
	Lori	79	10%	18	23%	61	77%	1.51	[0.81, 2.81]	0.191
	Shirak	75	9%	14	19%	61	81%	1.17	[0.6, 2.29]	0.636
	Syunik	19	2%	3	16%	16	84%	0.96	[0.17, 3.57]	1
	Tavush	33	4%	7	21%	26	79%	1.38	[0.56, 3.38]	0.482
	Vayots Dzor	7	1%	1	14%	6	86%	0.85	[0.02, 7.32]	1
	Foreign	8	1%	1	13%	7	88%	0.73	[0.02, 5.94]	1
	Urban	Rural	285	34%	56	20%	229	80%	1	NA
Urban		535	65%	85	16%	450	84%	0.77	[0.53, 1.12]	0.174
Missing		7	1%	1	14%	6	86%	0.68	[0.01, 5.8]	1
Registration Year	2016	238	29%	51	21%	187	79%	1	NA	NA
	2017	201	24%	27	13%	174	87%	0.57	[0.34, 0.95]	0.029
	2018	184	22%	29	16%	155	84%	0.69	[0.41, 1.13]	0.141
	2019	204	25%	35	17%	169	83%	0.76	[0.47, 1.22]	0.258
DR Type	MDR	310	37%	46	15%	264	85%	1	NA	NA
	RR	39	5%	6	15%	33	85%	1.04	[0.41, 2.63]	0.928
	XDR	64	8%	9	14%	55	86%	0.94	[0.43, 2.03]	0.873

Characteristics	Total N=827,		Female N=142,		Male N=685,		Odds Ratio/ Mean Difference	95% CI	p value	
	n/mean	%/SD	n/mean	%/SD	n/mean	%/SD				
Localization	PDR	224	27%	38	17%	186	83%	1.17	[0.73, 1.87]	0.506
	Mono	126	15%	20	16%	106	84%	1.08	[0.61, 1.92]	0.785
	Missing	64	8%	23	36%	41	64%	3.22	[1.77, 5.86]	<0.001
	Both	46	6%	10	22%	36	78%	1	NA	NA
	Extrapulmonary	67	8%	30	45%	37	55%	2.92	[1.25, 6.83]	0.011
	Pulmonary	714	86%	102	14%	612	86%	0.6	[0.29, 1.25]	0.167
TB Type	New	550	67%	111	20%	439	80%	1	NA	NA
	Relapse	94	11%	10	11%	84	89%	0.47	[0.24, 0.94]	0.028
	Treatment After Failure	78	9%	10	13%	68	87%	0.58	[0.29, 1.17]	0.123
	Treatment After LTFU	61	7%	8	13%	53	87%	0.6	[0.28, 1.29]	0.186
	Other	44	5%	3	7%	41	93%	0.29	[0.06, 0.94]	0.028
HIV Test	Negative	688	83%	118	17%	570	83%	1	NA	NA
	Positive	108	13%	14	13%	94	87%	0.72	[0.4, 1.3]	0.277
	Missing	31	4%	10	32%	21	68%	2.3	[1.06, 5.01]	0.031
Diabetes	Yes	64	8%	16	25%	48	75%	1		
	No	763	92%	126	17%	637	83%	0.59	[0.33, 1.08]	0.083
CVD	Yes	42	5%	5	12%	37	88%	1		
	No	785	95%	137	17%	648	83%	1.56	[0.6, 5.19]	0.527
Hepatitis C	Yes	117	14%	2	2%	115	98%	1		
	No	710	86%	140	20%	570	80%	14.1	[3.73, 119.4]	<0.001
Psychiatric Disease	Yes	10	1%	0	0%	10	100%	1		
	No	817	99%	142	17%	675	83%	Inf	[0.47, Inf]	0.226
Drug Abuse	Yes	19	2%	0	0%	19	100%	1		
	No	808	98%	142	18%	666	82%	Inf	[0.98, Inf]	0.057
Alcoholism	Yes	46	6%	0	0%	46	100%	1		
	No	781	94%	142	18%	639	82%	Inf	[2.62, Inf]	<0.001
Prison	Yes	9	1%	0	0%	9	100%	1		
	No	818	99%	142	17%	676	83%	Inf	[0.41, Inf]	0.371
Smoking	Yes	254	31%	8	3%	246	97%	1		
	No	573	69%	134	23%	439	77%	9.39	[4.52, 19.48]	<0.001
Age		43	15	36	17	44	14	-8.01 (+/- 1.56)	[-11.1, -4.93]	<0.001