Multidimensional Analysis of Tuberculosis-Associated Stigma in the Republic of Moldova

Published in Chișinău, 2025

Thanks

The study “Multidimensional Analysis of Tuberculosis-Associated Stigma in the Republic of Moldova” was carried out by the National Association of Tuberculosis Patients of the Republic of Moldova “SMIT” (Moldovan Society against Tuberculosis), at the request of the National Tuberculosis Response Program (NTRP), with support from the Center for Health Policies and Studies and the TB Europe Coalition, funded by the Global Fund to Fight AIDS, Tuberculosis and Malaria and the Stop TB Partnership, hosted by UNOPS.

We thank the NTRP Coordination Department for providing relevant information and support throughout the research process. We are also deeply grateful to the organizations actively involved in TB control, members of the TB Platform, and the Imaps Expert team, who contributed to data collection and analysis.

We sincerely thank all the respondents who participated in the study. We appreciate their time, engagement, openness, trust, and the valuable information they shared during focus group discussions and in-depth interviews.

We express our gratitude to the experts who reviewed and contributed to the finalization of the report.

This research report reflects the views of the authors and does not necessarily represent the position of the donor or any affiliated organization.

Content

List of figures

List of tables

Abbreviations and acronyms

Abbreviation	Defining
PAS Center	Center for Health Policy and Studies
DOT	Directly observed treatment of tuberculosis
SD	Standard deviation
MPE	Maximum permissible error
CI	Confidence interval
HIV	Human Immunodeficiency Virus
MDR	Multi-drug resistance
MIA	Ministry of Internal Affairs
MJ	Ministry of Justice
MLSP	Ministry of Labor and Social Protection
MH	Ministry of Health
OR	Odds Ratio
NTRP	National Tuberculosis Response Program
RR	Rifampicin resistance
AIDS	Acquired human immunodeficiency syndrome
SMIT	Moldovan Society Against Tuberculosis
Stop TB Partnership	Stop TB Partnership – Global network of organizations collaborating to eliminate TB as a public health problem by promoting access to diagnosis, treatment and reducing the stigma associated with the disease
TB	Tuberculosis
VST	Video Supported treatment

Abstract

Context. Tuberculosis-associated stigma is a complex, systemic, and multidimensional phenomenon that affects not only individuals diagnosed with the disease, but also their families, the communities they belong to, and even healthcare workers. It is often fueled by structural factors such as lack of information, social stereotypes, legislative shortcomings, and unequal application of fundamental rights. Previous assessments, including the 2022 national study, have highlighted alarming levels of anticipated stigma across various settings, including communities and among healthcare providers, as well as a high rate of self-stigmatization. In order to document experiences and progress in addressing stigma, it was proposed to conduct the study "Multidimensional analysis of tuberculosis-associated stigma in the Republic of Moldova".

Methods. The study design is descriptive-analytical, with a mixed approach (quantitative and qualitative) by applying semi-structured, internationally validated questionnaires among people with tuberculosis (336), their family members (37), community representatives (43) and medical personnel (35), people with tuberculosis being selected through stratified random sampling, based on data from SIME TB (information system for monitoring and evaluation of tuberculosis), ensuring geographical and demographic representativeness. The qualitative component included the organization of a focus group with the participation of key informants (decision-makers, civil society representatives, human rights experts and media representatives) in order to evaluate the legislative and political framework regarding the stigma associated with tuberculosis by using a policy analysis matrix, according to the methodology proposed by the Stop TB Partnership. Data in 14 districts of the Republic of Moldova and penitentiary system on the right bank of the Dniester River, were collected by 19 trained field operators, during the period March 14 – May 5, 2025. A total of 38 documents were analyzed, including government laws and regulations, executive orders, NTRP and Civil Society reports and studies. The analysis framework focused on quantifying the degree of stigma felt by people with tuberculosis, using internationally validated instruments adapted to the national context (Van Rie, Arcencio and Corrigan scales); identifying and describing forms of stigma (self-stigma, perceived and experienced stigma) in various social and institutional environments (family, community, workplace and health care system); assessing the impact of stigma and the barriers encountered in accessing health services along the therapeutic pathway (from symptom recognition to treatment completion and post-treatment social reintegration); identifying determining factors that could favor the experience of stigma; investigating how stigma associated with tuberculosis is perceived, internalized and manifested in the family and community environment; assessing the perception of stigma among medical personnel, including their own experiences of stigma and attitudes towards people with tuberculosis; exploring the stigma observed by people with tuberculosis, their families and medical staff, in order to understand the systemic nature and spread of the phenomenon in various social and institutional contexts. Written consent was obtained from all respondents and key informants, and the research protocol was examined and approved by the National Committee for Ethical Expertise of Clinical Studies by decision no. 1850 of February 10, 2025.

Results. The study reveals the persistent nature of stigma, which profoundly influences the lives of affected individuals and their access to health services. The Stigma Radar and the intensity of stigmatizing attitudes confirm the multidimensional character of the phenomenon and highlight the uneven distribution of stigma across different contexts — with high levels of self-stigmatization, followed by stigma experienced in the community and the workplace.

The highest intensity of stigmatizing attitudes was recorded in the community (81%), but remains significant within the family (57%), in self-perception (49%), and in the healthcare setting (43%).

A range of factors can influence how stigma is perceived and experienced, including: gender, employment status, low educational attainment, lack of health insurance, and poor living conditions. An interesting finding of the study was that patient status appears to act as a protective factor within the penitentiary system, possibly due to different patterns of social adaptation or a redefinition of norms among individuals with incarceration experience. Other key determinants include bacteriological confirmation, which tends to intensify stigma, and the compound stigma resulting from coexisting conditions such as HIV and drug use.

The study underscores that stigma affects all stages of the TB care pathway, with the healthcare environment representing a paradoxical space — one that is often perceived as stigmatizing, despite its intended role in providing support and care. Families experience associative stigma, while communities play a role in perpetuating stigma, which may persist even after treatment completion. The assessment of the legal environment and public policies revealed significant gaps which, although not solely rooted in the legislative framework, undermine the system's capacity to protect and support people affected by TB.

Background situation

Tuberculosis (TB) remains one of the most persistent public health challenges in the Republic of Moldova, despite progress in diagnosis, treatment and prevention. Classified by the World Health Organization among the 18 priority countries in the European region and among the 30 countries with a high burden of multidrug-resistant TB (MDR-TB), the Republic of Moldova faces not only a medical problem, but also a profound social one: the stigma associated with the disease [1,2].

The stigma associated with TB is a complex, systemic, and multidimensional phenomenon that affects not only those diagnosed with the disease, but also their families, the communities they belong to, and even healthcare professionals [3]. It manifests through negative attitudes, discrimination, social isolation, and self-stigmatization, significantly impacting care-seeking behaviors, treatment adherence, and post-treatment reintegration [4–6]. At the same time, TB stigma is driven by structural factors such as lack of information, social stereotypes, legislative shortcomings, and unequal enforcement of fundamental rights.

Previous assessments, including the 2021–2022 Assessment of Barriers Related to Community Engagement, Human Rights, Gender Aspects, and the Level of Stigma Associated with Tuberculosis in the Republic of Moldova, have highlighted alarming levels of anticipated stigma in the community and among healthcare workers, as well as high rates of self-stigma [7]. These data were confirmed and expanded upon in the second round of stigma assessment conducted in 2025, which used the Stop TB Partnership's standardized methodology and included an integrated, qualitative and quantitative approach, focused on the direct experiences of affected people.

The current study aimed to provide an in-depth understanding of TB stigma in the Republic of Moldova, analyzing it from multiple perspectives: individual, family, community, institutional and legislative. This approach seeks not only to document the phenomenon, but also to identify its underlying factors, barriers to accessing services, and gaps in the regulatory framework. In addition, the assessment explores the reflected dimension of stigma – how it is perceived and observed by others – and its impact on post-treatment social reintegration.

In a context where the right to health is recognized but often compromised by discriminatory practices, this report becomes an essential tool for formulating evidence-based policies, strengthening the framework for the protection of the rights of people with TB, and developing effective interventions to reduce stigma. Thus, the assessment is not only a research exercise but also a strategic intervention to promote equity, dignity, and inclusion within the healthcare system and society at large.

Methodology

Purpose and objectives

Scope

- The aim of the research is to assess the level and distribution of stigma associated with tuberculosis in the Republic of Moldova, using the standardized instrument [8] and adjusted to the country context.
- The study aimed to identify the forms of stigma experienced by people with tuberculosis, their families, the community and medical staff, as well as to analyze the impact of stigma on access to services and the relevant legislative and policy framework.

Objectives

In order to conduct a rigorous and multidimensional assessment of stigma associated with tuberculosis in the Republic of Moldova, the study proposed the following specific objectives:

1. Quantifying the degree of stigma felt by people with tuberculosis, using internationally validated instruments adapted to the national context, such as the Van Rie, Arcencio and Corrigan scales.
2. Identify and describe forms of stigma (self-stigma, perceived and experienced stigma) in various social and institutional settings, including family, community, workplace and healthcare.
3. Assessing the impact of stigma and barriers encountered in accessing health services along the therapeutic pathway: from symptom recognition to treatment completion and post-treatment reintegration.
4. Identifying the determinants that could favor the experience of stigma, including in various social and institutional contexts: self-stigma, family, community, workplace, and the medical system.
5. Analysis of the perception of stigma among families and the community by investigating how stigma associated with tuberculosis is perceived, internalized and manifested in the family and community environment.
6. Assessing the perception of stigma among healthcare professionals, including their own experiences of stigmatization and attitudes towards people with tuberculosis.
7. Exploring the stigma observed by people with tuberculosis, their families and medical staff, in order to understand the systemic nature and spread of the phenomenon in various social and institutional contexts.
8. Investigating the existence and applicability of relevant legal provisions and policies regarding the protection of the rights of people with tuberculosis, as well as identifying possible structural barriers that may contribute to the perpetuation of stigma.

Study design

The study design is descriptive-analytical, with a mixed approach (quantitative and qualitative), oriented towards the multidimensional assessment of TB-associated stigma in the Republic of Moldova, designed in accordance with the methodology and tools used, adapted to the national context through consultations with relevant stakeholders and preliminary testing.

The quantitative component of the study included the application of semi-structured, internationally validated questionnaires among several categories of respondents: people with TB, their family members, community representatives and medical personnel. The selection of respondents (people with TB) was carried out through stratified random sampling, based on data extracted from SIME TB (TB monitoring and evaluation information system), ensuring geographical and demographic representativeness. To investigate the factors influencing the perception of stigma, the analysis incorporated data extracted from the SIME TB system on the demographic profile, social conditions, medical history, and exposure to risk factors of individuals included in the study.

The qualitative component included the organization of a focus group with the participation of decision-makers, civil society representatives, human rights experts and media representatives, in order to assess the legislative and policy framework regarding tuberculosis-related stigma. A policy analysis matrix was used, according to the Stop TB Partnership methodology.

The study was conducted in the Republic of Moldova, on the right bank of the Dniester River.

Involving people who have experienced tuberculosis and women in the study

The process of developing and implementing the study was designed in a participatory manner, ensuring the active involvement of people who have experienced TB, including women, at all key stages. From the planning phase, the SMIT organization — a structure led by people with direct TB experience and with female leadership — was an integral part of the working team, collaborating closely with the PNCT in defining the objectives, developing the methodology and establishing sampling criteria.

During the data collection phase, members of former TB patient organizations were involved in facilitating access to communities and ensuring a needs-sensitive approach to participants. Later, in the process of data analysis and formulation of conclusions, they actively contributed to interpreting the results from the perspective of their lived experience.

Sample volume

People with tuberculosis

- person with TB - a person who is undergoing treatment for TB or who has completed it within a period not exceeding 12 months.
- the sample is represented by 336 people.

Method of sampling people with TB (right bank)

Sampling of people with TB was carried out through a multi-stage approach, based on epidemiological and demographic principles, to ensure national representativeness and balance between the various groups of populations with TB.

Stage 1. Territorial **stratification by TB incidence**: The 35 administrative-territorial units of the country (32 districts, 2 municipalities, 1 autonomous unit) were stratified into three categories, depending on the TB incidence rate: high, medium and low. Administrative territories were randomly selected from each category, resulting in a total of 14 units (12 districts, 2 municipalities) and the penitentiary sector, thus reflecting the geographical distribution of the TB burden.

Stage 2. Selection **of respondents from the SIME TB database**: Lists of individuals with TB in 2024, as well as those who completed treatment no more than 12 months before the extraction date, were extracted. This selection allowed the inclusion of both active and recently treated cases.

Stage 3. Respect for demographic proportions and vulnerabilities: The sample was constructed to reflect the structure of the TB population, according to national statistical data. Thus, it was aimed to maintain a ratio of approximately 3:1 between men and women and 1.4:1 between rural and urban areas. Attention was also paid to the proportional inclusion of vulnerable groups (homeless people, people living with HIV, people with disabilities, drug users, people with a history of detention or migration).

Stage 4. Random selection of respondents: The interview was conducted based on the extracted lists, using a sampling step of 5. If a person could not be contacted, was unavailable or expressed refusal, the next person on the list was selected consecutively.

Family members

- adults aged 18 and over who have had a direct role in supporting people with TB
- parents, children, life partners, brothers or sisters or other close family members, as well as informal caregivers who provided emotional, material or medical support.
- The sample consisted of 37 people.

Community members

- adults aged 18 and over who have a formal or informal position of influence in the communities where people with TB live
- neighbors or people close to people with TB, community leaders (formal or informal), representatives of local public authorities (LPA), social workers, non-medical staff from the penitentiary system (psychologists, social workers, educational staff) who have a role of community representation within penitentiary institutions.
- The sample consisted of 43 people.

Medical staff

- healthcare professionals (phthisiology doctors, nurses) who provide direct or indirect medical services to people with TB, within public medical institutions.
- The sample consisted of 35 people.

Focus group

- political decision-makers, representatives of civil society organizations, human rights experts and media representatives who have expertise or involvement in the field of tuberculosis and the relevant legislative and policy framework.
- 1 focus group of 27 participants.

Data collection

Data collection was carried out between March 14 and May 5, 2025, using a mixed approach, which combined quantitative and qualitative methods, in accordance with the methodology developed by the STOP TB Partnership and adapted to the context of the Republic of Moldova.

Tools used

- The tools developed by the STOP TB Partnership: *TB Stigma Assessment data collection tools,* including *Stigma Assessment Workbook v2* [8]
- Semi-structured questionnaires applied among people with TB, their family members, community representatives and healthcare professionals. These were built on internationally validated scales (Van Rie, Arcencio, Corrigan) and were linguistically and culturally adapted
- Focus group discussion guide used to assess the legislative and policy framework regarding TB stigma
- Policy and legislation evaluation matrix, completed within the focus group with experts and decision-makers

Collection procedure

- The interviews were conducted by 19 trained interviewers in 14 territorial units of the country, who respected fundamental ethical principles: informed consent, confidentiality, and voluntary participation.
- The data were recorded, coded and entered into a centralized Excel file *Stigma Assessment Workbook (v2)* [8], structured by respondent categories and scale types.
- For the qualitative component, the focus group was facilitated by an experienced moderator, and the discussions were documented by taking notes, with the consent of the participants.

Analysis methodology

Quantitative data analysis

Data analysis was carried out using a combination of descriptive and inferential statistical methods, adapted to the specific characteristics of each respondent group and the type of instrument applied. Responses to questionnaire items were collected using a 5-point Likert scale, ranging from 0 (strongly disagree) to 4 (strongly agree), allowing for the quantification of agreement with stigmatizing statements. To assess the internal consistency of the applied instruments, Cronbach's Alpha coefficient was calculated for each scale. The resulting values were interpreted according to methodological standards: values ≥0.70 were considered acceptable, ≥0.80 good, and ≥0.90 excellent, indicating high measurement reliability.

The descriptive analysis included the calculation of simple frequencies, proportions, and means for the relevant variables. For items with small sample sizes (n<30), Fisher's exact test was used instead of the chi-square test to ensure the validity of statistical inferences. In all other cases, the chi-square test was applied to assess associations between socio-demographic variables and levels of stigma, ensuring that the expected frequencies met the ≥0.05 threshold.

To estimate the risk of stigma associated with each independent factor, odds ratios (OR) were calculated through bivariate analyses. The interpretation of ORs was as follows: values >1 indicated a positive association between the analyzed factor and the likelihood of experiencing stigma; values <1 suggested a negative association; and values close to 1 were considered neutral. Confidence intervals (95%) were used to assess the precision of the estimates, and statistical significance was set at a threshold of p<0.05.

To interpret the scores obtained on the stigma items, distinct categories were defined for each group of respondents, depending on the distribution of individual mean scores, calculated based on five-point Likert scales (0–4).

For people with TB, the following categories were defined: no stigma (score=0.00), low stigma (0.01–1.33), moderate stigma (1.34–2.66), and high stigma (2.67–4.00). For inferential analysis, these scores were recoded into a binary variable: scores ≤1.33 were considered to indicate no or low stigma, and scores ≥1.34 were interpreted as reflecting moderate or high levels of stigma.

For family members of people with TB, the following categories were defined: no stigma (score=0.00), low stigma (0.01–1.49), moderate stigma (1.50–2.24), and high stigma (2.25–3.00). To facilitate comparative analyses, scores were recoded into a binary variable, where scores ≤1.49 were considered to indicate low or absent stigma, and scores ≥1.50 were interpreted as reflecting moderate or high levels.

For community members, the following categories were defined: no stigma (score=0.00), low stigma (0.01–1.98), moderate stigma (1.99–2.92), and high stigma (2.93–4.00). Recoding for inferential analysis was performed similarly: scores ≤1.98 were considered to indicate low or absent stigma, and scores ≥1.99 were interpreted as reflecting moderate or high levels of stigma.

Statistical analyses were performed using the specialized IBM SPSS Statistics program, version 20.

Qualitative data analysis

The data collected in the focus group were analyzed thematically, using a coding matrix developed based on the Stop TB Partnership guidelines [8].

Information on the legislative and policy framework was summarized according to key areas: protection of rights, access to services, mechanisms to combat discrimination.

Ethical considerations

The study was designed and implemented in compliance with the fundamental ethical principles applicable to research involving human beings, in accordance with the Declaration of Helsinki, the Good Clinical Practice Guidelines and relevant national legislation of the Republic of Moldova concerning personal data protection and patients' rights.

Participation in the study was voluntary, and each respondent was informed in advance about the purpose, objectives, and methodology of the research. Informed consent was obtained in writing, prior to the application of the data collection instruments. Participants were informed that they could refuse to answer questions or withdraw from the study at any time, without any consequences.

To protect confidentiality, all data collected were coded and anonymized. Interviewers were trained in confidentiality and signed non-disclosure agreements. Audio recordings, written notes, and electronic files were stored securely, and access to the data was restricted to authorized members of the research team. After completion of the study, data will be retained for 12 months and then destroyed in accordance with standard procedures.

The research protocol was examined and approved by the National Committee for Ethical Expertise of Clinical Studies by decision no. 1850 of February 10, 2025.

Study participants

People with tuberculosis

The majority of respondents were men (76%), primarily from rural areas (57%). The age group distribution was led by individuals aged 55 and over (28%), followed by the 35–44 age group (25%) and the 45–54 age group (24%). The younger groups, 18–24 and 25–34 years, together accounted for 22% of the total respondents (Table 1). The average age was 46.5 years, with a standard deviation of 14.6 years, and a median of 45 years, reflecting moderate age variability. The youngest respondent was 18 years old, and the oldest was 86.

Table 1 Demographic structure of the studied population: people with tuberculosis

Variable name	n (%)
Total	336
Sex	
Men	254 (75.6)
Women	82 (24.4)
Age group	
18 – 24 years	22 (6.5)
25 – 34 years	52 (15.5)
35 – 44 years	85 (25.3)
45 – 54 years	82 (24.4)
≥ 55 years	95 (28.3)
Residence environment	
Urban	143 (42.6)
Rural	193 (57.4)

In terms of educational status, the majority of respondents had completed secondary education (46%), followed by those with only primary education or no formal education (32%), while 2.7% had higher education. Regarding health insurance status prior to TB diagnosis, more than half of the respondents (52%) were uninsured. In 42% of cases, respondents were officially employed or had income from other sources (Table 2).

Table 2 Educational profile, occupational situation and insured status: people with tuberculosis

Variable name	n (%)
Total	336
Education level	
No education or primary education	107 (31.8)
Middle (secondary education)	155 (46.1)
Environments (specialty)	65 (19.3)
higher	9 (2.7)
Insured status prior to TB diagnosis	
Yes	161 (47.9)
Not	175 (52.1)
Salary or other income*	
Yes	141 (42.0)
Not	195 (58.0)

*Includes any type of income from salary, allowances, scholarships, pensions or income from other sources

The data reveal several social factors that may influence both the risk of developing TB and the ability of individuals to adhere to treatment. In about 10% of cases, respondents did not have a permanent residence, and 14% indicated a history of recent migration. In addition, 15% had a history of detention, of which 8.9% in the last two years before the diagnosis of TB. The subjective assessment of living conditions, carried out by the phthisiopneumologist, shows that 62% of the study participants had satisfactory living conditions, while almost 31% lived in poor conditions. For 7.4% of cases, the living conditions could not be assessed (Table 3).

Table 3 Social vulnerability factors among study participants: people with tuberculosis

Variable name	n (%)
Total	336
Living conditions*	
Satisfactory	208 (61.9)
Unsatisfactory	103 (30.7)
Unknown	25 (7.4)
No permanent address	
Yes	33 (9.8)
Not	90.2 (90.2)
Migration history*	
Yes	47 (14.0)
Not	289 (86.0)
Detention history*	
Yes, unknown range	20 (6.0)
Yes, in the last 2 years	30 (8.9)
Not	286 (85.1)

*Living conditions – estimated, subjective assessment assessed by the phthisiopneumologist during the consultation; Migration history – the person lived outside the country for a period of at least 3 months in the last 12 months prior to the diagnosis of TB; Detention history – the person was deprived of liberty (in detention) for the last 24 months or more before the diagnosis of TB.

The data highlight risk situations and possible sources of TB infection among the respondents. The majority of individuals included in the study (70%) were identified as having an increased risk for TB, reflecting significant exposure in vulnerable environments. Regarding the probable source of infection, in over 62% of cases it remained unknown, while 12% of respondents are presumed to have contracted TB at home, and 9.2% in the penitentiary setting (Table 4).

Concerning the referral pathway to specialized TB services, in approximately half of the cases (45%), respondents were referred by their family doctor, while in 12% of cases, they sought a TB specialist on their own initiative. Another 6% were diagnosed with TB during medical screening upon entry into the penitentiary (Table 4).

Table 4 Exposure factors and referral to the tuberculosis service for diagnosis

Variable name	n (%)
Total	336
Increased risk for TB*	
Yes	234 (69.6)
Not	102 (30.4)
Probable source of contagion	
Home	41 (12.2)
Penitentiary	31 (9.2)
Other known, unspecified sources	55 (16.4)
Unknown	209 (62.2)
Referral to a phthisiopneumologist:	
Direct addressing	41 (12.2)
Check at the entrance to the prison	20 (6.0)
Family doctor	152 (45.2)

Variable name	n (%)
Specialist doctor (phtisiopneumologist)	123 (36.6)

*Probable source of infection: other – includes other known sources outside the home; Increased risk for TB – employees in TB medical institutions, nursing homes or homeless people, penitentiary institutions, former prisoners, other locations at risk for TB; Probable source of infection (Other implies known but unspecified sources)

Clinical characteristics reveal a predominance of pulmonary TB (93%) and bacteriological confirmation in 71% of cases. Multidrug-resistant or rifampicin-resistant TB (MDR/RR-TB) was diagnosed in 16% of respondents. The majority of cases (73%) were new, while retreatment cases accounted for over one-fifth (27%). Hospitalization occurred in 92% of cases. Regarding treatment, 62% of respondents had completed it, 34% were still undergoing treatment, and 3.9% had started treatment but were no longer following it at the time of the interview (Table 5).

Table 5 Clinical and therapeutic profile of study participants: people with tuberculosis

Variable name	n (%)
Total	336
Location of the disease	
Pulmonary	313 (93.2)
Extrapulmonary	23 (6.8)
Bacteriologically confirmed	
Yes	238 (70.8)
Not	98 (29.2)
MDR/RR-TB	
Yes	55 (16.4)
Not	281 (83.6)
TB case type at registration	
New case	246 (73.2)
Recurrent case (relapse)	59 (17.6)
Re-treatment after loss of medical supervision	10 (3.0)
Re-treatment after failure	21 (6.2)
Hospitalized	
Yes	310 (92.3)
Not	26 (7.7)
TB treatment situation*	
Treatment completed	210 (62.5)
No treatment is being done	13 (3.9)
In treatment	113 (33.6)

*TB treatment status (treatment completed – cured or treatment ended; not undergoing treatment – initiated treatment but not completed)

The data presented in Table 6 highlight a range of conditions associated with TB, reflecting comorbidities and clinically and epidemiologically relevant risk factors. Among these, HIV infection stands out with a prevalence of 12%, underlining the link between the two diseases. Diabetes mellitus was present in 2.1% of participants, suggesting a possible influence on disease progression, while excessive alcohol consumption—reported in 9.5% of cases—may contribute to worsening health status and reduced treatment adherence. Drug use (any type), although reported in 1.2% of cases, remains a significant risk factor in the context of TB transmission among vulnerable groups. Mental health disorders, present in 2.4% of participants, may further complicate TB treatment management. In 8.6% of cases, respondents were identified as persons with disabilities, which can pose an additional barrier to accessing healthcare services and maintaining continuity of care (Table 6).

Table 6 Tuberculosis-associated conditions among people with tuberculosis

Variable name	n (%)
Total	336
HIV	
Positive	39 (11.6)
Negative	297 (88.4)
Diabetes mellitus	
Yes	7 (2.1)
Not	329 (97.9)
Excessive alcohol consumption*	
Yes	32 (9.5)
Not	304 (90.5)
Drug use*	
Yes	4 (1.2)
Not	332 (98.8)
Mental disorders	
Yes	8 (2.4)
Not	328 (97.6)
Person with disability	
Yes	29 (8.6)
Not	307 (91.4)

*Excessive alcohol consumption, drug use – conditions subjectively assessed by the doctor during the medical consultation

Family members of people with tuberculosis

The analyzed group consists of individuals close to people with TB — family members or other relatives — who provided support during the TB diagnosis and treatment process. Women represented the majority of this group (78%, or 29 individuals), and the predominant age group was 45 to 64 years (41%), followed by those aged 25 to 44 years (32%) (Table 7).

Table 7 Demographic structure of the studied population: family members of people with tuberculosis

Variable name	n (%)
Total	37
Sex	
Men	8 (21.6)
Women	29 (78.4)
Age group	
18 – 24 years	2 (5.4)
25 – 44 years	12 (32.4)
45 – 64 years	15 (40.5)
≥ 65 years	8 (21.6)

Most participants were other relatives of the person with TB (54%, or 20 individuals), indicating a broad involvement of the extended family. Parents of the patients accounted for 22% (8), their children for 11% (4), siblings made up 8.1% (3), and grandchildren represented 5.4% (2) (Table 8).

Table 8 Profile of kinship relationships in people with tuberculosis

Variable name	n (%)
Total	37
Parent	8 (21.6)
Child	4 (10.8)
Brother or sister	3 (8.1)
Nephew or niece	2 (5.4)
Other relatives	20 (54.1)

Members of communities affected by tuberculosis

The community member sample included a total of 43 participants. In terms of sex distribution, there was a predominance of women, who accounted for approximately 84% of the total. Regarding age distribution, 44% were in the 25–44 age group, 46% were between 45 and 64 years old, and 9.3% were aged 65 or older (Table 9).

Table 9 Demographic structure of the studied population: community members

Variable name	n (%)
Total	43
Sex	
Men	7 (16.3)
Women	36 (83.7)
Age group	
18 – 24 years old	0 (0.0)
25 – 44 years old	19 (44.2)
45 – 64 years old	20 (46.5)
≥ 65 years	4 (9.3)

Of the 43 respondents, the majority – 60% – mentioned that they know two or more people in their community who have had or have TB. In over a fifth of cases (21%), they indicated that they know only one person, while 16% stated that there are no people with TB in their community. Only one respondent (2.3%) stated that they did not know whether or not there was anyone with TB in their community (Table 10).

Table 10 Number of people with tuberculosis known personally in the community

Variable name	n (%)
Total	43
One only	9 (20.9)
Two or more	26 (60.5)
None	7 (16.3)
Don't know	1 (2.3)

Medical personnel in the healthcare system

The sample of healthcare workers is mainly represented by women (91%). The age structure shows a significant concentration in the 45–64 age group (63%), and the 25–44 age group is represented in over a third (31%) of cases. The professional structure of the medical staff included in the study sample highlights a predominance of doctors, representing 63% (Table 11).

Table 11 Demographic and professional structure of the studied population: medical personnel

Variable name	n (%)
Total	35
Sex	
Men	3 (8.6)
Women	32 (91.4)
Age group	
18 – 24 years old	1 (2.9)
25 – 44 years old	11 (31.4)
45 – 64 years old	22 (62.9)
≥ 65 years	1 (2.9)
Professional structure	
Doctor	22 (62.9)
Nurse	13 (37.1)

Stigma radar and the intensity of stigmatizing attitudes

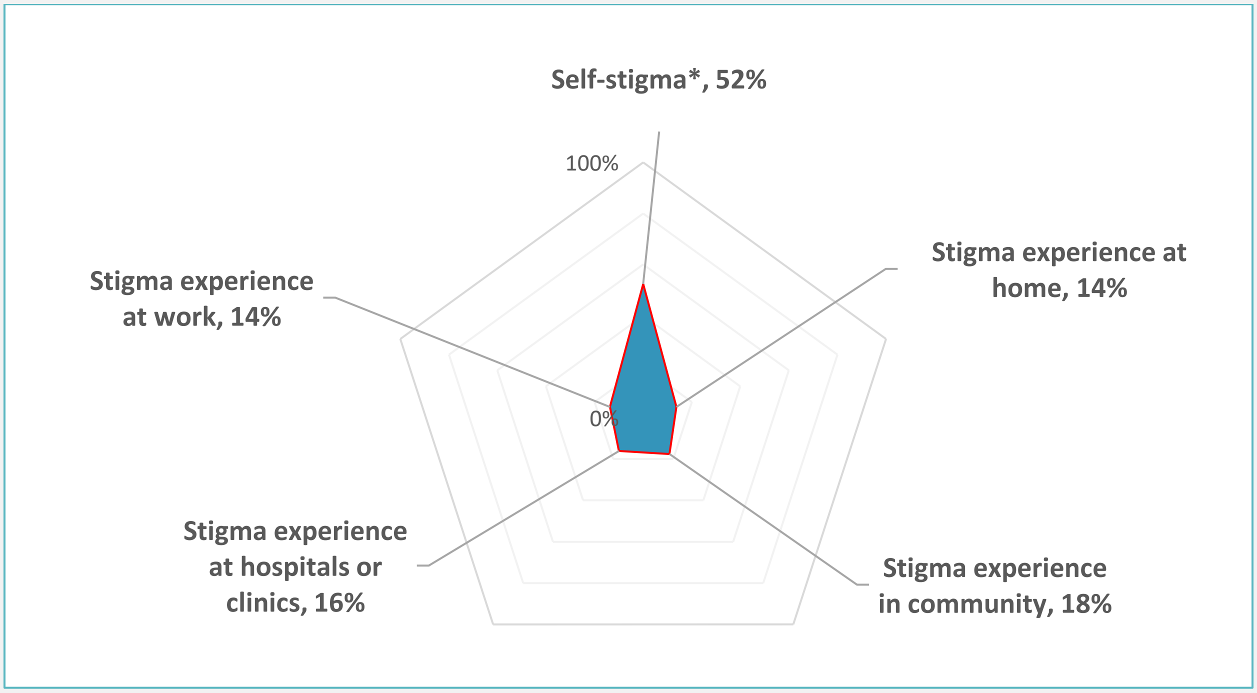
Stigma radar

The Stigma Radar provides a focused visual representation of the various forms of stigma experienced by people with TB across different social and institutional settings (288 out of 336). The shape of the chart, with its five radial axes, allows for a comparative understanding of the perceived intensity of stigma depending on the context in which it occurs (Figure 1).

The irregular yet coherent shape of the stigma radar suggests that stigma is not evenly distributed. Instead, it varies significantly depending on the environment. The highest level is recorded for self-stigma (52%), indicating a substantial internal psychological burden, reflecting feelings of shame, guilt, or fear of rejection experienced by people with TB. This is followed by community stigma (18%) and healthcare-related stigma (16%), both of which represent essential social spaces for support and integration but, in this case, act as sources of exclusion. Workplace stigma and family-related stigma are reported at 14% each, suggesting that even environments that should provide care and support are perceived as marginalizing by individuals with TB (Figure 1).

In this context, the radar chart offers a clear visual depiction of the complexity of TB-related stigma, underlining the fact that stigma is a multidimensional phenomenon that affects individuals in various ways depending on the setting.

Figure 1 Stigma radar: people with tuberculosis



Self-stigma - % of PWTB reported stigma inhibited them from accessing TB services

The intensity of stigmatizing attitudes

The data presented in Figure 2 illustrate the systemic and multidimensional nature of TB-related stigma. Notably, this form of stigma is pervasive and manifests at high levels across all spheres of life for people with TB — from self-perception to family and community relationships, as well as interactions with the healthcare system.

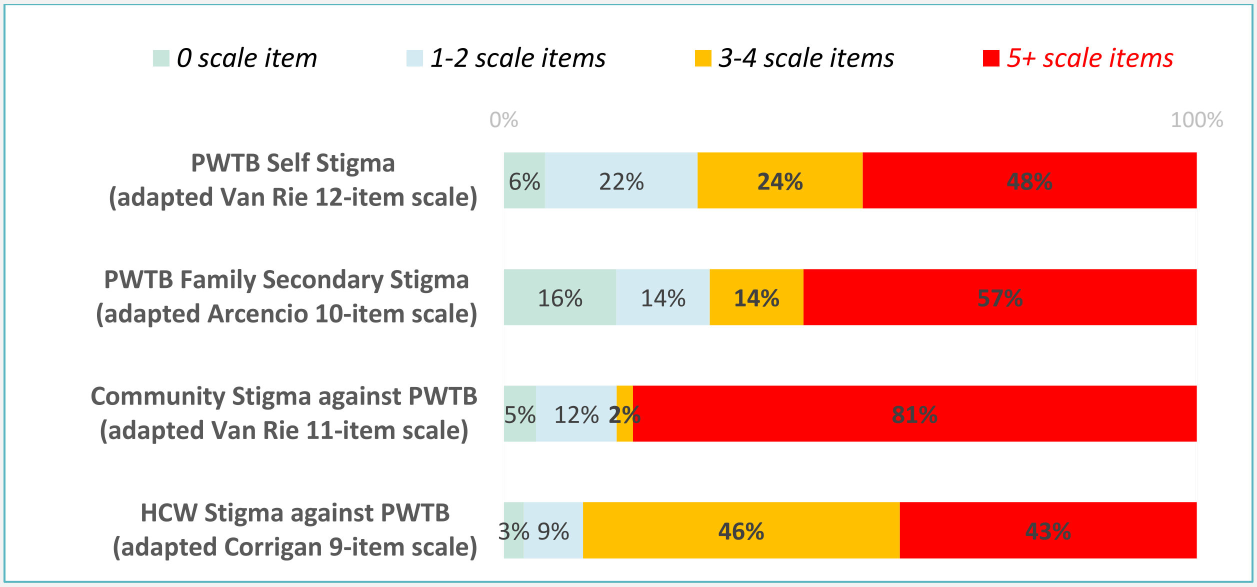
Community stigma is perceived as the most intense: 81% of people with TB reported experiencing five or more indicators of stigma, suggesting a deeply negative societal attitude toward those affected. This high percentage points to a collective internalization of prejudice and stereotypes, which may directly influence community behavior toward TB patients — including rejection, isolation, and discrimination (Figure 2).

Family-related stigma is also significant, with 57% of participants reporting high levels of stigmatization. This is particularly concerning, given that the family should ideally serve as a primary source of support. The presence of stigma within the family can lead to psychological distress, concealment of diagnosis, and even treatment abandonment (Figure 2).

Self-stigma is also pronounced: around 48% of people with TB indicated the presence of five or more stigma indicators, revealing internalized stigma and its damaging effects on self-esteem and help-seeking behavior. This dimension is critical, as it directly impacts treatment adherence and overall quality of life (Figure 2).

Stigma from healthcare providers, while somewhat more balanced, remains troubling: 43% of study participants reported high levels, and 46% moderate levels of stigma. Though less severe than community stigma, the presence of stigma within the health system is especially problematic, as it may damage the patient–provider relationship and hinder access to quality care (Figure 2).

Figure 2 Intensity of stigmatizing attitudes: people with tuberculosis



The intensity of stigmatizing attitudes expresses the degree to which respondents agreed with the statements presented in the items. Each dimension is assessed using a validated and adjusted scale (Van Rie, Arcencio, Corrigan), and the distribution of responses is expressed according to the number of stigmatization items reported (0, 1–2, 3–4, 5+).

The invisible dimension of tuberculosis: psychometric analysis of the effects of stigma

People with tuberculosis

Self-stigma scale

The analysis of participants' responses regarding the impact of TB on emotional and social well-being, based on 12 items, reveals a significant trend of agreement or strong agreement with statements reflecting stigma, guilt, and social isolation (Figure 3).

A considerable proportion of respondents (71%, 239) stated that they keep their distance from others to avoid spreading TB. This indicates both an increased awareness of the risk of transmission and a possible voluntary self-isolation, which may contribute to feelings of loneliness. This isolation is further supported by the fact that 39% (131) of respondents reported feeling lonely, and more than one-third (33%, 111) said they lose friends when it is revealed that they have TB (Figure 3).

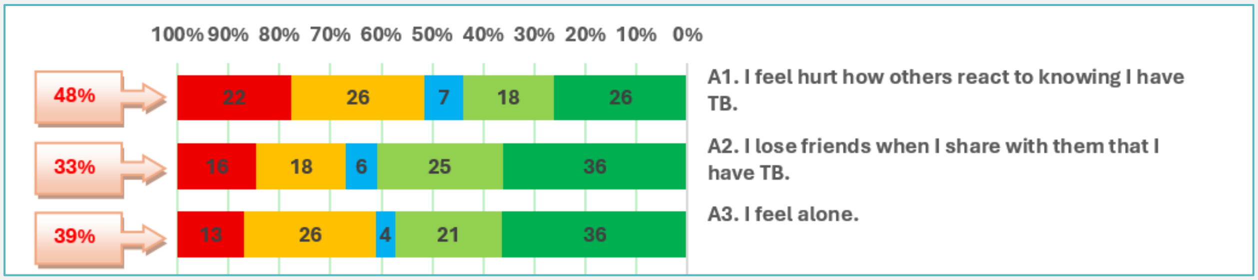
One of the most striking aspects is the fear of disclosing one's diagnosis. More than half of the participants (56%, 189) said they carefully choose whom to tell about their TB, and 44% (147) reported being afraid to disclose it to people outside their family for fear of being judged or rejected. Fear of disclosure also exists within the family: 16% (54) of respondents admitted being afraid to tell their family members about their diagnosis, suggesting a lack of emotional safety even in close circles.

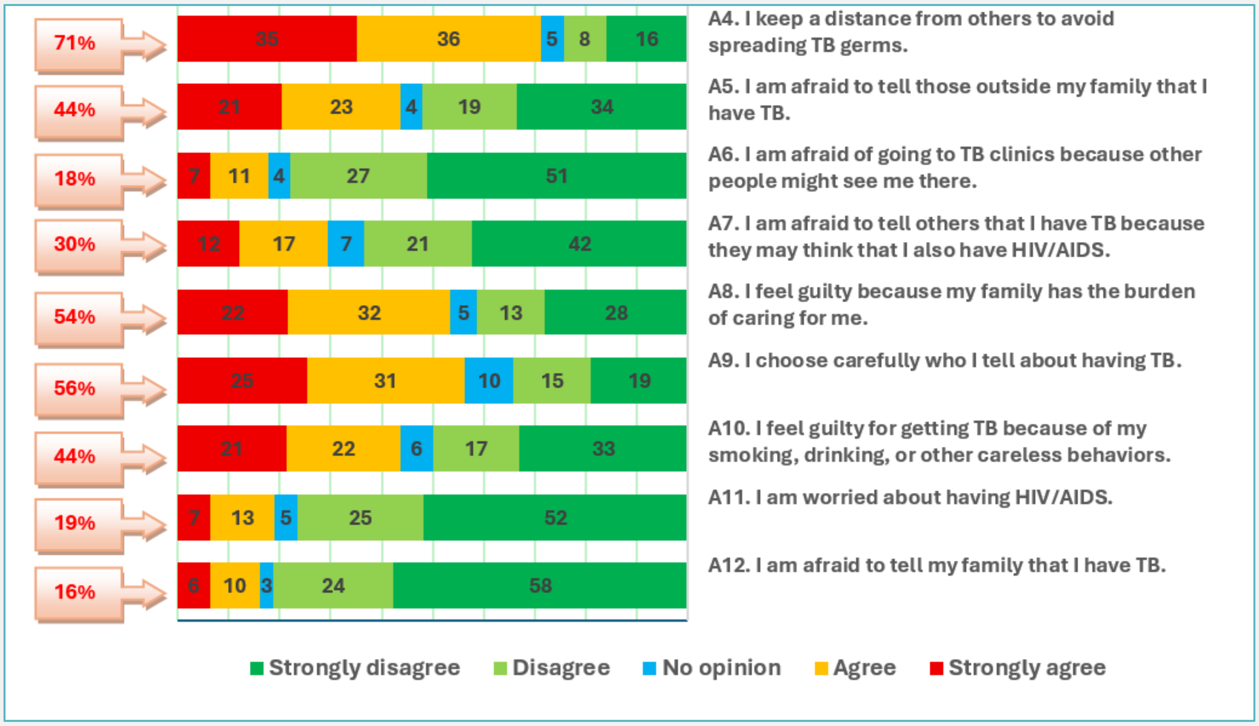
In nearly one-third of cases (30%, 99), respondents feared disclosing their TB status because others might assume they also have HIV/AIDS. This indicates a stigmatizing association between the two diseases in public perception. The stigma linking TB and HIV/AIDS is further reinforced by the fact that 19% (64) of respondents reported being worried they might have HIV/AIDS, reflecting not only fear of illness but also anxiety related to social perceptions (Figure 3).

Guilt is another commonly reported emotion. In 54% (180) of cases, respondents felt guilty that their family had to take care of them, and 44% (147) believed they contracted TB due to negligent behaviors, including smoking or alcohol use (Figure 3).

Social stigma is also evident in everyday interactions. In 49% (163) of cases, respondents said they feel hurt by how others react when they find out they have TB, and in 18% (60) of cases, respondents reported being afraid to go to TB clinics out of fear of being seen by others (Figure 3).

Figure 3 Psychosocial impact of tuberculosis measured based on the self-stigma scale among people with tuberculosis





Self-identification in relation to standardized statements about tuberculosis: analysis of subjective perceptions

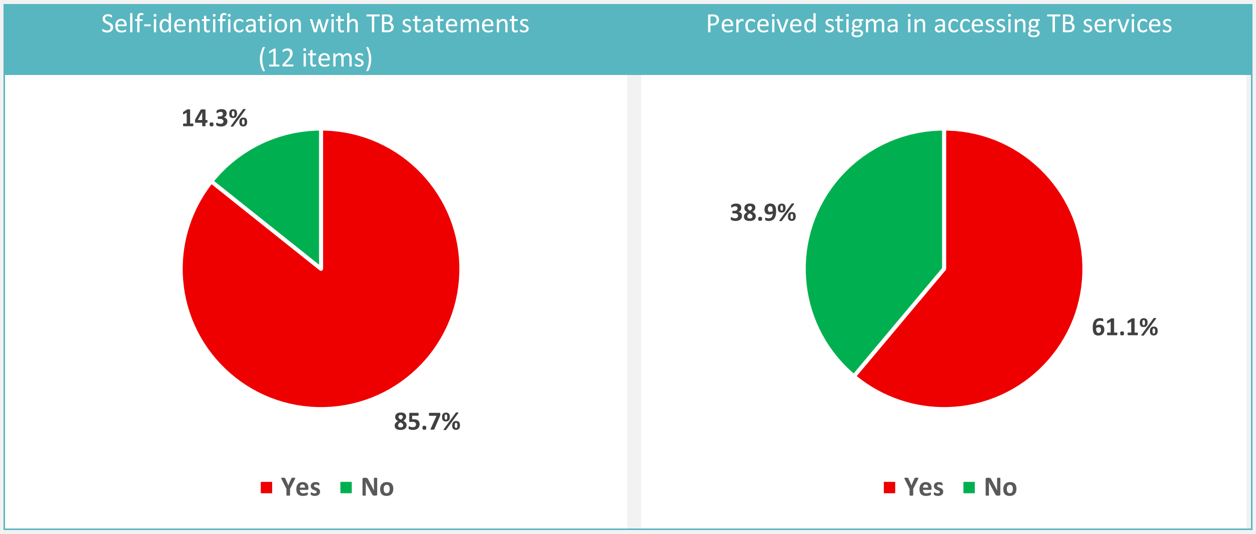
Respondents were asked whether *they identified with any of the 12 statements (items) regarding how they feel about TB* (Figure 1). The purpose of this question was to assess the degree of subjective identification with standardized statements about TB, particularly regarding the perception of stigma and the emotional impact of the disease.

The results show that the vast majority of participants (85.7%, 288) answered affirmatively, indicating that at least one of the 12 statements reflected their own experience or perception related to TB, and 18% (61) stated that they did not identify with any of the statements (Therefore, while a notable proportion of participants did not perceive their feelings as an obstacle, there remains a significant majority – over half – for whom stigma, fear, shame, or other emotions associated with the disease posed a real barrier to accessing care (Figure 4).

Figure 4A follow-up question was asked to determine whether *any of these feelings about TB have inhibited them seeking and accessing TB services*. The purpose of this question was to assess the extent to which subjective perceptions and emotional experiences related to the disease influenced healthcare-seeking behavior. Out of the total 288 respondents, 61% (176) stated that their feelings about TB had prevented them from seeking or accessing health services. In 39% of cases (112), participants reported that these emotions did not represent a barrier.

Therefore, while a notable proportion of participants did not perceive their feelings as an obstacle, there remains a significant majority – over half – for whom stigma, fear, shame, or other emotions associated with the disease posed a real barrier to accessing care (Figure 4).

Figure 4 Self-identification with perceptions about tuberculosis and impact on access to services



Indicators of stigma and emotional impact

The results presented in Table 1 reflect a detailed assessment of the emotional impact on people who suffer or have suffered from TB, using the 12-item scale (The analysis of participants' responses regarding the impact of TB on emotional and social well-being, based on 12 items, reveals a significant trend of agreement or strong agreement with statements reflecting stigma, guilt, and social isolation (Figure 3).

A considerable proportion of respondents (71%, 239) stated that they keep their distance from others to avoid spreading TB. This indicates both an increased awareness of the risk of transmission and a possible voluntary self-isolation, which may contribute to feelings of loneliness. This isolation is further supported by the fact that 39% (131) of respondents reported feeling lonely, and more than one-third (33%, 111) said they lose friends when it is revealed that they have TB (Figure 3).

One of the most striking aspects is the fear of disclosing one's diagnosis. More than half of the participants (56%, 189) said they carefully choose whom to tell about their TB, and 44% (147) reported being afraid to disclose it to people outside their family for fear of being judged or rejected. Fear of disclosure also exists within the family: 16% (54) of respondents admitted being afraid to tell their family members about their diagnosis, suggesting a lack of emotional safety even in close circles.

In nearly one-third of cases (30%, 99), respondents feared disclosing their TB status because others might assume they also have HIV/AIDS. This indicates a stigmatizing association between the two diseases in public perception. The stigma linking TB and HIV/AIDS is further reinforced by the fact that 19% (64) of respondents reported being worried they might have HIV/AIDS, reflecting not only fear of illness but also anxiety related to social perceptions (Figure 3).

Guilt is another commonly reported emotion. In 54% (180) of cases, respondents felt guilty that their family had to take care of them, and 44% (147) believed they contracted TB due to negligent behaviors, including smoking or alcohol use (Figure 3).

Social stigma is also evident in everyday interactions. In 49% (163) of cases, respondents said they feel hurt by how others react when they find out they have TB, and in 18% (60) of cases, respondents reported being afraid to go to TB clinics out of fear of being seen by others (Figure 3).

Figure 3). The mean total score of the scale is 19.83, indicating significant variability in the participants' responses. The mean self-stigma score per item equal to 1.65 indicates a moderate to low level of self-stigma, which suggests that, on average, participants do not strongly identify with the statements expressing internal stigma. In other words, most tend to be rather in disagreement or neutral towards these statements, although there are individual variations. The Cronbach's Alpha coefficient, with values between 0.779 and 0.811 for each item, suggests a high internal consistency of the scale, confirming the reliability of measuring perceptions related to TB stigma in the studied sample (Table 12).

The items with the highest means are *A4 - I keep a distance from others to avoid spreading TB germs* with a mean of 2.66 and *A9 - I choose carefully who I tell about having TB* with a mean of 2.28, indicating a strong concern for protecting others and controlling personal information. These *behaviors* can be interpreted both as *forms of social responsibility* and as *defense mechanisms against stigma* (Table 12).

On the other hand, items *A12 - I am afraid to tell my family that I have TB* and *A11 - I am worried about having HIV/AIDS* have the lowest means, 0.83 and 0.97 respectively, suggesting that, despite the stigma, fear of family reaction or association with HIV/AIDS is not prevalent among respondents. However, these values do not exclude the existence of individual cases in which these fears are acute (Table 12).

Guilt is a relevant dimension, reflected in items *A8 - I feel guilty because my family has the burden of caring for me* and *A10 - I feel guilty for getting TB because of my smoking, drinking, or other careless behaviors*, with means of 2.06 and 1.82, indicating that many respondents feel a moral burden related to the care provided by the family or the behaviors perceived as risk factors. These feelings can contribute to social isolation and affect self-stigma (Table 12).

From the perspective of internal consistency, the items that are most closely correlated with the total score of the scale are A2 - *I lose friends when I share with them that I have TB* (correlation = 0.561), A3 - *I feel alone* (correlation = 0.548) and *A7 - I am afraid to tell others that I have TB because they may think that I also have HIV/AIDS* (correlation = 0.563). These items seem to be the most relevant to the measured construct, being the most closely correlated with the total score of the scale, which indicates that the central dimension of self-stigma among people with TB is deeply linked to social isolation and fear of rejection. These aspects constitute the core of the stigmatizing experience, expressing most clearly the central dimension of social stigma and perceived isolation (Table 12).

Overall, the analysis highlights that TB stigma is experienced primarily through avoidance, guilt, and information control behaviors, rather than through deep shame or fear of family reaction. In other words, affected individuals appear more concerned with not being judged by others or not spreading information about the disease than with feeling directly ashamed or fearing rejection by those close to them. This type of stigma is more subtle, but can have significant effects on emotional state and social relationships, which is why interventions should focus on reducing isolation and encouraging open communication.

Table 12 Descriptive statistics and internal consistency of self-stigma scale items

Item name	Average responses ± standard deviation	Item-total correlation	coefficient Cronbach's Alpha
A1. I feel hurt how others react to knowing I have TB.	2.01 ±1.54	0.466	0.789
A2. I lose friends when I share with them that I have TB.	1.51 ±1.50	**0.561**	0.779
A3. I feel alone.	1.58 ±1.51	**0.548**	0.781
A4. I keep a distance from others to avoid spreading TB germs.	2.66 ±1.44	0.389	0.796
A5. I am afraid to tell those outside my family that I have TB.	1.79 ±1.59	0.517	0.783
A6. I am afraid of going to TB clinics because other people might see me there.	0.95 ±1.26	0.533	0.784
A7. I am afraid to tell others that I have TB because they may think that I also have HIV/AIDS.	1.36 ±1.47	**0.563**	0.779
A8. I feel guilty because my family has the burden of caring for me.	2.06 ±1.56	0.478	0.787
A9. I choose carefully who I tell about having TB.	2.28 ±1.47	0.366	0.798
A10. I feel guilty for getting TB because of my smoking, drinking, or other careless behaviors.	1.82 ±1.59	0.234	0.811
A11. I am worried about having HIV/AIDS.	0.97 ±1.29	0.234	0.803
A12. I am afraid to tell my family that I have TB.	0.83 ±1.24	0.234	0.788
Average total scale score	**19.83 ±9.88**	**-**	**-**
Average score per item	**1.65 ±0.82**	**-**	**-**
Cronbach's Alpha coefficient	**-**	**-**	**0.804**

Estimated level of self-stigma

The distribution of perceived stigma among people with TB provides essential insight into the social impact of the disease. Based on the responses to the set of 12 items (The analysis of participants' responses regarding the impact of TB on emotional and social well-being, based on 12 items, reveals a significant trend of agreement or strong agreement with statements reflecting stigma, guilt, and social isolation (Figure 3).

A considerable proportion of respondents (71%, 239) stated that they keep their distance from others to avoid spreading TB. This indicates both an increased awareness of the risk of transmission and a possible voluntary self-isolation, which may contribute to feelings of loneliness. This isolation is further supported by the fact that 39% (131) of respondents reported feeling lonely, and more than one-third (33%, 111) said they lose friends when it is revealed that they have TB (Figure 3).

One of the most striking aspects is the fear of disclosing one's diagnosis. More than half of the participants (56%, 189) said they carefully choose whom to tell about their TB, and 44% (147) reported being afraid to disclose it to people outside their family for fear of being judged or rejected. Fear of disclosure also exists within the family: 16% (54) of respondents admitted being afraid to tell their family members about their diagnosis, suggesting a lack of emotional safety even in close circles.

In nearly one-third of cases (30%, 99), respondents feared disclosing their TB status because others might assume they also have HIV/AIDS. This indicates a stigmatizing association between the two diseases in public perception. The stigma linking TB and HIV/AIDS is further reinforced by the fact that 19% (64) of respondents reported being worried they might have HIV/AIDS, reflecting not only fear of illness but also anxiety related to social perceptions (Figure 3).

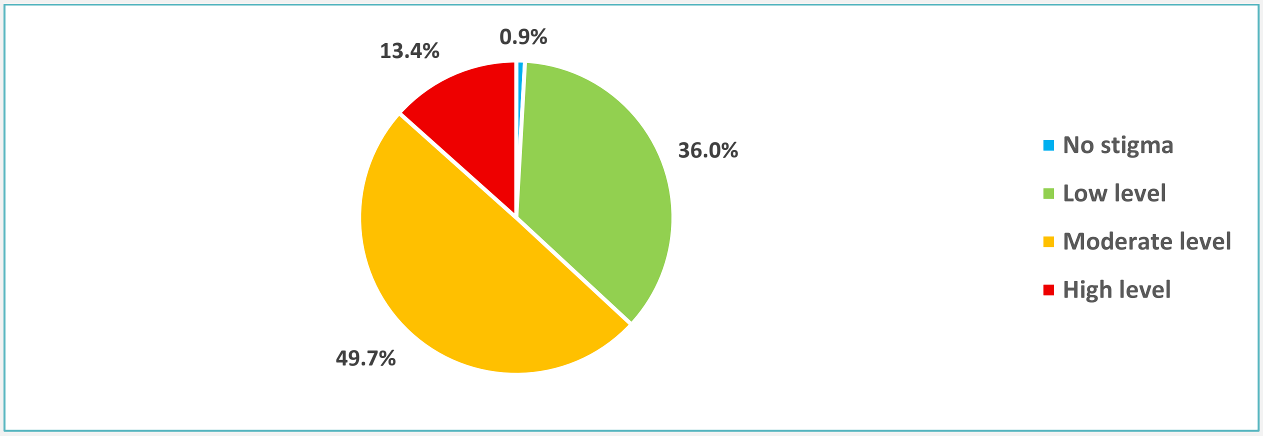
Guilt is another commonly reported emotion. In 54% (180) of cases, respondents felt guilty that their family had to take care of them, and 44% (147) believed they contracted TB due to negligent behaviors, including smoking or alcohol use (Figure 3).

Social stigma is also evident in everyday interactions. In 49% (163) of cases, respondents said they feel hurt by how others react when they find out they have TB, and in 18% (60) of cases, respondents reported being afraid to go to TB clinics out of fear of being seen by others (Figure 3).

Figure 3), an individual mean per item per respondent was calculated, which allowed the construction of a scale to measure the level of self-stigma. The scale thus obtained allowed the delimitation of four distinct levels of self-stigma: no stigma, low level, moderate level and high level.

Thus, the largest proportion of respondents (50%, 167) fell into the moderate stigma category, suggesting that, although they do not face extreme forms of social rejection, they still perceive significant social pressure related to TB. A considerable percentage (36%, 121) fall into the low stigma category, which may indicate either greater acceptance in their communities or increased personal resilience in the face of negative reactions. It is important to note that only 0.9% (3) of respondents did not experience any self-stigma at all. In addition, 13% (45) of participants face high levels of stigma, with potential negative impacts on treatment adherence, emotional state and social integration (Figure 5).

Figure 5 Level of stigma among people with tuberculosis



Factors associated with high perception of stigma: people with tuberculosis

This sub-chapter analyses factors that may be associated with high levels of perceived stigma among people with TB. For this analysis, the estimated level of self-stigma, derived from the 12-item composite scale, was recoded into two categories: **low stigma** (which includes levels of no stigma and low stigma) and **high stigma** (which includes levels of moderate stigma and high stigma). Binary recoding allowed the examination of the relationship between high perceptions of stigma and a series of demographic, social, clinical and contextual variables. In this context, the analysis allows the identification of determinants that could contribute to the intensification of the feeling of stigma among people with TB, which will allow the targeting of stigma reduction interventions.

Demographic factors associated with high perception of stigma

The analysis of the relationship between demographic characteristics and perceived level of stigma does not show statistically significant associations. Results suggest that high stigma associated with TB disease is a cross-sectional phenomenon, affecting individuals regardless of gender, age or residential environment ($p > 0.05$, Table 13).

Table 13 Demographic factors associated with high stigma perception

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Total	212	124		
Sex				
Men	159 (75.0)	95 (76.6)	0.91 [0.54-1.53]	0.746
Women	53 (25.0)	29 (23.4)	ref	
Age group				
≤ 44 years	102 (48.1)	57 (46.0)	1.09 [0.69-1.69]	0.706
≥ 45 years	110 (51.9)	67 (54.0)	ref	
Residence environment				
Urban	86 (40.6)	57 (46.0)	0.80 [0.51-1.25]	0.337
Rural	126 (59.4)	67 (54.0)	ref	

Socio-economic factors associated with high perception of stigma

The analysis of the association between the perceived level of stigma and socioeconomic variables highlights statistically significant relationships, suggesting that educational status, health insurance and professional occupation influence the perception of stigma among people with TB. Regarding the level of education, respondents with no education or only primary education are almost twice as likely to perceive a high level of stigma compared to those with vocational secondary or higher education (OR = 1.99, $p = 0.026$). This association is even more pronounced among those with general secondary education, where the risk of perceiving high stigma is more than twice as high (OR = 2.3; $p = 0.005$). In this context, the results suggest that a lower educational level is a vulnerability factor in relation to the perception of high social stigma (Table 14).

Health insurance status prior to TB diagnosis is also a significant determinant. Uninsured individuals are twice as likely to perceive high stigma compared to insured individuals (OR=2.0; $p=0.002$). Lack of access to health services may contribute to feelings of marginalization and negative perceptions of one's condition (Table 14).

With reference to occupational status, unemployed people (without income) have a double risk of perceiving high stigma (OR=2.0; $p=0.003$), compared to people with income (Table 14).

Table 14 Socio-economic factors associated with high stigma perception

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Total	212	124		
Education level				

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
No education or primary education	70 (33.0)	37 (29.8)	1.99 [1.09-3.65]	**0.026**
General secondary education	106 (50.0)	49 (39.5)	2.28 [1.29-4.02]	**0.005**
Vocational secondary or higher	36 (17.0)	38 (30.6)	ref	
Insured status prior to TB diagnosis				
Yes	88 (41.5)	73 (58.9)	ref	
Not	124 (58.5)	51 (41.1)	2.01 [1.28-3.16]	**0.002**
Salary or other income*				
Yes	76 (35.8)	65 (52.4)	ref	
Not	136 (64.2)	59 (47.6)	1.97 [1.25-3.09]	**0.003**

*Includes any type of income from salary, allowances, scholarships, pensions or income from other sources

Social vulnerability factors associated with high perception of stigma

The analysis of the relationship between the perception of high stigma and social vulnerability factors reveals the absence of statistically significant associations (p> 0.05, Table 15).

Table 15 Social vulnerability factors associated with high stigma perception

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Total	212	124		
Living conditions*				
Satisfactory	128 (60.4)	80 (64.5)	ref	
Unsatisfactory	65 (30.7)	38 (30.6)	1.06 [0.65-1.74]	0.792
Unknown	19 (9.0)	6 (4.8)	1.97 [0.75-5.16]	0.161
No permanent address				
Yes	21 (9.9)	12 (9.7)	1.02 [0.48-2.16]	>0.999
Not	191 (90.1)	112 (90.3)	ref	
Migration history*				
Yes	29 (13.7)	18 (14.5)	0.93 [0.49-1.76]	0.951
Not	183 (86.3)	106 (85.5)	ref	
Detention history*				
Yes	32 (15.1)	18 (14.5)	1.04 [0.56-1.95]	>0.999
Not	180 (84.9)	106 (85.5)	ref	

*Living conditions – estimated, subjective assessment assessed by the phthisiopneumologist during the consultation; Migration history – the person lived outside the country for a period of at least 3 months in the last 12 months prior to the diagnosis of TB; Detention history – the person was deprived of liberty (in detention) for the last 24 months or more before the diagnosis of TB.

Associations between risk exposure, referral to tuberculosis service for diagnosis, and perception of high stigma

The analysis of the relationship between the perception of high stigma in relation to the increased risk for TB, contracting the disease in prison, and referral to a phthisiopneumologist reveals the absence of statistically significant associations (p >0.05, However, the analysis of the probable source of infection reveals an interesting trend: individuals for whom the source of infection is unknown are more likely to perceive a high level of stigma (65% vs. 57%, OR = 1.6), with the p-value being close to the threshold of statistical significance (p = 0.052). Although the result is not statistically significant, it may suggest a relationship between uncertainty about the origin of the disease and the feeling of stigmatization, possibly through increased anxiety or feelings of guilt.

Table 16).

However, the analysis of the probable source of infection reveals an interesting trend: individuals for whom the source of infection is unknown are more likely to perceive a high level of stigma (65% vs. 57%, OR = 1.6), with the p-value being close to the threshold of statistical significance (p = 0.052). Although the result is not statistically significant, it may suggest a relationship between uncertainty about the origin of the disease and the feeling of stigmatization, possibly through increased anxiety or feelings of guilt.

Table 16 Exposure factors and diagnostic pathway associated with high stigma perception

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Total	212	124		
Increased risk for TB				
Yes	146 (68.9)	88 (71.0)	0.90 [0.55-1.46]	0.691
Not	66 (31.1)	36 (29.0)	ref	
Probable source of contagion				
Home or other*	53 (25.0)	43 (34.7)	ref	
Penitentiary	21 (9.9)	10 (8.1)	1.70 [0.72-4.00]	0.307*
Unknown	138 (65.1)	71 (57.3)	1.57 [0.96-2.58]	**0.052**
Referral to TB service:				
Direct addressing	23 (10.8)	18 (14.5)	0.73 [0.37-1.41]	0.446*
Check at the entrance to the prison	14 (6.6)	6 (4.8)	1.33 [0.49-3.57]	0.755*
Family doctor or specialist	175 (82.5)	100 (80.6)	ref	

*Increased risk for TB – employees in TB medical institutions, nursing homes or homeless people, penitentiary institutions, former prisoners, other locations at risk for TB; Probable source of contagion (Other assumes known but unspecified sources)

Clinical and therapeutic factors associated with high perception of stigma

Respondents with bacteriologically confirmed TB were significantly more likely to perceive a high level of stigma, with an estimated double odds (OR=1.71; p=0.030), a result that can be interpreted in terms of the increased visibility of the disease in the case of bacteriological confirmation, which may draw attention to the status of a TB patient and amplify the perception of social stigma . Other clinical factors, such as disease location, MDR/RR TB, case type, hospitalization, and TB treatment status, did not show statistically significant associations with the perception of high stigma (p > 0.05, Table 17).

Table 17 Clinical and therapeutic factors associated with high stigma perception

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Total	212	124		
Location of the disease				
Pulmonary	200 (94.3)	113 (91.1)	1.62 [0.69-3.79]	0.273
Extrapulmonary	12 (5.7)	11 (8.9)	ref	
Bacteriologically confirmed				
Yes	159 (75.0)	79 (63.7)	1.71 [1.06-2.76]	**0.030**
Not	53 (25.0)	45 (36.3)	ref	
MDR/RR-TB				
Yes	35 (16.5)	20 (16.1)	1.02 [0.56-1.87]	>0.999

	stigma			
Variable name	High, n (%)	Reduced, n (%)	**OR [CI:95%]**	**P-value**
Not	177 (83.5)	104 (83.9)	ref	
TB case type at registration				
New case	149 (70.3)	97 (78.2)	ref	
Re-treatment	63 (29.7)	27 (21.8)	1.51 [0.90-2.55]	0.113
Hospitalized				
Yes	195 (92.0)	115 (92.7)	0.96 [0.71-1.28]	0.816
Not	17 (8.0)	9 (7.3)	ref	
TB treatment situation*				
Treatment completed	127 (59.9)	83 (66.9)	ref	
No treatment is being done	7 (3.3)	6 (4.8)	0.76 [0.24-2.34]	0.843
In treatment	78 (36.8)	35 (28.2)	1.45 [0.89-2.36]	0.129

*TB treatment status: treatment completed (cured or treatment completed); not undergoing treatment (initiated treatment but did not complete it)

Tuberculosis-associated conditions in relation to high perceptions of stigma

One of the most relevant findings is the significant association between HIV infection and the perception of stigma. A high level of perceived stigma was reported among people living with HIV at a significantly higher rate compared to those who are HIV-negative (15% vs. 6.5%), with HIV-positive individuals being approximately 2.5 times more likely to experience high stigma (OR = 2.48; p = 0.035). This association can be explained by the overlapping social stigmas related to both conditions—TB and HIV—each often perceived, in many contexts, as "shameful" diseases or associated with stigmatized behaviors (Table 18).

Drug use also showed a significant association with perceived stigma (OR=12.7; p=0.040). Although the number of cases is small, the result suggests that stigma is much more intense among people with a history of drug use, probably due to the overlap of social stigmas associated with addiction and infectious disease (Table 18).

Other conditions associated with TB, such as the presence of diabetes, excessive alcohol consumption, mental health conditions, and the presence of disabilities, reveal a limited relationship with the perception of stigma, which is statistically insignificant (p > 0.05, Table 18).

Table 18 Tuberculosis-associated conditions in relation to perception of high stigma

	stigma			
Variable name	High, n (%)	Reduced, n (%)	**OR [CI:95%]**	**P-value**
Total	212	124		
People with HIV				
Yes	31 (14.6)	8 (6.5)	2.48 [1.09-5.52]	**0.035**
Not	181 (85.4)	116 (93.5)	ref	
Diabetes mellitus				
Yes	6 (2.8)	1 (0.8)	3.58 [0.42-30.11]	0.399
Not	206 (97.2)	123 (99.2)	ref	
Excessive alcohol consumption*				
Yes	18 (8.5)	14 (11.3)	0.72 [0.34-1.52]	0.510
Not	194 (91.5)	110 (88.7)	ref	
Drug use*				
Yes	3 (1.4)	1 (0.8)	12.72 [1.27-126.8]	**0.040**

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Not	209 (98.6)	123 (99.2)	ref	
Mental disorders				
Yes	4 (1.9)	4 (3.2)	0.57 [0.14-2.34]	0.667
Not	208 (98.1)	120 (96.8)	ref	
Person with disability				
Yes	19 (9.0)	10 (8.1)	1.12 [0.50-2.49]	0.9469
Not	193 (91.0)	114 (91.9)	ref	

*Excessive alcohol consumption, drug use – conditions subjectively assessed by the doctor during the medical consultation

Family members of people with tuberculosis

Self-stigma scale

The analysis of the 10 items regarding the impact of TB on the emotional and social state of family members highlights a clear trend of agreement and total agreement with statements reflecting stigmatization, guilt and social isolation. In this context, the responses indicate a profound psychosocial impact, marked by emotional discomfort, fear of exposure and concealment behaviors, specific to the phenomenon of self-stigma (Figure 6).

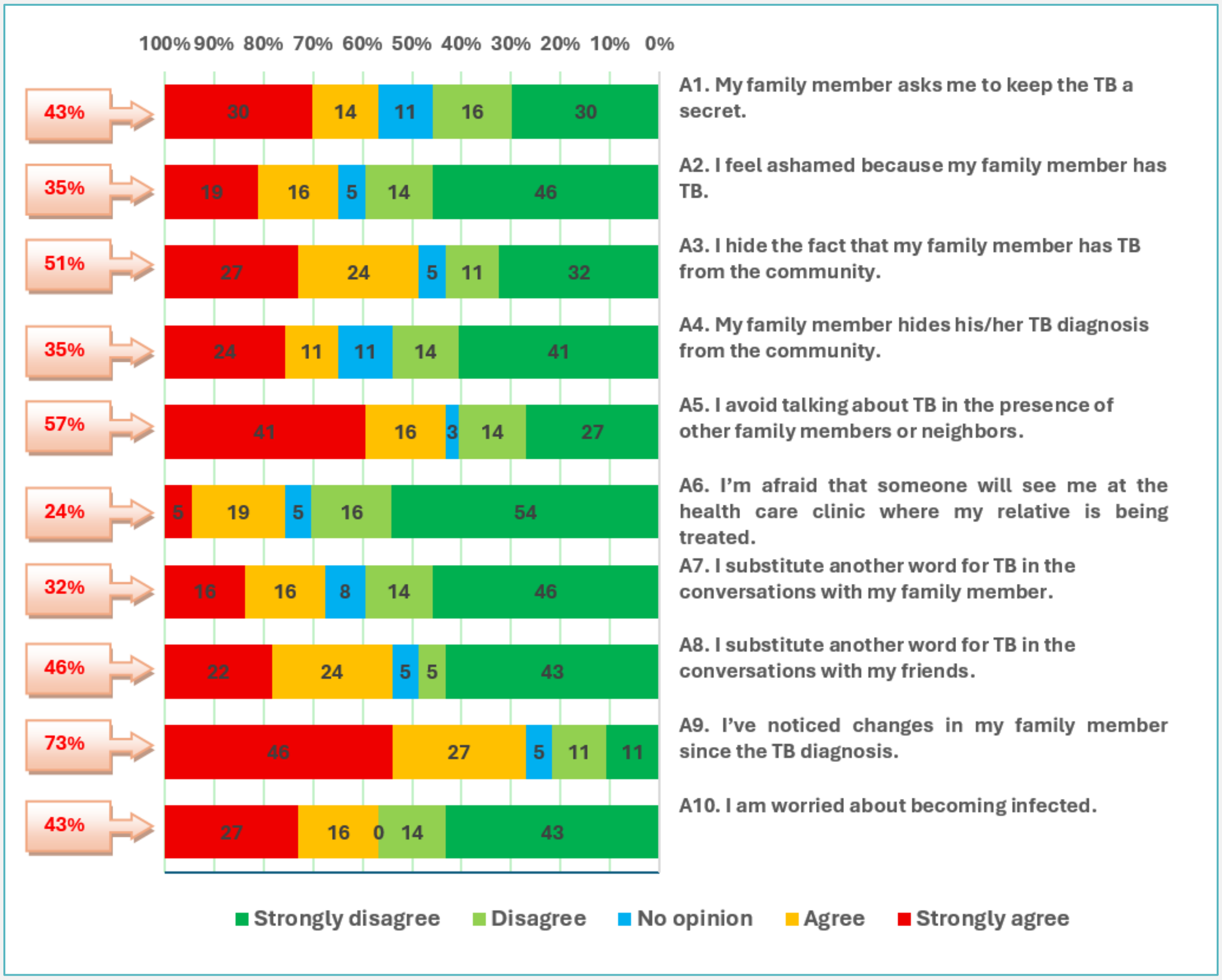
The majority (73%, 27) of family members mentioned that they had noticed behavioral changes in their relative since he or she was diagnosed with TB, which suggests a deep awareness of the effects of the disease on the behavior and general condition of the sick person. In 57% (21) cases, relatives specified avoiding discussions about TB in the presence of other family members or neighbors, which indicates a clear tendency for social avoidance, possibly due to fear of stigmatization (Figure 6).

In over half (51%, 19) of cases, relatives admitted to hiding from the community the fact that a family member had TB. In 46% of cases (17), they used euphemisms—replacing the word “tuberculosis” in conversations with friends—reflecting defense mechanisms and shame associated with the disease; similar behavior was observed in conversations with family members, where 32% (12) avoided using the term directly (Figure 6).

Also, 43% (16) of family members indicated that they were worried that they might also get TB, and another 43% (16) stated that the family asked them to keep the diagnosis a secret, which highlights internal and external pressure to maintain silence (Figure 6).

Over a third (35%, 13) of relatives of people with TB feel ashamed because a family member has TB, while for about a quarter (24%, 9) of family members, the mere presence at the medical institution where their relative with TB is being treated causes discomfort, for fear of being recognized, reflecting a real concern for social image (Figure 6).

Figure 6 Psychosocial impact of tuberculosis on the family of people with tuberculosis measured based on the self-stigma scale



Indicators of stigma and emotional impact in the family environment

Statistical analysis of the 10 items that make up the self-stigma scale among family members of people with TB highlights good internal consistency and significant variability in the perceptions and reactions of the respondents. The mean total score of the scale is 18.24 (with a standard deviation of 10.01), which indicates considerable variability in the responses of the participants. The mean self-stigma score per item is 1.94 (standard deviation 0.57), which indicates a moderate level of agreement with the scale statements, suggesting that the perceptions of the respondents are generally homogeneous, without extreme variations between items, reflecting a common tendency to experience stigma in a moderate and constant form. The Cronbach's Alpha coefficient, with a value of 0.818, reflects a high internal consistency of the scale, confirming the reliability of measuring the psychosocial dimensions associated with TB stigma in the studied sample (Table 19). At the individual item level, the items with the highest mean scores are *A9 - I've noticed changes in my family member since the TB diagnosis* (mean = 2.86) and *A5. I avoid talking about TB in the presence of other family members or neighbors* (mean = 2.30). The results indicate a clear perception of the impact of the disease on the affected person, but also a tendency to avoid the subject in close social contexts. These behaviors can be interpreted as protection mechanisms against stigmatization, but also as signals of emotional discomfort and tensions within the family (Table 19).

Concealing the diagnosis from the community (*A3 - I hide the fact that my family member has TB from the community*, mean = 2.03) and pressure to keep the secret within the family (*A1 - My family member asks me to keep the TB a secret*, mean = 1.97) indicate a constant concern for controlling information and avoiding external stigmatization, results that suggest that perceived stigma from the community plays an important role in shaping isolation and concealment behaviors. Similarly, the use of alternative terms to refer to TB, both in conversations with friends *A8 - I substitute another word for TB in the conversations with my friends* (mean = 1.76), and with family members *A7 - I substitute another word for TB in the conversations with my family member* (mean = 1.43), reflects a subtle strategy of euphemism, intended to reduce tension and avoid direct confrontation with the reality of the disease. Concern about the possibility of personal infection (*A10 - I am worried about becoming infected*, mean = 1.70) and the perception that the affected person hides their diagnosis (*A4 - My family member hides his/her TB diagnosis from the community*, mean = 1.65) suggest a combination of anxiety and social protection, without reaching alarming levels. The level of personal shame related to the disease is relatively low *(A2 - I feel ashamed because my family member has TB*, mean = 1.49), which may indicate a less stigmatizing attitude at the individual level. In contrast, the fear of being seen at the medical institution where the family member is treated (*A6 - I'm afraid that someone will see me at the health care clinic where my relative is being treated*, mean = 1.05) is almost non-existent, suggesting a greater acceptance of medical services or a reduced perception of the risk of stigmatization in medical institutions (Table 19).

From the perspective of internal consistency, the items that are most correlated with the total score of the scale are *A3 - I hide the fact that my family member has TB from the community* and *A4 - My family member hides his/her TB diagnosis from the community*, with corrected item-total correlations of 0.623 and 0.617. These items seem to be the most relevant to the measured construct (what the questionnaire measures), reflecting the central dimension of social stigma or in other words, they best express the main idea of social stigma (Table 19).

Overall, the data indicate a moderate level of perceived stigma, with an emphasis on avoiding communication and protecting social image, rather than on personal shame or fear of exposure. These results suggest that TB stigma is felt especially in the relationship with the community and in managing information about the disease, while dimensions related to internal shame or fear of public association are less pronounced (Table 19).

Table 19 Descriptive statistics and internal consistency of self-stigma scale items: family members of people with tuberculosis

Item name	Average responses ± standard deviation	Item-total correlation	coefficient Cronbach's Alpha
A1. My family member asks me to keep the TB a secret.	1.97 ±1.66	0.493	0.803
A2. I feel ashamed because my family member has TB.	1.49 ±1.64	0.378	0.815
A3. I hide the fact that my family member has TB from the community.	2.03 ±1.67	**0.623**	0.788
A4. My family member hides his/her TB diagnosis from the community.	1.65 ±1.67	**0.617**	0.789

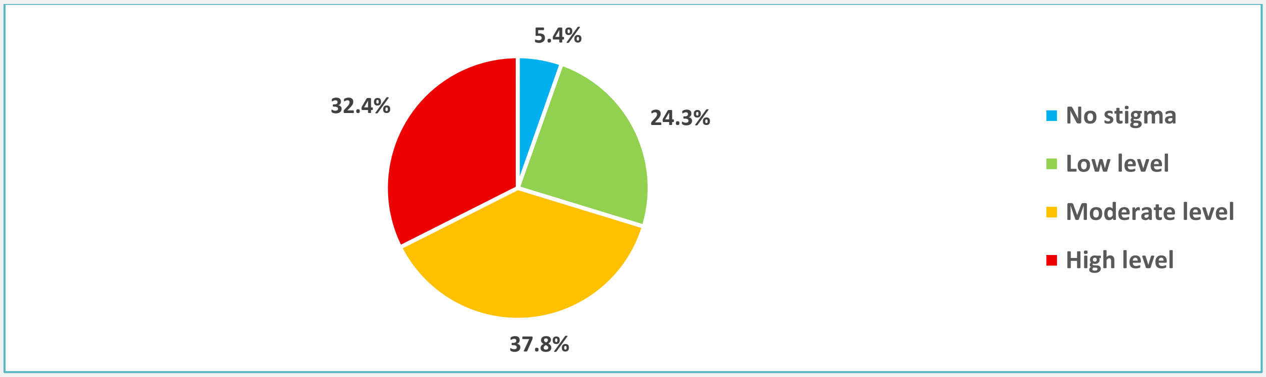
Item name	Average responses ± standard deviation	Item-total correlation	coefficient Cronbach's Alpha
A5. I avoid talking about TB in the presence of other family members or neighbors.	2.30 ±1.73	0.552	0.796
A6. I'm afraid that someone will see me at the health care clinic where my relative is being treated.	1.05 ±1.37	0.396	0.812
A7. I substitute another word for TB in the conversations with my family member.	1.43 ±1.59	0.576	0.794
A8. I substitute another word for TB in the conversations with my friends.	1.76 ±1.71	0.545	0.797
A9. I've noticed changes in my family member since the TB diagnosis.	2.86 ±1.39	0.386	0.821
A10. I am worried about becoming infected.	2.86 ±1.40	0.512	0.801
Average total scale score	**18.24 ±10.01**	-	-
Average score per item	**1.94±0.57**	-	-
Cronbach's Alpha coefficient	-	-	**0.818**

Estimated level of self-stigma in the family environment

Based on the responses to the set of 10 items (Figure 6), an individual mean per item per respondent was calculated, which allowed the construction of a scale to measure the level of self-stigma. The scale thus obtained allowed the delimitation of four distinct levels of self-stigma: no stigma, low level, moderate level and high level.

Of the total of 37 participants, only 2 people (5.4%) showed no signs of stigma at all, which suggests that the complete absence of stigma is rare in the affected family environment. A number of 9 respondents (24%) fell into the low stigma category, for 14 people (38%), a moderate level of stigma was estimated, which indicates the presence of significant emotional experiences and avoidance behaviors. At the same time, 12 of the participants (32%) were classified as high stigma (Figure 7).

Figure 7 Level of stigma felt in the family environment



Factors associated with high perception of stigma in the family environment

The estimated level of self-stigma, derived from the 10-item composite scale, was recoded into two categories: **low stigma** (which includes levels of no stigma and low stigma) and **high stigma** (which includes levels of moderate stigma and high stigma). Binary recoding allowed examination of the relationship between high stigma perception and demographic and kinship factors.

In context, the analysis by gender and age did not identify notable differences for a high level of stigma, and a p value greater than 0.05 indicates a statistically insignificant association, suggesting that these factors do not clearly influence the level of stigma perceived in the family (Table 20).

Table 20 Demographic factors associated with the perception of high stigma in the family environment

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Total	26	11		
Sex				
Men	4 (15.4)	4 (36.4)	3.18 [0.62-1.62]	0.326
Women	22 (84.6)	7 (63.6)	ref	
Age group				
≤ 44 years	10 (38.5)	4 (36.4)	1.09 [0.25-4.71]	0.999
≥ 45 years	16 (61.5)	7 (63.6)	ref	

The statistical analysis, expressed as odds ratio (OR=1.28), indicates a slight tendency for stigma to be more frequently perceived in direct kinship relationships, but the wide confidence interval and p-value>0.999 suggest that this difference is not statistically significant (Table 21).

Table 21 Family relationships - factors associated with the perception of high stigma in the family environment

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Total	26	11		
Direct family relationships	11 (42.3)	4 (36.4)	1.28 [0.29-5.49]	>0.999
Other family relationships	15 (57.7)	7 (63.6)	ref	

Direct kinship relationships: child, parent, brother, sister; Other kinship relationships: other relatives

Members of communities affected by tuberculosis

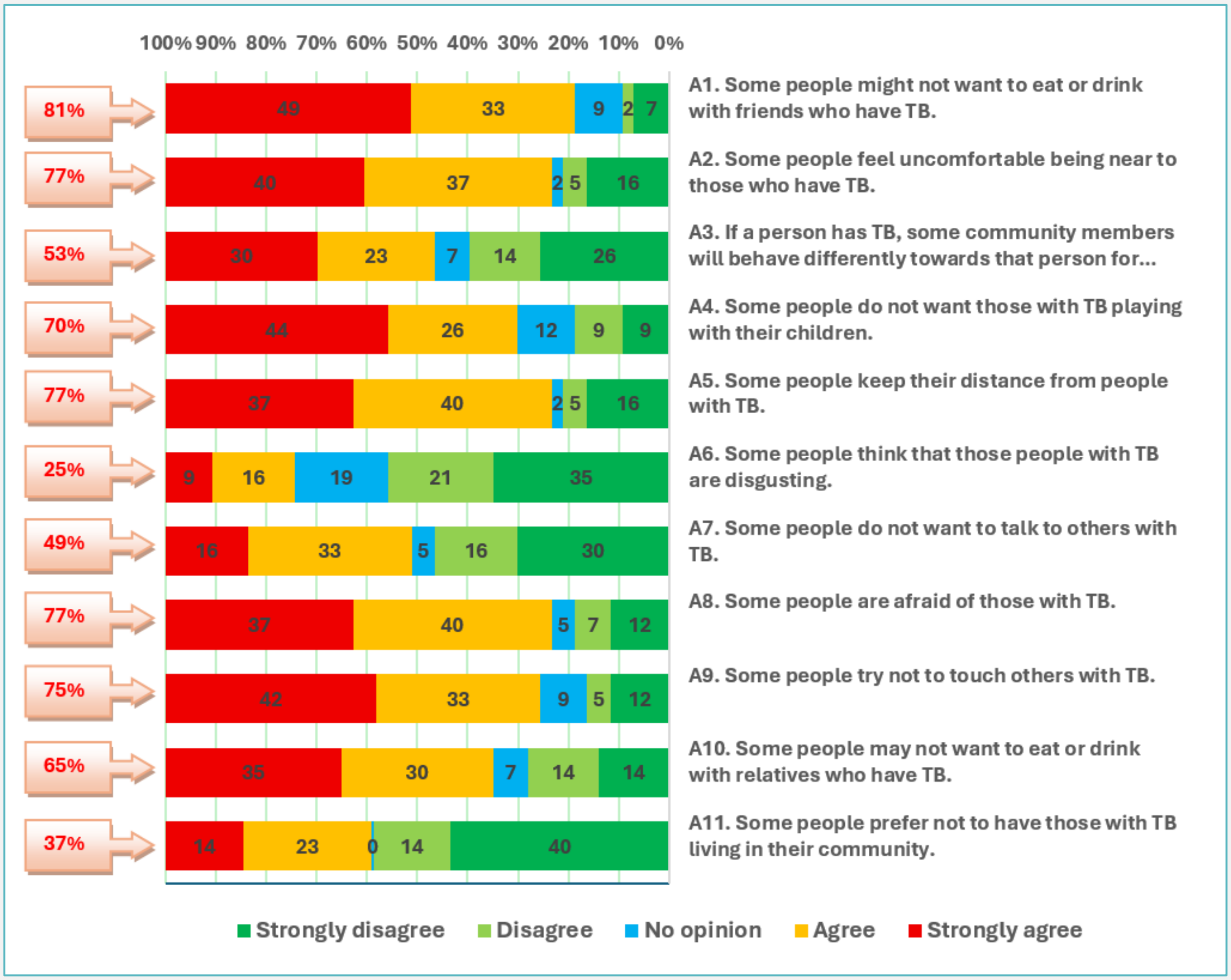
Self-stigma scale

The analysis of the 11 items regarding social perceptions towards people with TB, among community members (43 people), highlights a clear tendency towards avoidance, rejection and social distancing towards people with TB (Figure 8).

The largest proportion (81%, 35) of participants indicated that there are people who avoid eating or drinking with friends diagnosed with TB. This attitude of avoidance in the close circle is also supported by the fact that the majority (77%, 33) observed the discomfort felt around those with TB, the tendency to keep their distance or to show fear towards people with TB (Figure 8). Physical avoidance behaviors are also common: 75% (32) of respondents mentioned that some avoid physical contact with those who have TB. In 70% (30), participants claim that some parents do not allow sick people to interact with their own children. Also, in 65% (28) cases, participants observed that some people refuse to eat or drink with relatives sick with TB, which suggests a persistent perception of risk even within the family (Figure 8).

The perception of lasting stigma is present in 53% (23) of the cases, where participants noted that some people permanently change their behavior towards a person diagnosed with TB. In terms of communication, 49% (21) observed a tendency to avoid dialogue with people with TB, which may contribute to their social isolation (Figure 8). At the opposite end, 37% (16) of respondents specified that some people prefer that people with TB not live in the same community, and 25% (11) indicated that some people consider people with TB to be repulsive (Figure 8).

Figure 8 Psychosocial impact of tuberculosis on community members measured based on the self-stigma scale



Indicators of stigma and emotional impact in the community environment

The statistical analysis of the 11 items that make up the scale of perception of stigma in the community environment towards people with TB highlights a high internal consistency and a moderate variability in the participants' responses. The average total score of the scale is 26.95 (standard deviation 10.43), which indicates a relatively large dispersion of perceptions within the sample. The average score per item is 2.45, which suggests a moderate level of support for statements reflecting social stigma, without obvious extremes. The Cronbach's Alpha coefficient, equal to 0.876, confirms a very good internal consistency of the scale, which indicates that the items coherently measure the perceived dimension of stigma. This value supports the reliability of the instrument in assessing social attitudes towards TB within the studied sample (Table 22).

At the individual item level, the highest mean scores were recorded for *A9 - Some people try not to touch others with TB* (mean = 2.88), *A4 - Some people do not want those with TB playing with their children* (mean = 2.86) and *A8 - Some people are afraid of those with TB* (mean = 2.84). These results indicate a clear perception of the risk of contracting TB and a tendency to physical avoidance, which reflects a form of stigmatization based on fear and personal protection (Table 22).

Items *A2 - Some people feel uncomfortable being near to those who have TB* (mean = 2.79) and *A5 - Some people keep their distance from people with TB* (mean = 2.77) support this tendency towards social distancing, suggesting that TB is perceived as a latent threat in everyday interactions. Also, *A10 - Some people may not want to eat or drink with relatives who have TB* (mean = 2.58) indicates a reluctance even within close family settings (Table 22).

In contrast, the lowest mean scores were recorded for A6 - Some people think that those people with TB are disgusting (mean = 1.44), *A11 - Some people prefer not to have those with TB living in their community* (mean = 1.58) and *A7 - Some people do not want to talk to others with TB* (mean = 1.88). These values suggest that *although avoidance behaviors exist, they are not always accompanied by explicit hostile or devaluing attitudes* (Table 22).

From the perspective of internal consistency, the items that best correlate with the total score of the scale are A9 (item-total correlation = 0.806), A2 (0.752) and A5 (0.729). These items appear to be the most relevant to the measured construct, reflecting the central dimension of social stigma – physical distancing and discomfort in interaction (Table 22).

Table 22 Descriptive statistics and internal consistency of self-stigma scale items: community members

Item name	Average responses ± standard deviation	Item-total correlation	coefficient Cronbach's Alpha
A1. Some people might not want to eat or drink with friends who have TB.	3.14 ±1.47	0.475	0.872
A2. Some people feel uncomfortable being near to those who have TB.	2.79 ±1.44	**0.752**	0.854
A3. If a person has TB, some community members will behave differently towards that person for the rest of their life.	2.19 ±1.62	0.512	0.871
A4. Some people do not want those with TB playing with their children.	2.86 ±1.334	0.546	0.868
A5. Some people keep their distance from people with TB.	2.77 ±1.43	**0.729**	0.855
A6. Some people think that those people with TB are disgusting.	1.44 ±1.37	0.555	0.867
A7. Some people do not want to talk to others with TB.	1.88 ±1.55	0.545	0.869
A8. Some people are afraid of those with TB.	2.84 ±1.33	0.650	0.861
A9. Some people try not to touch others with TB.	2.88 ±1.33	**0.806**	0.851
A10. Some people may not want to eat or drink with relatives who have TB.	2.58 ±1.45	0.449	0.875
A11. Some people prefer not to have those with TB living in their community.	1.58 ±1.55	0.453	0.875

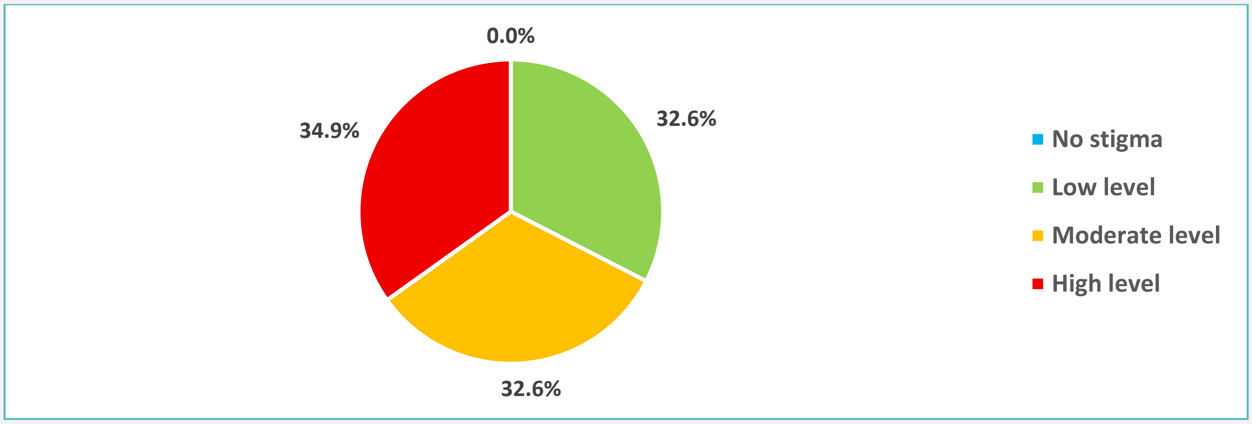
Item name	Average responses ± standard deviation	Item-total correlation	coefficient Cronbach's Alpha
Average total scale score	**26.95 ±10.43**	**-**	**-**
Average score per item	**2.45 ±0.58**	**-**	**-**
Cronbach's Alpha coefficient	**-**	**-**	**0.876**

Estimated level of self-stigma in the community environment

Based on the responses to the set of 11 items (Figure 8), an individual mean per item per respondent was calculated, which allowed the construction of a scale to measure the level of self-stigma. The scale thus obtained allowed the delimitation of four distinct levels of self-stigma: no stigma, low level, moderate level and high level.

With regard to the perceived level of stigma in the community environment towards people with TB, the study results indicate a balanced but significant trend towards moderate and high forms of stigma. Out of the total of 43 participants, none recorded a score equal to zero, which means that the complete absence of stigma was not present in this sample. A number of 14 respondents (33%) fell into the low stigma category, reflecting a relatively restrained perception towards people with TB. Another 14 respondents (33%) were classified as moderate stigma, indicating a significant presence of ambivalent feelings, in which both empathy and avoidance or fear behaviors can coexist. The highest proportion was recorded in the high stigma category, where 15 respondents (35%) presented scores indicating frequent support for stigmatizing statements. This category is the most concerning, as it reflects a deeply negative perception of people with TB, with the potential to lead to social exclusion, discrimination, and limited access to support and services (Figure 9).

Figure 9 Level of stigma felt in the community environment



Factors associated with high perception of stigma in the community environment

The estimated level of self-stigma, derived from the 11-item composite scale, was recoded into two categories: **low stigma** (includes levels of no stigma and low stigma) and **high stigma** (includes levels of moderate stigma and high stigma). Binary recoding allowed examination of the relationship between high perceptions of stigma and demographic and TB environment factors.

The analysis of the association of demographic factors and the perception of high stigma in the community environment reveals significant differences by age. Respondents aged 45 years or older were significantly more likely to perceive a high level of stigma (24 people), compared to those in the low stigma group (1 person). This difference is supported by a statistically significant association (p<0.001) and a very high odds ratio (OR=408), but the extreme value of the OR and the wide confidence interval suggest that the estimate should be interpreted with caution, in the context of the small sample size (Table 23).

Table 23 Demographic factors associated with perception of high stigma in the community setting

Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Total	25	18		
Sex				
Men	3 (12.0)	4 (22.2)	0.47 [0.09-2.46]	0.627
Women	22 (88.0)	14 (77.8)	ref	
Age group				
≤ 44 years	1 (4.0)	17 (94.4)	ref	
≥ 45 years	24 (96.0)	1 (5.6)	408 [23.83 -6986]	**<0.001**

Awareness of the presence of people with TB in the community appears to be a significant factor associated with the perception of high stigma. Respondents who reported knowing two or more people with TB were much more likely to perceive high stigma (19 individuals), compared to those who knew at most one person (6 individuals). This difference is supported by a statistically significant association (p=0.018) and an odds ratio of 4.97, suggesting that more frequent exposure to TB cases is associated with a higher likelihood of perceiving stigma. However, given the relatively small sample size and fairly wide confidence interval, this estimate should be interpreted with caution (Table 24).

Table 24 Association between perception of high stigma in the community environment and the number of people with tuberculosis personally known

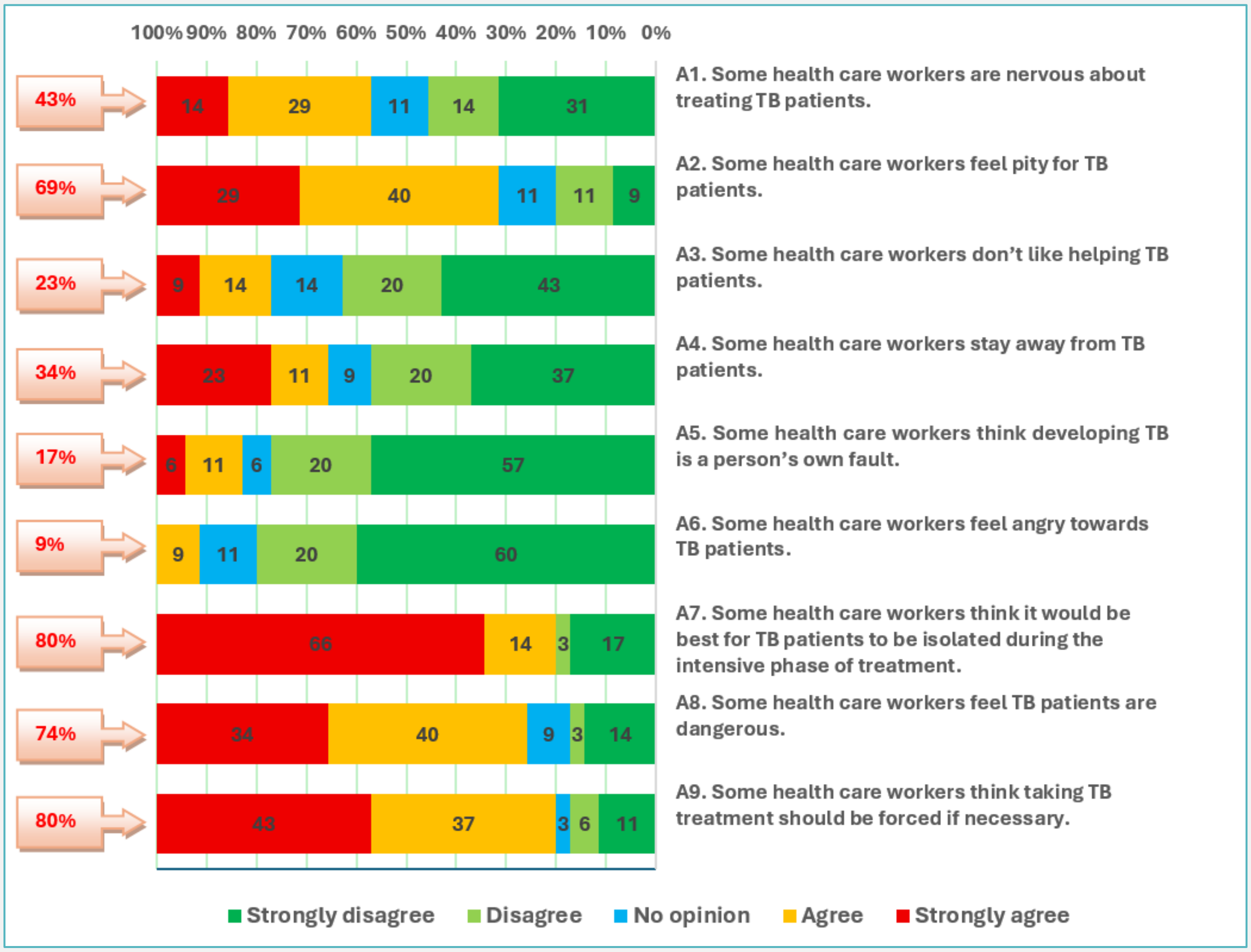
Variable name	stigma		OR [CI:95%]	P-value
	High, n (%)	Reduced, n (%)		
Total	25	18		
None or one only	6 (24.0)	7 (38.9)	ref	**0.018**
Two or more	19 (76.0)	11 (61.1)	4.97 [1.33-18.61]	

Medical personnel in the healthcare system

Stigmatizing attitudes of medical personnel towards people with tuberculosis

The analysis of the nine items regarding the perceptions of healthcare professionals towards TB patients highlights a series of attitudes that may contribute to the perpetuation of the stigma associated with this disease. A significant proportion of respondents (80%, 28) believe that TB treatment should be imposed, if necessary, which suggests an authoritarian approach, possibly motivated by the perception of the disease as a threat to public health. This trend is supported by the fact that 74% (26) of participants perceive TB patients as dangerous, which may fuel fear and avoidance. (Figure 10).

Figure 10 Stigmatizing attitudes of medical personnel towards people with tuberculosis measured based on standardized items



Isolation of patients in the intensive phase of treatment is supported by 80% of the respondents (28), indicating a clear preference for physical separation of patients, with a potential negative impact on their psychosocial state. Another 9% (3) of participants acknowledge the existence of feelings of hostility towards TB patients, suggesting that stigma is not always conscious or directly expressed, but can be manifested through other forms of behavior, such as avoidance or lack of support (Figure 10).

Holding the patient solely responsible for contracting TB is a view shared by 17% (6) of respondents, indicating a tendency to blame, with the risk of reducing empathy and willingness to provide support. This lack of availability is also reflected in the fact that 23% (8) of participants believe that some healthcare workers do not show support towards patients, while 34% (12) admit to avoiding contact with them (Figure 10).

On the other hand, there are also clear signs of empathy: 69% (24) of respondents state that some health workers feel compassion towards TB patients, which may partially counterbalance stigmatizing attitudes. However, anxiety related to the care of these patients is present in 43% (15) of cases, which may negatively impact the quality of medical care and the therapeutic relationship (Figure 10).

Indicators regarding stigmatizing attitudes of medical personnel towards people with tuberculosis

Statistical analysis of the 9 items that make up the scale of perception of stigma among medical personnel towards TB patients highlights an acceptable internal consistency and a moderate variability in the participants' responses. The average total score of the scale is 17.74 (standard deviation = 6.95), which indicates a relatively large dispersion of perceptions within the sample. The average score per item is 1.97 (standard deviation = 1.36), which suggests a moderate level of support for statements reflecting professional stigma, without obvious extremes. The Cronbach's Alpha coefficient, equal to 0.729, confirms a reasonable internal consistency of the scale, indicating that the items coherently measure the perceived dimension of stigma in the professional context within the studied sample (Table 25).

At the individual item level, the highest mean scores were recorded for *A7 - Some health care workers think it would be best for TB patients to be isolated during the intensive phase of treatment* (mean = 3.09), *A9 - Some health care workers think taking TB treatment should be forced if necessary (*mean = 2.94) and *A8 - Some health care workers feel TB patients are dangerous* (mean = 2.77). These results indicate a clear perception of the risk of TB transmission and a tendency to control and isolate, reflecting a form of stigmatization based on fear and institutional protection or public health considerations (Table 25).

Item *A2 - Some health care workers feel pity for TB patients* (mean = 2.69) offers a different nuance, suggesting that, despite perceptions of danger, there is also an empathetic component in the relationship with patients. However, this attitude is not dominant in the scale as a whole (Table 25).

In contrast, the lowest mean scores were recorded for *A6 - Some health care workers feel angry towards TB patients* (mean = 0.69), *A5 - Some health care workers think developing TB is a person's own fault* (mean = 0.89) and *A3 - Some health care workers don't like helping TB patients* (mean = 1.26). These values suggest that although avoidance or controlling behaviors exist, they are not always accompanied by explicit hostile or devaluing attitudes (Table 25).

From the perspective of internal consistency, the items that best correlated with the total score of the scale are *A6 - Some health care workers feel angry towards TB patients* (item-total correlation = 0.594), *A4 - Some health care workers stay away from TB patients* (0.579) and *A7 - Some health care workers think it would be best for TB patients to be isolated during the intensive phase of treatment* (0.575). These items appear to be the most relevant to the measured construct, reflecting the central dimension of professional stigma – physical distancing, perception of danger and the need for isolation (Table 25).

Table 25 Descriptive statistics and internal consistency of scale items regarding stigmatizing attitudes of medical personnel towards people with tuberculosis

Item name	Average responses ± standard deviation	Item-total correlation	coefficient Cronbach's Alpha
A1. Some health care workers are nervous about treating TB patients.	1.80 ±1.51	0.390	0.708
A2. Some health care workers feel pity for TB patients.	2.69 ±1.25	0.040	0.760
A3. Some health care workers don't like helping TB patients.	1.26 ±1.38	0.525	0.683
A4. Some health care workers stay away from TB patients.	1.63 ±1.62	**0.579**	0.558

Item name	Average responses ± standard deviation	Item-total correlation	coefficient Cronbach's Alpha
A5. Some health care workers think developing TB is a person’s own fault.	0.89 ±1.28	0.425	0.701
A6. Some health care workers feel angry towards TB patients.	0.69 ±0.993	**0.594**	0.683
A7. Some health care workers think it would be best for TB patients to be isolated during the intensive phase of treatment.	3.09 ±1.54	**0.575**	0.670
A8. Some health care workers feel TB patients are dangerous.	2.77 ±1.35	0.352	0.714
A9. Some health care workers think taking TB treatment should be forced if necessary.	2.94 ±1.32	0.212	0.736
Average total scale score	**26.95 ±10.43**	-	-
Average score per item	**1.97 ±1.36**	-	-
Cronbach's Alpha coefficient	-	-	**0.729**

Stigma experienced

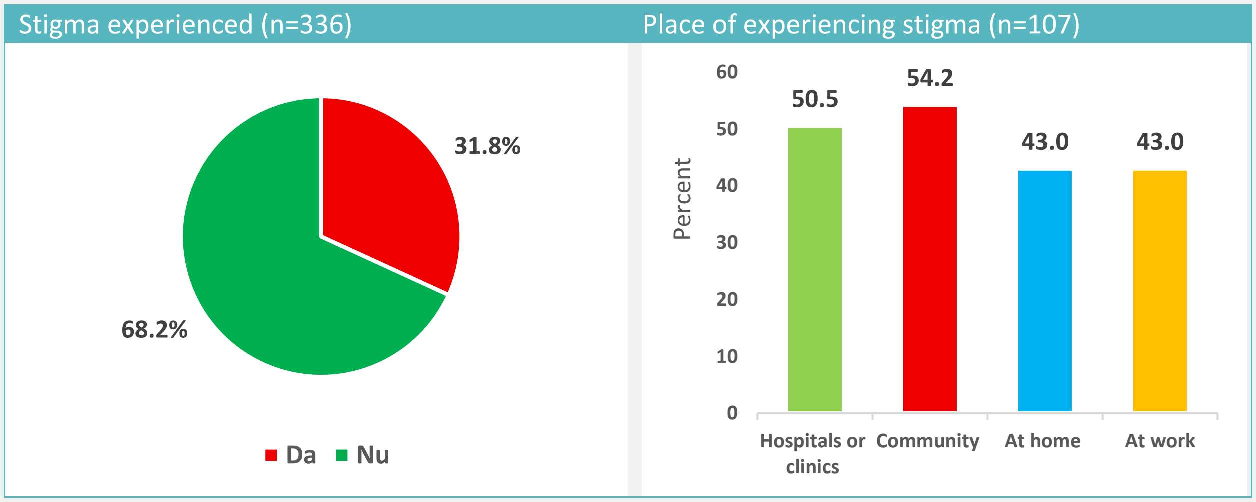
This subchapter aims to explore experienced stigma both acknowledged and lived. The analysis focuses on identifying the settings where stigma was encountered, such as medical institutions, the community, the home, and the workplace, as well as examining potential risk factors (demographic, social, clinical, and contextual) that may influence or determine these experiences. In addition, the relationships between these factors and experienced stigma were analyzed, along with their connection to the specific contexts (settings) in which stigma manifests.

People with tuberculosis

Dimensions of stigma experienced by people with TB

Experiences of stigma reveal a complex picture of how respondents perceive and experience stigma in various social contexts. Out of a total of 336 respondents, one third (32%, 107) specified that they had experienced stigma. Among them, 50.5% (54 out of 107) mentioned that this took place within medical institutions, suggesting the existence of deficiencies in professional ethics and in ensuring equitable access to health services. At the same time, stigmatization in the community was found in 54% of cases (58 out of 107), which highlights persistent social pressure and a lack of acceptance in the everyday environment, contributing to the isolation and marginalization of these people. The workplace represented another vulnerable space, where 43% (46 out of 107) of respondents mentioned experiences of stigmatization, which could affect not only the psychological state of the individual, but also professional performance. Another 43% (46 out of 107) respondents specified stigma in their home environment (Figure 11).

Figure 11 Dimensions of stigma: experiences and environments where it was felt

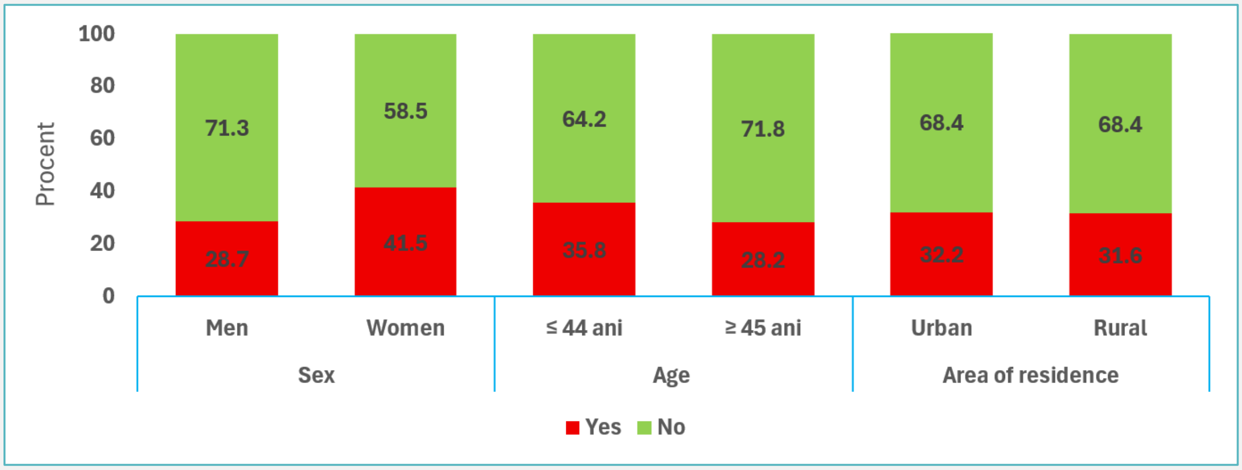

Stigma experienced (n=336)

Place of experiencing stigma (n=107)

Experiencing stigma and the demographic profile of people with tuberculosis

Analysis of data on the experience of stigma according to the demographic characteristics of the respondents highlights significant differences in terms of gender, but not according to age or area of residence. The distribution by gender shows a statistically significant difference in that women experienced stigma more frequently compared to men (OR=1.75; 95% CI:1.04-2.94; p=0.023). Regarding age and area of residence, they did not significantly influence the probability of experiencing stigma ($p > 0.05$, Figure 12).

Figure 12 Experiencing stigma by demographic characteristics, % (n=336)



After analyzing the relationship between demographic characteristics — gender, age, and residential environment — and the perception of TB-associated stigma in four distinct contexts (community, workplace, healthcare institutions, and home), the significant influence of age and residential environment on this perception is highlighted. Stigma is more frequently reported among young people and those living in rural areas, suggesting increased vulnerability in these groups.

Therefore, within the community, the differences are striking. People under 44 years of age (64%) are more than twice as likely to perceive stigma (OR=2.55; 95% CI: 1.16–5.58), and those in rural areas (71%) show a similarly increased risk (OR=2.41; 95% CI: 1.042–5.58). The *associated p- values* (0.014 and 0.002) confirm the statistical significance of these associations, suggesting that stigma is more intensely felt in less informed or more conservative social contexts (Table 26).

At home, although the data are more fragmented, the same trend is maintained: stigma is more frequently reported by people from rural areas (67%), with a marginally significant statistical association (OR=2.13; 95% CI: 0.964–4.72; p=0.045). These results indicate that private space is not necessarily a refuge from stigma, especially in rural communities (Table 26).

In the healthcare setting, perceptions of stigma did not vary significantly by gender or age, indicating a relatively even distribution of stigma experiences in this setting. However, people from rural areas (61%) tended to report such experiences more frequently, although the differences did not reach statistical significance (p=0.252, Table 26).

Table 26 Experiencing stigma by demographic characteristics and place of perception

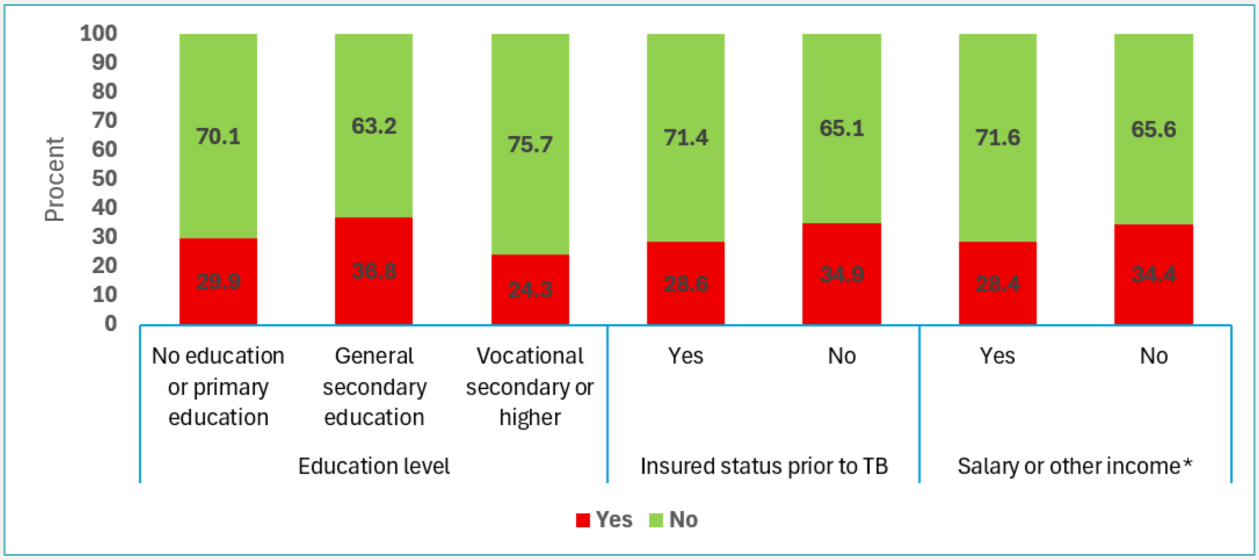
	Medical institutions			Community			Home			Workplace		
Variable name	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
Sex												
Men	36 (66.7)	37 (69.8)	0.444	39 (67.2)	34 (69.4)	0.489	35 (76.1)	38 (62.3)	0.95	34 (73.9)	39 (63.9)	0.188
Women	18 (33.3)	16 (39.2)		19 (32.8)	15 (30.6)		11 (23.9)	23 (37.7)		12 (26.1)	22 (36.1)	
Age group												
≤ 44 years	30 (55.6)	27 (50.9)	0.388	37 (63.8)	20 (40.8)	**0.014**	26 (56.5)	31 (50.8)	0.349	26 (56.5)	31 (50.8)	0.349

	Medical institutions			Community			Home			Workplace		
Variable name	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
≥ 45 years	24 (44.4)	26 (49.1)		21 (36.2)	29 (59.2)		20 (43.5)	30 (49.2)		20 (43.5)	30 (49.2)	
Residence environment												
Urban	21 (38.9)	25 (47.2)	0.252	17 (29.3)	29 (59.2)	**0.002**	15 (32.6)	31 (50.8)	**0.045**	17 (37.0)	29 (47.5)	0.185
Rural	33 (61.1)	28 (52.8)		41 (70.7)	20 (40.8)		31 (67.4)	30 (49.2)		29 (63.0)	32 (52.5)	

Experiencing stigma and the socio-economic profile of people with tuberculosis

Data on the experience of stigma by education level, health insurance status prior to TB diagnosis, and occupation suggest the existence of differences between subgroups, but these do not appear to be very pronounced, with none of the factors being associated with the experience of stigma (p > 0.05, Figure 13).

Figure 13 Experiencing stigma by socio-economic profile, % (n=336)



Salary includes any type of income from salary, allowances, scholarships, pensions or other income

The analysis of socio-economic variables — education level and health insurance status prior to TB diagnosis — did not reveal a statistically significant association with experiencing stigma, regardless of the context in which it was perceived: in medical institutions, community, at home or at work (p > 0.05). These results suggest that, within the analyzed sample, the listed characteristics did not significantly influence the perception of TB-associated stigma (Table 27).

In contrast, employment status demonstrated a statistically significant association with perceived stigma in the context of healthcare settings (p = 0.030). Unemployed individuals—defined as those without income from wages, pensions, scholarships, or other sources—reported stigma at a significantly higher rate (72%) than employed individuals. The risk estimate (OR = 2.32; 95% CI: 1.04–5.18) indicates that unemployed individuals are more than twice as likely to experience stigma in healthcare settings. This difference may reflect increased social and economic vulnerability, which influences how they are perceived and treated in healthcare settings (Table 27).

Regarding the perception of stigma at home, unemployed people (non-salaried) reported stigmatization at a rate of 61%, indicating a possible influence of socio-economic status on how stigma is felt in the private space. Although this relationship is not statistically confirmed, the p-value of 0.067 suggests a trend towards significance, indicating that the observed differences could reflect a real effect, but insufficiently supported by the available data to be considered statistically significant (Table 27).

Table 27 Experiencing stigma according to socio-economic profile and place of perception

	Medical institutions			Community			Home			Workplace		
Variable name	Yes	Not	*P-value*	Yes	Not	*P-value*	Yes	Not	*P-value*	Yes	Not	*P-value*
	n (%)	n (%)		n (%)	n (%)		n (%)	n (%)		n (%)	n (%)	
Total (n=107)	54	53		58	49		46	61		46	61	
Education level												
Primary or no education	15 (27.8)	17 (32.1)	0.394	21 (36.2)	11 (22.4)	0.179	17 (37.0)	15 (24.6)	0.335	11 (23.9)	21 (34.4)	0.489
General secondary education	32 (59.3)	25 (47.2)		30 (51.7)	27 (55.1)		23 (50.0)	34 (55.7)		27 (58.7)	30 (49.2)	
Vocational secondary or higher	7 (13.0)	11 (20.8)		7 (12.1)	11 (22.4)		6 (13.0)	12 (19.7)		8 (17.4)	10 (16.4)	
Previous TB insured status												
Yes	21 (38.9)	25 (47.2)	0.252	23 (39.7)	23 (46.9)	0.287	20 (43.5)	26 (42.6)	0.543	21 (45.7)	25 (41.0)	0.387
Not	33 (61.1)	28 (52.8)		35 (60.3)	26 (53.1)		26 (56.5)	35 (57.4)		25 (54.3)	25 (54.3)	
Salary or other income												
Yes	15 (27.8)	25 (47.2)	**0.030**	20 (34.5)	20 (40.8)	0.317	13 (28.3)	27 (44.3)	0.067	18 (39.1)	22 (36.1)	0.450
Not	39 (72.2)	28 (52.8)		38 (65.5)	29 (59.2)		33 (71.7)	34 (55.7)		28 (60.9)	39 (63.9)	

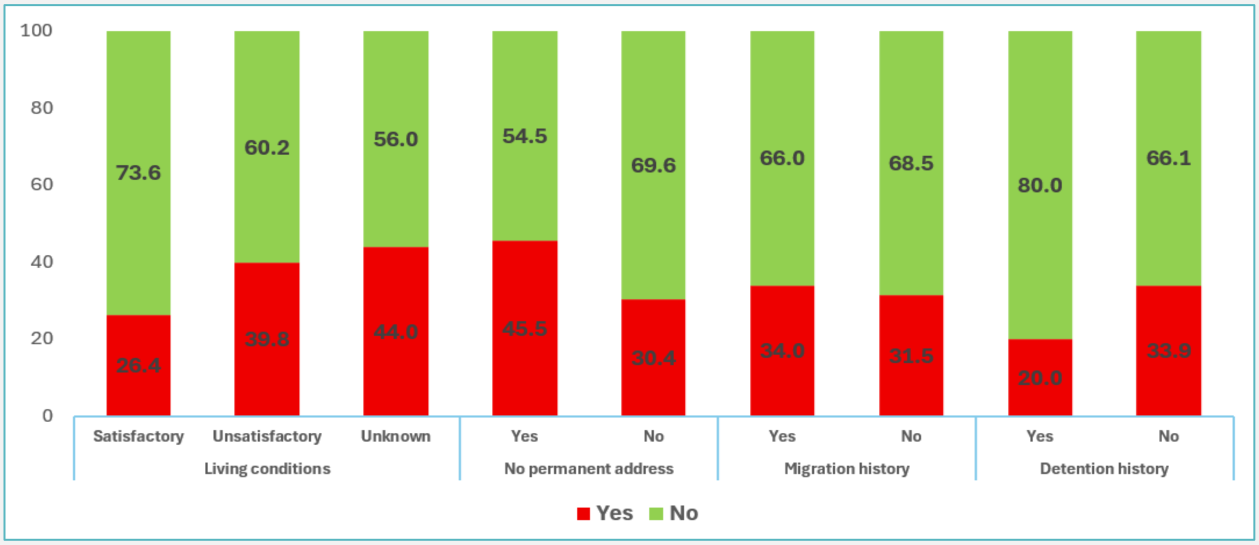
* Salary includes any type of income from salary, allowances, scholarships, pensions or income from other sources

Experiencing stigma in relation to social factors of vulnerability

With reference to the analysis of the relationship between the experience of stigma and social vulnerability factors, it highlights a statistically significant association between living conditions and the experience of stigma. People living in unsatisfactory conditions had a significantly higher risk of experiencing stigma compared to those benefiting from satisfactory conditions (OR = 1.84; 95% CI: 1.11–3.03; p = 0.023). Also, the history of detention is significantly associated with the experience of stigma, but in this case, detention seems to act as a protective factor, reducing the probability of perceiving stigma in the community (OR = 0.48; 95% CI: 0.23–1.11; p=0.034) (Figure 14).

Two other factors analyzed—migration history and lack of a stable home—do not appear to significantly influence the experience of stigma, although the p-value of 0.061 for homeless people and the experience of stigma is close to the threshold of significance, meaning that there is a possibility that this association is not random, but it is not strong enough to be considered statistically significant (Figure 14).

Figure 14 Experiencing stigma depending on social vulnerability factors, % (n=336)



A detailed picture of the relationship between social vulnerability factors and the perception of stigma in four distinct contexts: community, workplace, medical institutions and home is presented in Table 28In this context, factors such as living conditions, lack of a stable home and migration history do not seem to have significantly influenced the experience of stigma depending on the place where it was perceived (p>0.05).

In contrast, a history of imprisonment is statistically significantly associated with a lower likelihood of perceiving stigma (OR=0.128; 95% CI:0.16–1.24; p=0.025), indicating a possible protective effect in certain social contexts, particularly in the community (3.4%) and at home (2.2%). This inverse relationship may reflect different social adaptation or altered perception of stigma among people with imprisonment experience, which may influence how they interpret or internalize stigmatizing attitudes around them (Table 28).

Table 28 Experiencing stigma in relation to social vulnerability factors and place of perception

	Medical institutions			Community			Home			Workplace		
Variable name	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
Living conditions												
Satisfactory	28 (51.9)	27 (50.9)	0.940	24 (41.4)	31 (63.3)	0.067	21 (45.7)	34 (55.7)	0.104	23 (50.0)	32 (52.5)	0.965
Unsatisfactory	21 (38.9)	20 (37.7)		26 (44.8)	15 (30.6)		17 (37.0)	24 (39.3)		18 (39.1)	23 (37.7)	
Unknown	5 (9.3)	6 (11.3)		8 (13.8)	3 (6.1)		8 (17.4)	3 (4.9)		5 (10.9)	6 (9.8)	
No permanent address												
Yes	8 (14.8)	7 (13.2)	0.516	7 (12.1)	8 (16.3)	0.361	7 (15.2)	8 (13.1)	0.485	7 (15.2)	8 (13.1)	0.485
Not	46 (85.2)	46 (86.8)		51 (87.9)	41 (83.7)		39 (84.8)	53 (86.9)		39 (84.8)	53 (86.9)	
Migration history*												
Yes	8 (14.8)	8 (15.1)	0.591	7 (12.1)	9 (18.4)	0.261	7 (15.2)	9 (14.8)	0.578	6 (13.0)	10 (16.4)	0.422
Not	46 (85.2)	45 (84.9)		51 (87.9)	40 (81.6)		39 (84.8)	52 (85.2)		40 (87.0)	51 (85.0)	

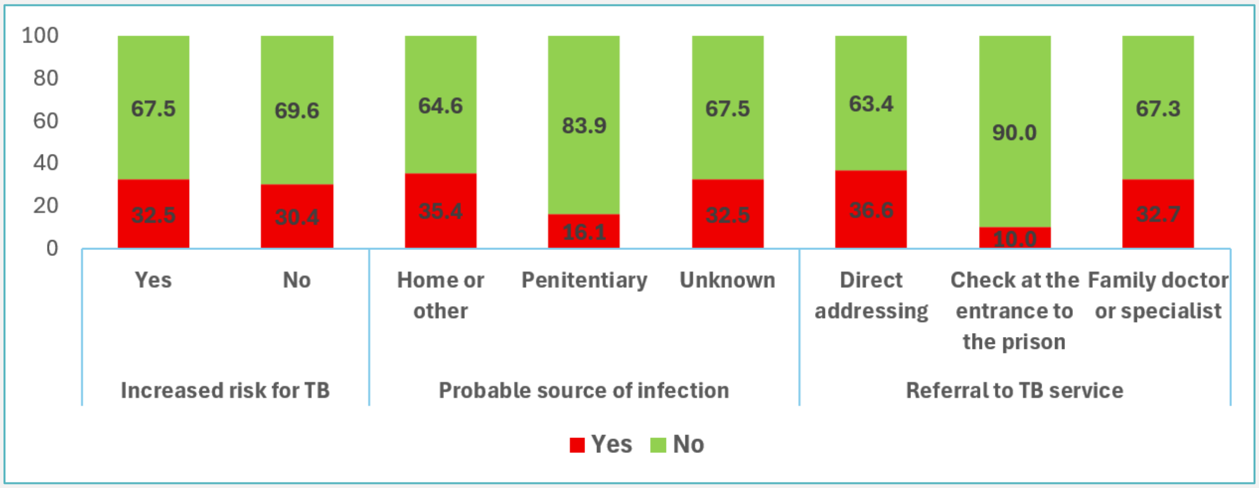
	Medical institutions			Community			Home			Workplace		
Variable name	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
Detention history*												
Yes	6 (11.1)	4 (7.5)	0.383	2 (3.4)	8 (16.3)	**0.025**	1 (2.2)	9 (14.8)	**0.025**	2 (4.3)	8 (13.1)	0.112
Not	48 (88.9)	49 (92.5)		56 (96.6)	41 (83.7)		45 (97.8)	52 (85.2)		44 (95.7)	53 (86.9)	

*Living conditions – estimated, subjective assessment assessed by the phthisiopneumologist and pneumology doctor during the consultation; Migration history – the person lived outside the country for a period of at least 3 months in the last 12 months prior to the diagnosis of TB; Detention history – the person was deprived of liberty (in detention) for the last 24 months or more before the diagnosis of TB.

Experiencing stigma in relation to exposure factors and referral to TB service

The variables analyzed, such as conditions of increased risk for contracting TB, probable sources of contagion, and the method of referral to the TB service, did not present statistically significant associations with the experience of stigma (p > 0.05) (Figure 15).

Figure 15Experiencing stigma in relation to tuberculosis exposure factors and referral method to the tuberculosis service for diagnosis, % (n=336)



*Increased risk for TB – employees in TB medical institutions, nursing homes or homeless people, penitentiary institutions, former prisoners, other locations at risk for TB; Probable source of contagion (Other assumes known but unspecified sources)

In the four contexts analyzed – community, workplace, healthcare facilities and home – the variables related to increased risk for TB, as well as those related to the probable source of infection, revealed variations in the frequency of stigma perception. However, not all the differences observed reached the threshold of statistical significance (p>0.05), which suggests that although trends exist, they cannot be considered conclusive (Table 29).

Analysis of referral patterns to TB services reveals a clear trend towards referrals through family doctors or specialists, regardless of the context in which stigma is perceived (p=0.047). Regarding the perception of stigma in the community, at home and at work, no statistically significant differences were identified depending on the type of referral. However, in the case of individuals who reported stigma in health facilities, direct referral to the TB service was significantly associated with this perception, suggesting a statistically relevant relationship between the type of referral and the institutional context. Specifically, 22% of those who directly contacted the TB service experienced stigma, and the effect estimate analysis showed that they were more than four times more likely to perceive stigma compared to people referred by a healthcare professional (OR=4.78; 95% CI: 1.23–18.10; p=0.015) (Table 29).

Table 29 Experiencing stigma in relation to tuberculosis exposure factors and referral to tuberculosis service for diagnosis and place of perception

Variable name	Medical institutions			Community			Home			Workplace		
	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
Increased risk for TB												
Yes	37 (68.5)	39 (73.6)	0.358	42 (72.4)	34 (69.4)	0.447	34 (73.9)	40 (65.6)	0.111	36 (78.3)	40 (65.6)	0.111
Not	17 (31.5)	14 (26.4)		16 (27.6)	15 (30.6)		12 (26.1)	21 (34.4)		10 (21.7)	21 (34.4)	
Probable source of infection												
Home or other*	16 (29.6)	18 (34.0)	0.385	22 (37.9)	12 (24.5)	0.324	14 (30.4)	20 (32.8)	0.118	14 (30.4)	20 (32.8)	0.519
Penitentiary	4 (7.4)	1 (1.9)		0 (0.0)	5 (10.2)		0 (0.0)	5 (8.2)		1 (2.2)	4 (6.6)	
Unknown	34 (63.0)	34 (64.2)		36 (62.1)	32 (65.3)		32 (69.6)	36 (59.0)		31 (67.4)	37 (60.7)	
Referral to TB service												
Direct addressing	12 (22.2)	3 (5.7)	**0.047**	6 (10.3)	9 (18.4)	0.226	5 (10.9)	10 (16.4)	0.199	10 (21.7)	5 (8.2)	0.129
Check at the entrance to the prison	1 (1.9)	1 (1.9)		2 (3.4)	0 (0.0)		2 (4.3)	0 (0.0)		1 (2.2)	1 (1.6)	
Family doctor or specialist	41 (75.9)	49 (92.5)		50 (86.2)	40 (81.6)		39 (84.8)	51 (83.6)		35 (76.1)	55 (90.2)	

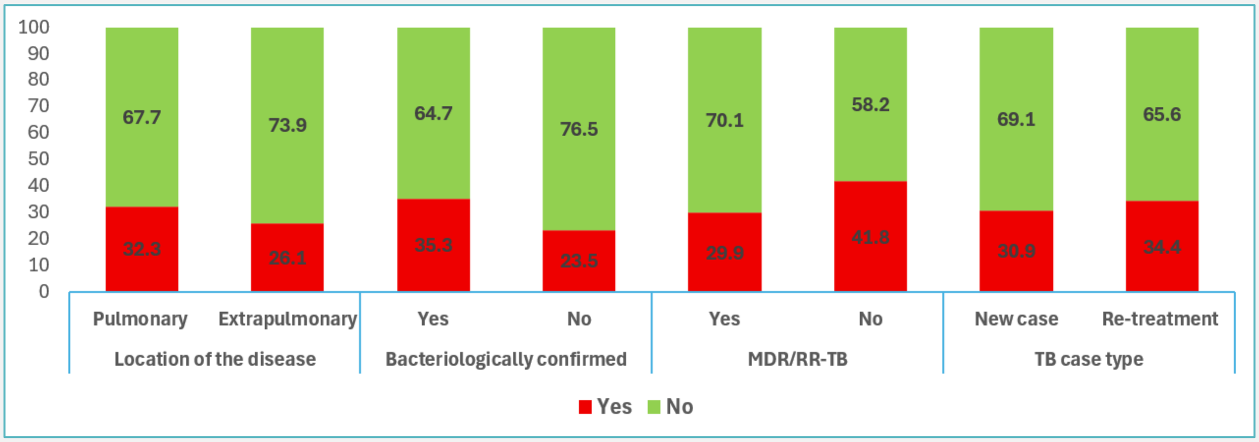
*Increased risk for TB – employees in TB medical institutions, nursing homes or homeless people, penitentiary institutions, former prisoners, other locations at risk for TB; Probable source of contagion (Other assumes known but unspecified sources)

Experiencing stigma in relation to clinical characteristics

The relationship between clinical characteristics of TB and the experience of stigma shows some variations depending on the type of diagnosis and the location of the disease, but does not reach the threshold of statistical significance. Thus, respondents with pulmonary TB and those with re-treatments experienced stigma in a higher proportion compared to those with extrapulmonary forms and new cases, but the difference is not statistically significant ($p > 0.05$), suggesting that the location and type of case do not decisively influence the experience of stigma. Regarding MDR/RR TB, the proportion of those who reported stigma was lower compared to those without this form, and the p value equal to 0.059 indicates a trend towards statistical significance. In context, although the conventional threshold of significance is not reached, this difference could signal a potential relationship (Figure 16).

People with bacteriologically confirmed TB were significantly more likely to perceive stigma compared to those without bacteriological confirmation. Statistical analysis indicates a significant association between bacteriological confirmation and experiencing stigma (OR=1.78; 95% CI:1.03–3.04; p=0.022), suggesting that people with bacteriologically confirmed TB are approximately twice as likely to experience stigma (Figure 16).

Figure 16 Experiencing stigma according to clinical characteristics, % (n=336)



A detailed analysis of how the perception of stigma varies according to the clinical characteristics of TB and the context in which it is experienced—community, workplace, medical institutions, and home—highlights relevant differences, but not all of them statistically supported (Table 30).

Regarding the location of the disease, the majority of cases were pulmonary TB, and the distribution of stigma perception is similar among affected individuals, regardless of the context analyzed. The p-values, all above the significance threshold (p>0.05), indicate that the location of the disease does not significantly influence the perception of stigma.

Also, neither the presence of MDR/RR TB nor the type of case at notification (new vs. recurrent case) were significantly associated (p>0.05) with the perception of stigma in any of the four contexts, suggesting that these clinical characteristics do not directly determine the stigma felt (Table 30).

A statistically significant difference is noted in the case of bacteriologically confirmed TB. In the context of health institutions, 87% of people who reported stigmatization had bacteriologically confirmed disease, compared to 70% of those who did not experience stigmatization. The risk estimate indicates almost three times more likely to experience stigma among those with a bacteriologically confirmed diagnosis (OR = 2.9; 95% CI: 1.08–7.79; p=0.033).

This association is even more pronounced in the context of the home, where 89% of people who experienced stigmatization had bacteriological confirmation. In this case, the risk of experiencing stigma is more than three times higher (OR = 3.43; 95% CI: 1.16–10.1; p=0.002). These results suggest that the presence of a confirmed bacteriological diagnosis, often associated with increased contagiousness and isolation measures, may amplify the perception of stigma, especially in close and institutional settings (Table 30).

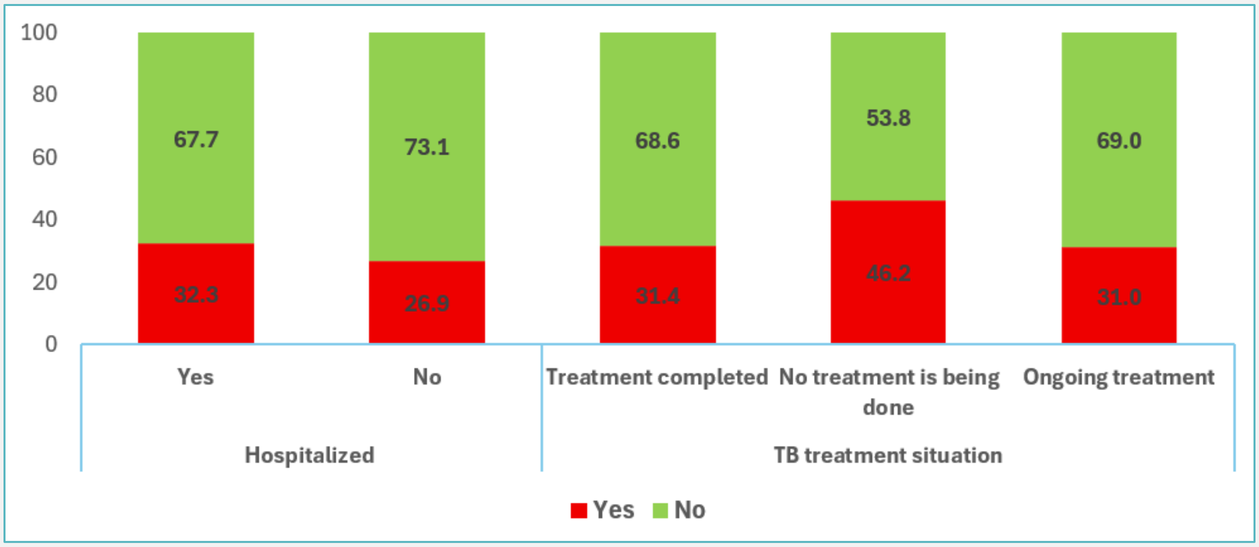
Table 30 Experiencing stigma according to clinical characteristics and place of perception

	Medical institutions			Community			Home			Workplace		
Variable name	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
Location of the disease												
Pulmonary	50 (92.6)	51 (96.2)	0.348	55 (94.8)	46 (93.9)	0.577	43 (93.5)	58 (95.1)	0.519	45 (97.8)	56 (91.8)	0.182
Extrapulmonary	4 (7.4)	2 (3.8)		3 (5.2)	3 (6.1)		3 (6.5)	3 (4.9)		1 (2.2)	5 (8.2)	

	Medical institutions			Community			Home			Workplace		
Variable name	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
Bacteriologically confirmed												
Yes	47 (87.0)	37 (69.8)	**0.033**	46 (79.3)	38 (77.6)	0.505	41 (89.1)	43 (70.5)	**0.002**	38 (82.6)	46 (75.4)	0.477
Not	7 (13.0)	16 (30.2)		12 (20.7)	11 (22.4)		5 (10.9)	18 (29.5)		8 (17.4)	15 (24.6)	
MDR/RR-TB												
Yes	40 (74.1)	44 (83.0)	0.187	43 (74.1)	41 (83.7)	0.169	35 (76.1)	49 (80.3)	0.384	35 (76.1)	49 (80.3)	0.384
Not	14 (25.9)	9 (17.0)		15 (25.9)	8 (16.3)		11 (23.9)	12 (19.7)		11 (23.9)	12 (19.7)	
TB case type												
New case	37 (68.5)	39 (73.6)	0.358	41 (70.7)	35 (71.4)	0.553	32 (69.6)	44 (72.1)	0.469	34 (73.9)	42 (68.9)	0.363
Re-treatment	17 (31.5)	14 (26.4)		17 (29.3)	14 (28.6)		14 (30.4)	17 (27.9)		12 (26.1)	19 (31.1)	

Stigma perception in relation to hospitalization status or TB treatment status did not show statistically significant differences. Hospitalized individuals reported stigma at a slightly higher rate compared to those who were not hospitalized, but the p-value of 0.374 indicates that this difference is not statistically significant (Figure 17).

Figure 17 Experiencing stigma in relation to hospitalization and treatment status for tuberculosis, % (n=336)



*TB treatment status (treatment completed – cured or treatment ended; not undergoing treatment – initiated treatment but not completed)

Regarding treatment status, the proportion of those who experienced stigma is relatively similar between patients who completed treatment and those in treatment, while a higher proportion was observed among those who did not follow treatment (initiated but no longer continued).

The results reflect the trend, but do not provide sufficient evidence to support a clear relationship between treatment status and perception of stigma (p=0.527) (Figure 17).

With regard to the experience of stigma in relation to hospitalization and TB treatment status, reported to four contexts, such as: medical institutions, community, workplace and home, did not reveal statistically significant associations. Regarding hospitalization, the proportion of people who reported stigma is slightly higher among those who were hospitalized, compared to those who were not hospitalized, in all four contexts analyzed. However, these differences are not supported by statistical significance (p>0.05), indicating that the experience of hospitalization does not significantly influence the perception of stigma (Table 31).

Similarly, analysis of treatment status shows that individuals who have completed treatment tend to report stigma to a higher extent, especially in professional and community settings. However, these differences are also not statistically significant (p>0.05), suggesting that treatment status—whether ongoing or completed—is not a determining factor in perceptions of stigma (Table 31).

Table 31 Experiencing stigma in relation to hospitalization, treatment situation and place of perception

	Medical institutions			Community			Home			Workplace		
Variable name	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
Hospitalized												
Yes	52 (96.3)	48 (90.6)	0.211	54 (93.1)	46 (93.9)	0.594	43 (93.5)	57 (93.4)	0.655	43 (93.5)	57 (93.4)	0.655
Not	2 (3.7)	5 (9.4)		4 (6.9)	3 (6.1)		3 (6.5)	4 (6.6)		3 (6.5)	4 (6.6)	
TB treatment situation												
Treatment completed	32 (59.3)	34 (64.2)	0.688	37 (63.8)	29 (59.2)	0.633	28 (60.9)	38 (62.3)	0.091	31 (67.4)	35 (57.4)	0.325
No treatment is being done	4 (7.4)	2 (3.8)		4 (6.9)	2 (4.1)		6 (13.0)	0 (0.0)		1 (2.2)	5 (8.2)	
In treatment	18 (33.3)	17 (32.1)		17 (29.3)	18 (36.7)		12 (26.1)	23 (37.7)		14 (30.4)	21 (34.4)	

*TB treatment status (treatment completed – cured or treatment ended; not undergoing treatment – initiated treatment but not completed)

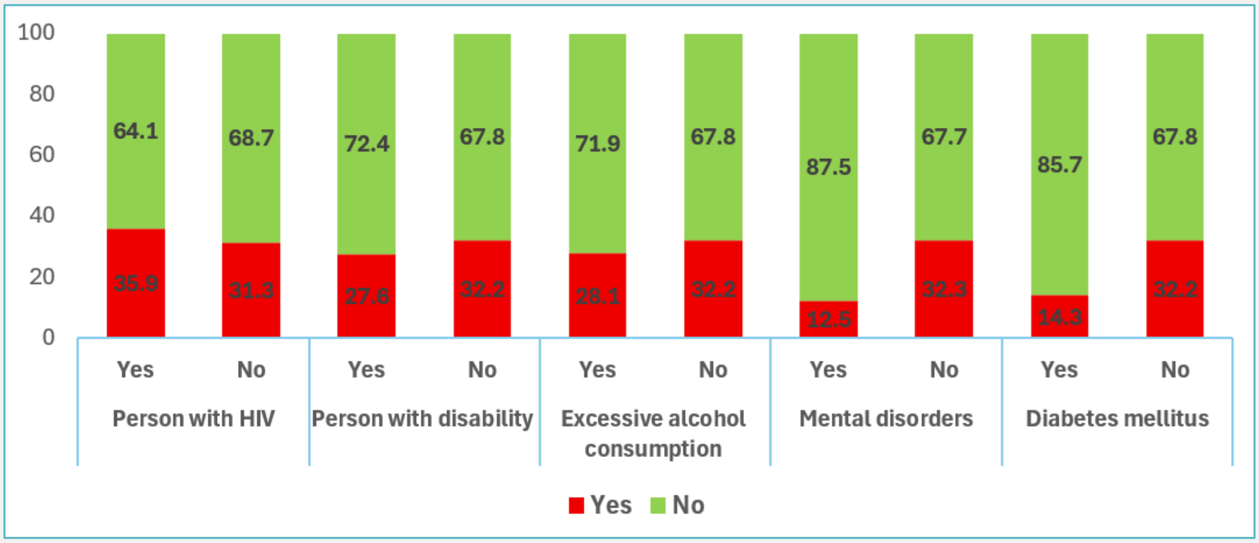
Experiencing stigma in relation to some tuberculosis-associated conditions

Regarding the relationship between the presence of associated conditions — such as HIV infection, disability, excessive alcohol consumption, mental disorders and diabetes mellitus — and the experience of stigma did not reveal statistically significant associations.

Thus, among people living with HIV, 36% experienced it, compared to 31% of those without HIV (p=0.341), a difference that is not statistically significant. Similar situations are observed in the case of other conditions: people with disabilities (28% vs. 32%; p=0.387), excessive alcohol consumption (28% vs. 32%; p=0.399), mental disorders (12% vs. 32%; p = 0.217) and diabetes mellitus (14% vs. 32%; p=0.289) experienced stigma to a lesser extent than those without these conditions, but the differences are not statistically supported.

In context, in all cases, the p-values are higher than the conventional significance threshold (p>0.05), indicating that these conditions do not significantly influence the likelihood of experiencing stigma among people with TB (Figure 18).

Figure 18 Experiencing stigma in relation to some tuberculosis-associated conditions, % (n=336)



The experience of stigma in relation to TB-associated conditions and the four social contexts, such as community, workplace, medical institutions and home, is presented in Table 32.

Of all the variables analyzed, the only statistically significant association is observed in the case of people living with HIV in the context of health institutions. Here, 20% of people who experienced stigma had HIV, compared to only 5.7% of those who did not (p=0.023).

This difference suggests that HIV infection may amplify the perception of stigma in institutional settings, possibly due to the overlap of stigma associated with both conditions — TB and HIV — and an increased sensitivity in interaction with health personnel.

In the other contexts (community, home and workplace), the proportions are relatively close between the groups that perceived and those that did not perceive stigma, and the p values (all > 0.05) indicate the lack of a significant association. Regarding disability and excessive alcohol consumption, no statistically significant differences were identified in any of the four contexts (p > 0.05, Table 32).

Table 32 Experiencing stigma in relation to tuberculosis-associated conditions and place of perception

	Medical institutions			Community			Home			Workplace		
Variable name	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
Person with HIV												
Yes	11 (20.4)	3 (5.7)	**0.023**	8 (13.8)	6 (12.2)	0.523	7 (15.2)	7 (11.5)	0.387	5 (10.9)	9 (14.8)	0.386
Not	43 (79.6)	50 (94.3)		50 (86.2)	43 (87.8)		39 (84.8)	54 (88.5)		41 (89.1)	52 (85.2)	
Person with disability												
Yes	5 (9.3)	3 (5.7)	0.368	5 (8.6)	3 (6.1)	0.456	5 (10.9)	3 (4.9)	0.215	3 (6.5)	5 (8.2)	0.524
Not	49 (90.7)	50 (94.3)		53 (91.4)	46 (93.9)		41 (89.1)	58 (95.1)		43 (93.5)	56 (91.8)	
Excessive alcohol consumption												

	Medical institutions			Community			Home			Workplace		
Variable name	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*	Yes n (%)	Not n (%)	*P-value*
Total (n=107)	54	53		58	49		46	61		46	61	
Yes	49 (90.7)	49 (92.5)	0.512	7 (12.1)	2 (4.1)	0.128	4 (8.7)	5 (8.2)	0.596	4 (8.7)	5 (8.2)	0.596
Not	5 (9.3)	4 (7.5)		51 (87.9)	47 (95.9)		42 (91.3)	56 (91.8)		42 (91.3)	56 (91.8)	

*Excessive alcohol consumption, drug use – conditions subjectively assessed by the doctor during the medical consultation

Experiencing stigma in accessing health services for tuberculosis

Of the 336 respondents, 107 (32%) reported experiences of stigma. Of these, 54 (51%) reported stigma in health care settings, 58 (54%) in the community, 46 (43%) in the home environment, and 46 (43%) in the workplace. Detailed analysis of these experiences, depending on where stigma was perceived in the healthcare pathway, reveals differences in the impact of stigma on access to services and treatment continuity for people with TB (Figure 19).

Within healthcare settings, stigma was most commonly experienced during the stage of establishing a correct diagnosis (56%, 30 out of 54), suggesting difficulties in the patient–caregiver relationship. In about half of cases, respondents experienced stigma during the stages of treatment initiation (46%, 25 out of 54), adherence support (46%, 25 out of 54), and symptom recognition (46%, 25 out of 54). Seeking care was affected in 46% (23 out of 54), and accessing aftercare services in 39% (21 out of 54), indicating a systemic influence of stigma on the entire therapeutic pathway (Figure 19).

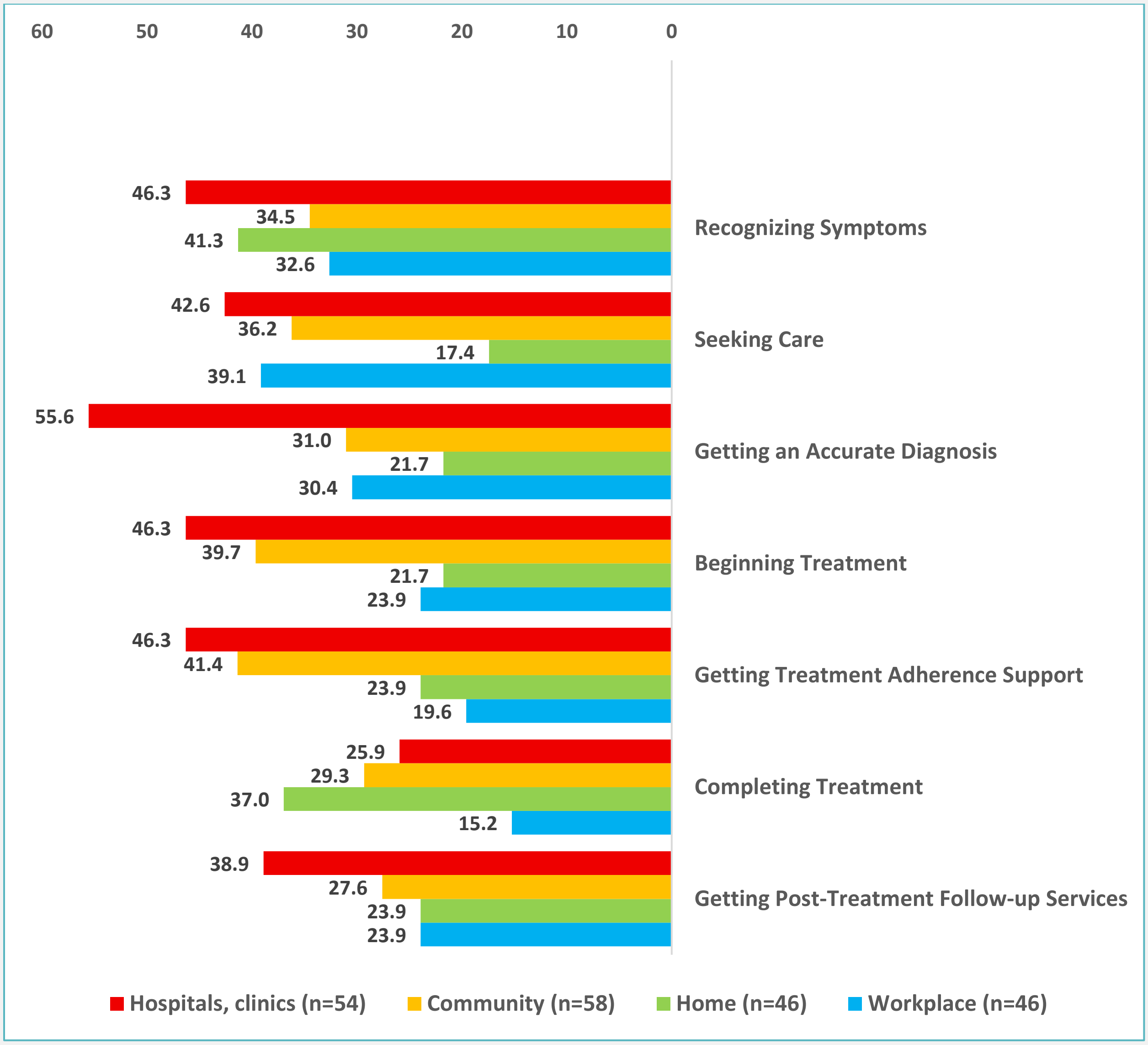
In the community, stigma was most strongly felt at the stages of adherence support (41%, 24 of 58) and treatment initiation (40%, 23 of 58), followed by seeking medical care (36%, 21 of 58) and symptom recognition (34%, 20 of 58). Establishing a diagnosis was affected in 31% (18 of 58), and accessing aftercare services in 28% (16 of 58). These data suggest that social pressure and fear of public judgment can delay access to treatment and compromise its continuity (Figure 19).

In the home setting, stigma was most commonly experienced at the stage of symptom recognition (41%, 19 out of 46), indicating early psychosocial barriers to care. Treatment completion was affected in 37% (17 out of 46), and adherence support in 24% (11 out of 46). Access to post-treatment services was also affected in 24% (11 out of 46), and diagnosis in 22% (10 out of 46), suggesting a persistent influence of stigma in the home setting (Figure 19).

In the workplace, stigma was most commonly experienced in seeking medical care (39%, 18 out of 46) and recognizing symptoms (33%, 15 out of 46), reflecting fears of occupational discrimination. Establishing a diagnosis was affected in 30% (14 out of 46), and initiating treatment in 24% (11 out of 46). Accessing aftercare services (24%, 11 out of 46) and adherence support (20%, 9 out of 46) were less frequently specified (Figure 19).

In context, the results of the analysis highlight that stigmatization of people with TB significantly affects every stage of the therapeutic pathway, from symptom recognition to accessing post-treatment services. Although the intensity and forms of stigma varied depending on the context in which it is experienced — medical institutions, community, home or workplace — its impact is constant.

Figure 19 Experiencing stigma along the path to accessing health services



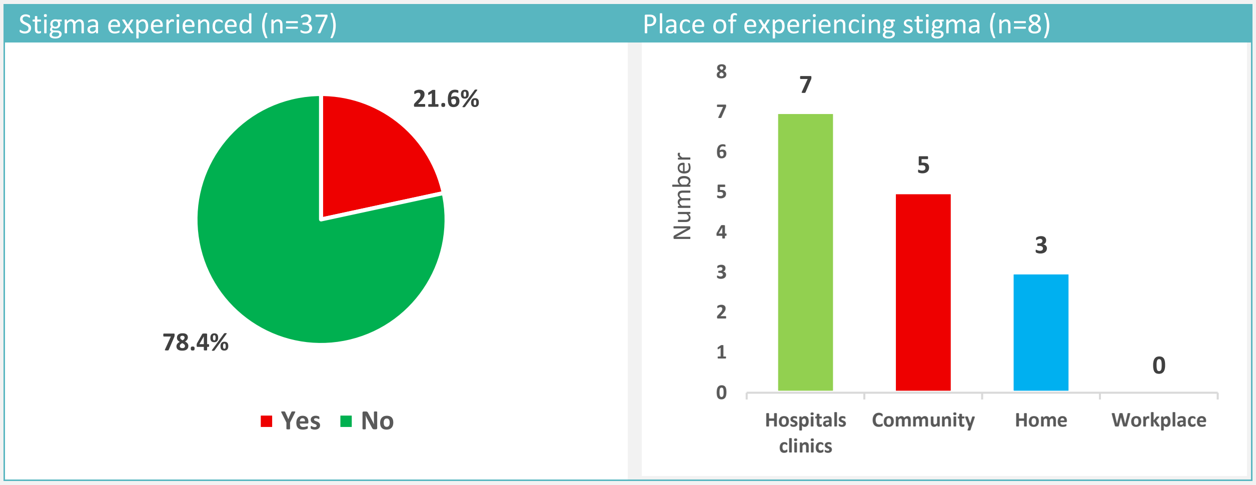
Family members of people with tuberculosis

Dimensions of stigma experienced in the family environment

Experiences of stigma within the family environment reveal that more than one fifth of family members of people with TB (22%, 8 out of 37) reported feeling stigmatized. Among the 8 participants who reported experiences of stigmatization, the hospital environment was the most frequently mentioned, indicated by 7 people. The community was mentioned by 5 respondents, while the home environment was associated with stigmatization by 3 people. In the workplace, no respondent specified such experiences.

These results suggest that the perception of stigma varies depending on the context, being more pronounced in institutional and community environments, and less present in family or professional ones (Figure 20).

Figure 20 Dimensions of stigma in the family environment: experiences and environments where it was felt


Stigma experienced (n=37)

Place of experiencing stigma (n=8)

Experiencing stigma by family members in accessing health services for tuberculosis

The data highlight the stigma experienced by family members who provided care for a relative with TB, across various stages of the caregiving process and in four settings: medical institutions, the community, the home, and the workplace.

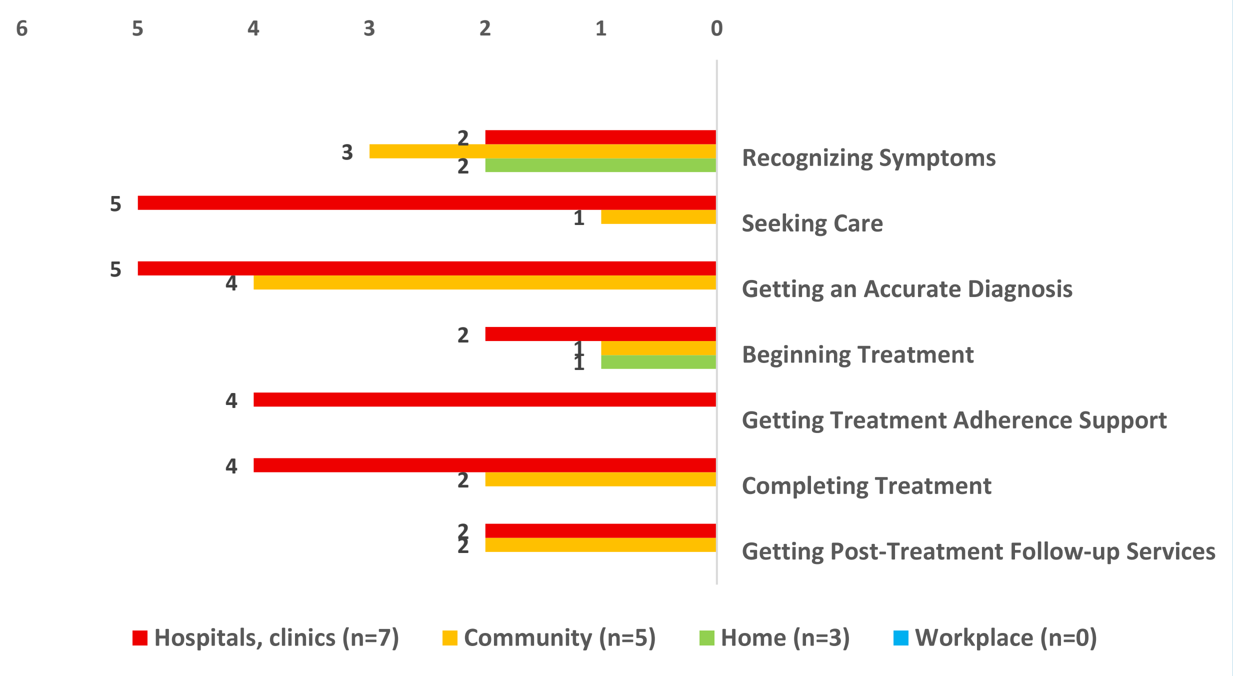
Stigma was most frequently felt in the interaction with the medical system, especially in the stages of establishing the diagnosis and requesting care (5 out of 7 each), but also in the stage of requesting support for treatment adherence (4 out of 7) and completing treatment (4 out of 7); results that suggest that medical institutions can represent a vulnerable space for the emergence of stigma, even at times when family support is essential (Figure 21).

In the community, stigma was felt especially at the stage of symptom recognition (3 out of 5), but also at the stages of establishing the diagnosis (4 out of 5) and accessing post-treatment services (2 out of 5), which could indicate increased social exposure in the early stages of the disease, when suspicion or lack of information can generate negative reactions (Figure 21).

Stigma was experienced less frequently in the home environment, but it was not absent. It was experienced at the stage of symptom recognition (2 out of 3) and treatment initiation (1 out of 3), suggesting that in some situations even the home environment can become a place of tension and judgment (Figure 21).

At work, no experiences of stigma were mentioned, which may reflect either a lack of exposure or a reluctance to discuss the illness in this context (Figure 21).

Figure 21 Stigma experienced by family members in the process of caring for people with tuberculosis: variations by context and stage

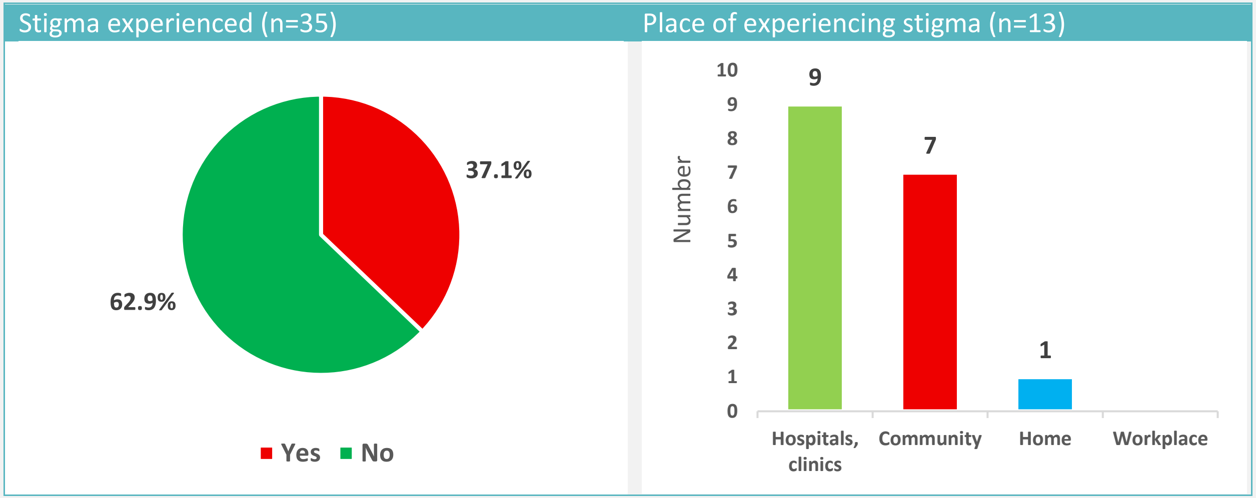


Medical personnel in the healthcare system

Dimensions of stigma experienced by medical personnel

Analysis of data on direct experiences of stigma among healthcare personnel paints a complex picture, in which TB-related stigma continues to be present in certain social and professional contexts.

Figure 22 Dimensions of stigma among healthcare professionals: experiences and environments where stigma was felt



More than one third of respondents (37.1%, 13) reported being exposed to some form of stigma, highlighting the persistence of this phenomenon. Of those who felt stigmatized (13), nine indicated that they had been stigmatized in medical institutions; seven – in the community environment, and one respondent indicated that he or she felt stigmatized in the family environment (Figure 22).

Observed stigma

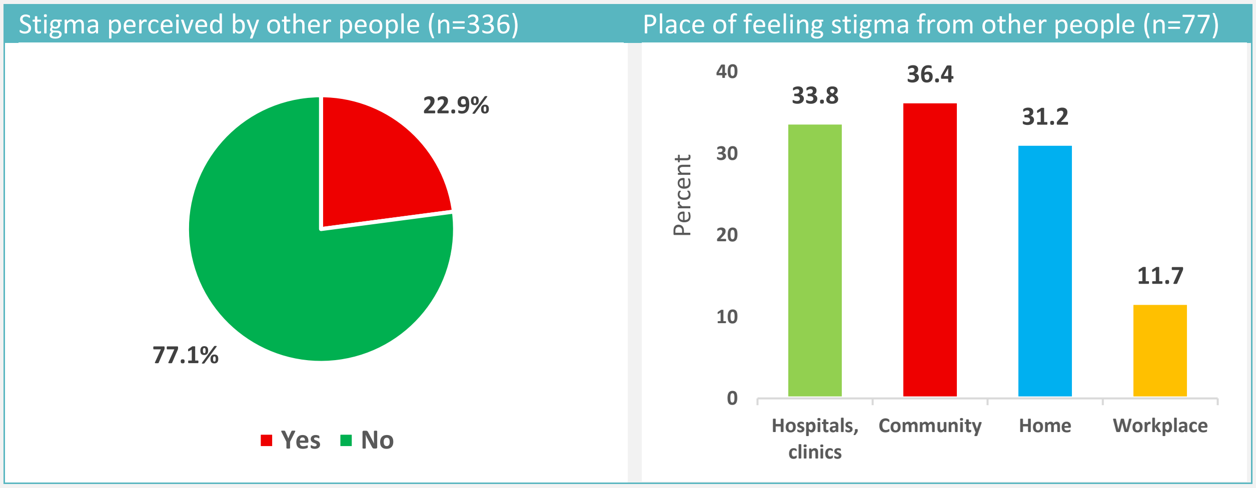
Reflected stigma: perceptions of people with tuberculosis on the stigmatization of other people with tuberculosis

The present study analyzed the indirect perception of stigma, reflected through observations of people with TB on the experiences of other people with TB.

Thus, Figure 23reflects the indirect perception of stigma among study participants, through the question "*Do you know other people who have been stigmatized?".* The results show that 23% (77/336) of respondents specified that they know of other people who have experienced stigmatization.

Stigma of others was observed both in health facilities and in the community, but also in the home or workplace, with variations between these settings. Health facilities were mentioned in 34% (26 out of 77) of cases as the place where they observed stigmatization of other people with TB. The community was perceived as a stigmatizing space by 36% (28 out of 77) of respondents, and the home environment by 31% (24 out of 77), indicating that stigma can be present even in the space that should provide the most emotional support. The workplace was mentioned the least, with only 12% (9 out of 77) of respondents specifying that they observed stigmatization of others in this context (Figure 23).

Figure 23 Dimensions of indirect stigma and settings where stigma was perceived by other people with TB


Stigma perceived by other people (n=336)

Place of feeling stigma from other people (n=77)

Reflected stigma: the perception of stigma in accessing health services by other people with tuberculosis

The indirect perception of stigma, reflected through observations by people with TB of how other people with TB have been treated, provides valuable insight into vulnerabilities in the health system and social environments.

Thus, in healthcare settings, stigmatization of other people with TB was most frequently observed at the stage of initiating treatment and seeking medical care (both 77%, 20 out of 26), followed by the stage of establishing the diagnosis and completing treatment (both 73%, 19 out of 26).

Stigma was also frequently observed at the stage of recognizing symptoms, but also during the period of requesting support for adherence (both 65%, 17 out of 26). Stigma of other people with TB during their access to post-treatment services was observed less frequently (35%, 9 out of 26). In this context, the results obtained could suggest that stigma can be present throughout the interaction with the healthcare system, affecting patients' trust in the care provided (Figure 24).

In the community, stigmatization of other people with TB was perceived as intense at the stage of seeking medical care and recognizing symptoms (both 79%, 22 out of 28), but also at the stage of providing support for adherence (75%, 21 out of 28). At the stages of initiating treatment, completing treatment and accessing post-treatment services, stigmatization of other people with TB was observed by 71% of participants (20 out of 28 each).

Stigma at the stage of establishing the diagnosis was observed in 68% (19 out of 28) cases. These results may reflect strong social pressure, which may discourage people with TB from seeking help or following treatment openly (Figure 24).

In the home environment, stigmatization of other people with TB was observed especially in the stages of providing adherence support (62%, 15 out of 24) and recognizing symptoms (54%, 13 out of 24). At the stages of seeking medical care and accessing post-treatment services, stigmatization of other people with TB was observed by half of the respondents (both 50%, 12 out of 24).

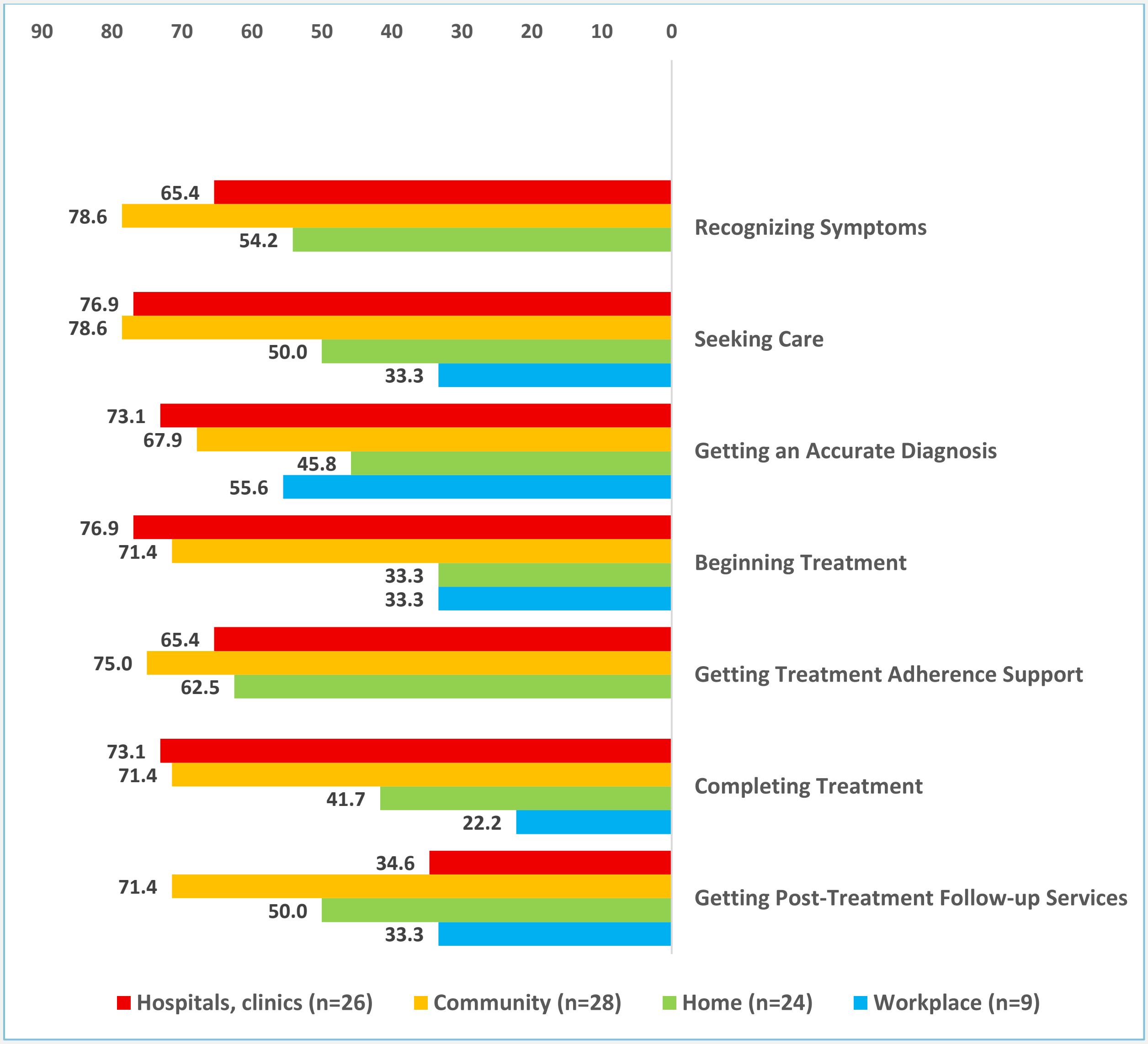
Stigma of other people with TB was observed less frequently at the stages of establishing the diagnosis (46%, 11 out of 24), initiating treatment (33.3%, 8 out of 24) and completing treatment (42%, 10 out of 24).

At work, although only 9 respondents indicated this context, stigmatization of other people with TB was observed in the stages of symptom recognition (6 out of 9), diagnosis and adherence support (5 out of 9 each).

At the stages of seeking medical care, initiating treatment (3 out of 9) and accessing post-treatment services, stigmatization of other people with TB was observed by three of the study participants (3 out of 9 each), and at the stage of completing treatment by two of the respondents (2 out of 9). Although stigmatization observed at work was mentioned less frequently for all stages, it nevertheless indicates the presence of stigma in this space as well.

In context, indirect perception of stigma or observed stigma confirms that stigmatization of people with TB is a widespread and persistent phenomenon, which manifests itself at all stages of care and in various social contexts.

Figure 24 Indirect stigma: places where people with TB observed stigmatization of others on the path to accessing health services

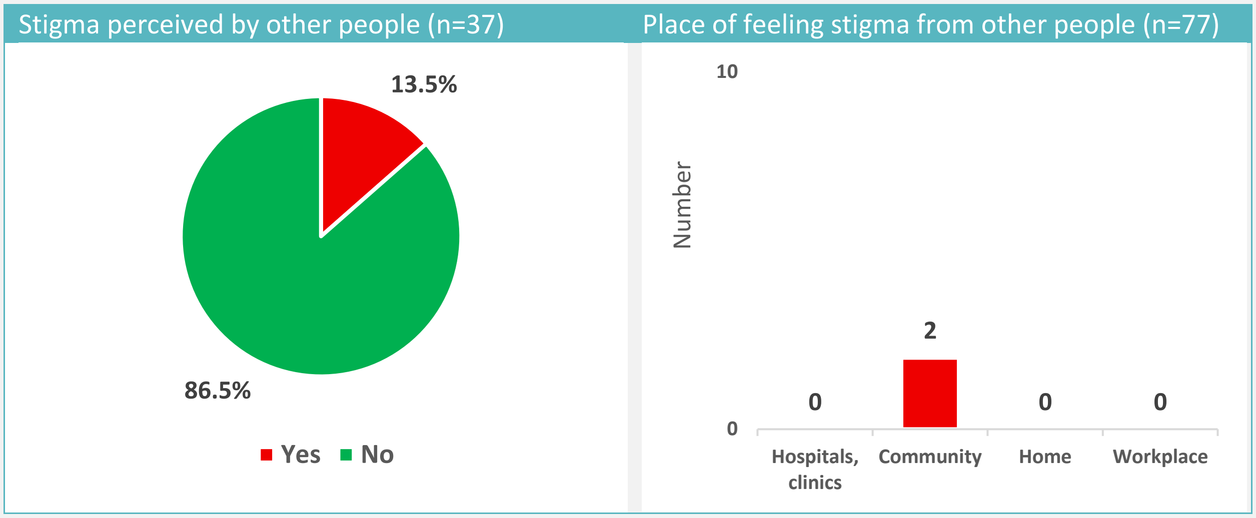


Reflected stigma: perception of stigmatization by other families in the process of caring for people with tuberculosis

The present study analyzed the indirect perception of stigma, reflected through the observations of family members who cared for their family members with TB on the experiences of other families with people with TB.

The results show that 13% (5 out of 37) specified that they know of other families who have been stigmatized while supporting a member with TB. However, when analyzing the distribution of these perceptions according to social context — medical institutions, community, home or workplace — an extremely low visibility of stigma is observed. The only environment in which such cases were reported is the community, where only two people mentioned knowing affected families. This trend suggests that the stigmatization of other families is rarely recognized or discussed, which may reflect either a positive reality or a lack of awareness or communication around this phenomenon.

Figure 25 Dimensions of indirect stigma and the place of feeling stigma from other families



Stigma perceived by other people (n=37)

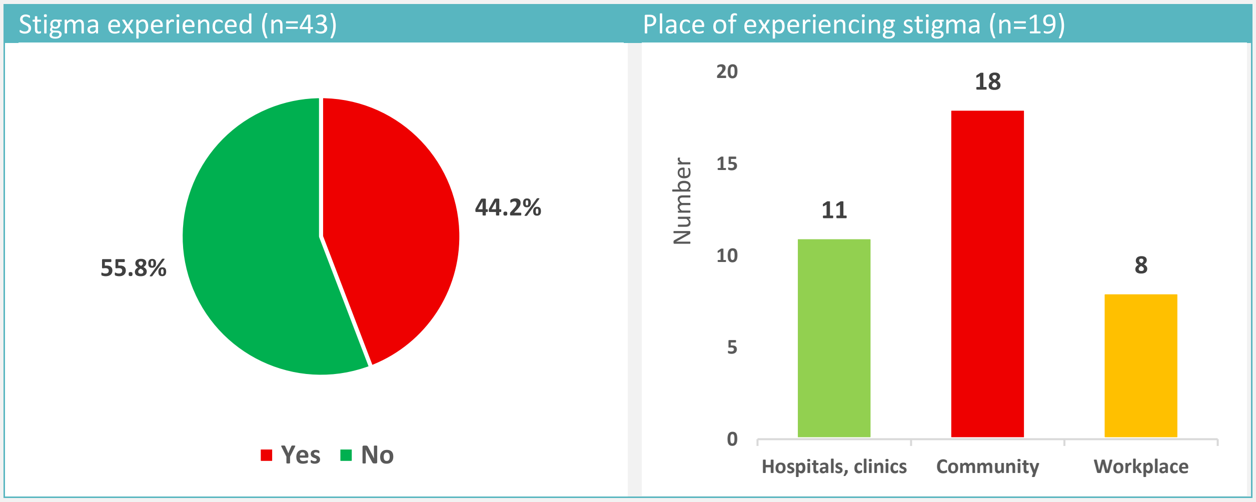
Place of feeling stigma from other people (n=77)

Reflected stigma: the perception of stigma in the community environment

Direct perception of stigma in the community was assessed by the question “*Have you ever seen or heard community members stigmatizing people with TB?”.* Of the total of 43 participants, 44% (19) responded that they had had such an experience (Figure 24).

Of the 19 respondents who specified direct or indirect experiences of stigmatization, the majority indicated that these behaviors were observed within medical institutions (11 people). Also, 18 respondents mentioned the community environment as a place where they witnessed stigmatization, and 8 indicated the workplace (Figure 26).

Figure 26 Dimensions of stigma in the community environment: experiences and environments where it was felt



Stigma experienced (n=43)

Place of experiencing stigma (n=19)

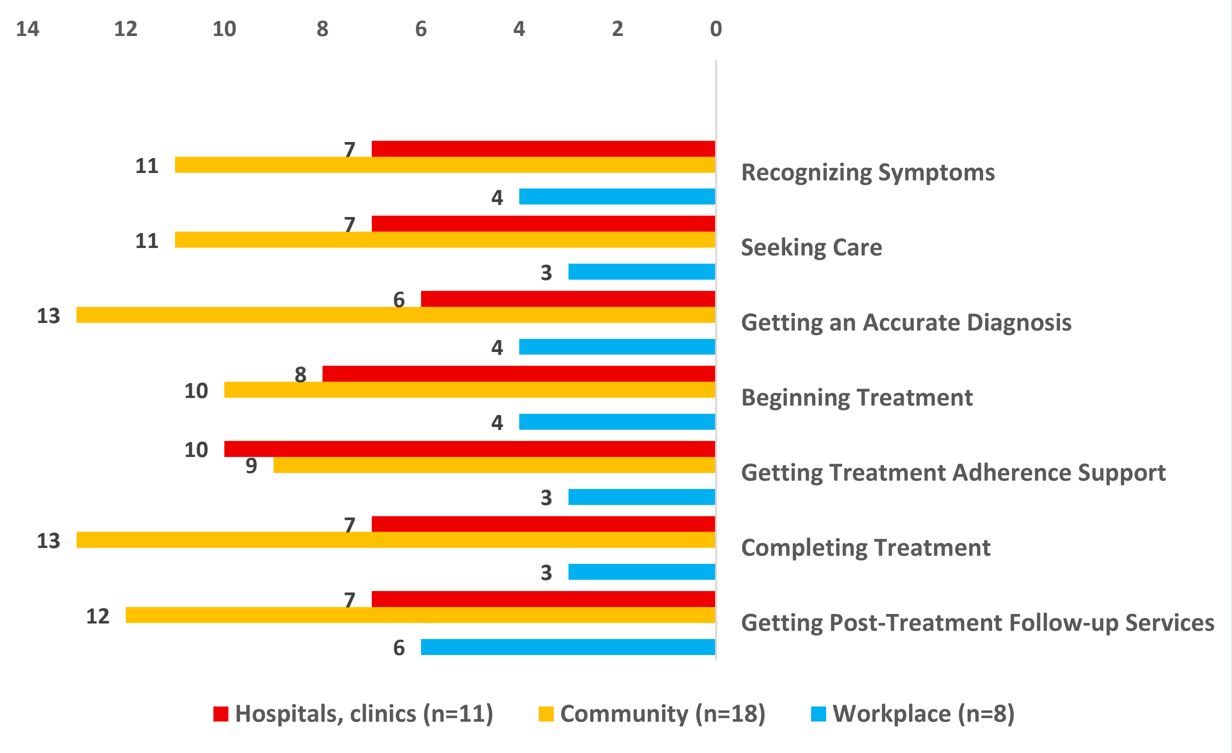
The analyzed data reflect stigmatizing reactions of people with TB at various stages regarding access to health services, observed by the community, namely: in the community, medical institutions and workplaces.

The community was identified as the space where stigma was most frequently observed. Most mentions were recorded at the stage of completing treatment (13 of 18), establishing the correct diagnosis (13 of 18) and accessing post-treatment services (12 of 18). Also, recognizing symptoms (11), seeking care (11) and initiating treatment (10) were stages marked by stigma. These results suggest that social exposure in the community, especially in the beginning and ending phases of treatment, may amplify the risk of stigmatization.

Healthcare settings were the second most frequently mentioned context. Stigma was most frequently observed in the adherence support stage (10 out of 11), followed by treatment initiation (8), symptom recognition (7), seeking care (7), and treatment completion (7). These data indicate that interaction with the healthcare system can become a vulnerable moment for patients, especially in stages that involve repeated contact with healthcare personnel.

In the workplace, stigma was observed less frequently, but not absent. Most mentions were recorded in the stage of accessing post-treatment services (6 out of 8), followed by the stage of establishing the diagnosis (4), recognizing symptoms (4) and initiating treatment (4). Although less frequent, this context remains relevant, especially in terms of the social and professional reintegration of affected individuals.

Figure 27 Indirect stigma: places where community members with TB were observed to experience stigma on the pathway to accessing TB health services (absolute numbers)

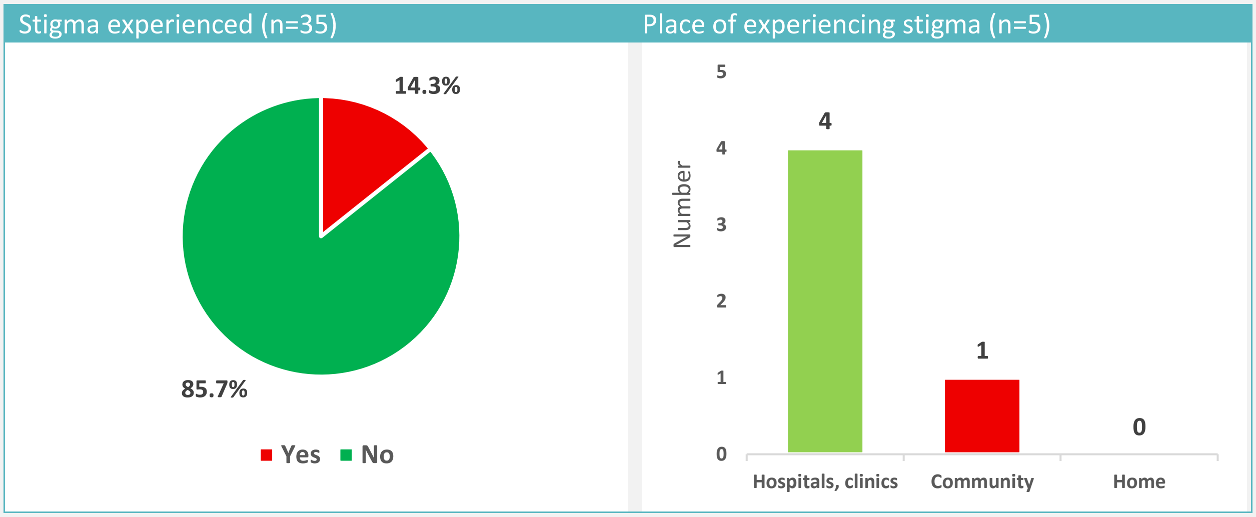


Reflected stigma: perception of stigma among medical staff

Direct perception of stigma in the healthcare environment was assessed by asking the question “*Have you ever seen or heard of other healthcare workers being stigmatized in relation to TB?”.* Of the total of 35 participants, 14% (5 people) answered affirmatively, indicating that they had had such an experience (Figure 24).

Of the five respondents who mentioned indirect experiences of stigmatization, four mentioned that these behaviors were observed within medical institutions, and one indicated that the stigmatization occurred in the community (Figure 26).

Figure 28 Dimensions of stigma in the community environment: experiences and environments where it was felt



Qualitative analysis of tuberculosis-associated stigma in accessing health services

People with tuberculosis – personal experiences

Stigma associated with TB can negatively impact the entire patient journey – from symptom recognition to treatment completion and social reintegration. This qualitative analysis explores TB patients' perceptions and experiences of stigma, based on a set of open-ended responses collected as part of the study. Over a third of people with TB (32%, 107 out of 336) expressed their views in this regard.

Recognizing TB symptoms (4 out of 107). Most participants did not mention difficulties in recognizing symptoms, but a few indicated awareness of the disease through symptoms such as severe coughing and feeling of suffocation. Others mentioned that they sought information from external sources (internet, family experiences), suggesting a need for more accessible and structured medical education.

"*My grandfather had tuberculosis, and his brother died of tuberculosis three years ago, so I was afraid of getting sick too*" – in this context, the fear of getting sick, fueled by family histories marked by TB, reflects the persistence of social stigma. This fear can negatively influence health care-seeking behaviors, highlighting the need for educational interventions and reducing the stigma associated with the disease.

Seeking medical care (7 out of 107). Access to care was affected by administrative and social barriers. Participants mentioned difficulties in obtaining medical examinations, lack of support from family doctors and discrimination in accessing other medical services. Lack of residence permit (refugee), but also precarious socio-economic status were mentioned as additional barriers to accessing medical care.

"*Because I didn't have a residence permit, I had problems accessing treatment*" highlighting the impact of social exclusion on access to essential services. In addition, stigmatization is also manifested in interactions with the medical system: "*Because of my diagnosis, they refuse to admit me for other health problems*" indicating direct and dangerous discrimination.

Establishing a correct diagnosis (4 out of 107). Obtaining a correct diagnosis for TB was most often hampered not only by logistical difficulties, but also by stigmatizing attitudes on the part of medical personnel. Participants reported problems accessing basic investigations, such as chest X-rays, but also a lack of empathy and professionalism in interactions with medical personnel.

"I had great difficulty getting a chest X-ray," highlighting the bureaucratic and organizational obstacles that can delay diagnosis. In addition, negative reactions from medical staff, such as *"The medical staff, including the family doctor, did not react calmly when they learned the diagnosis,"* contribute to increasing stigma and creating a hostile environment for the sick person. Experiences in medical centers, including lack of respect and irony from staff, contribute to feelings of marginalization and the perception that TB patients are treated inferiorly – all of which directly affect trust in the health system, but also discourage people from seeking and accessing health services.

Treatment initiation (3 out of 107). Although some patients acknowledged that TB is a treatable disease, others mentioned difficulties in initiating treatment, particularly due to lack of support and early stigma.

Support for adherence to treatment (5 out of 107). Support for adherence to TB treatment remains fragmented, reflecting gaps in a coherent support framework, which contributes to the vulnerability of individuals. Although some have benefited from psychological support, this support is perceived as limited: *"I only received psychological support".* Participants highlighted the need for concrete and continuous support from healthcare professionals and organisations involved, as well as the importance of access to clear and useful information: *"We need support and information, and we should receive help from healthcare professionals and organisations".*

At the same time, the lack of adequate social protection measures, such as granting sick leave for the entire duration of treatment, generates professional and financial insecurity: *"There is no sick leave offered for the entire duration of treatment, I am afraid I will lose my job."* These difficulties can negatively affect the continuity of treatment and the psychosocial state of patients.

Completion of treatment (3 out of 107). Completion of TB treatment does not always mark the end of difficulties for affected individuals. Participants reported negative experiences in interacting with public institutions and the medical system, where they were treated with indifference or rejection: *"At the Social Assistance Directorate they ignored me and treated me harshly"* and *"I was shunned in other hospitals, I cannot get a job, even the ambulance will not take me*". These situations reflect a lack of information and empathy on the part of institutions, which perpetuates stigma and affects access to essential services.

On the other hand, some people have chosen not to disclose their diagnosis precisely to avoid stigma: *"Because I didn't tell anyone, I wasn't stigmatized."* This silence, while protective in the short term, can lead to isolation and lack of support.

Access to post-treatment supervision services (7 out of 107) and social reintegration (28 out of 107). Participants' responses show that stigma persists even after treatment ends, negatively influencing social and professional reintegration.

Testimonials reflect persistent rejection from the community, colleagues, friends and even family: *"All my friends have ignored me since I got sick"*, *"I have completely lost touch with my brother because of the stigma".* Exclusion from social or educational activities: *"I was rejected from the dance group",* marginalization in one's own living environment: *"The neighbors say it's not good to associate with me".*

Stigmatization also manifests itself in the professional space through dismissals and avoidance by colleagues: *"At work, my colleagues avoid and ignore me"; "I was fired. At another job, they refused to hire me."*

People with tuberculosis – stigma observed

Qualitative analysis that explored perceptions of TB patients regarding stigma based on a set of open-ended responses collected within the study. 23% of people with TB (77 out of 336) expressed their views in this regard.

Recognizing TB symptoms (5 out of 39). Partial awareness of tuberculosis symptoms, persistence of misconceptions about the disease - situations that contribute to the stigmatization of people affected by TB, fueled by fear and ignorance by the community.

Seeking medical care (7 out of 39). Stigmatization is suggested by ideas such as isolating patients before diagnosis is confirmed. *"New patients should be isolated until diagnosis is confirmed."*

Establishing a correct diagnosis (5 out of 39). Lack of transparency, insufficient communication and neglect of patients' rights during TB diagnosis. Confidentiality is a major concern, and stigma is manifested through unequal treatment and lack of access to benefits: *"Diagnosis should be anonymous and confidentiality respected."*

Initiation of treatment (4 out of 39). Lack of information contributes to stigmatization, especially when sick people do not know that they are no longer contagious after starting treatment: *"Patients need to know that there are modern treatments and that they are no longer contagious."*

Support for treatment adherence (5 out of 39). Social and economic difficulties experienced during treatment, which amplify stigma and affect adherence: *"I lost my job and accumulated debt. I need financial support"*.

Completion of treatment (6 out of 39). Facing persistent social and emotional effects, difficulties in professional reintegration that induce stigma: *"After treatment, the status of a TB patient is not forgotten and makes it difficult to get a job."*

Accessing post-treatment follow-up services (7 out of 39). Situations of discrimination and social exclusion: *"I am shunned on public transport", " Let us be treated with respect and not be labeled".*

Family members of people with tuberculosis

24% of participants (9 out of 37) chose to share their views

Although a significant portion of family members say they have not encountered any stigmatizing situations, the experiences of those who have gone through such episodes show how deeply TB can affect the entire family. In some cases, the diagnosis is hidden even by the sick person, for fear of the reactions of those close to them: *" My brother-in-law initially concealed his diagnosis. My mother-in-law was afraid we might get infected and ended up in conflict with his friends, believing they were the ones who had made him sick".*

Stigma often extended to family members, especially children, who were isolated in the school or preschool environment: *"My child was rejected at school "*, *"She was taken out of class by a teacher, and a teacher disclosed her diagnosis. All the children started pointing fingers at her"*, *"The child attends a school in Chișinău, but the clinic in Chișinău refused to register her for care"*, which forced the family to make weekly trips to Nisporeni to pick up the medication so that the child could continue her studies in Chisinau.

Other forms of exclusion were also mentioned: children who were not accepted into kindergarten during treatment, grandparents who were no longer accepted in public activities or at their workplace, as well as socially withdrawn young people who lacked trust in the medical system.

All these examples show that stigma not only affects the diagnosed person, but also the entire family, profoundly influencing social relationships, access to services and quality of life.

Members of communities affected by tuberculosis

44% of participants (19 out of 43) chose to share their views.

Deep and persistent stigmatization of people diagnosed with TB, manifested through rejection, marginalization and discrimination, is found in various social contexts. Although several people participating in the study stated that they had not observed such situations, the majority of those who had direct contact with people with TB describe a reality marked by fear, shame and exclusion.

A frequently mentioned aspect is the refusal to accept people with TB in the community, including from close relatives: *“It is not accepted by relatives and society.”* This rejection also extends to the sphere of social services, where sick people are excluded from social canteens or care centers, and their children are marginalized in schools. In dormitories, neighbors prohibit them from access to shared kitchens or bathrooms, which accentuates isolation and a sense of injustice.

Fear of stigma sometimes leads patients to hide their illness, avoid treatment, or not reveal their diagnosis even to closest ones. A telling example is that of a person who *“did not follow treatment for fear of relatives and neighbors finding out that he had TB.”* In other cases, sick people were kicked out of the house or excluded from the community after the diagnosis became known: *“The husband, being sick, was kicked out of the house because he did not say he was sick, and the relatives found out from the neighbors.”*

Workplace discrimination emerged as another serious form of stigmatization, as reported by community members. Many described cases where individuals were refused employment, lost their jobs, or were excluded from workgroups—even after completing treatment. Some people with TB had to hide their symptoms or diagnosis in order not to lose their source of income. In one case, a person with a disability caused by TB had to divorce and apply for placement in a state institution, where her diagnosis was only confirmed later.

Stigmatization also manifests itself in public spaces: *“He was not allowed to enter the store and was served from outside.”* Such behaviors not only violate the fundamental rights of the affected individuals, but also contribute to the perpetuation of fear and misinformation among the population.

In context, these testimonies show that stigma in the community is not an isolated phenomenon, but a reality that profoundly affects the lives of people with TB.

Medical personnel in the healthcare system

Opinions were expressed by 37% of participants (13 out of 35).

Personal experiences and perceptions regarding stigma associated with tuberculosis. Although some medical personnel state that they have not directly experienced situations of stigmatization, the testimonies of those who have had contact with people with TB – as medical professionals – outline a complex reality, marked by fear, prejudice and social exclusion.

The stigma was not related to the disease itself, but to the simple fact that he works with people with TB. One health worker recounts how he was shunned by colleagues in other departments, who preferred to communicate by phone or through the window, and in the community, some of his friends distanced themselves. *“Colleagues told me to change jobs”* or *"I was asked directly if I was afraid to come into contact with people who have TB"* – remarks that reflect the social pressure and lack of understanding towards the professionals involved in the care of these patients.

Stigma is also evident among medical personnel, with some medical specialists refusing to see people with bacteriologically confirmed TB, and others avoiding direct contact with the sick person. This attitude not only affects the quality of care, but also sends a message of fear and rejection, amplifying the isolation of sick people.

In some cases, stigmatization led to direct conflicts and defamation: the doctor was insulted in the courtyard of the apartment building by a family member of a person with TB.

These experiences show that TB stigma is not just a medical problem, but a deeply social one, affecting not only sick people but also those who provide them with medical care.

Stigma observed among healthcare colleagues. The stigma associated with TB is not limited to people with TB. It extends subtly but persistently to those who care for them – healthcare workers who, by the nature of their profession, come into direct contact with the disease. The testimonies collected outline a reality in which healthcare personnel themselves become victims of prejudice and collective fear.

For some, the stigmatization began within the medical system itself. A doctor who was diagnosed with TB was no longer allowed to practice in his specialty, being restricted to the field of TB. This decision not only limited his career, but also sent a clear message of professional marginalization. In another case, a colleague was considered " *inferior* " by other doctors, simply because she worked with TB patients.

This attitude is also reflected in the daily behaviors of medical colleagues in other departments, who keep their distance, wear masks excessively, and avoid direct interactions. While these gestures may be justified by caution, they are often laden with fear and lack of information, which contributes to the professional isolation of those working in the field of TB.

Stigma does not stop at the door of medical institutions. In the community, health workers who provide medical services to people with TB are in some cases excluded from social life. Some are no longer invited to family reunions, and parents in kindergartens limit their children's contact with them, fearing that they could transmit the disease.

Despite these challenges, some medical professionals choose to speak out in defense of sick people, combat stigmatizing language, and promote empathy.

Assessment of the legal and policy environment

Legislative and policy environment

Figure 29reflects a synthetic assessment of the regulatory and public policy framework from the perspective of the existence, application and media coverage of the fundamental rights of people with TB.

Existence of the legislative and policy framework. The Republic of Moldova has a relatively well-defined legislative framework regarding the protection of the rights of people with TB, including:

- prohibition of discrimination
- access to information and services
- informed consent
- medical data confidentiality
- the right to safe work

The assessment shows that this framework is often incomplete or non-existent in terms of protection against arbitrary detention and involuntary isolation. There are also significant discrepancies between regions of the country, especially between the right bank and the eastern region, where access to data and enforcement of the law are limited.

Enforcement of the legislative and policy framework. The effective enforcement of laws and policies is uneven and often deficient. Although legislation is in place, its implementation is affected by:

- insufficient training of medical personnel,
- insufficient financial and human resources,
- inadequate infrastructure, especially in rural and remote areas,
- victims' reluctance to report abuse.

This situation is reflected in low enforcement scores, particularly regarding the right to a secure job and protection against arbitrary detention.

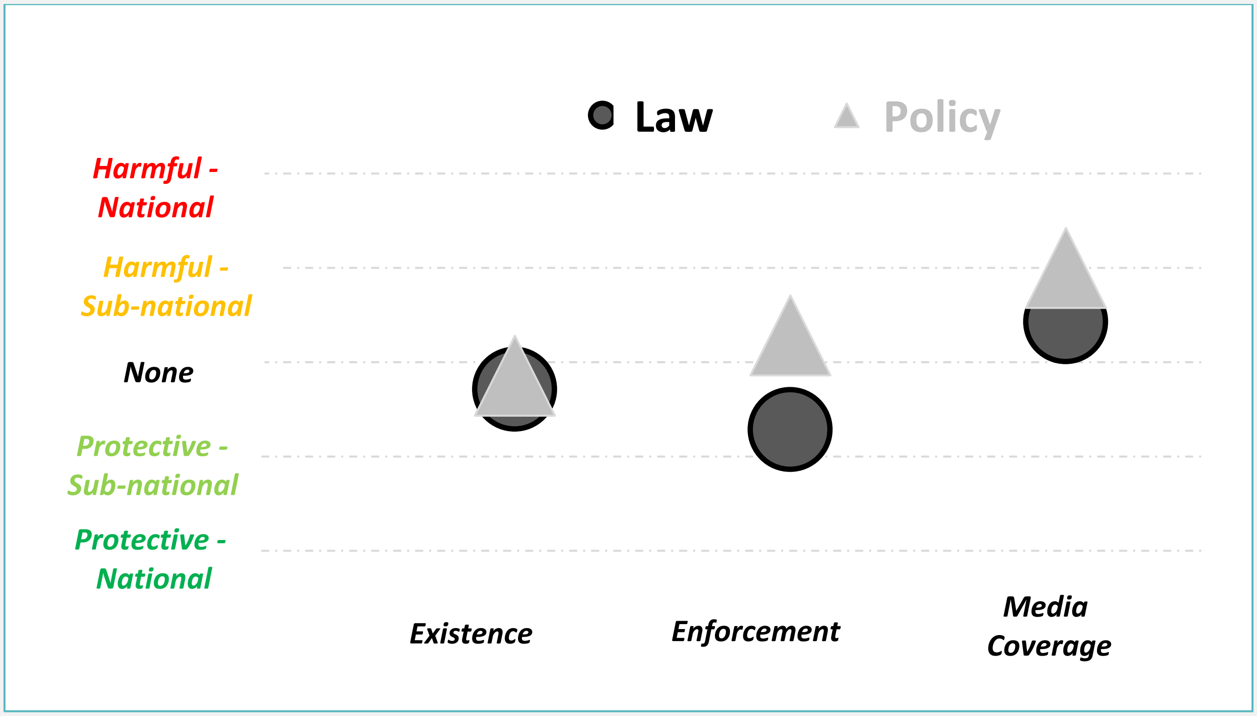
Mediation of rights and policies. Mediation is one of the weakest components of the protection framework. The rights of people with TB are rarely promoted in the media, and information campaigns are occasional, often dependent on external funding. The lack of a coherent communication strategy reduces the impact of policies and contributes to the maintenance of stigma and discrimination.

Synthetic results. According to the diagram (Figure 29), the average scores for the 7 rights analyzed are:

- Laws: 1.71 (existence), 1.28 (enforcement), 2.43 (average)
- Policies: 1.86 (existence), 2.29 (enforcement), 3.00 (average)

These results indicate a slight superiority of policies over the legislative framework in terms of enforcement and coverage, but both areas require significant improvements.

Figure 29 Legislative and policy environment (average of 7 rights)



Focus group results

In accordance with the research methodology, a focus group was organized to assess the legal and policy environment. In this regard, invitations for online participation were sent to approximately 60 people from the governmental, non-governmental and media sectors. In the end, 27 people were present in the focus group, representative according to the data below (Table 33).

Table 33 Participants in the focus group on the assessment of the legal and policy environment

Sector name	Service name	Number	Total
Governmental	Phthisiopneumology Service	3	6
	Primary healthcare	1	
	Prison medical staff	2	
nongovernmental	CSOs active in the TB response	17	19
	lawyer	2	
Mass media		2	2
Total			**27**

During the Focus Group discussions on the existence, application and appropriate media coverage of the legal and policy framework, conducted among governmental and non-governmental actors, including with the participation of media representatives, 7 fundamental rights were assessed: (1) The right to freedom from discrimination; (2) The right to access information; (3) The right to access services; (4) The right to privacy; (5) The right to informed consent; (6) The right to freedom from arbitrary arrest/detention and involuntary isolation; (7) The right to a safe workplace. The accumulated scores were entered, according to the applied instruments, into the stigma radar.

The assessment exercise was carried out only for the right bank of the Dniester River, the left side of the Dniester River (the eastern region or self-proclaimed Transnistria) not being included and assessed due to lack of access to data.

Table 34 Results of the assessment of the legal and policy environment, right bank

	2021		**2025**	
Straight/score	Law matrix **maximum 12 points**	Policy matrix **maximum 12 points**	Law matrix **maximum 12 points**	Policy matrix **maximum 12 points**
Rights to Freedom from Discrimination (enacted stigma)	10	10	7	6
Rights to Access Information	10	11	9	6
Rights to Access Services	10	10	9	6
Rights to Privacy	9	10	7	6
Rights to Informed Consent	9	10	7	6
Rights to Freedom from Arbitrary Arrest/Detention and Involuntary Isolation	9	10	4	2
Rights to Safe Workplace	9	10	3	2
Total	66/84	71/84	**44/84**	**34/84**

The opinions of the focus group participants regarding the legal and policy environment are described in accordance with the rights stated.

The right to freedom from discrimination	**7**	**6**
Existence of the legislative/policy framework	3	3
Implementation of the legislative framework/policies	3	2
Publicizing the application of the legislative framework/policies	1	1

Law. The Republic of Moldova has a legislative framework that prohibits discrimination on the grounds of health, including TB. Law No. 60/2012 on the social inclusion of persons with disabilities, the Labor Code, as well as other normative acts regulate the protection of persons against discrimination in the field of employment and access to medical services. The National TB Response Plan (2022–2025) also explicitly recognizes the importance of respecting human rights. Although the legislation exists, its implementation is often deficient, especially in the eastern region (self-proclaimed Transnistria). NGO reports show that TB patients face discrimination in the medical system and at the workplace. There are difficulties in accessing justice, lack of training of medical professionals in the field of patients' rights, and reluctance of victims of discrimination to file complaints due to fear or ignorance of their rights. Cases of discrimination against persons with TB and aspects related to their rights are rarely covered in the national media. Civil society initiatives exist, but they do not have wide coverage. Public information campaigns on the rights of TB patients are also rare and insufficient to change public perception.

Policies. The Republic of Moldova has legislation that protects the population from discrimination, including people with TB. The NTRP is a document that regulates the state's actions in this area that contains policies for prevention, diagnosis, treatment and reduction of discrimination. Although there are national policies, their implementation is uneven in different regions of the country. Some rural or less developed areas do not benefit from full access to treatments or adequate medical infrastructure. Financial resources for the effective implementation of these policies are insufficient in some territories, especially the eastern region. There are difficulties in the uniform implementation of DOT/VST treatments, especially in isolated localities and with a shortage of human resources in health system. Media coverage and promotion of policies to protect people with TB is limited. Public campaigns and information aimed at educating the population and healthcare professionals are not sufficiently visible. The media does not regularly promote progress or shortcomings in the implementation of these policies.

Right of access to information	9	6
Existence of the legislative/policy framework	3	3
Implementation of the legislative framework/policies	3	2
Publicizing the application of the legislative framework/policies	3	1

Right. The Republic of Moldova has a general legislative framework that guarantees the right to information, including in the field of health. Law No. 982/2000 on access to information and Law No. 411/1995 on health protection regulate the right of citizens to be correctly and completely informed about their health status, treatment methods and associated risks. In addition, clinical guidelines and national strategies in the field of TB include provisions on patient information. In practice, the right to information is often applied inconsistently. Medical personnel do not always have the time or training necessary to correctly explain the treatment regimen and the importance of adherence. Some illiterate people or people from vulnerable groups do not understand the information provided, and there is a lack of adapted educational materials (in simplified language or in minority languages, such as Romani). The media rarely addresses the issue of access to information in the context of TB, which contributes to the persistence of stigma and misconceptions about the disease among the population of the Republic of Moldova.

Policies. Policies align with international standards and include measures to inform the public and people affected by TB about treatment, prevention and protection options. The NTRP regulates government activities in this area, and public health policy includes measures for universal access to treatment and to combat discrimination against those affected by TB. Although national policies exist, their implementation varies in different regions of the country, especially in the self-proclaimed Transnistria. In rural or less developed areas, the implementation of these policies is insufficient or uneven with a greater emphasis on urban areas and fewer resources in rural regions. There are information programs, but implementation and resources (human, financial) are insufficient to ensure complete and uniform coverage throughout the country. Media coverage of policies to protect people with TB is limited. Awareness campaigns are not sufficiently visible at the national level, and the general public does not have access to information related to their rights in the context of TB, and the media does not sufficiently promote these topics.

Right of access to services	9	6
Existence of the legislative/policy framework	3	3
Implementation of the legislative framework/policies	3	2
Publicizing the application of the legislative framework/policies	3	1

Law. The Republic of Moldova has a legislative framework and national policies that guarantee universal access to health services, including for TB. The NTRP and the Health Protection Law (no. 411/1995) explicitly recognize access to free diagnostic, treatment and care services for TB. Treatment is also covered by public and international funds (including the Global Fund). Although the legal framework is in place, in practice access to services is uneven. In rural areas or among vulnerable populations (homeless people, Roma, migrants), physical access to services is hampered by the lack of infrastructure or transport (including the eastern region). Information about free TB services and patients' rights is sufficiently promoted in the public space, but information campaigns are often occasional and dependent on external funding. Ignorance of services is more severe in vulnerable and marginalized communities.

Policies. The Republic of Moldova has implemented national policies and strategies to combat tuberculosis, including access to diagnosis and treatment for all people affected by TB, without discrimination, regulated by the NTRP, which includes prevention, treatment and support measures for patients, including for vulnerable groups. Although there is a well-structured national policy, the implementation of these policies can vary significantly by region (these policies do not work in the eastern region, which is under the control of self-proclaimed authorities). In some rural and isolated areas, access to necessary treatments can be limited due to factors such as poor infrastructure and lack of resources. Media coverage of policies is limited and not widely disseminated. Information on patients' rights and treatment options, including outpatient treatment, is not effectively promoted in the national media. Media coverage and public education are priorities of the NTRP, awareness campaigns are sufficient in number, but the general public is not always well informed about treatment options and access to health services.

Right to privacy	**7**	**6**
Existence of the legislative/policy framework	3	3
Implementation of the legislative framework/policies	3	2
Publicizing the application of the legislative framework/policies	1	1

Law. The Republic of Moldova has a legal framework that guarantees the confidentiality of medical data: (1) Law on Patient Rights and Responsibilities No. 263/2005 stipulates that health data is personal information and cannot be disclosed without the individual's consent. (2) Law No. 133/2011 on the Protection of Personal Data provides additional safeguards for the processing of sensitive data. (3) Health system protocols include data protection measures for contact investigations and case reporting. Although the law is clear, in practice problems have been reported when patients' TB status was disclosed informally by healthcare personnel or in the community, and contact investigations were conducted without sufficient discretion, exposing the patient's identity. Sometimes, other sensitive information (e.g. HIV, drug use) is also disclosed in the process of diagnosing TB, without explicit consent. There are not enough public campaigns or training for healthcare professionals and the community on the importance of confidentiality. This topic is not consistently addressed by authorities or the media, and patients are not systematically informed about their rights regarding the protection of medical data.

Policies. The Republic of Moldova has a legislative framework that ensures the protection of the right to confidentiality in the field of health care under the Law on the Protection of Personal Data and the Law on Patients' Rights. The confidentiality of people affected by TB is regulated by national policies that guarantee the protection of patients' personal data, including information about their health status and the treatments they are undergoing. In practice, the implementation of confidentiality policies varies depending on the regions of the country (especially the left bank of the Dniester River). In urban areas, regulations are often correctly complied with, but in rural areas there may be gaps in the correct implementation of confidentiality protection measures. Training of medical staff on managing patient confidentiality and data protection is an area for improvement, especially in regions with limited access to continuing professional training. The promotion of health confidentiality policies and the protection of the rights of TB patients is insufficient. The general public is not fully informed about existing data protection and privacy measures, which can lead to a lack of trust in the healthcare system. Awareness campaigns on privacy and data protection rights are limited, and patients are not always aware of their rights in this area.

The right to informed consent	7	6
Existence of the legislative/policy framework	3	3
Implementation of the legislative framework/policies	3	2
Publicizing the application of the legislative framework/policies	1	1

Law. The Republic of Moldova has legal provisions guaranteeing informed consent: (1) Law No. 263/2005 on patient rights affirms the right of every person to be informed about the diagnosis, treatment and possible risks, as well as the right to accept or refuse treatment. (2) The norms of the medical system require obtaining written consent before initiating TB treatment. (3) The law prohibits forced testing and treatment, with limited and regulated exceptions (in cases of major public risk). Although the legislation is clear, in practice not all people with low levels of education or from vulnerable groups receive sufficiently clear explanations about TB treatment and their options. There are cases of involuntary HIV testing of TB patients, without adequate prior information or involuntary summoning to treatment, including with the involvement of the police, without clear judicial decisions. The right to informed consent is not sufficiently promoted among the general population or vulnerable groups. Information campaigns are rare and do not sufficiently reach vulnerable, marginalized or TB-affected communities, and educating patients about their legal rights in relation to the medical system is not systematic.

Policies. Informed consent for TB treatment is regulated by national legislation, including provisions on patients' rights to be informed about their treatments and to make informed decisions about their care. There is currently a clear legislative framework that protects patients' right to informed consent before starting TB treatments, in line with international standards. In some regions of the Republic of Moldova, the policy implementation of informed consent is not always uniform (Eastern Region). Training of medical staff and patient information procedures are implemented, but may not be sufficiently consistent across all medical institutions, especially in rural areas. Media coverage of informed consent policies is limited. The public is not always sufficiently informed about their legal rights, including informed consent. There are also insufficient mass educational campaigns that explain clearly and accessibly what informed consent entails in the context of TB treatment.

The right to freedom from arbitrary arrest/detention and involuntary isolation	4	2
Existence of the legislative/policy framework	0	0
Implementation of the legislative framework/policies	3	1
Publicizing the application of the legislative framework/policies	1	1

Law. The Constitution of the Republic of Moldova guarantees the right to liberty and personal security and prohibits arbitrary detention, including in a medical context. Law No. 411 of 28.03.1995 on health protection, art. 58, para. (2) provides that in the case of socially dangerous communicable diseases (including tuberculosis), health authorities may apply mandatory isolation and forced treatment, provided that the legislation and fundamental rights are respected. Law on public health No. 10/2009 allows the isolation of persons with communicable diseases only under strictly regulated conditions, with legal guarantees, including judicial control. Law No. 23 of 16.02.2007 on the control and prevention of tuberculosis, art. 12 provides for the application of coercive measures if a person with contagious TB: (1) refuses treatment, or (2) interrupts treatment without justification, and (3) poses a danger to public health, then the health authority may refer the case to the court for forced hospitalization, forced treatment, mandatory isolation. The Enforcement Code of the Republic of Moldova (No. 443 of 24.12.2004) regulates the forced execution of court decisions, including those imposing forced treatment. The Criminal Code of the Republic of Moldova, Art. 215 – Spread of epidemic diseases, punishes with imprisonment persons who, knowing that they are infected (for example, with active TB), refuse treatment and infect other persons. In practice, forced isolation of TB patients is applied very rarely and is carried out in specialized hospitals (e.g. "Chiril Draganiuc" Institute of Pneumology), and the measures are coordinated with the National Agency for Public Health. In prisons, isolation does not always comply with medical standards or human rights protections. Cases of arbitrary detention or involuntary confinement are rarely addressed publicly, and the lack of transparent official reporting and the involvement of civic organizations makes it difficult to assess the extent of the phenomenon. There are no clear public campaigns or mechanisms to inform patients about the right to refuse treatment and the legal limits of solitary confinement [9].

Policies. The Republic of Moldova has national policies that protect the rights of people with TB, including the right not to be subjected to involuntary arrest or isolation without clear legal justification. National legislation provides for exceptional measures that may include involuntary isolation in public health settings, but these are only applied in very strict cases, in compliance with legal procedures and the principles of necessity and proportionality. While there are national policies that protect people with TB, their application varies at the local level. In some regions, protection and treatment measures for people with TB may not be implemented uniformly. The application of isolation and detention measures is regulated, but in practice, cases can still be observed where patients are involuntarily isolated or subjected to more drastic measures, especially in detention facilities. Media coverage of the policy is limited, and the general public is not sufficiently informed about the legal rights of people with TB. This includes the right not to be subjected to arbitrary isolation or detention. There are no public campaigns or adequate measures to inform the population or people with TB about their protection measures, which can lead to abuses or errors in the application of legislation. Additionally, the increase in hospitalization rates in recent years, due to the misalignment of the capacity of TB hospitalization institutions in the Republic of Moldova [10] , which is considerably higher than the actual need causes TB service providers to maintain inefficient practices, such as the unjustified hospitalization of TB patients, repeated hospitalization or unjustified hospitalizations for diagnostics, etc. is extremely worrying and potentially threatens the freedom to choose the outpatient treatment option from day one, recommended by the World Health Organization.

The right to a safe workplace	3	2
Existence of the legislative/policy framework	1	0
Implementation of the legislative framework/policies	1	1
Publicizing the application of the legislative framework/policies	1	1

Law. The Law on Occupational Safety and Health (Law No. 186/2008) guarantees the right of workers to a safe working environment, including protection against the risks of exposure to infectious diseases, such as TB. The Labor Code of the Republic of Moldova (Law No. 154/2003) prohibits discrimination against employees based on health status, including in the case of people with TB. There are regulations that require measures to prevent infectious risks, including in the healthcare sector and in detention facilities, where the risks of tuberculosis transmission are higher.

In practice, there are deficiencies in the implementation of protective measures against the risks of exposure to TB in the workplace, especially in medical facilities and prisons, where ventilation and hygiene are often insufficient. Health workers and workers in other sectors at risk (e.g. prisons, hospitals) are exposed to an increased risk of infection due to inadequate working conditions (poor ventilation and airing). At the same time, the problem of tuberculosis among employees of law enforcement agencies with special status in the Republic of Moldova (police officers, Intelligence and Security Services employees, prisons, etc.) is a delicate one, at the intersection of public health, labor law and the strict disciplinary regime of these functions. In particular, cases of post-tuberculosis sequelae, extended treatment periods and the impossibility of extending sick leave beyond 12 months raise legal and administrative issues. Law no. 320/2012 on police activity and the status of police officers and Law no. 300 of 21.12.2017 on the penitentiary administration system stipulates the conditions of medical fitness and the obligation to maintain work capacity, which is assessed by the subordinate medical-military commissions. Dismissal is possible if permanent medical incapacity is found or the maximum legal duration of sick leave is exceeded. The Labor Code of the Republic of Moldova (no. 154/2003), in art. 86 letter t) provides that the individual employment contract may be terminated if the employee has benefited from sick leave for 180 cumulative days in a calendar year. Sick leave in the Republic of Moldova can have a maximum of 180 days in a year, with the possibility of extension up to 240 days for serious illnesses (with the approval of the Consultative Council of Medical and Social Expertise - CEMD), and over 240 days - only for recovery purposes and only in exceptional circumstances (very rarely approved). If the leave cannot be extended and the employee is not fit to return to work, the employer may initiate dismissal. However, in the case of employees of law enforcement agencies, the final decision lies with the military medical commission, which may propose an extension of the treatment period under another regime (without active status), dismissal for medical reasons, or retirement due to illness. The Regulation on the manner of conducting the medical examination of the work capacity and health status of employees and candidates for positions in law enforcement agencies (Ministry of Internal Affairs, Intelligence and Security Services, National Administration of Penitentiaries, etc.), contains *the List of diseases that exclude employment* in positions with special status, classifying the diseases according to *the degree of incompatibility* with the service. Post-tuberculosis sequelae do not automatically exclude employment in law enforcement agencies, if the person is cured, does not have significant functional impairments, and there are no specific contraindications according to the military medical regulation and the desired position [11] .

In the private sector, there are several cases of discrimination in hiring or firing people with TB, and employers do not always apply appropriate protective measures.

The lack of awareness-raising campaigns on the rights of people with TB in the workplace means that these people are poorly informed about their protection. There are no effective public campaigns to inform employers and employees about the necessary protection measures and their legal rights. Trade unions and NGOs are not sufficiently involved in promoting and monitoring the respect of the rights of people with TB in the workplace.

Policies. The Republic of Moldova has national policies regulating the protection of workers, including people with TB, in terms of safe working conditions. These policies stipulate the obligations of employers to ensure a working environment that prevents the risks of TB transmission. They provide for measures to ventilate workplaces and ensure adequate sanitary and hygienic conditions in workplaces, especially in medical or penitentiary institutions. Although national policies exist, their application can sometimes be inconsistent depending on the region and sector of activity. In some places, measures to protect workers with TB are partially or less effectively implemented. In medical institutions, there is a more rigorous application of measures to prevent contamination risks, but in other sectors, such as places of detention or other workplaces with higher risk, ventilation and occupational safety may be insufficient, a fact confirmed by the statistics of TB cases in certain professional groups. Media coverage of these policies is limited, and information is not accessible or effectively distributed to the general public or workers. Although there are regulations that protect people with TB in the workplace, many of them are poorly known by employers and employees. Awareness campaigns on workplace safety for people with TB are insufficient, which makes the implementation of these measures less effective.

Discussions

TB-associated stigma is a complex, multidimensional and persistent phenomenon, affecting not only access to services, but also quality of life, social relationships and trust in institutions.

This study explored in depth the phenomenon of TB-related stigma, approaching it not only as a visible social reaction, but as a complex, layered and often invisible experience. Through an integrated approach, the research analyzed multiple dimensions of stigma: from self-stigma felt at the individual level, to stigma experienced directly in interaction with the social and institutional environment, to stigma observed in the case of other affected people. This perspective allows for a nuanced understanding of how stigma manifests, perpetuates and influences behaviors, relationships and access to services.

In parallel, the study assessed the legal environment and relevant public policies, providing a clear picture of the existing legislative framework, its applicability and the degree of media coverage. This component highlights the tensions between formal norms and practical realities, as well as the essential role of institutions in combating or, on the contrary, perpetuating stigmatization.

In addition, the involvement of TB survivors and women in the study design and in the data collection, analysis and interpretation of the results contributed significantly to the relevance and applicability of the conclusions drawn. This participatory approach ensured the integration of the voices of those directly affected by TB at all stages of the process, strengthening the legitimacy and usefulness of the proposed recommendations.

Through the analysis of quantitative and qualitative data, a reality emerges in which TB stigma is not a marginal phenomenon, but a systemic one, profoundly affecting the lives of people with TB, their families, communities, and even health professionals. The following discussions synthesize these findings, highlighting the social, psychological, and institutional implications of stigma, as well as possible directions for intervention.

In this context, the study highlights a deep and often invisible dimension of TB's impact on the lives of people affected—the social stigma and self-stigmatization that are clearly reflected both in the stigma radar chart and in the responses to self-stigma items. Among these, self-stigmatization emerges as the most pronounced dimension. The application of the self-stigma scale reveals a complex psychosocial reality in which TB is not perceived solely as a medical condition, but also as a source of emotional distress, social isolation, and guilt.

The tendency of people with TB to self-isolate, reflected by keeping their distance from other people, is not only a protective measure, but also a mechanism to avoid stigma, a phenomenon also reported in other studies that confirm that people with TB, faced with the fear of judgment or rejection, often choose to self-isolate [12]. This choice is often reinforced by feelings of loneliness and loss of social relationships, which indicates a profound impairment of social support networks [13].

The lack of emotional safety and internalization of stigma is evident through the fear of disclosing the diagnosis. Literature data confirms that the stigma associated with TB is often linked to shame, fear of rejection and loss of social status, which causes people to avoid disclosing the diagnosis even to those close to them [12], this behavior being in fact a mechanism of protection against discrimination, but which contributes to isolation and late access to health services [14].

Guilt - another dimension, especially in the relationship with the family and in relation to behaviors perceived as causing the illness. Guilt, although sometimes can stimulate reparative behaviors, is often accompanied by persistent self-criticism, which can lead to low self-esteem and social withdrawal [15]. In the context of TB, feelings of guilt are amplified by social stigma and the perception that the illness is the result of poor personal choices, which accentuates isolation and emotional distress [12].

The analysis of the intensity of stigmatizing attitudes confirms the systemic nature of the phenomenon. Stigma is significantly felt in four major social contexts: medical institutions, community, home and workplace. Community stigmatization is perceived as the most intense, which suggests a collective internalization of prejudices and stereotypes related to TB. People with TB have experienced stigmatization, to a visible extent, including in the medical environment, results indicate that stigma is not limited to informal social interactions, but also penetrates into institutions that should provide support and protection. Literature data confirms that TB stigma is fueled by myths and misconceptions in the community, but also by discriminatory practices in medical institutions, where patients may be treated with a lack of empathy or excluded from the decision-making process regarding treatment [16]. In addition, persistent stigma in these contexts contributes to social isolation, impaired mental health, and delays in accessing health services [4].

Demographic factors such as gender, age, or residential area were not associated with a higher likelihood of stigma perception. However, the study shows that women were more exposed to stigma than men [17], and young people and those from rural areas experience more intense stigma, especially in the community and at home, a fact that is likely influenced by social and cultural norms, which can be more rigid in rural environments where the level of information is often lower [18].

Low educational attainment, lack of health insurance, and lack of income are associated with an increased likelihood of experiencing high stigma. TB stigma is often fueled by myths, and in combination with lower educational attainment, may contribute to delayed access to diagnosis and initiation of treatment, particularly among those with poor socioeconomic status [12]. The literature shows that TB disproportionately affects people from disadvantaged backgrounds, and the catastrophic costs associated with the disease can lead to social and economic marginalization [19–22].

Occupational status plays an important role in experiencing stigma. Unemployed people experienced stigma to a significantly higher extent in healthcare settings, which may reflect structural vulnerability and negative perceptions in the healthcare environment – a mechanism of social exclusion that amplifies existing inequalities and affects equitable access to healthcare services [6].

People with unsatisfactory living conditions are more likely to experience stigma [23], and a history of imprisonment seems to paradoxically act as a protective factor, possibly due to different social adaptation or an altered perception of stigma [24], reflecting an increased resilience to stigma or a redefinition of social norms among people with imprisonment experience.

Clinically, bacteriological confirmation of TB is associated with high stigma, possibly due to the increased visibility of the disease and the perceived risk of contagiousness. Studies show that patients with bacteriologically confirmed TB are more likely to be perceived as *“dangerous”* or *“contagious”*, which amplifies social stigma and can lead to isolation or discrimination [25]. Moreover, although modern diagnostic methods are faster and more accurate, they may increase the visibility of the disease and, consequently, stigmatization—especially in communities where understanding of the illness is limited [26]. In addition, bacteriological confirmation of TB is significantly associated with experiencing stigma in health care settings and at home. People with a diagnosis of bacteriologically confirmed TB are two to three times more likely to experience stigma, which can be explained by the association with contagiousness and isolation measures.

Other clinical characteristics, such as disease location, case type (new vs. recurrent), or MDR/RR TB, were not significantly associated with stigmatization, a finding consistent with the results of other research that emphasizes that the perception of stigma is influenced by visibility and perception of transmission risk rather than by the clinical complexity of the case [27].

Overlapping stigmas are evident in people with HIV or a history of drug use, who are at significantly higher risk of perceiving high stigma. In the case of people living with HIV, stigma is often compounded by prejudices related to morality, sexual behaviors, or substance use, which instills vulnerability to multiple forms of social exclusion [28,29]. HIV infection has been associated with increased perceptions of stigma in health care settings, reflecting the overlapping stigmas associated with the two conditions. International studies show that people living with HIV face stigma at all levels of the ecological system—from family and community to health care settings—which negatively affects mental health, adherence to treatment, and access to health services [30]. In addition, HIV stigma in the health care setting is amplified by negative attitudes among health care professionals, which can influence the quality of care and discourage patients from accessing health and support services [31].

Other conditions associated with TB, such as disability, alcohol use, mental health conditions, or diabetes, did not show significant associations with perceived stigma in the context of TB. The literature suggests that while these conditions may be stigmatizing in other contexts, in the case of TB, they do not appear to significantly influence the experience of perceived stigma [12,14].

With regard to the impact on access to health services, among people with TB, stigma affects all stages of the therapeutic pathway: from symptom recognition, diagnosis, treatment initiation and adherence, to treatment completion and access to post-treatment services. Literature data confirms that TB-associated stigma significantly contributes to delaying access to health services, hesitating to seek diagnosis, and treatment discontinuation, thus affecting disease control and treatment outcomes [12].

In the healthcare environment, stigma is felt most intensely at the diagnostic stage, where patients are sometimes treated with a lack of empathy or excluded from the decision-making process, reflecting the existence of *“stigma cultures”* in this environment [32]. In this context, stigmatization by healthcare personnel (43%) remains problematic, as it directly affects the patient–healthcare system relationship and can compromise access to quality care.

In the community and workplace, stigma is frequently associated with fear of judgment and discrimination, particularly at the stages of seeking health services and recognizing symptoms, which can lead to delayed medical interventions and worsening health status [31]. Thus, stigma not only affects emotional well-being, but also compromises access to care and continuity of treatment, with direct implications for public health.

Family environment. Self-stigma in the family environment of people with TB reveals a psychosocial reality marked by subtle but persistent tensions towards the disease and the way it is perceived and managed within the family. Stigma is not only manifested at the level of the sick person, but also extends to those close to them, generating behaviors of shame, avoidance, guilt, concealment and emotional discomfort – a phenomenon known as *“stigma by association” (courtesy stigma)* [33].

The tendency to hide the diagnosis from the community also persists in the family environment, reflecting a constant concern about one's image in society [12]. In most cases, family members choose to avoid discussing the disease, even in close circles, which suggests an internalization of stigma and a difficulty in integrating the experience of the disease into an open and socially accepted discourse [33,34].

Euphemistic behaviors—replacing the term *"tuberculosis"* with vaguer or more neutral terms—indicate a strategy of symbolic distancing from the disease. This mechanism can be interpreted as a form of psychological protection, but also as an expression of deep discomfort felt in the face of a reality perceived as stigmatizing. Studies show that avoiding direct terms and using ambiguous language are common in families affected by TB, reflecting the fear of labeling and the desire to control social perception [12,34]. At the same time, the pressure to maintain secrecy within the family environment accentuates the feeling of isolation and contributes to the consolidation of a culture of silence regarding TB. The literature on *"family secrets"* emphasizes that such concealments can become *"toxic,"* affecting communication, relationships, and the emotional health of family members [34]. In the case of TB, this silence is often fueled by shame, fear, and the desire to protect the family's reputation, making the disease not just a medical problem but also a deeply relational and cultural one [17]. Such emotional experiences indicate an ambivalence between the desire to protect the sick person and the need to protect oneself, both physically and socially [12].

Another important element is the perception of behavioral changes in the sick person, observed by family members, suggesting a deep awareness of the impact of the disease on the emotional and social state of the affected person, but also a possible reflection of their own fears and projections. Thus, the disease becomes not only a medical problem, but also a catalyst for complex psychosocial processes in the family environment [14].

Overall, the results suggest that family stigma associated with TB is felt mainly in relation to the outside world—community, neighbors, circle of friends—and less in terms of direct personal shame. Although only one-fifth of family members mentioned direct experiences of stigma, their distribution by context is revealing. Stigma was most frequently felt in medical institutions, followed by the community and home—results suggesting that institutional and community spaces, where interaction with people outside the family circle is more intense, are perceived as the most stigmatizing. The absence of mentioning the workplace as a stigmatizing one may reflect either a lack of exposure or a reluctance to discuss the disease in this environment.

The stages of the therapeutic journey in which family members most frequently experienced stigma are: establishing the diagnosis, requesting medical services, and obtaining the necessary support for adherence to treatment – essential moments for therapeutic success, which require close collaboration between the patient, family, and the medical system. The fact that stigma appears at these stages indicates the existence of a break in communication and trust in health institutions.

Members of communities affected by TB. The study data suggest that stigmatization of people with TB in the community is a complex phenomenon, fueled by fear, ignorance and rigid social norms. The results obtained paint a clear picture of persistent social stigma, manifested by avoidance, distancing and rejection behaviors towards people diagnosed with TB in the community environment, reflecting fear, but also a deeply rooted perception of the disease as dangerous, socially shameful [12,35] .

There is a tendency to maintain physical and emotional distance from people with TB. Avoiding physical contact, refusing to share common spaces or objects, and reluctance to allow people with TB to interact with children are behaviors that indicate a persistent perception of risk, even in the absence of a clear understanding of how the disease is transmitted [5,35].

In addition to avoidance behaviors, there is also a subtle but persistent form of discomfort in the presence of people with TB. This state of social tension contributes to the isolation of those affected and can lead to their marginalization in the community. Although not all attitudes are explicitly hostile, they create a climate of silent exclusion, in which people with TB are perceived as *"different"* or *"dangerous"* [5,12].

Community perceptions are not uniform [35]. There is a part of the population that exhibits more reserved or even empathetic attitudes, which suggests that stigma is not universal, but influenced by factors such as level of information, personal experiences, or age.

Healthcare professionals. Results from healthcare professionals reveal a range of ambivalent attitudes towards people diagnosed with TB, which may contribute to the perpetuation of stigma in healthcare settings. Although direct hostility is rarely expressed, there is a clear tendency towards distancing and control, reflected in support for patient isolation and the imposition of treatment, attitudes that suggest a dominant perception of TB as a threat to public health, which may justify, in the eyes of professionals, restrictive and authoritarian measures [36]. The literature confirms that such approaches are frequently found in so-called *"stigma cultures"* in healthcare settings, where organizational norms favor coercive practices and a punitive atmosphere, to the detriment of patient-centered care [32].

The perception of people with TB as dangerous or contagious fuels fear and can lead to avoidance behaviors, even among those who should be providing health care and support. Stigma is not always conscious or directly expressed, but can manifest itself through subtle attitudes, such as lack of empathy, reluctance to have direct contact, or a tendency to place excessive responsibility for one's own illness on the patient [37]. However, there are also examples of compassion and empathy among health care professionals, reflecting a diversity of perspectives and a possible openness to change.

A particularly relevant aspect is the fact that some of the medical staff mentioned their own experiences of stigmatization, especially in the medical and community environment, a phenomenon that suggests that TB stigma does not only affect patients, but can also influence the perception and behavior of health professionals, especially in contexts in which they are associated with the disease by the nature of their activity. Thus, stigmatization becomes a bidirectional process, affecting both those who provide medical services and those who receive them. Literature data confirms that stigmatization can become a bidirectional process, especially in contexts dominated by fear, misinformation or punitive institutional norms [5]. In such environments, stigma can be internalized by medical staff, affecting their emotional state, professional confidence and the quality of the relationship with patients [32].

Reflected stigma. The indirect perception of stigma was analyzed from several dimensions, such as observed by people with TB, observed in other family and community environments, and also by health personnel.

The way people with TB observe and interpret the experiences of others provides valuable insight into the spread and depth of the stigma phenomenon. A clear picture emerges of stigma as a pervasive phenomenon, manifested in multiple contexts – from health institutions and the community, to the home and workplace. Particularly worrying is the fact that stigma is observed even in spaces that, in theory, should offer support and protection, such as family or health institutions – a reality that suggests that stigma is not just an isolated act, but a systemic process, which can affect the entire care pathway of the person with TB. The most vulnerable stages observed seem to be those at the beginning and end of treatment – moments when social exposure is greater and community support is essential [38].

Another important aspect is the perception of stigma among families caring for people with TB. Although less frequently recognized, this form of stigma reflects a subtle reality, in which not only the sick person, but also those close to them can become the target of prejudice. The lack of visibility of this phenomenon may be the result of a collective silence or a lack of awareness.

Similarly, the perception of stigma among healthcare workers – both as observers and potential subjects of stigma – highlights the bidirectional nature of this phenomenon [5]. When healthcare workers are associated with TB through their profession, they themselves become vulnerable to stigmatization, which can affect the quality of therapeutic services, as well as trust in the healthcare system.

Overall, the indirect perception of stigma confirms that stigmatization of people with TB is a widespread, persistent and complex phenomenon, which manifests itself at all stages of care and in various social contexts.

Post-TB stigma. After completing TB treatment, the process of social reintegration often proves to be a difficult and emotionally charged stage for former patients. Although clinical cure marks the end of medical intervention, social stigma persists, profoundly affecting the individual's ability to resume their lives normally. Testimonies from affected people indicate that, during this period, they face rejection, mistrust and discrimination – not only in public spaces or at work, but sometimes even within the family. This reality reflects the fact that stigma does not disappear with the disease, but continues to shape the perceptions and behaviors of those around them. In the absence of clear post-treatment support mechanisms – such as psychosocial counseling, social protection measures or community information campaigns – reintegration becomes a fragmented, vulnerable and often solitary process. Thus, the post-treatment period should not be viewed as a simple return to normality, but as a critical stage that requires coordinated interventions, institutional empathy, and community involvement to prevent relapse and truly support the person's full recovery [12].

Legal and policy environment. In parallel, the study assessed the legal environment and relevant public policies, providing a clear picture of the existing legislative framework, its applicability and the degree of media coverage. This component highlights the tensions between formal norms and practical realities, as well as the essential role of institutions in combating or, on the contrary, perpetuating stigma.

The assessment of the legal environment and public policies in the context of TB highlights a series of systemic dysfunctions that contribute to the perpetuation of stigmatization of affected persons. Although the Republic of Moldova has a relatively well-defined legislative framework regarding the protection of the fundamental rights of TB patients, the application of these provisions is often uneven, fragmented and poorly communicated.

A first critical aspect is the discrepancy between the existence of legislation and its effective implementation. Although the rights to non-discrimination, access to information, services, confidentiality and informed consent are guaranteed by national laws and policies, in practice these rights are often violated or ignored, especially in rural areas, vulnerable communities and areas with limited access to services. The lack of training of medical personnel, the reluctance of victims to report abuses and the absence of effective monitoring mechanisms contribute to maintaining a climate of mistrust and exclusion.

Of particular concern is the situation regarding the right to a safe workplace and protection from arbitrary detention or involuntary isolation. In these areas, the scores obtained in the assessment indicate a significant regression compared to previous years. Practices of forced isolation, although rare, continue to be applied unevenly, and the lack of transparency and public information fuels perceptions of abuse. In addition, to the detriment of outpatient care, increased practices of hospitalization, including on grounds of social vulnerability, even in the absence of purely clinical indications, contribute to maintaining perceptions of *“danger, contagiousness and* threat to public health”. At the same time, people with TB face discrimination in employment, job loss and lack of adequate social protection measures, especially for employees in high-risk sectors such as healthcare and the prison system.

Another vulnerable point is the insufficient media coverage of patients’ rights and existing policies. The lack of information campaigns, adapted educational materials and active media involvement contribute to maintaining stigma and perpetuating myths about TB. Although there are initiatives by NTRP and civil society, they do not benefit from sufficient financial support to address stigma and fail to reach a wide audience.

Study limitations

The present study presents a number of methodological limitations that must be considered when interpreting the results.

First, the data collected is based solely on self-reporting, which carries an inherent risk of response *bias*. Participants may be influenced by factors such as a desire to provide socially acceptable answers, difficulty recalling experiences, or reluctance to disclose sensitive information, particularly regarding perceptions of stigma and experiences of discrimination.

Second, percentages for subgroups with absolute numbers of cases less than 30 are reported for descriptive and informative purposes. Their interpretation should be made with caution, as estimates may be affected by statistical instability and significant proportional variations. In such cases, a small change in the number of respondents can lead to considerable percentage differences, which limits the generalizability of the results.

Third, the cross-sectional design of the study does not allow for the establishment of causal relationships between the variables analyzed. The associations identified between stigma and individual, social, or institutional factors should be interpreted as correlations, not causations.

Fourth, the data were collected exclusively in localities located on the right bank of the Dniester River in the Republic of Moldova – a geographical delimitation that restricted the possibility of making comparisons between the populations on the two banks, thus limiting the generalization of the results to the entire territory of the country.

Also, another limitation of the study is that the *TB Stigma Assessment data collection tools*[8] were adapted and expanded into a more comprehensive format, which made it impossible to compare the data obtained with those from the previous study that used earlier versions of the tools.

Finally, although the sample was stratified and included relevant vulnerable groups, full national representativeness cannot be guaranteed, especially for certain subpopulations that are difficult to reach or underrepresented in the database used for participant selection.

Conclusions

Stigma is a systemic and multidimensional phenomenon. TB-related stigma is not a simple act of social rejection, but a complex process, rooted in social, cultural and institutional structures. It affects individuals at the psychological, relational and institutional levels, manifesting itself in various ways – from deep self-stigma, to stigmatizing attitudes expressed in the community, family, workplace and medical environment. The study reveals the omnipresent and persistent nature of stigma, which profoundly influences the lives of affected people and their access to health services.

The stigma radar and the intensity of stigmatizing attitudes confirm the multidimensional nature of the phenomenon. The visual representation of stigma through the radar highlights the uneven distribution of stigma according to context, with high levels of self-stigma, followed by stigmatization in the community and at work. The intensity of stigmatizing attitudes is highest in the community (81%), but also remains significant in the family (57%), in self-perception (49%) and in the medical environment (43%), data that confirm that TB-associated stigma is a systemic phenomenon, which profoundly affects the lives of affected people in all social and relational spheres.

Self-stigma is the most pronounced form. People diagnosed with TB tend to self-isolate, not only as a measure of epidemiological protection, but also as a mechanism to avoid social judgment. This isolation is reinforced by the loss of support networks and the difficulty of communicating openly about the disease. Fear of disclosing the diagnosis, feelings of guilt and shame contribute to delays in accessing health services, thus affecting both individual and public health.

Favorable factors that can influence the perception and experience of stigma:

- Women, young people and those from rural areas are more exposed to stigma, especially in the community and family.
- Occupational status also plays an important role, with unemployed people feeling stigmatization more intensely in the medical environment.
- Low educational level and lack of health insurance are associated with an increased likelihood of perceiving high stigma.
- Unsatisfactory living conditions also correlate with a higher likelihood of experiencing stigma.
- History of imprisonment - protective factor, possibly due to different social adaptation or a redefinition of norms among people with prison experience, which suggests increased resilience in the face of stigma.

Bacteriological confirmation amplifies stigma. Increased visibility of the disease and perception of contagiousness lead to greater stigmatization in patients with bacteriologically confirmed TB. Other clinical characteristics, such as disease location or case type, do not significantly influence the perception of stigma.

Overlapping stigmas. People living with HIV or who have a history of drug use are at significantly higher risk of perceiving high stigma. In these cases, TB-related stigma is amplified by prejudices related to morality, sexual behaviors, or substance use, leading to multiple vulnerabilities and severe social exclusion. In contrast, other comorbidities such as disability, alcohol use, mental health conditions, or diabetes did not show a significant influence on the perception of stigma in the context of TB.

Stigma affects all stages of the treatment journey. From symptom recognition and diagnosis to treatment initiation, adherence, and completion, stigma negatively influences health behaviors. Affected individuals are hesitant to seek medical help, face difficulties in maintaining relationships with the health system, and may abandon treatment due to social pressure.

The healthcare environment is a paradoxical space. In spite of being supposed to provide support and protection, the healthcare environment is often perceived as stigmatizing. Patients report experiences of lack of empathy, exclusion from decision-making, and discriminatory attitudes. These practices reflect the existence of *"cultures of stigma"* in healthcare institutions, where organizational norms favor distancing and control over patient-centered care.

Families experience stigma by association. Stigma is not limited to the person with the disease, but extends to family members, who may experience shame, concealment of the diagnosis, and avoidance of discussion of the disease. The use of euphemistic language and pressure to keep it a secret reflect a culture of silence, which affects communication and emotional support within the family.

The community contributes to the perpetuation of stigma. Avoidance, distancing and rejection behaviors are common in the community, even in the absence of a clear understanding of how the disease is transmitted. While not all attitudes are hostile, they create a climate of silent exclusion, in which people with TB are perceived as *"different"* or *"dangerous."*

Medical staff – between a support role and a source of stigma. The study reveals a series of ambivalent attitudes among medical staff towards people with TB, which may contribute to the perpetuation of stigma in the medical environment. Direct hostility is rarely expressed, rather there is a clear tendency for distancing and control, reflected in supporting the isolation of patients and the imposition of treatment. These attitudes suggest a dominant perception of TB as a threat to public health, which may justify, in the eyes of professionals, restrictive and authoritarian measures.

Observed stigma – an indirect confirmation of the systemic nature. People with TB frequently observe the stigmatization of others in contexts such as health facilities, community, home and workplace, which confirms the widespread and persistent nature of the phenomenon. Stigma is perceived even in spaces that should provide support, such as family or health facilities. Families and health care staff can also become targets of stigmatization, which highlights the bidirectional nature of the process. This reflected dimension emphasizes that stigmatization is not an isolated act, but a collective and systemic process, with an impact on the entire ecosystem of care.

Stigma persists even after recovery. Social reintegration after completing treatment is a difficult stage, marked by rejection, mistrust and discrimination. The lack of support mechanisms – such as psychosocial counselling or information campaigns – makes this period vulnerable and often lonely. Clinical recovery does not equate to the disappearance of stigma, which continues to shape the perceptions and behaviours of those around it.

The legal framework and public policies need strengthening to effectively combat stigma. The assessment of the legal environment and public policies reveals the existence of significant gaps that, although not exclusively stemming from the legislative framework, affect the system's capacity to protect and support people affected by TB. To reduce stigma and guarantee fundamental rights, an integrated approach is needed that combines legislative reforms with effective implementation measures, professional training, institutional monitoring and sustained public communication.

Recommendation

To reduce the stigma associated with TB in the Republic of Moldova and improve equitable access to health services, a multisectoral, coherent and sustained intervention is needed. Based on the study findings, the following courses of action are recommended:

Strengthening the regulatory and institutional framework

- Review and harmonization of legislation on the rights of people with TB, with a focus on protection against discrimination, confidentiality of medical data, and equitable access to services.
- Ensuring uniform application of legal provisions in all regions of the country, including the eastern part and rural areas.
- Strengthening mechanisms for monitoring and reporting cases of discrimination and stigmatization in the healthcare system and in accessing other public services

Training and awareness-raising of medical personnel

- Including modules on TB stigma and patients' rights in continuing education programs for healthcare workers.
- Promoting an organizational culture based on empathy, patient-centered communication and respect for human dignity.
- Encourage self-reflection and recognition of one's own stigmatizing attitudes among medical staff.

Public information and education campaigns

- Developing and implementing national TB information campaigns, focused on combating myths, reducing fear, and promoting inclusion.
- Adapting educational materials to the literacy level of the population and translating them into minority languages.
- Involving the media and community leaders in promoting anti-stigma messages.

Psychosocial support for affected people

- Ensuring access to psychological counseling services for people with TB and their families, including in the post-treatment period.
- Developing and strengthening support groups and community networks to facilitate social and professional reintegration.
- Promoting the involvement of people with TB experience in peer-support and advocacy activities.

Targeted interventions for vulnerable groups

- Developing specific strategies to reduce stigma among key populations: people with HIV, people with a history of imprisonment, drug users, people from rural areas.
- Ensuring priority access to diagnostic, treatment and support services for these groups.
- Collaborating with civil society organizations that work directly with these communities.

Integrating the anti-stigma dimension into public policies

- Include stigma reduction as an explicit objective in the National TB Response Program and public health strategies.
- Allocating dedicated resources for implementing anti-stigma interventions.
- Periodically monitor the level of stigma through national studies and use the results to adjust policies.

Bibliography

1. Tuberculosis surveillance and monitoring in Europe. 2025 [cited 2025 Jul 5]; Available from: https://www.who.int/about/who-we-are/publishing-poli-
2. World Health Organization. WHO releases new global lists of high-burden countries for TB, HIV-associated TB and drug-resistant TB [Internet]. WHO Library Cataloguing. 2021 [cited 2025 Mar 4]. Available from: https://www.who.int/news/item/17-06-2021-who-releases-new-global-lists-of-high-burden-countries-for-tb-hiv-associated-tb-and-drug-resistant-tb
3. Craig GM, Daftary A, Engel N, O'Driscoll S, Ioannaki A. Tuberculosis stigma as a social determinant of health: a systematic mapping review of research in low incidence countries. Int J Infect Dis [Internet]. 2017 Mar 1 [cited 2025 Jul 4];56:90–100. Available from: https://www.sciencedirect.com/science/article/pii/S120197121631195X
4. Ingram I, Kelly PJ. Isolation, Loneliness and Mental Health. In: Existential Concerns and Cognitive-Behavioral Procedures: An Integrative Approach to Mental Health [Internet]. Springer, Cham; 2022. p. 115–33. Available from: https://link.springer.com/chapter/10.1007/978-3-031-06932-1_7
5. Parekh R, Childs EW. Stigma and prejudice: Touchstones in understanding diversity in healthcare. [Internet]. 2016 [cited 2025 Jul 3]. 23–40 p. Available from: https://psycnet.apa.org/record/2016-29706-000
6. Liamputtong P, Rice ZS. Stigma, Discrimination, and Social Exclusion. Handb Soc Incl [Internet]. 2021;1–17. Available from: https://link.springer.com/rwe/10.1007/978-3-030-48277-0_6-1
7. Assessment of barriers to community engagement, human rights, gender and the level of stigma associated with Tuberculosis in the Republic of Moldova [Internet]. Available from: https://smitmd.wordpress.com/2022/12/14/evaluarea-barierelor-privind-implicarea-comunitara-drepturile-omului-aspectele-de-gen-si-nivelul-de-stigma-asociata-tuberculozei-in-republica-moldova/
8. Stop TB Partnership. Stop TB Stigma Assessment Tool Implementation Handbook | Stop TB Partnership [Internet]. 2022. Available from: https://www.stoptb.org/tb-stigma-assessment-tool
9. Rucsineanu O. Tuberculosis Legal Environment and Human Rights Scorecard Republic of Moldova.
10. Assessment of the need for specialized inpatient care for tuberculosis in the context of the epidemiological transition and the 2021 WHO recommendations on the treatment of multidrug-resistant tuberculosis [Internet]. [cited 2025 Jul 6]. Available from: https://pas.md/ro/PAS/Studies/Details/317
11. NATIONAL GUIDE CRITERIA AND STANDARDS FOR DIAGNOSTIC, EVALUATION AND MEDICAL EXPERTISE WITHIN THE MINISTRY OF INTERNAL AFFAIRS, THE NATIONAL ANTI-CORRUPTION CENTER AND THE NATIONAL PENITENTIAL ADMINISTRATION EDITION II, revised and updated, Chisinau municipality-2025.
12. Kamboj A, Lause M, Kamboj K. The Problem of Tuberculosis: Myths, Stigma, and Mimics. Integr Sci [Internet]. 2023;11:1047–62. Available from: https://link.springer.com/chapter/10.1007/978-3-031-15955-8_50
13. Lim MH, Holt-Lunstad J, Badcock JC. Loneliness: contemporary insights into causes, correlates, and consequences. Soc Psychiatry Psychiatr Epidemiol [Internet]. 2020 Jul 1;55(7):789–91. Available from: https://pubmed.ncbi.nlm.nih.gov/32529475/
14. Njie GJ, Khan A. Prevalence of Tuberculosis and Mental Disorders Comorbidity: A Systematic Review and Meta-analysis [Internet]. Vol. 24, Journal of Immigrant and Minority Health. 2022. Available from: https://www.mendeley.com/catalogue/87f39564-5452-3e83-a904-89ffd7e4229c
15. Kim S, Thibodeau R, Jorgensen RS. Shame, Guilt, and Depressive Symptoms: A Meta-Analytic Review. Psychol Bull [Internet]. 2011;137(1). Available from: https://www.mendeley.com/catalogue/5f1eb84f-5a90-32bb-a9d1-2a0584b2a83d

16. Blodgett JM, Tiley K, Harkness F, Musella M. What works to reduce loneliness: a rapid systematic review of 101 interventions [Internet]. Vol. 46, Journal of Public Health Policy. Palgrave Macmillan; 2025. p. 245–68. Available from: https://pubmed.ncbi.nlm.nih.gov/40050496/

17. Brüggemann R, Schlumberger F, Chinshailo F, Willis M, Kadyrov A, Kalmambetova G, et al. Stigmatization and discrimination of female tuberculosis patients in Kyrgyzstan – a phenomenological study. Int J Equity Heal 2025 241 [Internet]. 2025 Jul 1;24(1):1–14. Available from: https://equityhealthj.biomedcentral.com/articles/10.1186/s12939-025-02566-4

18. Dabitao D, Bishai WR. Sex and Gender Differences in Tuberculosis Pathogenesis and Treatment Outcomes. In: Current Topics in Microbiology and Immunology [Internet]. Springer, Cham; 2023. p. 139–83. Available from: https://link.springer.com/chapter/10.1007/978-3-031-35139-6_6

19. Baena IG, Floyd K, Cunnama L. The Global and Individual Economics of Tuberculosis. Essential Tuberc [Internet]. 2021 Jan 1;375–82. Available from: https://link.springer.com/chapter/10.1007/978-3-030-66703-0_41

20. Ciobanu A, Plesca V, Doltu S, Manea M, Domente L, Dadu A. Determinant of catastrophic costs associated with treatment for rifampicin-resistant TB in households in the Republic of Moldova. IJTLD Open [Internet]. 2024 Jun 14;1(6):266–73. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC11249656/

21. Ciobanu A, Plesca V, Doltu S, Manea M, Domente L, Dadu A. TB and poverty: the effect of rifampicin-resistant TB on household income. IJTLD Open [Internet]. 2024 Apr 1 [cited 2025 Jul 4];1(4):181–8. Available from: https://pubmed.ncbi.nlm.nih.gov/38988411/

22. Assessment of catastrophic costs associated with tuberculosis treatment borne by affected households in the Republic of Moldova [Internet]. Available from: https://www.pas.md/ro/PAS/Studies/Details/447

23. Courtwright A, Turner AN. Tuberculosis and stigmatization: Pathways and interventions. Public Health Rep [Internet]. 2010;125(SUPPL. 4):34–42. Available from: https://pubmed.ncbi.nlm.nih.gov/20626191/

24. Dara M, Acosta CD, Melchers NVSV, Al-Darraji HAA, Chorgoliani D, Reyes H, et al. Tuberculosis control in prisons: Current situation and research gaps. Vol. 32, International Journal of Infectious Diseases. 2015. p. 111–7.

25. Bares SH, Swindells S. Latent Tuberculosis and HIV Infection [Internet]. Vol. 22, Current Infectious Disease Reports. Springer; 2020. p. 1–8. Available from: https://link.springer.com/article/10.1007/s11908-020-00726-x

26. Alagna R, Cabibbe AM, Tortoli E, Cirillo DM. Microbiological Diagnosis of Tuberculosis Disease. In: Essential Tuberculosis [Internet]. Springer, Cham; 2021. p. 87–96. Available from: https://link.springer.com/chapter/10.1007/978-3-030-66703-0_10

27. Achour W, Chebbi Y. Pathophysiology of Tuberculosis and Microbiological Diagnosis. In: Medical Radiology [Internet]. Springer, Cham; 2022. p. 15–27. Available from: https://link.springer.com/chapter/10.1007/978-3-031-07040-2_2

28. Greenwood GL, Wilson A, Bansal GP, Barnhart C, Barr E, Berzon R, et al. HIV-Related Stigma Research as a Priority at the National Institutes of Health. AIDS Behav [Internet]. 2022 Jan 1;26(Suppl 1):5–26. Available from: https://pubmed.ncbi.nlm.nih.gov/33886010/

29. Earnshaw VA, Chaudoir SR. From conceptualizing to measuring HIV stigma: A review of HIV stigma mechanism measures [Internet]. Vol. 13, AIDS and Behavior. AIDS Behav; 2009. p. 1160–77. Available from: https://pubmed.ncbi.nlm.nih.gov/19636699/

30. Sharma BB, Small E, Patel M, Mwima S, Okumu M. Understanding the Intersecting Roles of Culture, Misinformation, and Socioecological Systems on HIV Stigma and Coping. Glob Soc Welf [Internet]. 2024 Oct 17;1–16. Available from: https://link.springer.com/article/10.1007/s40609-024-00362-6

31. Ahmed RFM, Hawk M, Kay ES, Coulter RWS, Friedman MR, Yu L. Associations Between Healthcare

Providers' Stigmatizing Attitudes Toward People Living with HIV and People Who Use Drugs: A Canonical Correlation Analysis. AIDS Behav [Internet]. 2025 Jun 16;1–16. Available from: https://link.springer.com/article/10.1007/s10461-025-04794-9

32. Stuart H, Knaak S. Measuring aspects of stigma cultures in healthcare settings. Soc Psychiatry Psychiatr Epidemiol [Internet]. 2025 May 1;60(5):1239–47. Available from: https://link.springer.com/article/10.1007/s00127-024-02780-5

33. van der Sanden RLM, Pryor JB, Stutterheim SE, Kok G, Bos AER. Stigma by association and family burden among family members of people with mental illness: the mediating role of coping. Soc Psychiatry Psychiatr Epidemiol [Internet]. 2016 Sep 1;51(9):1233–45. Available from: https://link.springer.com/article/10.1007/s00127-016-1256-x

34. Deslypere E, Rober P. Family Secrecy – A Challenge for Researchers. In Springer, Cham; 2020. p. 191–204. Available from: https://link.springer.com/chapter/10.1007/978-3-030-36560-8_11

35. Becker G, Arnold R. Stigma as a Social and Cultural Construct. In: The Dilemma of Difference [Internet]. Springer, Boston, MA; 1986. p. 39–57. Available from: https://link.springer.com/chapter/10.1007/978-1-4684-7568-5_3

36. Healy M, Richard A, Kidia K. How to Reduce Stigma and Bias in Clinical Communication: a Narrative Review. J Gen Intern Med [Internet]. 2022 Aug 1 [cited 2025 Jul 4];37(10):2533. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC9360372/

37. Moudatsou M, Stavropoulou A, Philalithis A, Koukouli S. The role of empathy in health and social care professionals [Internet]. Vol. 8, Healthcare (Switzerland). MDPI AG; 2020. p. 26. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC7151200/

38. Authors, Ritchie L, Horton J. Community Supports for People With Tuberculosis. Community Support People With Tuberculosis CADTH Heal Technol Rev [Internet]. 2023; Available from: https://www.ncbi.nlm.nih.gov/books/NBK601825/

Annex 1. Suggestions for eliminating the stigma associated with tuberculosis – thematic synthesis from interviews

The participants' suggestions reflect a deep understanding of the impact of TB-related stigma and provide clear directions for interventions. Correlated with the six general recommendations, the proposals highlight the need for an integrated approach: education, psychosocial support, institutional reforms and anti-stigma public policies. The voices of patients, families, communities and health professionals outline a coherent framework for actions that can transform TB from a source of exclusion into a challenge that can be treated with dignity and solidarity.

Recommendation	Suggestions from participants Number of respondents and type	Participants' quotes
Strengthening the regulatory and institutional framework	• The need to protect personal data and confidentiality (5 people with TB) • Establishing the degree of disability at diagnosis and maintaining it post-treatment (5 people with TB) • Equal access to treatment, without discrimination (6 people with TB) • The need for professional and social reintegration policies (8 TB people) • The need for decent conditions in hospitals (6 people with TB and family members) • The obligation of institutions to ensure accessible and effective treatment (community)	*"TB diagnosis should be anonymous and personal data protected at all stages of treatment"* (person with TB) *"The degree of disability should be established from the moment of diagnosis"* (TB person) *"Patients with extrapulmonary TB or who are compliant with treatment should not be treated the same as those with contagious forms"* (person with TB) *"After treatment, the status of a former TB patient continues to affect employment opportunities "* (person with TB) *"Treatment must be immediately available, effective and supported by regular medical check-ups"* (community)
Training and awareness-raising of medical personnel	• The need for an empathetic and respectful attitude (6 people with TB and family members) • Avoiding stigmatizing reactions to diagnosis (5 people with TB) • Clear communication about the disease and treatment (5 people with TB and medical staff) • Respect for confidentiality (5 people with TB and medical staff) • Involvement of medical personnel in community education (medical personnel and members of affected communities).	*"Medical staff, especially family doctors, must avoid exaggerated or stigmatizing reactions"* (person with TB) *"Respect and dignity from medical staff, not to be discriminated against or labeled"* (person with TB) *"Empathy and respect in the relationship with patients, to avoid arrogant behaviors"* (family member) *"Medical staff must treat patients with dignity, maintain the confidentiality of the diagnosis"* (medical staff) *"Doctors should explain the causes, risks and steps to follow in treatment"* (medical staff)
Public information and education campaigns	• The need for accurate and constant information about TB (6; community members and medical staff)	*"The community must be informed that treated patients are no longer contagious"* (person with TB)

Recommendation	Suggestions from participants Number of respondents and type	Participants' quotes
	- Early childhood education in schools and kindergartens (5 people with TB, families and communities) - Informing that treated people are no longer contagious (8 people with TB, all categories) - Media campaigns and information materials (medical personnel and affected communities) - Combating stereotypes and fear through education (family and community members).	*“Public campaigns should explain that treated people are no longer contagious”* (community member) *"Educational programs are needed in schools, kindergartens and communities"* (community member) *"Media campaigns, public announcements and informational materials that clearly explain how TB is transmitted"* (medical personnel) *"Combating stereotypes related to TB through early education and openness in communication"* (family member)
Psychosocial support for affected people	- The need for psychological counseling for patients and families (6 people with TB, families and medical staff) - Emotional support during treatment (5 people with TB and communities) - Combating loneliness and isolation (5 people with TB) - Acceptance in family and community (8 people with TB and communities) - Respect and humane treatment in hospitals (6 people with TB and families)	*"Hospitals must provide a decent environment, with psychological support and respect for patients"* (person with TB) *"Psychological support for patients and families: counseling services to manage stress, fear of stigma"* (family member) *"Psychological and social support to cope with post-treatment effects and reintegration"* (person with TB) *"Acceptance in the community: respect and acceptance in public spaces and in social relationships"* (person with TB) *"Patients need emotional support, healthy nutrition and social help"* (community member)
Targeted interventions for vulnerable groups	- Free and affordable treatment for homeless people (mentioned by 7 people with TB) - Home treatment option, without mandatory hospitalization (7 people with TB) - Special measures for patients who do not comply with treatment (6 TB people) - Education and prevention in marginalized communities (affected communities and medical personnel) - Temporary isolation measures with respect for dignity (affected communities)	*“Homeless people should receive free and affordable treatment”* (person with TB) *"Sick people should have the option to receive treatment at home"* (person with TB) *“Patients who do not comply with treatment should be monitored”* (person with TB) *"Educational programs are needed in communities to combat fear and discrimination"* (community member) *"In contagious cases, separation and medical monitoring are suggested, but with respect for the dignity of the person"* (community member).
Integrating the anti-stigma dimension into public policies	- Combating the perception of TB as a permanent label (5 people with TB) - The need for professional and social reintegration (8 people with TB and communities) - Informing employers that TB is treatable (families and communities)	*“Combating the perception of 'condemnation': a TB diagnosis should not be perceived as a permanent label”* (person with TB) *"Professional reintegration: support in employment and non-discrimination in employment"* (person with TB)

Recommendation	Suggestions from participants Number of respondents and type	Participants' quotes
	• Respect and dignity for former patients (all categories of respondents) • Policies to support acceptance in the community and workplace (people with TB and healthcare personnel).	*"Informing employers that TB is treatable and is not a reason to avoid former patients"* (family member) *“Respect and dignity for people with TB: treating them with respect, without labels or marginalization”* (family member) *"The community must be encouraged to be more understanding, and patients must be supported in social reintegration"* (medical staff)
Other suggested recommendations from study participants	• Prohibition of alcohol consumption in hospitals (6 people with TB) • Monitoring patients who do not comply with treatment (6 people with TB) • Family involvement in the treatment process (medical staff and people with TB) • Healthy eating as part of support (affected communities) • Social solidarity and empathy (affected communities and medical personnel); • The need for regular medical check-ups (medical personnel); • Mandatory initiation of treatment in serious cases (affected communities).	- *"Alcohol consumption in hospitals should be banned" (person with TB);* - *"Patients who do not comply with treatment should be monitored"* (person with TB) *"Doctors should also involve the family in the support process"* (medical staff) *"Patients need healthy food and social support* " (community member) *"The community must be encouraged to be more understanding"* (medical staff) *"Treatment must be supported by regular medical check-ups"* (medical staff) *“In some cases, treatment initiation should be mandatory to protect the community”* (community member)