

Stop TB Partnership

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UNOPS



TUBERCULOSIS

**Key and Vulnerable
Populations
Size Estimation Tool**



PEOPLE LIVING WITH HIV / PRISONERS / DETAINEES
MINERS / PEOPLE WITH SILICOSIS / MIGRANTS / REFUGEES
INTERNALLY DISPLACED PEOPLE / NOMADIC POPULATION
PEOPLE WHO USE DRUGS / PEOPLE WHO USE TOBACCO
PEOPLE LIVING IN POVERTY / PEOPLE WITH DISABILITIES
PEOPLE WITH ALCOHOL DEPENDENCY / SEX WORKERS
LGBTQIA+ PEOPLE / INDIGENOUS PEOPLES / CHILDREN
HOMELESS PEOPLE / ELDERLY PEOPLE / URBAN POOR
HOSPITAL WORKERS / COMMUNITY HEALTH WORKERS
OUTREACH WORKERS / RURAL POOR / PRISON WORKERS
PEOPLE LIVING WITH HIV / PRISONERS / DETAINEES
MINERS / PEOPLE WITH SILICOSIS / MIGRANTS / REFUGEES
INTERNALLY DISPLACED PEOPLE / NOMADIC POPULATION
EXPERIENCE HUMAN RIGHTS BARRIERS TO TB SERVICES
PEOPLE WHO USE DRUGS / PEOPLE WHO USE TOBACCO
PEOPLE LIVING IN POVERTY / PEOPLE WITH DISABILITIES
PEOPLE WITH ALCOHOL DEPENDENCY / SEX WORKERS
LGBTQIA+ PEOPLE / INDIGENOUS PEOPLES / CHILDREN
HOMELESS PEOPLE / ELDERLY PEOPLE / URBAN POOR
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PEOPLE LIVING WITH HIV / PRISONERS / DETAINEES
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PEOPLE WHO USE DRUGS / PEOPLE WHO USE TOBACCO
PEOPLE LIVING IN POVERTY / PEOPLE WITH DISABILITIES
PEOPLE WITH ALCOHOL DEPENDENCY / SEX WORKERS



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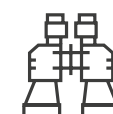


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Abbreviations

| | | | |
|----------------|---------------------------------------------------------|-------------------|--------------------------------------------------------------------|
| ART | antiretroviral therapy (for HIV) | TLS | time-location sampling |
| CSS | community systems and responses strengthening | TB | tuberculosis |
| CRG | community, rights and gender | TB KVP | TB key and vulnerable populations |
| CCM | Country Coordinating Mechanism | TGF | The Global Fund to Fight AIDS, Tuberculosis and Malaria |
| FAO | Food and Agriculture Organization of the United Nations | UN | United Nations |
| HIV | human immunodeficiency virus | UNAIDS | Joint United Nations Programme on HIV/AIDS |
| IDMC | Internal Displacement Monitoring Centre | UNDP | United Nations Development Programme |
| ILO | International Labour Organization | UNESCO | United Nations Educational, Scientific and Cultural Organization |
| IOM | International Organization for Migration | UN-HABITAT | United Nations Human Settlements Programme |
| MDR TB | multidrug-resistant TB | UN HLM | United Nations High-Level Meeting on TB |
| M&E | monitoring and evaluation | UNHCR | United Nations High Commissioner for Refugees |
| NGO | non-government organization | UNICEF | United Nations Children's Fund |
| NSP | National Strategic Plan | UNIDO | United Nations Industrial Development Organization |
| NTP | National TB Programme | UNOCHA | United Nations Office for the Coordination of Humanitarian Affairs |
| PRM | participative ranking methodology | UNODC | United Nations Office on Drugs and Crime |
| PSE | population size estimation | UNOHCHR | Office of the United Nations High Commissioner for Human Rights |
| PLHIV | people living with human immunodeficiency virus | USAID | United States Agency for International Development |
| PMNCH | The Partnership for Maternal, Newborn & Child Health | WHO | World Health Organization |
| PNUD | United Nations Development Programme | WOAH | World Organisation for Animal Health |
| PWID | people who inject drugs | | |
| PWUD | people who use drugs | | |
| RDS | respondent-driven sampling | | |
| STP | Stop TB Partnership | | |



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Context

The need for a TB Key and Vulnerable Populations (TB KVP) Size Estimation Tool emerged from the Stop TB Partnership (STP) *Global Plan to End TB*' priority action to prioritize and reach TB KVP, as well as emerging from Community, Rights and Gender (CRG) Assessments where countries undertook TB KVP prioritization initiatives and developed costed TB CRG Action Plans. To help the process of costing TB CRG Action Plans and, more importantly, TB National Strategic Plans (NSPs), an understanding is needed of the number of people who may be characterized as being part of key and vulnerable populations.

READ MORE:

1. The Global Plan to End TB 2023-2030
<https://omnibook.com/embedview/dc664b3a-14b4-4cc0-8042-ea8f27e902a6/en/#z-b011>

STP, together with the Global Fund (TGF) TB team, conducted consultations to frame these needs. Two desk reviews were undertaken concurrently. The first looked at information pertaining to TB key and vulnerable populations, the barriers they experience when aiming to access quality health services and processes for operationalizing TB CRG. The second looked at methodologies for population estimates that could be relevant for TB KVP. Based on these desk reviews and consultations, a series of methodologies were recommended and a tool drafted. STP presented the draft tool to over 160 TB-affected community and civil society partners during the 2022 STP Community Summit, obtaining further feedback and validating the principles and processes underlying the tool. Further input was also received from TGF and the World Health Organization (WHO).



Definitions

CHILDREN

Human beings below the age of eighteen years unless, under the law applicable to the child, majority (the legal status of adulthood) is attained earlier.²

COMMUNITY, RIGHTS AND GENDER

TB CRG relates to the meaningful engagement of TB-affected communities in the TB response; the overcoming of social, policy and legal barriers to TB services; and the application and promotion of human rights and gender approaches in the planning, implementation, monitoring, evaluation and governance of TB programmes.

COMMUNITY SYSTEMS AND RESPONSES STRENGTHENING

CSS relates to interventions that support the development and reinforcement of informed, capable, coordinated and sustainable structures, mechanisms, processes and actors through which community members, organizations and groups interact, coordinate and deliver their responses to the challenges and needs affecting their communities.³ Community systems strengthening is increasingly recognized in international commitments and normative guidelines. However, interventions in countries to strengthen community systems remain insufficiently acknowledged, prioritized, funded or integrated into national and disease-specific plans and budgets.

ELDERLY PEOPLE

Defined by the United Nations as a person who is over 60 years of age.⁴

HEALTH WORKERS

All people engaged in work whose primary intent is to improve health, including doctors, nurses, midwives, public health professionals, laboratory technicians, health technicians, medical and non-medical technicians, personal-care workers, community health workers, healers and traditional medicine practitioners.⁵

HOMELESSNESS

One of the most acute forms of material deprivation. Homelessness refers to the inability of people to enjoy permanent accommodation, or to a person who lives in severely inadequate housing due to a lack of access to minimally acceptable accommodation.⁶

READ MORE:

- Convention on the Rights of the Child
<https://www.unicef.org/child-rights-convention/convention-text>
- Technical Brief: Community Systems Strengthening – allocation period 2023–2025
https://www.theglobalfund.org/media/4790/core_community_systems_technicalbrief_en.pdf
- Older persons
<https://emergency.unhcr.org/entry/43935/older-persons>
- Occupational health: health workers
<https://www.who.int/news-room/fact-sheets/detail/occupational-health--health-workers>
- Homelessness and the SDGs
https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2019/07/SALCEDO_Jesus_Presentation_2-1.pdf



WORDS MATTER LANGUAGE GUIDE

Words Matter is a TB language guidance promoting the use of inclusive, empowering and stigma-free language and is a useful resource for TB stakeholders.

→ <https://www.stoptb.org/words-matter-language-guide>

INDIGENOUS PEOPLES

Distinct social and cultural groups that share collective ancestral ties to the lands and natural resources where they live, which they occupy or from which they have been displaced. The land and natural resources on which they depend are inextricably linked to their identities, cultures and livelihoods, as well as to their physical and spiritual well-being.⁷

MEANINGFUL ENGAGEMENT

The process of developing relationships that enable stakeholders to work together to address health-related issues and promote well-being to achieve positive health impacts and outcomes.⁸ For community engagement to be meaningful, it must be financially supported and include mobilization and capacity-building to ensure the inclusive, informed and coordinated participation of people with or who have survived TB, TB-affected persons, TB KVP and civil society. Meaningful engagement is not just related to service delivery. It should include participation in TB policy and programme prioritization, design, implementation, monitoring, review and evaluation. Community engagement also includes participation in advocacy, human rights, demand generation and social accountability for interventions that contribute to building community systems for health.

MIGRANTS

People who move or have moved across an international border or within a State away from their habitual place of residence, regardless of (1) their legal status; (2) whether this movement is voluntary or involuntary; (3) what the causes of the movement are; or (4) their length of stay.⁹

MINERS

People involved in either industrial or artisanal mining and quarrying in confined and poorly ventilated environments, exposed to silica dust and they often have limited access to health and social support services.¹⁰

READ MORE:

- Indigenous peoples
<https://www.worldbank.org/en/topic/indigenouspeoples>
 - Community engagement: A health promotion guide for universal health coverage in the hands of the people
<https://www.who.int/publications/i/item/9789240010529>
 - Global issues: Migration
<https://www.un.org/en/global-issues/migration>
 - Myanmar – Extending TB services to hard-to-reach areas: Case study health coverage in the hands of the people
https://cdn.who.int/media/docs/default-source/inaugural-who-partners-forum/myanmar-case-study_v13751dcf2e-018a-4b3a-afb2-715be3b7e8e0.pdf?sfvrsn=46679259_1&download=true
- Grant to fight TB in southern Africa's mining sector
<https://www.worldbank.org/en/news/press-release/2016/02/05/grant-to-fight-tb-in-southern-africas-mining-sector>

PARTICIPATIVE RANKING METHODOLOGY (PRM)

A 'mixed methods' approach to data collection in which a group of knowledgeable participants is guided in generating responses to a specific question or set of questions.

PEOPLE LIVING IN POVERTY

People living on less than \$2 a day are considered to be living in poverty. People who live on less than \$1.25 a day are considered to live in extreme poverty.¹¹

PEOPLE LIVING WITH DIABETES

People who live with a chronic disease that affects how the body turns food into energy. A person living with diabetes who is also infected with TB is more likely to develop TB disease than someone without diabetes.¹²

PEOPLE LIVING WITH HIV

People who are living with Human Immunodeficiency Virus, an infection that attacks the body's immune system, specifically the white blood cells called CD4 cells.¹³

PEOPLE WHO USE DRUGS

People who inject drugs (excluding alcohol) and those who do not inject but share drugs or drug equipment with others, inhale and exhale smoke directly from and into another person's mouth ('shot-gunning'), and live in or take drugs with others in cramped conditions with poor ventilation.¹⁴

PRISONERS/DETAINEES

People deprived of their liberty and held by the state in institutions.¹⁵ This can include individuals convicted of a crime but also those who are on remand. Prisons are often overcrowded, poorly ventilated and lack adequate provision of medical care and nutrition.¹⁶

REFUGEES

People who are unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion.¹⁷

SOCIAL JUSTICE

A central concept of equality and human rights that examines how these rights manifest in the lives of individuals. It aims to redress inequities based on gender, race, religion, age, sexual orientation, economic status and other characteristics. Achieving social justice is critical in health care to ensure that all individuals can maintain their highest level of health and wellness.

READ MORE:

11. Academic impact: Addressing poverty
<https://www.un.org/en/academic-impact/addressing-poverty>

12. TB and diabetes
<https://www.cdc.gov/tb/topic/basics/tb-and-diabetes.html>

13. Health topics: HIV
https://www.who.int/health-topics/hiv-aids#tab=tab_1

14. Managing tuberculosis in people who use and inject illicit drugs and Tuberculosis and drug use: Review and update
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3605021/>

Tuberculosis and drug use: Review and update
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3110742/>

15. Prisons and health
<https://www.who.int/europe/health-topics/prisons-and-health>

16. Organisation and management of health care in prison: Guidelines
<https://rm.coe.int/guidelines-organisation-and-management-of-health-care-in-prisons/168093ae69>

17. What is a refugee?
<https://www.unhcr.org/what-is-a-refugee.html>

TB KEY AND VULNERABLE POPULATIONS

Defined in the *The Global Plan to End TB 2023–2030*¹⁸ as people who:

1. Have increased exposure to TB due to where they live or work: prisoners, contacts, sex workers, miners, hospital visitors, health-care workers and community health workers. They include people who:

- Live in urban slums
- Live in poorly-ventilated or dusty conditions
- Are contacts of individuals with TB, including children
- Live or work in environments that are overcrowded
- Work in hospitals or are healthcare professionals
- Are in contact with or live with livestock
- Live or work in close proximity to cattle or ingest raw milk or blood

2. Have limited access to quality TB services: migrant workers, women in settings with gender disparity, children, refugees or internally displaced people, miners and undocumented migrants. They include people who:

- Are from tribal populations, or indigenous people
- Are homeless
- Live in hard-to-reach areas
- Live in homes for the elderly
- Have mental or physical disabilities
- Face legal barriers to accessing care
- Are lesbian, gay, bisexual or transgender

3. Are at increased risk of TB because of biological or behavioural factors that compromise immune function. They include people who:

- Live with HIV
- Have diabetes or silicosis
- Are undergoing immunosuppressive therapy
- Are undernourished
- Use tobacco
- Suffer from alcohol-use disorders
- Inject drugs

READ MORE:

18. The Global Plan to End TB 2023–2030
<https://omnibook.com/embedview/dc664b3a-14b4-4cc0-8042-ea8f27e902a6/en#z-b011>



FURTHER GUIDANCE

→ Prisoners

https://stop.tb.org/assets/documents/resources/publications/acsm/kp_prisoners_spreads.pdf

→ Mobile and migrant populations

https://stop.tb.org/assets/documents/resources/publications/acsm/kp_Mobile_Spreads.pdf

→ People who use drugs

https://stop.tb.org/assets/documents/resources/publications/acsm/kp_peopleusedrugs_spreads.pdf

→ Indigenous peoples

https://stop.tb.org/assets/documents/resources/publications/acsm/6_27-unops-kpb-indigenous-web.pdf

→ People living with HIV

https://stop.tb.org/assets/documents/resources/publications/acsm/KPBrief_PLHIV_ENG_WEB.pdf

→ Health-care workers

https://stop.tb.org/assets/documents/resources/publications/acsm/KPBrief_HealthCareWorker_ENG_WEB.pdf

→ The urban poor

https://stop.tb.org/assets/documents/resources/publications/acsm/kp_Urban_Spreads.pdf

→ Rural populations

https://stop.tb.org/assets/documents/resources/publications/acsm/KPBrief_RuralPopulations_ENG_WEB.pdf

→ Miners

https://stop.tb.org/assets/documents/resources/publications/acsm/kp_miners_spreads.pdf

→ Children

https://stop.tb.org/assets/documents/resources/publications/acsm/kp_children_spreads.pdf

<https://www.who.int/publications/i/item/9789240022676>

<https://www.who.int/publications/i/item/9789240022614>

<https://www.who.int/publications/i/item/9789240046832>

<https://www.who.int/publications/i/item/9789240046764>



Introduction

TB is treatable and curable but remains a leading infectious killer, resulting in the deaths of 4,400 people (including over 700 children) every day. TB also remains the biggest killer of people living with HIV. *The Global Plan to End TB 2023–2030*¹⁹ provides a detailed roadmap to implement the *WHO End TB Strategy*²⁰ and to end TB by 2030. This roadmap requires efforts to be made to find and treat all people with TB. The Global Fund Strategic Initiative on Finding the Missing People with TB highlights the need to identify those with enhanced vulnerability to TB and the type of barriers that these people experience when trying to access TB services as being a critical component of the *Find. Treat. All. Initiative*.²¹ In addition, and as part of a commitment to ensure no one is left behind, there is a need to understand TB from the perspective of different people and different groups and to tailor TB responses to their specific needs and priorities. Without an enhanced focus on TB KVP, their priorities, needs and the barriers they face, we will not end TB.

The WHO's *Global TB Report 2022* emphasizes the increased challenges to ending TB as a result of the COVID-19 pandemic. The most significant impact of COVID-19 was the significant drop in notifications of people with TB disease, which peaked at 7.1 million in 2019 but fell to 5.8 million in 2020 – a level last seen in 2012. Even more significantly, the number of people reported to have died from TB in 2021 increased to over 1.6 million, up from approximately 1.5 million people in 2020.²²

The Political Declaration from the 2018 United Nations High-Level Meeting on TB²³ (UN HLM) laid out agreed targets to end TB. These included treating 40 million people, including 3.5 million children with TB, by 2022.²⁴ The *Find. Treat. All.*²⁵ Initiative reiterates these targets. While COVID-19 has significantly impacted TB responses, in many countries it has disproportionately impacted TB KVP, including children, with increased rates of poverty²⁶ and marginalization.²⁷ Consistent with the UN HLM on TB Political Declaration commitment of “prioritizing... high-risk groups and other people who are vulnerable or in vulnerable situations”,²⁸ we must ensure we have strategic and nuanced TB initiatives that focus on TB prevention, diagnosis, treatment, care and support among these prioritized populations.

READ MORE:

19. The Global Plan to End TB 2023–2030
<https://omnibook.com/embedview/dc664b3a-14b4-4cc0-8042-ea-8f27e902a6/en#z-b011>
20. The WHO End TB Strategy
<https://www.who.int/teams/global-tuberculosis-programme/the-end-tb-strategy>
21. WHO DG flagship initiative on ending TB
<https://www.who.int/initiatives/find-treat-all-endtb>
22. Global tuberculosis report 2022
<https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022>
23. The second TB HLM will take place on 22 September 2023 and a new Political Declaration with updated targets is expected soon after this date.
24. UN HLM on TB key targets & commitments for 2022
<https://www.stoptb.org/advocacy-and-communications/unhlm-tb-key-targets-and-commitments>
25. WHO DG flagship initiative on ending TB
<https://www.who.int/initiatives/find-treat-all-endtb>
26. COVID-19 leaves a legacy of rising poverty and widening inequality
<https://blogs.worldbank.org/developmenttalk/covid-19-leaves-legacy-rising-poverty-and-widening-inequality>
27. Impact of COVID-19 on minoritized and marginalized communities
<https://www.ama-assn.org/delivering-care/health-equity/impact-covid-19-minoritized-and-marginalized-communities>
28. Political declaration of the high-level meeting of the General Assembly on the fight against tuberculosis
https://digitallibrary.un.org/record/1645268/files/A_73_L-4-EN.pdf

As we know, powerful social dynamics underpin the TB epidemic and we need a global TB response that is rooted in universal human rights, eliminates TB stigma and discrimination, is gender-transformative, and tailored to KVP's needs. This approach is critical to finding, reaching and treating all people and communities affected by TB. Social and cultural factors heavily influence people's TB risk and vulnerability, and their ability to access quality TB prevention, diagnosis, treatment, care and support. These social determinants are very much linked to human rights-related barriers that are now well documented²⁹ across the following thematic areas (which are also the seven pillars of TB CRG):

1. Accessibility, acceptability, availability and quality of drugs, diagnosis and support services for TB KVP, including social protection, mental health and other related support services.
2. Stigma and discrimination including in families, communities, workplaces and healthcare settings for TB KVP.
3. Health-related freedoms including privacy and confidentiality among TB KVP, as well as access to information in a format that is culturally and linguistically appropriate.
4. Gender-sensitive programming to ensure gender-related barriers are identified and overcome for TB KVP.
5. Participation of TB KVP in planning, design, implementation, monitoring, review and governance of TB programmes.
6. Legal and administrative remedies, accessible to and able to be used by TB KVP, to human rights-related barriers.

→ **Note:** The seventh pillar relates to strategic and impactful policy and programmes for TB KVP.

Because these social factors play a huge role in driving the TB epidemic, it is critical that TB responses extend beyond health systems and include broader interventions that:

- Address socioeconomic factors that increase one's exposure, risk of and vulnerability to TB and/or influence health-seeking behaviour and resulting treatment outcomes;
- Remove legal, cultural, human rights- and gender-related barriers to prevention, diagnosis, treatment, care and support;
- Create an enabling environment for TB prevention, care and support;
- Build strong and sustainable community systems and responses among TB KVP and TB survivors.

We also understand that human rights-related barriers further inhibit access to TB prevention, diagnosis, treatment, care and support services for TB KVP. Reaching people who are vulnerable, marginalized, underserved or at risk of TB infection and illness will be essential for ending TB. It is imperative, from epidemiological, programmatic, and equity and human rights perspectives, that TB programmes:

READ MORE:

29. Building the evidence for a rights-based, people-centered, gender-transformative tuberculosis response: An analysis of the Stop TB Partnership community, rights and gender tuberculosis assessment
<https://www.hhrjournal.org/2021/12/building-the-evidence-for-a-rights-based-people-centered-gender-transformative-tuberculosis-response-an-analysis-of-the-stop-tb-partnership-community-rights-and-gender-tuberculosis-assessment/>

- Prioritize ending TB among KVP as an entry point to end TB for all;
- Have sufficient evidence and information pertaining to TB KVP for efficient and effective programmatic and policy decision-making;
- Ensure that KVP have convenient access to TB prevention, diagnosis, treatment, care, and support including through primary care and integrated health services (e.g., TB and nutritional support, TB/HIV, TB-diabetes, TB and tobacco cessation);
- Understand the social, political, legal and economic barriers KVP face in accessing TB services;
- Involve KVP as priority stakeholders and equal partners in the fight against TB;
- Coordinate and collaborate with other programmes and ministries focused on gender, rights, and development.³⁰

Unlike in HIV response, there is no universally established list of prioritized key populations; each country has different KVP needs and priorities (though in many countries there are similarities in the KVP identified). Therefore, to inform all programming it is critically important that National TB Programmes (NTPs), together with TB-affected communities and civil society, undertake a prioritization exercise of TB KVP. The exercise should particularly focus on human rights-related barriers to accessing quality services. STP has developed a tool to support this process.³¹ While country context will mean different KVP are prioritized, it is recommended that people living with HIV and people deprived of their liberty (e.g. prisoners) are included in the prioritized list. It is also

important not to assume that those KVP that have been identified in the NSP are the only relevant KVP in any given country context. The prioritization exercise may result in similar populations being identified, however there may be others that also need further attention. With this in mind, it is also important that there may be prioritized KVPs that are located in specific geographic regions of the country. While they may not be country wide – they can still be included in the prioritisation list for size estimation.

Once there is a prioritized list of TB KVP, it is important to understand what interventions are needed to reach these populations – to ensure the *Find. Treat. All.* commitment can be realized – but also to understand the type of support that is needed for these interventions to be effective. The scope of interventions would include those that ensure TB KVP meaningful engagement and participation in programme design, monitoring and evaluation (M&E); peer support; treatment literacy; research and development; advocacy; accountability; and human rights. So, it is important to first understand the size of the relevant TB KVP. This tool provides guidance on where to locate existing KVP size estimates and, where they are not available, suggests methodologies that can be utilized to determine size estimates of prioritized TB KVP.

READ MORE:

30. The global plan to end TB 2023-2030
<https://omnibook.com/embedview/dc664b3a-14b4-4cc0-8042-ee8f27e902a6/en#panel-z-9525>

31. Date for action for tuberculosis key, vulnerable and underserved populations
[https://stoptb.org/assets/documents/communities/Data for Action for Tuberculosis Key, Vulnerable and Underserved Populations Sept 2017.pdf](https://stoptb.org/assets/documents/communities/Data%20for%20Action%20for%20Tuberculosis%20Key,%20Vulnerable%20and%20Underserved%20Populations%20Sept%202017.pdf)



Target audience

Implementation of TB CRG tools and processes rely on partnerships to have impact. There is a need for KVP to see themselves in both the information and action items that result from the TB KVP size estimation and, just as important, that the evidence derived is nationally owned. The NTP is therefore a primary target audience for this tool, as are TB-affected communities – particularly those from among TB KVP – and civil society partners in-country. TB CRG is an opportunity for TB-affected communities, including TB KVP and civil society, to lead work that directly impacts their constituencies – the communities they work with and represent. Together with the NTP, affected communities and civil society have a critical role to play in the implementation of this TB CRG tool.

In addition to the two primary target audiences, this tool will also be useful for broader TB and health stakeholders, including health service providers in the public and private sectors, technical partners and donors, as well as academia and those working in health governance structures, including TGF Country Coordinating Mechanism (CCM).



Principles

1

There are five central principles that underline the importance of a TB KVP size estimation and the process by which the size estimate should be completed.

HUMAN RIGHTS-BASED

A TB KVP size estimation should be guided by human rights, equity, social justice, and dignity. KVP are often marginalized and/or criminalized, facing disproportionate human rights violations and barriers, and the promotion and protection of these rights is essential to finding the missing people with TB and supporting them to successful treatment outcomes. Ensuring that human rights remain central to the process of a TB KVP size estimation can also contribute to sensitizing stakeholders and empowering TB KVP.

2

NATIONAL OWNERSHIP

The process and findings of TB KVP size estimation require national validation and ownership, meaning the NTP must play a central role. Through national ownership, these findings can be used to strengthen legislation, policy, and TB NSPs to ensure nuanced programming for TB KVP and to ensure human rights barriers in the TB response are identified, mitigated, and removed.

3

TB AFFECTED COMMUNITY-LED

In utilizing TB CRG tools it is critical to make space for TB-affected communities and KVP to engage, build capacity and become equal partners in the process. TB KVP, affected communities and civil society have unique roles to play in accessing and engaging KVP in conducting the size estimation but also in designing, implementing, monitoring, and evaluating the effectiveness of TB policies and programming in response to TB KVP needs and priorities.

4

EVIDENCE-BASED

The process and conclusions should draw upon the best-available data and evidence, informed by objective research, national surveillance and integrated with the values of the TB KVP. In instances where size estimations are required, proven models and approaches to the process ensure that well-informed conclusions can be drawn. Currently information on TB KVP is not available to or is underutilized by many TB programmes. Evidence-based policy and programming will strengthen TB responses for TB KVP and help TB programmes find and treat all people, including KVP. The NTPs and stakeholders, including TB affected communities and civil society, have a key role to play in actualizing realizing these policies and programmes.

5

MULTISECTORAL

When reaching TB KVP there is a need to ensure different sectors and partners are engaged, that their expertise is tapped, and that key stakeholders and actors are accountable for their role in strengthening TB policies, programming, and the engagement of TB KVP. This strategy also promotes ownership and ensures sustainability of interventions targeting TB KVPs.



Framework

The framework of the TB KVP size estimation is guided by three pillars, as well as by the five guiding principles described in the previous section.

The first pillar of the framework, 'Identify and Prioritize', underlines the importance of identifying and prioritizing TB KVP for a particular country context, and ensuring that TB strategies, policies, programmes, and responses are enhanced and nuanced to better cater to the needs and experiences of particular KVPs. Identifying and prioritizing TB KVP demands attention to three subsets of investigation:

- Developing a list of populations that may be marginalized, disenfranchised or vulnerable, and unpacking several social determinants, including exploring TB risks for each of these groups (environments where people live and work; biological factors relating to reduced immunity; behavioural factors; limits on access to services, which may be legal, medical, social or economic).
- Listing and analyzing drivers of TB risk, including those that may be legal and economic (such as criminalization and poverty) and those related to human rights and gender (such as stigma and discrimination) for the longlist of TB KVP identified during the first step.
- Triangulating the TB risks and TB risk drivers that most impact efforts to find, prevent, treat and support people with

TB. As a result of unpacking TB risks and TB risk drivers, country partners will develop a shortlist of prioritized TB KVP (likely to be at least six TB KVP in total). This process is not about valuing certain TB KVP above others, but about providing enhanced focus and attention on TB KVP that have been identified as experiencing the most significant vulnerabilities.

- The later validation of the results of the TB KVP size estimation, by stakeholders including the NTP, helps to create a legitimacy around its findings. The fact that the TB-related legal and gender tools applied as part of this process also generate their own evidence base increases this legitimacy, opening the way for more accurate estimates and greater political motivation to address the specific needs of these populations in future.

The second pillar of the framework is applied further to this shortlist of TB KVP. To 'Learn and Understand', existing data are gathered, compiled, and disaggregated by TB KVP, and data gaps identified. For some populations, there may already be comprehensive data that is able to be used. Broad investigation and desk review will enable many data gaps to be filled. For others, additional data-gathering techniques and methodologies will need to be applied to ensure the size estimations can be completed for all shortlisted TB KVP prioritized by country partners.

The third pillar of this framework is 'Act and Improve'. Through this process, the size estimations of prioritized TB KVP results in enhanced political mobilization, (enhanced) resource allocation, law and policy review and reform, service and programme planning, programme governance, representation and expertise, M&E, and public health and social policy. In essence, all TB KVP that have been prioritized should feature in the NSP. This inclusion should be accompanied by specific interventions for TB prevention, screening, diagnosis, treatment, care and support – including interventions to mitigate and overcome the human rights-related barriers identified – along with budget and monitoring indicators that correspond to the size of the population and its unique circumstances. This action will be both a product, of and contribute to, enhanced political engagement and mobilization. The size estimation process complements the development of a CRG Costed Action Plan,³² which countries are being supported to develop for their own contexts. As a result of this process, countries are investing more into their NSPs and with enhanced TB KVP nuance, which is why the Size Estimation Tool is important.

Through the application of this framework, TB responses will evolve to meet the needs of TB KVP, with evidence-based resource allocation, more targeted M&E and ultimately a clear contribution to finding and treating people with TB – in this case, those who are all too often left behind. Detailed methods and processes are described below.

TB KVP SIZE ESTIMATION FRAMEWORK



1

IDENTIFY AND PRIORITIZE

- TB risks, Tb risk drivers, TB service barriers for KVPs
- Multi-stakeholder participation
- TB KVP prioritized



2

LEARN AND UNDERSTAND

- Gather available KVP data
- Identify data and information gaps
- Fill the gaps through the TB KVP Size Estimation methodology



3

ACT AND IMPROVE

- Political mobilization
- Strategy, policy and programme review
- Ressource (re)allocation
- Service and programme planning, implementation and delivery
- Monitoring, evaluation and learning

READ MORE:

32. TB CRG Costed Action Plan development guidance <https://www.stoptb.org/tb-crg-costed-action-plan-development-guidance>



Roles and Responsibilities

Several partners have significant and defined roles in the implementation of the TB KVP Size Estimation Tool.

NATIONAL TB PROGRAMME

Provides strategic and technical guidance, access to data, serves as a member of the Core Group coordination team, expedites the validation process, and commits to integrating findings into the NSP and related documents and/or processes. The NTP can convene this process and work closely with the leading civil society partner, including representatives of TB KVP, to facilitate an engaged and effective process. This aligns with the principle of national ownership.

LEAD CIVIL SOCIETY ORGANIZATION

The established approach for TB CRG tools (TB CRG Assessment, TB Stigma Assessment, TB Community-Led Monitoring) is a partnership between the NTP and a TB civil society and/or TB survivor organization. The organization selected to lead this process should have experience working on TB CRG. Consistent with the approach for TB CRG tools, the TB size estimation should be lead by a civil society organization, but in close partnership with the NTP and other partners/donors (e.g. WHO, USAID, etc.). The lead organization would be responsible for identifying the lead consultant; engaging the NTP other partners and stakeholders; convening the process; arranging the conception, prioritization, and validation workshops; and undertaking follow-up engagement to ensure the findings are adopted and operationalized. Over the course of implementing the TB KVP Size Estimation Tool, the lead organization will also work to coordinate the Core Group. This aligns with the community-led principle.

WHO COUNTRY OFFICE

The WHO Country Office, which already supports country TB programmes, can leverage its support for the NTP and partners during the size estimation process. The Country Office can assist with the prioritization exercise, the desk review, and the validation of TB KVP size estimations linking it to existing processes and surveys such as epidemiological reviews of national TB surveillance data, TB prevalence surveys, catastrophic cost surveys, TB programme reviews, NSP development etc.

OTHER GOVERNMENT DEPARTMENTS

There are specific areas of government with relevant mandates and that engage with various TB KVP, and they need to be involved in this process – particularly those that are ultimately working with the prioritized TB KVP. This may include other programmes within the Ministry of Health, and from other Ministries such as Justice, Migration, Industry, Agriculture, Livestock, Rural Development, and Indigenous Populations among others.

POPULATION SIZE DATA EXPERT

For effective implementation this tool requires expertise in data, population size, epidemiology, and public health (including familiarity with the methods and approaches that are discussed in Annex C). An expert with experience in conducting population size estimations and familiarity with the tools, methods, and processes for conducting these will be an important actor in the implementation of this tool. This aligns with the principle of evidence-based.

TB KVP

As this tool focuses on the experiences of TB KVP and its output is intended to assist in implementing evidence-based interventions that help find and treat all prioritized TB KVP, it is essential that representatives of TB KVP groups are involved throughout this process – particularly during the TB KVP prioritization exercise. This aligns with the principles of human rights and equity.

HEALTH PRACTITIONERS, HEALTH SERVICE PROVIDERS AND BROADER CIVIL SOCIETY

To ensure inclusion and widespread participation it is important that health service providers and practitioners and civil society organizations working in service delivery, law and advocacy are also engaged in the TB KVP size estimation process – including during the conception, prioritization, and validation workshops.

CORE GROUP

A multisectoral group of partners (including the NTP, civil society, affected communities, academia, government departments that work with TB KVP, health service providers, technical partners, donor agencies, a legal expert, CCM representatives and others) will need to collectively oversee and engage in the implementation of the TB KVP Size Estimation Tool. This approach is consistent with the principle of multisectorality.



Methodology

1

INCEPTION MEETING

The TB KVP size estimation is a TB CRG tool. To implement a TB CRG tool, the process begins with an inception meeting. This event, convened by the lead civil society organization in partnership with the NTP, brings together stakeholders from different government agencies, civil society, academia, service providers and affected communities – including those listed in the “Roles and Responsibilities” section above. This may be a specifically organised meeting or leverage another opportunity where stakeholders are already present. The participants will be guided through the purpose and process of the TB KVP size estimation – understanding goals and objectives, stages of the process, roles of different partners – and arrive at an agreed understanding of the timeline and how results will be operationalized. Prior to the meeting, the lead civil society organization should recruit a population size estimation consultant (see “Roles and Responsibilities” in the previous section). The consultant should have expertise in data, epidemiology and public health (including the methodologies and approaches discussed in Annex C). The consultant may play a facilitation role at the inception meeting and provide a briefing on the process (including the six steps described in this process for implementing the tool).

The NTP and lead civil society partner, as joint convenors and organizers of this inception meeting, will identify a venue, and develop a list of participants and an agenda. The expected outcome of the inception meeting is general agreement on the need for a TB KVP size estimate, and the formation of a Core Group (see “Roles and Responsibilities” in the previous section) to oversee the process, and an agreed-upon timeline. The Core Group will be comprised of the NTP, leading civil society partner and strategic representatives from amongst other stakeholders, as listed in the previous section. The Core Group will commit to the agreed timeline to execute the remaining steps of the TB KVP size estimation. The inception meeting should also be an opportunity for the NTP to update all partners as to the TB situation in-country and for the lead TB civil society organization to sensitize participants on TB CRG tools, barriers, and evidence about TB KVP more generally.

A six-step process is required to implement the TB KVP Size Estimation Tool at country level.

The first step requires a multi-stakeholder inception meeting where partners are briefed on the purpose and the process. In the second step, TB KVP are analyzed and prioritized at the country level and then endorsed. The third step is a desk review of data sources related to each of the TB KVP that have been prioritized. This step will also identify significant data gaps. At the fourth step, country partners will work to close the identified data gaps through the application of further data-collection methods as relevant for the respective population(s). The fifth step is to validate the TB KVP size estimation data. The sixth step integrates and uses the TB KVP size estimates in NSPs and national TB data systems.

There should also be an effort to review relevant laws and policies or undertake a CRG Assessment informed by the choice of prioritized populations, to identify areas of law and policy reform that can support enhanced access to services, alongside processes of resource (re)allocation, political mobilization and enhanced engagement of TB KVP as contributors to finding and treating missing people with TB.

2

PRIORITIZATION OF TB KVP

Prioritization should explore human rights-related barriers and social determinants of health, to understand the vulnerability that different groups of people have in relation to TB disease – that is, TB risks, TB risk drivers and barriers to accessing quality services. This stage of the process employs a participative ranking methodology (PRM) – a ‘mixed methods’ approach to data collection in which a group of knowledgeable participants is guided in generating responses to a specific question or set of questions. This methodology promotes an engaged and participatory process that rapidly highlights key findings while providing the opportunity for deeper analysis.³³ When collected in a structured manner, PRM findings can be quickly synthesized to inform priorities.

The prioritization exercise will be conducted during a workshop convened by the lead TB civil society organization, and the stakeholder group will agree on a longlist of TB KVP (which might be based on the indicative list provided in the prioritization template (Annex A)).³⁴ The list will be assessed using the template provided in Annex A. Possible TB KVP include, but are not limited to, prisoners and people deprived of their liberty; and people living with HIV (both recommended as prioritized KVP); migrants, refugees, internally displaced people and mobile populations; people who use drugs; health-care workers and community health volunteers; children; people with diabetes; urban poor and people living in slums; TB contacts; elderly people; and miners and people with silicosis. As TB KVP will vary across different contexts, there may be KVP not included in the indicative list in Annex A that could be considered for inclusion. It is expected that a longlist of a maximum of 20 TB KVP is reached by consensus during the workshop. Note that a KVP can be prioritized even if people who identify as part of the particular KVP are only found in certain geographic regions / have sub national representation.

READ MORE:

33. Participative ranking methodology
<http://www.cpcnetwork.org/research/methodology/participative-ranking-methodology/>

34. TB KVP included in the indicative list in Annex A have been documented by STP as frequently prioritized in numerous countries.

As mentioned, the TB KVP identified will be assessed against six categories:

1. **Environmental risks:** Overcrowding, poor ventilation, zoonotic disease hotspot, dust industries
2. **Biological risks:** Reduced immunity, low levels of nutrition
3. **Behavioural traits:** Actions including sharing smoking devices
4. **Legal barriers:** Legal status, criminalization, discrimination
5. **Sociocultural barriers:** Literacy, gender, religion, patriarchal/matriarchal norms, work, domestic responsibilities
6. **Economic barriers:** Poverty

Each TB KVP included in the list will be assessed on a rating scale (0–10) in each category, with 10 being the highest probability that a population will face the risk. The rating exercise is conducted in small groups who, using the PRM approach, will rate the listed TB KVP and develop a shortlist of prioritized TB KVP (likely to be around six TB KVP). The larger group will then reconvene and each group will present their shortlist of prioritized TB KVP. Guided by the PRM approach, the full group will discuss and, based on the cumulative scores, rankings and rationales provided by each small group, decide together their final shortlist of prioritized TB KVP (again likely to be around six TB KVP). This prioritization process is not about valuing some TB KVP above others, but about bringing enhanced attention to those experiencing the most significant vulnerability – a focus that may influence the trajectory of the country’s TB epidemic. During this step, it is important for the workshop facilitator to document the prioritization rationale for each TB KVP discussed.

3

DESK REVIEW

Documenting the size of each of the shortlisted priority populations will help to ensure evidence-based TB policy and programming. A comprehensive desk review should be undertaken by the population size estimation consultant to synthesize available data and information to inform and directly contribute to the size estimation. The consultant should produce a comprehensive literature review structured around the risks and vulnerabilities for each TB KVP. There are many existing sources of data about TB KVP at national and global levels (including national TB surveillance data, data from surveys, as well as operational research). The consultant should review and collate the data for national-level TB KVP size estimation. Ideally this analysis should also include data disaggregated by age and gender, as well as sub-national locality where possible. Existing sources of data on TB KVP are described in Annex B.

During this desk-review exercise, it is recommended to consider global and government data sources (national and sub national), as well as information from academia and civil society, related to each of the prioritized TB KVP. Any limitations noted during this analysis should be documented. For many of the prioritized TB KVP, size estimation data may exist already, such as for people deprived of their liberty (e.g. prisoners) or people living with HIV (PLHIV). In such cases, it makes sense to import or use existing size estimates and not to duplicate the process. While there may already be size estimates, it will be important to ensure they are available and used in the national TB response.

The following table can be used to map the desk review results.

— **Template for results from desk review of existing data and information on TB KVP**

| Prioritized KVP | 1 | 2 | 3 | 4 | 5 | 6 |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| Estimated KP size (age & gender disaggregated) Note: If data is available incl the number of this population with TB disease. | | | | | | |
| Source of data | | | | | | |
| Where they are concentrated (geographically) Note: specify relevant subnational geographic areas. | | | | | | |
| What are their key TB risks and related drivers? | | | | | | |
| What are their TB diagnosis, prevention, treatment and care challenges? | | | | | | |
| What TB services are needed to increase access? | | | | | | |
| Services available | | | | | | |
| Gaps to be addressed | | | | | | |

Should data gaps remain among the prioritized TB KVP, further size estimation methods may be used, as explained in detail below.

4

ADDITIONAL TB KVP SIZE ESTIMATION METHODS

This step is applied only if gaps remain after Step 3 and requires expertise in data collection. It is critical that the data expert/consultant is familiar with the methodologies and approaches described in detail in Annex C.

A gold-standard method for population size estimation (PSE) does not exist, but the quality of estimates can be improved by using empirical methods, multiple data sources and sound statistical concepts. A special collection of papers in *JMIR Public Health and Surveillance*³⁵ has been released under the title “Key Population Size Estimations” which can help to guide this process. Often, however, reported PSE are based on methods that are neither empirical (based on scientific, systematic observation or measurement) nor standardized, and are not well-documented. There are two prominent approaches that may support the collection of data to fill the gaps identified by the desk review: sampling key populations (especially those without sampling frames)³⁶ and estimating the sizes of key populations through specific PSE exercises.

Ideally, the goal is to be able to collect data from a much smaller proportion of a population and, because of the way the data are collected, that the information from that data describes the entire population sampled (not just the sample). Sampling methods are classified as either *probability* (respondent-driven sampling (RDS) or time-location sampling (TLS) or *non-probability* (non-random selection such as convenience, judgement and quota sampling). This tool describes several established sampling approaches including simple random sampling, systemic sampling, stratified sampling, cluster sampling, chain-referral sampling, and institutional-based surveys. Further information on these approaches and helpful links are provided in Annex C. Each method has its strengths, but also challenges and limitations – as such, there may be instances where a combination of approaches is required. Taking the examples of undocumented migrants and artisanal miners, a combination of RDS and TLS would be recommended.

The type of key population and whether they have a sampling frame (refer to Annex C) will dictate the most robust sampling method to use. In the table below, the most appropriate sampling method is suggested for each of the TB KVP highlighted in this document.

— Overview of sampling methods for different TB KVP

| Key population | Specific sampling method | Notes |
|----------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Documented migrants and refugees in camps (sampling frame) | Sampling of all migrants (census), random sampling | Often captured through screening when leaving or returning to a country |
| Undocumented migrants and internally displaced people (no sampling frame) | RDS TLS | As described in section 5, data on irregular and internal migrants and internally displaced people are largely absent. In some settings, they are often screened while in formal camps or host communities. |
| Miners in the formal sector, or unionized (sampling frame) | Sampling of all migrants (census), random sampling | Often screened through their work in the mines |
| Miners in the informal sector or not unionized (no sampling frame) | RDS TLS | Usually sampled using convenience methods |
| Prisoners (assuming there is a sampling frame) | Sampling all prisoners, random sampling | Often screened while in prison; qualitative methods |
| Detainees (assuming there is a sampling frame) | Random sampling | Often screened while in detention; qualitative methods |
| People who use drugs | RDS TLS | Limited data on TB |
| PLHIV | RDS TLS | Often screened for TB at clinics and hospitals (but missing those who do not go to clinics) |

Annex C includes a sampling algorithm to help the consultant determine which approaches they should use to gather additional data on TB KVP and conduct the size estimation. Once the consultant has identified the most appropriate approach, they should brief the Core Group. This algorithm is complemented by guidance on sampling considerations (e.g. gender, risk behaviour and age) as well as information on which types of size-estimation approaches may be of use (e.g. census mapping, multiplier methods and successive sampling). For more information on recommended methodologies for various TB KVP size estimations, see Annex C.

READ MORE:

35. CDC theme issue 2018: Key population size estimations <https://publichealth.jmir.org/themes/578-cdc-theme-issue-2018-key-population-size-estimations>

Sampling key populations for HIV surveillance: Results from eight cross-sectional studies using respondent-driven sampling and venue-based snowball sampling. Assessing bias in population size estimates among hidden populations when using the service multiplier method combined with respondent-driven sampling surveys: Survey study <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7325001/>

Capture-recapture methods – useful or misleading? <https://academic.oup.com/ije/article/30/1/12/619016>

36. Refer to Annex C for more detail.

5

VALIDATION OF FINDINGS

The validation of TB KVP size estimations should involve the stakeholders who participated in the inception meeting and prioritization workshops. In advance of the validation meeting, it is important to send TB KVP size estimates and related assumptions to these stakeholders. In many instances it would also be valuable to run in-person briefings with stakeholders as well, to ensure there is understanding of and support for the estimates that have been produced. The validation meeting can be conducted in several stages – reflecting on the prioritization, sharing the findings and exploring implications for operational planning:

- Conduct pre-briefings with the NTP, relevant government ministries and other partners as relevant for the respective TB KVP (such as representatives of TB KVP groups, the WHO Country Office, USAID and CCM) to update them on progress since the prioritization workshop
- Recount the rationale, process and outcomes of the TB KVP prioritization exercise
- Share the findings from the desk review and size estimation exercises in terms of:
 - The review of risk and vulnerability literature pertaining to the prioritized TB KVP
 - The existing data on prioritized TB KVP
 - The size estimation of each prioritized TB KVP
- Seek agreement by consensus or no objection from key stakeholders participating in this exercise
- Conduct some active planning to operationalize interventions for prioritized TB KVP, guided by the pillars or focus areas of the NSP as well as the TB CRG Costed Action Plan thematic areas
- Continue to work to increase the understanding and accuracy relating to the TB KVP size estimation data and the impact that TB has on the prioritized groups

The outcome for this step is to validate the estimations and develop clear ideas for strengthening efforts to engage and tailor interventions to the needs of TB KVP in relation to laws, policies, service delivery and budgeting.

6

UTILIZING DATA FOR PLANNING

The *Global Plan to End TB 2023-2030*³⁷ calls for countries to develop ambitious, needs-based NSPs. While countries aim to detect 90 per cent of people with TB, it is very important to ensure that TB KVP are included in that 90 per cent. It is very likely that, unless focused interventions are planned and implemented, TB programmes could miss members of TB KVP. STP has developed a tool to support countries in developing national TB CRG Costed Action Plans. Incorporating the TB CRG Action Plan into the budget of the NSP requires an understanding of the magnitude and distribution of the TB KVP – TB KVP size estimates will therefore be necessary inputs for NSP budgeting.

Knowing the size and distribution (which part/s of the country) of TB KVP is also critical to planning focused interventions such as active case-finding, community care, social support and nutritional/financial/occasional support to TB KVP and their families. The TB KVP size and distribution data will also help in engaging other sectors relevant to TB – for example, knowing the size and distribution of the mine-worker population could assist in generating resources from the Ministry of Mining (and relevant sub-national authorities) or additional resources from the corporate sector for addressing TB among migrant labourers.

The TB KVP size estimation is critical for proper monitoring of TB services to ensure that TB KVP are adequately reached by TB programmes.

READ MORE:

37. The Global Plan to End TB 2023-2030
<https://omnibook.com/embedview/dc664b3a-14b4-4cc0-8042-ea8f27e902a6/en#z-b011>



ANNEX A

**TB KVP
prioritization template**



ANNEX B

TB KVP available data and sources

This Annex suggests potential sources of international and national data for a range of TB KVP, and then gives detailed sources and data (correct at time of publication) for a select number of these populations in TB high-burden countries.

While the data presented are the best available, there are often gaps; where no data have been supplied by the reporting agency, cells in the relevant table have been left blank. In addition, the terms used to describe different groups about whom data are collected have been chosen by the reporting agency, and may not represent current best-practice use of language in relation to TB.

— Global sources of data for TB KVP

| Key population | Responsible UN Agencies/ Organizations | Examples of country-level data sources/responsible units |
|-----------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| People living with HIV (PLHIV) | UNAIDS and WHO | National AIDS Control Programme National AIDS Commission |
| Prisoners and detainees | UNODC and World Prison Brief | Ministry of Justice National Prison Service |
| Miners | ILO, World Bank and UNIDO | Ministry of Labour Ministry of Lands and Mineral Resources National Statistics Office National Chamber of Mines |
| People with silicosis | ILO | Ministry of Health Government health agencies National Institute for Occupational Safety and Health Occupational Safety and Health Administration |
| Migrants | IOM and World Bank | National Population Council National Statistics Service Ministries of Interior or Immigration |
| Refugees | UNHCR, UN OHCHR, World Bank and UNDP | National Population Council |
| Internally displaced people | UNHCR, UN OCHA and IDMC | National Population Council |
| Nomadic populations | UN, World Bank and IOM | National Population Council National Statistics Service |
| People who use drugs | UNODC | Ministry of Justice National Prison Service |
| People who use tobacco | WHO | Ministry of Health |
| People with diabetes | WHO | Ministry of Health |
| People with alcohol dependency | WHO | Ministry of Health |
| People with disabilities | WHO | Ministry of Health National health-related surveys |
| Sex workers | UNAIDS | National AIDS Control Programme National AIDS Commission Ministries of Labour or Social Affairs |
| LGBTQIA+ people | UNAIDS | National AIDS Control Programme National AIDS Commission Ministries of Equality or Health National Statistics Service |
| Indigenous peoples | WHO, UNDP, World Bank and UNESCO | Ministry for Indigenous Affairs/First Nations/Tribal Populations National Population Council National Census |
| Homeless people | UN-Habitat and UNDP | National Statistics Service |
| Children | UNICEF | Ministry of Children, Welfare and Social Protection Ministry of Social Services |
| Elderly people | UNDP, WHO and ILO | National Statistics Service Ministry of Social Services |
| Hospital workers | WHO | Ministry of Health National organizations of health care workers |
| Community health/outreach workers | WHO and PMNCH | Ministry of Health National organizations of health care workers |
| Urban poor | UNDP, World Bank and UN-Habitat | National Population Council National Statistics Service |
| Rural poor | UNDP and World Bank | National Population Council |
| Prison workers | ILO | Ministries of Interior, Justice or Labour National Prison Service |
| People at risk of zoonotic TB | FAO, WHO and WOAH | Ministry of Health National and regional Centres for Disease Control and Prevention National Tuberculosis Control Programme Veterinary and animal health organizations |

| Global data source |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| https://aidsinfo.unaids.org https://www.who.int/teams/global-tuberculosis-programme/data#profiles |
| https://dataunodc.un.org/dp-prisons-persons-held https://www.prisonstudies.org/world-prison-brief-data |
| https://ilostat.ilo.org/ https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_821061.pdf https://delvedatabase.org/data |
| https://www.ilo.org/global/statistics-and-databases/lang--en/index.htm https://www.healthdata.org/results/gbd_summaries/2019/silicosis-level-4-cause |
| https://migrationdataportal.org/ https://publications.iom.int/books/world-migration-report-2022 https://www.un.org/development/desa/pd/content/international-migrant-stock https://data.worldbank.org/ |
| https://www.unhcr.org/refugee-statistics/ https://www.internal-displacement.org/database/displacement-data |
| https://dataunodc.un.org/dp-drug-use-prevalence https://www.unodc.org/unodc/en/hiv-aids/new/drug-use_and_HIV.html |
| https://www.who.int/data/gho/data/indicators |
| https://www.who.int/data/gho/data/indicators https://diabetesatlas.org/data/en/ |
| https://www.who.int/data/gho/data/indicators https://www.who.int/publications/i/item/9789240063600 https://disabilitydata.ace.fordham.edu/wp-content/uploads/2022/Main_text_2022_Disability_Data_Report.pdf |
| https://kpatlas.unaids.org/dashboard |
| https://kpatlas.unaids.org/dashboard |
| UN Department of Economic and Social Affairs UN Expert Mechanism on the Rights of Indigenous Peoples UNICEF World Bank |
| https://data.unicef.org/ |
| https://platform.who.int/data/maternal-newborn-child-adolescent-ageing/ageing-data https://data.oecd.org/pop/elderly-population.htm |
| https://www.who.int/data/gho/data/indicators |
| https://www.who.int/data/gho/data/indicators |
| https://data.unhabitat.org/ https://data.worldbank.org/ |
| https://data.worldbank.org/ |
| https://www.woah.org/en/disease/bovine-tuberculosis/ |

People living with HIV

Globally there were 38.4 million people living with HIV (PLHIV) in 2021.³⁸ PLHIV are 18 times more likely than the general population to develop active TB. According to WHO, in 2021 187,000 TB-related deaths occurred among PLHIV.³⁹ It is estimated that 7.5 million PLHIV received TB preventive treatment in the period 2018–2020.⁴⁰ The relevant Stop TB Key populations brief⁴¹ outlines factors that makes PLHIV more vulnerable to TB.

At the country level, there are two sources of information on the size of populations of PLHIV and their TB burdens:

- UNAIDS' AIDSInfo⁴² provides PLHIV numbers (often with breakdowns of HIV-related key populations such as injecting drug users, sex workers, men who have sex with men and transgender people) for over 100 countries and territories.
- The WHO *Global tuberculosis report 2022*⁴³ provides information on TB case notifications, numbers of people with TB also tested for HIV, TB/HIV co-infection, antiretroviral therapy (ART) for HIV and TB preventive treatment (co-trimoxazole and isoniazid preventive therapies) in over 200 countries/territories.

The table below shows data available for the 49 WHO TB high-burden countries. PLHIV population sizes and data on TB burdens are readily available. However, as the relevant agencies (including UNAIDS and WHO) collect a variety of annual data from countries and in different ways, care should be taken in choosing the correct data points and using these to support the service cascade from active case finding to treatment outcome.

READ MORE:

38. Global HIV & AIDS statistics – Fact sheet
<https://www.unaids.org/en/resources/fact-sheet>

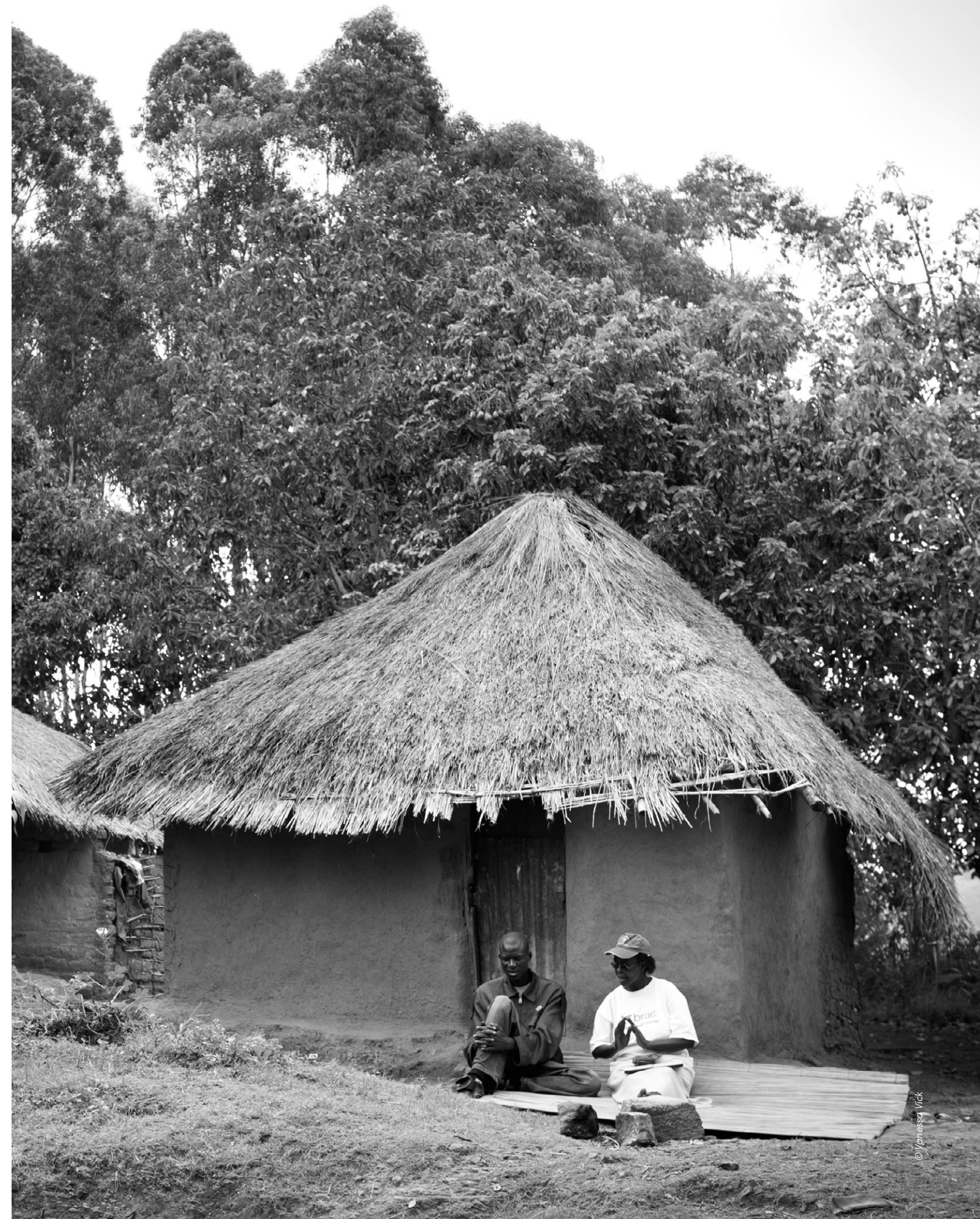
39. Global tuberculosis report 2022 – 2.1 TB incidence
<https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022/tb-disease-burden/2-1-tb-incidence>

40. Fact sheet – World tuberculosis day 2022
https://www.unaids.org/sites/default/files/media_asset/20220324_TB_FactSheet_en.pdf

41. Key populations brief: People living with HIV
https://stop.tb.org/assets/documents/resources/publications/acsm/KPBrief_PLHIV_ENG_WEB.pdf

42. AIDSinfo
<https://aidsinfo.unaids.org/>

43. Global tuberculosis report 2022
<https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022>



— Data on people living with HIV in TB high-burden countries

| WHO 2022 TB HIGH-BURDEN COUNTRIES | | | | UNODC & UNAIDS DATABASE (25 JAN. 2023) | | |
|-------------------------------------|-----------|-----------|-----------|----------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------|
| Countries | TB | TB/HIV | MDR/RR-TB | Number of PLHIV (2021) | Proportion of PLHIV on ART who completed a course of TPT (2021) | Proportion of PLHIV newly enrolled in HIV care with active TB DISEASE (2020) |
| Angola | Y | | Y | 320 000 | | 9.1 |
| Azerbaijan | | | Y | 10 000 | | 7.5 |
| Bangladesh | Y | | Y | 15 000 | | 6.2 |
| Belarus | | | Y | 28 000 | | 5.5 |
| Botswana | | Y | | 360 000 | | |
| Brazil | Y | Y | | 960 000 | | |
| Cameroon | | Y | | 500 000 | | |
| Central African Republic | Y | Y | | 83 000 | 87.5 | |
| China | Y | Y | Y | | | 1.7 |
| Congo | Y | Y | | 130 000 | | |
| DPR Korea | Y | | Y | | | |
| DR Congo | Y | Y | Y | 540 000 | | 6.0 |
| Eswatini | | Y | | 220 000 | 59.8 | 3.5 |
| Ethiopia | Y | Y | | 610 000 | | 6.7 |
| Gabon | Y | Y | | 47 000 | | |
| Guinea | | Y | | 120 000 | | 3.4 |
| Guinea-Bissau | | Y | | 40 000 | | |
| India | Y | Y | Y | 2 400 000 | 85.7 | 1.6 |
| Indonesia | Y | Y | Y | 540 000 | | 5.9 |
| Kazakhstan | | | Y | 35 000 | 99 | |
| Kenya | Y | Y | | 1 400 000 | | 3.3 |
| Kyrgyzstan | | | Y | 10 000 | 84.6 | |
| Lesotho | Y | Y | | 290 000 | 84 | |
| Liberia | Y | Y | | 34 000 | | 6.9 |
| Malawi | | Y | | 990 000 | | 2.5 |
| Mongolia | Y | | Y | 1 000 | 100 | 8.0 |
| Mozambique | Y | Y | Y | | | 4.4 |
| Myanmar | Y | Y | Y | 270 000 | | |
| Namibia | Y | Y | | 220 000 | | |
| Nepal | | | Y | 30 000 | | |
| Nigeria | Y | Y | Y | 1 900 000 | | |
| Pakistan | Y | | Y | 210 000 | | |
| Papua New Guinea | Y | | Y | 59 000 | | 13.6 |
| Peru | | | Y | 98 000 | | |
| Philippines | Y | Y | Y | 140 000 | | 19.1 |
| Republic of Moldova | | | Y | 15 000 | | |
| Russian Federation | | Y | | | | |
| Sierra Leone | Y | | | 76 000 | | |
| Somalia | | | Y | 7 700 | | |
| South Africa | Y | Y | Y | 7 500 000 | 63 | 5.6 |
| Tajikistan | | | Y | 13 000 | 98.5 | 9.4 |
| Thailand | Y | Y | | 520 000 | | |
| Uganda | Y | Y | | 1 400 000 | 90.3 | 3.5 |
| Ukraine | | | Y | 240 000 | | 12.9 |
| United Republic of Tanzania | Y | Y | | 1 700 000 | | 6.6 |
| Uzbekistan | | | Y | 59 000 | | 9.0 |
| Viet Nam | Y | | Y | 240 000 | | 13.1 |
| Zambia | Y | Y | Y | 1 300 000 | 82 | |
| Zimbabwe | | Y | | 1 300 000 | | 2.8 |
| Countries with data (49 max) | 30 | 30 | 30 | 45 | 11 | 26 |
| Total | | | | 26 980 700 | 934.4 | 177.8 |

WHO GLOBAL TB REPORT 2022

| Total TB (all forms) patients notified (2021) | % of TB patients who know their HIV status, among all notified (2021) | TB incidence among PLHIV | TB mortality among people not living with HIV | TB mortality among PLHIV | Number of TB Patients with known HIV status who are HIV-positive | HIV-positive TB patients on antiretroviral therapy | Treatment success rate of PLHIV diagnosed with TB (2020) |
|-----------------------------------------------|-----------------------------------------------------------------------|--------------------------|-----------------------------------------------|--------------------------|------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------|
| 63 970 | 73 | 14 000 | 18 000 | 3 100 | 5 619 | 5 619 | 33 |
| 4 944 | >100 | 130 | 890 | 35 | 92 | 92 | |
| 307 561 | 6.4 | 730 | 42 000 | 170 | 106 | 106 | 76 |
| 1 696 | 100 | 250 | 370 | 110 | 128 | 128 | 84 |
| 2 368 | 93 | 3000 | 820 | 1300 | 974 | 974 | 76 |
| 88 099 | 80 | 12 000 | 6 000 | 2 200 | 6 870 | 6 870 | 47 |
| 22 866 | 96 | 9 100 | 8 100 | 3 900 | 4 375 | 4 375 | 83 |
| 13 428 | 80 | 8 200 | 5 300 | 1 500 | 2 940 | 2 940 | 82 |
| 593 743 | 70 | 10 000 | 30 000 | 2 100 | 5 429 | 5 429 | 86 |
| 12 152 | 42 | 6 600 | 3 100 | 2 600 | 966 | 966 | 45 |
| 93 597 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 215 787 | 78 | 24 000 | 42 000 | 7 200 | 13 373 | 13 373 | 74 |
| 2 049 | 98 | 2 400 | 280 | 740 | 1 201 | 1 201 | 79 |
| 104 854 | 82 | 7 400 | 19 000 | 2 100 | 4 467 | 4 467 | |
| 5 201 | 38 | 3 600 | 2 200 | 1 700 | 704 | 704 | |
| 19092 | 92 | 4800 | 2100 | 1100 | 3 480 | 3 480 | 88 |
| 2 505 | 84 | 2 200 | 1600 | 1 200 | 620 | 464 | 72 |
| 2 116 976 | 95 | 54 000 | 494 000 | 11 000 | 34 339 | 31 935 | 73 |
| 443 235 | 48 | 22 000 | 144 000 | 6 500 | 8 015 | 3 242 | 68 |
| 10 008 | 99 | 930 | 1 100 | 91 | 625 | 581 | 69 |
| 77 854 | 97 | 32 000 | 20 000 | 11 000 | 17 635 | 16 996 | 80 |
| 5 199 | 96 | 240 | 550 | 130 | 126 | 77 | 53 |
| 4 553 | 97 | 8700 | 1400 | 3 900 | 2 397 | 2 207 | 76 |
| 7 441 | 92 | 1 800 | 3 500 | 850 | 775 | 705 | |
| 14 594 | 99 | 12 000 | 3 000 | 4 700 | 6 467 | 6 401 | 87 |
| 2823 | 79 | 13 | 340 | 10 | 2 | 2 | 100 |
| 98 485 | 100 | 29 000 | 8000 | 5 700 | 24 296 | 23 145 | 89 |
| 65 125 | 87 | 14 000 | 32 000 | 4 400 | 3 972 | 2 203 | 75 |
| 6864 | 99 | 3 600 | 1 500 | 1 300 | 1 985 | 1 966 | 83 |
| 28 677 | 73 | 540 | 17 000 | 220 | 162 | 144 | |
| 207 785 | 97 | 28 000 | 112 000 | 13 000 | 11 715 | 10 782 | 82 |
| 343 024 | 52 | 15 000 | 48 000 | 2 100 | 1013 | 637 | 82 |
| 30 180 | 62 | 4 600 | 5 100 | 370 | 1068 | 898 | 66 |
| 26 437 | 95 | 2 600 | 4 000 | 670 | 1453 | 732 | 70 |
| 328 497 | 34 | 14 000 | 60 000 | 810 | 1 350 | 1 349 | 81 |
| 2 248 | 97 | 280 | 180 | 150 | 214 | 169 | 61 |
| 79 686 | 96 | 18 000 | 4 900 | 3 700 | 14132 | 10764 | 41 |
| 17 669 | 98 | 3 600 | 2 900 | 1 000 | 2543 | 2537 | 79 |
| 17 504 | 87 | 390 | 11 000 | 190 | 139 | 84 | 46 |
| 181 864 | 89 | 163 000 | 23 000 | 33 000 | 81 770 | 73 117 | 78 |
| 4 299 | 99 | 250 | 1 200 | 100 | 118 | 118 | 77 |
| 72 851 | 84 | 8 900 | 9 600 | 1 700 | 5 313 | 4 795 | 74 |
| 76 268 | 99 | 29 000 | 6 300 | 6 200 | 23 692 | 23 674 | 88 |
| 19 793 | 98 | 6 300 | 3 600 | 2 000 | 3 646 | 3 354 | 67 |
| 87 415 | 99 | 24 000 | 18 000 | 7800 | 15 321 | 15 238 | 92 |
| 15 450 | >100 | 600 | 1 100 | 250 | 441 | 395 | |
| 78 935 | 82 | 5 100 | 12 000 | 2200 | 1 945 | 1 521 | 83 |
| 50 825 | 96 | 20 000 | 3 800 | 4100 | 16 272 | 15 902 | 90 |
| 16541 | 99 | 18 000 | 2 000 | 5300 | 8 056 | 7 647 | 84 |
| 49 | 49 | 49 | 49 | 49 | 49 | 49 | 42 |
| 562 068 | 78.3 | 208 923 | 313 100 | 65 376 | 26 401 | 25 299 | 63.7 |

Prisoners and detainees

UNODC estimates that about 11 million people are held in prisons or detained in other settings, of whom 4.8 per cent live with HIV while 2.8 per cent have active TB.⁴⁴ Globally, conditions in most prisons have deteriorated resulting in overcrowding and facilitating the spread of TB, MDR-TB and other infectious diseases. This have affected health outcomes in countries where excessive incarceration is prevalent.⁴⁵

At the country level, information on prisoners and detainees is being documented. This has made it easier to publicly access information through the following:

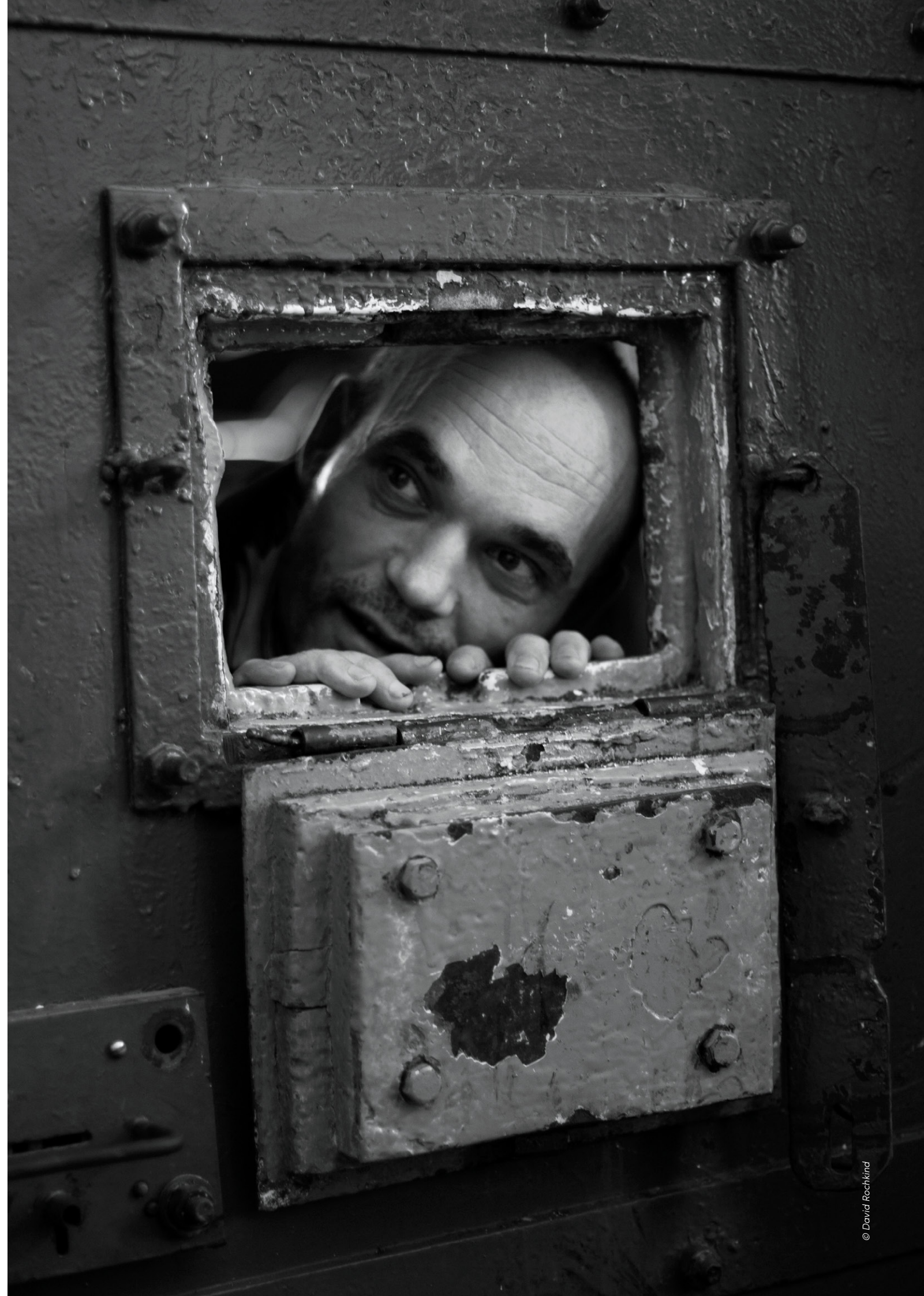
- The World Prison Brief,⁴⁶ a database maintained by the Institute for Criminal Policy Research at Birkbeck, University of London, provides information on prisoners, prison populations and prison systems in over 200 nations and territories worldwide. It includes data on population size, percentages of male, female and foreign-born prisoners, and prison occupancy capacity.
- UNAIDS' AIDSInfo database⁴⁷ provides information on HIV prevalence among prisoners and detainees in over 50 countries.

However, a review of literature on HIV, TB and prisoners showed that, unlike data on HIV prevalence, data on TB in prisons is hardly reported.⁴⁸ In contrast to global trends, in the European Union and European Economic Area 26 countries reported on TB case detection in prisons in 2021.⁴⁹ Reporting on HIV co-infection and TB and treatment outcomes in prisons remain sporadic.

The table below shows data available for the 49 WHO TB high-burden countries.

READ MORE:

44. Prisons and HIV
https://www.unodc.org/unodc/es/hiv-aids/new/prison_settings_HIV.html
45. Key populations brief: Prisoners
https://stoptb.org/assets/documents/resources/publications/acsm/KPBrief_Prisoners_ENG_WEB.pdf
46. World Prison Brief data
<https://www.prisonstudies.org/world-prison-brief-data>
47. Global data on HIV epidemiology and response
<https://aidsinfo.unaids.org/>
48. Tuberculosis surveillance and monitoring in Europe 2022 – 2020 data
<https://www.ecdc.europa.eu/en/publications-data/tuberculosis-surveillance-and-monitoring-europe-2022-2020-data>
https://coekostat.unodc.org/coekostat/en/news/regional_snapshot_1.html
<https://www.unodc.org/southernafrica/en/hiv/prison-settings.html>
<https://www.paho.org/journal/en/articles/prevalence-tuberculosis-incarcerated-populations-systematic-review-and-meta-analysis>
49. Tuberculosis surveillance and monitoring in Europe 2023 – 2021 data
<https://www.ecdc.europa.eu/sites/default/files/documents/tuberculosis-surveillance-monitoring-2023.pdf>



— Data on prisoner and detainee populations in TB high-burden countries

| WHO 2022 TB HIGH-BURDEN COUNTRIES | | | | UNAIDS AIDSINFO DATABASE (25 JAN. 2023) |
|-----------------------------------|-----------|-----------|-----------|--------------------------------------------|
| Countries | TB | TB/HIV | MDR/RR-TB | HIV Prevalence in Prisons % (UNAIDS) |
| Angola | Y | | Y | 15.9 |
| Azerbaijan | | | Y | 2.3 |
| Bangladesh | Y | | Y | |
| Belarus | | | Y | 8.5 |
| Botswana | | Y | | |
| Brazil | Y | Y | | |
| Cameroon | | Y | | 4.0 |
| Central African Republic | Y | Y | | 3.6 |
| China | Y | Y | Y | |
| Congo | Y | Y | | 3.9 |
| DPR Korea | Y | | Y | |
| DR Congo | Y | Y | Y | 2.5 |
| Eswatini | | Y | | 34.9 |
| Ethiopia | Y | Y | | |
| Gabon | Y | Y | | |
| Guinea | | Y | | 2.3 |
| Guinea-Bissau | | Y | | |
| India | Y | Y | Y | 1.9 |
| Indonesia | Y | Y | Y | 0.7 |
| Kazakhstan | | | Y | 4.4 |
| Kenya | Y | Y | | |
| Kyrgyzstan | | | Y | 11.3 |
| Lesotho | Y | Y | | 31.4 |
| Liberia | Y | Y | | |
| Malawi | | Y | | 19.0 |
| Mongolia | Y | | Y | 0.0 |
| Mozambique | Y | Y | Y | 24 |
| Myanmar | Y | Y | Y | 4.7 |
| Namibia | Y | Y | | |
| Nepal | | | Y | |
| Nigeria | Y | Y | Y | 2.8 |
| Pakistan | Y | | Y | 2.0 |
| Papua New Guinea | Y | | Y | |
| Peru | | | Y | 0.5 |
| Philippines | Y | Y | Y | |
| Republic of Moldova | | | Y | 3.8 |
| Russian Federation | | Y | | |
| Sierra Leone | Y | | | 3.7 |
| Somalia | | | Y | 0.4 |
| South Africa | Y | Y | Y | 3.5 |
| Tajikistan | | | Y | 3.1 |
| Thailand | Y | Y | | 0.7 |
| Uganda | Y | Y | | 4.0 |
| Ukraine | | | Y | 8.5 |
| United Republic of Tanzania | Y | Y | | 6.7 |
| Uzbekistan | | | Y | 0.5 |
| Viet Nam | Y | | Y | |
| Zambia | Y | Y | Y | 27.4 |
| Zimbabwe | | Y | | 24.1 |
| Countries with data (49 max) | 30 | 30 | 30 | 33 |
| Total | | | | 8.1 |

WORLD PRISON BRIEF (25 JAN. 2023)

| Total prison population (including pre-trial detainees/remand prisoners) | % Pre-trial detainees | Female prisoners (% of prison population) | Juveniles/minors/ young prisoners (% of prison population) | % Foreign prisoners | Number of facilities | Capacity |
|-----------------------------------------------------------------------------|-----------------------|----------------------------------------------|------------------------------------------------------------------|---------------------|----------------------|------------------|
| 24 966 | 44.4 | 2.5 | | 3.1 | 40 | 21 000 |
| 22 334 | 21.8 | 2.7 | 0.2 | 2.2 | 53 | 25 471 |
| 81 156 | 75.6 | 3.9 | 0.7 | 0.6 | 68 | 42 626 |
| 32556 | 16.6 | 10.8 | 0.4 | 3.1 | 67 | 35 720 |
| 3 882 | 22.5 | 4.7 | 10.4 | 13.5 | 23 | 4 337 |
| 835 643 | 27.2 | 5.1 | 0.0 | 0.3 | 1413 | 466 529 |
| 32 003 | 58.0 | 2.6 | 2.6 | 4.9 | 79 | 17 915 |
| 1 291 | 70.2 | 5.0 | | | 13 | 0 |
| 1 690 000 | | 8.6 | 0.8 | 0.4 | | 0 |
| 1 388 | 60.0 | 3.7 | 4.4 | | 12 | 225 |
| 53 920 | 35.1 | 7.3 | 1.6 | 4.7 | 54 | 48 130 |
| 22 820 | 75.0 | 2.3 | 2.3 | | 11 | 7 070 |
| 3 362 | 23.9 | 2.9 | 0.7 | 6.0 | 12 | 2 838 |
| 110 000 | 14.9 | 4.2 | | | 126 | 0 |
| 5 226 | 80.2 | 2.2 | 2.9 | | 9 | 0 |
| 4 375 | 54.2 | 3.0 | 5.0 | 2.7 | 31 | 2 552 |
| 596 | 67.9 | 2.6 | 2.6 | 7.1 | 3 | 90 |
| 554 034 | 77.1 | 4.1 | 0.0 | 1.0 | 1319 | 425 609 |
| 275 518 | 17.5 | 4.9 | 1.0 | 0.4 | 526 | 132 107 |
| 35 228 | 20.3 | 7.0 | 0.2 | 3.7 | 80 | 46 479 |
| 58 887 | 41.0 | 5.1 | 0.6 | 0.6 | 134 | 34 000 |
| 10 142 | 16.6 | 4.2 | 0.1 | 3.2 | 28 | 17 134 |
| 2 216 | 19.5 | 2.9 | 2.2 | 0.9 | 14 | 2 936 |
| 2 925 | 67.6 | 2.8 | 1.9 | 2.0 | 16 | 1 351 |
| 14 500 | 7.6 | 1.1 | 7.7 | 0.2 | 30 | 7 000 |
| 5 832 | 24.3 | 4.5 | 1.5 | 0.4 | 50 | 6 182 |
| 18 700 | 31.9 | 2.9 | 8.6 | 1.5 | 157 | 8 500 |
| 100 324 | 15.1 | 12.3 | 1.6 | 0.7 | 96 | 89 938 |
| 8 900 | 54.0 | 2.9 | 0.1 | 8.9 | 13 | 5 424 |
| 25 400 | 54.4 | 5.4 | 3.3 | 5.1 | 74 | 15 466 |
| 74 367 | 69.4 | 2.1 | 1.7 | 0.3 | 240 | 50 153 |
| 85 670 | 70 | 1.6 | 1.6 | 1.2 | 116 | 64 099 |
| 5 087 | 34.4 | 4.9 | 3.7 | 0.4 | 18 | 4 366 |
| 90 293 | 38.5 | 5.1 | 0.0 | 3.0 | 69 | 41 123 |
| 166 912 | 64.3 | 9.8 | 1.0 | 0.3 | 440 | 45 730 |
| 6 461 | 16.6 | 5.6 | 0.9 | 1.7 | 17 | 6 868 |
| 439 453 | 25.5 | 8.9 | 0.2 | 6.2 | 872 | 714 253 |
| 4 430 | 54 | 1.5 | 0.0 | 0.5 | 21 | 2 375 |
| | | | | | | 0 |
| 144 938 | 32.9 | 2.6 | 0.1 | 10.5 | 235 | 108 804 |
| 14 000 | 14.1 | | 0.2 | 4.9 | 19 | 11 950 |
| 285 572 | 19.6 | 11.5 | | 3.5 | 143 | 110 000 |
| 70 535 | 48.8 | 4.6 | 0.0 | 1.8 | 254 | 19 986 |
| 48 038 | 35.6 | 3.9 | 0.2 | 2.3 | 110 | 88 737 |
| 33 570 | 50 | 3.4 | 3.9 | 3.7 | 126 | 29 760 |
| 22 867 | 10.0 | | | | 54 | 54 875 |
| 125 697 | 12.6 | 12.1 | | 0.4 | 54 | 0 |
| 23 062 | 17.6 | 2.7 | 2.5 | 2.1 | 90 | 10 500 |
| 20 898 | 25.2 | 2.1 | 0.6 | 1.9 | 72 | 17 000 |
| 48 | 47 | 46 | 42 | 42 | 47 | 43 |
| 5 699 974 | 27.0 | 1.4 | 0.6 | 1.1 | 3998 | 2 115 808 |

Miners

Information on the number of people formally employed in the mining sector is limited.⁵⁰ However, the World Bank estimates that about 44.7 million people work in artisanal and small-scale mining, 30 per cent of whom are women.⁵¹ The scale of the TB burden among miners is not known, except in South Africa and a handful of other countries. In southern Africa there seems to be increased political will to finally tackle the TB epidemic. Given the mix of factors that contribute to TB in the mining industry, multifaceted solutions involving multiple stakeholders are required.⁵²

Official data on the number of people employed in the mining sector is limited. However, the World Bank and its partners have developed an online database, Delve,⁵³ to assist in monitoring artisanal and small-scale mining.

Data published by South Africa's Department of Mineral Resources and Energy shows high levels of screening for TB and a steady decline in the number of reported cases of TB among mineworkers. In 2018, South Africa had a record-low 1,716 TB diagnoses among miners.⁵⁴

The Nigerian National Bureau of Statistics⁵⁵ estimates that the mining and quarrying industry employs 0.2% of the country's labour force, however there is no information available on the prevalence of TB among mineworkers there.

The table below provides information available on TB in miners. The sources of this data include the World Bank,⁵⁶ National Bureaux of Statistics and other published articles.⁵⁷

READ MORE:

50. Women in mining: Towards gender equality
https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_821061.pdf
51. Delve: A global platform for artisanal & small scale mining data
<https://delvedatabase.org/>
52. Key populations brief: Miners
https://stoptb.org/assets/documents/resources/publications/acsm/kp_miners_spreads.pdf
53. Delve: A global platform for artisanal & small scale mining data
<https://delvedatabase.org/>
54. Tuberculosis in the South African mining industry: Fact sheet
<https://www.mineralscouncil.org.za/industry-news/publications/fact-sheets/send/3-fact-sheets/749-tuberculosis-in-south-africa>
55. Nigerian mining and quarrying sector: Summary report 2010-2012
<https://www.nigerianstat.gov.ng/pdfuploads/nbs Mining and Quarrying Report 2010-12.pdf>
56. The Southern Africa TB in the mining sector initiative
<https://www.worldbank.org/en/programs/the-southern-africa-tb-in-the-mining-sector-initiative>
57. The prevalence of pulmonary tuberculosis among miners from the Karonga, Rumpfi, Kasungu and Lilongwe Districts of Malawi in 2019
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8364790/>



— Data on populations of miners in TB high-burden countries

WHO 2022 TB HIGH-BURDEN COUNTRIES

| Countries | TB | TB/HIV | MDR/RR-TB |
|------------------------------|----|--------|-----------|
| Angola | Y | | Y |
| Azerbaijan | | | Y |
| Bangladesh | Y | | Y |
| Belarus | | | Y |
| Botswana | | Y | |
| Brazil | Y | Y | |
| Cameroon | | Y | |
| Central African Republic | Y | Y | |
| China | Y | Y | Y |
| Congo | Y | Y | |
| DPR Korea | Y | | Y |
| DR Congo | Y | Y | Y |
| Eswatini | | Y | |
| Ethiopia | Y | Y | |
| Gabon | Y | Y | |
| Guinea | | Y | |
| Guinea-Bissau | | Y | |
| India | Y | Y | Y |
| Indonesia | Y | Y | Y |
| Kazakhstan | | | Y |
| Kenya | Y | Y | |
| Kyrgyzstan | | | Y |
| Lesotho | Y | Y | |
| Liberia | Y | Y | |
| Malawi | | Y | |
| Mongolia | Y | | Y |
| Mozambique | Y | Y | Y |
| Myanmar | Y | Y | Y |
| Namibia | Y | Y | |
| Nepal | | | Y |
| Nigeria | Y | Y | Y |
| Pakistan | Y | | Y |
| Papua New Guinea | Y | | Y |
| Peru | | | Y |
| Philippines | Y | Y | Y |
| Republic of Moldova | | | Y |
| Russian Federation | | Y | |
| Sierra Leone | Y | | |
| Somalia | | | Y |
| South Africa | Y | Y | Y |
| Tajikistan | | | Y |
| Thailand | Y | Y | |
| Uganda | Y | Y | |
| Ukraine | | | Y |
| United Republic of Tanzania | Y | Y | |
| Uzbekistan | | | Y |
| Viet Nam | Y | | Y |
| Zambia | Y | Y | Y |
| Zimbabwe | | Y | |
| Countries with data (49 max) | 30 | 30 | 30 |
| Total | | | |

VARIOUS SOURCES (24–26 JAN. 2023)

| Year | Number of miners the formal sector | of which female miners | Minimum number of artisanal miners | Maximum estimated number of artisanal miners | Incidence of pulmonary TB (per 100 000) | Estimated prevalence of TB in miners as a % of overall population |
|------|------------------------------------|------------------------|------------------------------------|----------------------------------------------|-----------------------------------------|-------------------------------------------------------------------|
| | | | 861 000 | | | |
| | | | 150 000 | 300 000 | | |
| | | | 9 000 000 | | | |
| | | | 2 000 000 | | | |
| | | | 1 260 000 | | | |
| | | | 1 500 000 | | | |
| | | | 3 600 000 | | | |
| | | | 140 000 | | | |
| | | | 30 000 | 100 000 | | 14 |
| | | | 70 000 | | | |
| | | | 100 000 | | | |
| | | | 520 000 | | | |
| 2012 | 1 358 795 | 529 590 | 400 000 | 500 000 | | |
| | | | 70 000 | | | |
| 2017 | 500 000 | | | | 3 000 | |
| | | | 200 000 | 400 000 | | |
| | | | 1 000 000 | 1 500 000 | | |
| 2012 | 90 000 | | | 1 000 000 | | |
| | | | | | | |
| | 3 | 1 | 16 | 6 | 1 | 1 |

Migrant populations

International migration reached 281 million in 2020,⁵⁸ representing 3.6 per cent of the world's population. According to UNICEF, 36 million of these migrants were children and 20.7 million were refugees.⁵⁹ Migrant populations often face challenges in accessing TB care, as a result of numerous complex economic, social, political and environmental factors that form part of the migration process. Migrants often arrive at their destination with low socioeconomic status, which makes them especially vulnerable to diseases such as TB. When accessing health care, migrants must contend with discriminatory policies and practices, poor availability of services, negative attitudes from health care workers, language barriers and stigma.⁶⁰

In 2021, the International Organization for Migration (IOM) conducted TB radiological investigations on 1.1 million migrants and provided directly-observed TB therapy for 13,000 people with TB,⁶¹ of whom 12 people had multidrug-resistant TB (MDR-TB) (2.9 per cent).⁶²

IOM continues to provide a pre-migration health service on behalf of governments in high TB-burden countries. In 2021 more than 480,000 migration health assessments were provided in more than 90 countries, for both migrants (81.8 per cent) and refugees (18.2 per cent), of whom 512 people were diagnosed with active TB disease and referred for treatment. Of these people, 415 (81.1 per cent) had their TB confirmed via laboratory testing⁶³ while 2.9 per cent of this group (12 people) were found to have MDR-TB.⁶⁴

The table below provides information accessed from World Bank Open Data⁶⁵ and the IOM Migration Data Portal⁶⁶ on migrant and refugee populations. These databases are updated regularly and allow users to compare and visualize data across regions, countries and time periods.

READ MORE:

58. World migration report 2022
<https://worldmigrationreport.iom.int/wmr-2022-interactive/>
59. Migration
<https://data.unicef.org/topic/child-migration-and-displacement/migration/>
60. Key populations brief: Mobile populations
https://stoptb.org/assets/documents/resources/publications/acsm/KP_Mobile_Spreads.pdf
61. Migration health 2021 impact overview: Addressing continuous disease threats
<https://publications.iom.int/system/files/pdf/MHD-Annual-Report-2021.pdf>
62. Migration health assessment programme: Pre-migration health activities
https://www.iom.int/sites/g/files/tmzbd486/files/our_work/DMM/Migration-Health/MHD_Infosheet_HAP_2021_29.11.2022.pdf
63. It is important to ensure that rapid molecular methods are the initial diagnostic test for TB.
64. Ibid
65. World Bank Open Data
<https://data.worldbank.org/indicator/SM.POP.NETM>
66. Migration Data Portal
https://www.migrationdataportal.org/international-data?i=stock_abs_&t=2020



— Data on migrant and refugee populations in TB high-burden countries

| WHO 2022 TB HIGH-BURDEN COUNTRIES | | | | WORLD BANK (25 JAN. 2023) |
|-------------------------------------|-----------|-----------|-----------|------------------------------------|
| Countries | TB | TB/HIV | MDR/RR-TB | Estimated total net migration 2021 |
| Angola | Y | | Y | 29 089 |
| Azerbaijan | | | Y | 1 084 |
| Bangladesh | Y | | Y | - 174 500 |
| Belarus | | | Y | 12 961 |
| Botswana | | Y | | 1 816 |
| Brazil | Y | Y | | 20 376 |
| Cameroon | | Y | | - 9 889 |
| Central African Republic | Y | Y | | - 85 860 |
| China | Y | Y | Y | - 200 194 |
| Congo | Y | Y | | - 4 466 |
| DPR Korea | Y | | Y | - 1 589 |
| DR Congo | Y | Y | Y | 64 643 |
| Eswatini | | Y | | - 4 897 |
| Ethiopia | Y | Y | | - 1 391 |
| Gabon | Y | Y | | 1 516 |
| Guinea | | Y | | - 4 367 |
| Guinea-Bissau | | Y | | - 1 395 |
| India | Y | Y | Y | - 301 970 |
| Indonesia | Y | Y | Y | - 14 992 |
| Kazakhstan | | | Y | - 18 917 |
| Kenya | Y | Y | | - 52 549 |
| Kyrgyzstan | | | Y | 16 510 |
| Lesotho | Y | Y | | - 1 490 |
| Liberia | Y | Y | | - 11 862 |
| Malawi | | Y | | - 1 775 |
| Mongolia | Y | | Y | 0 |
| Mozambique | Y | Y | Y | 9 515 |
| Myanmar | Y | Y | Y | - 35 382 |
| Namibia | Y | Y | | - 4 301 |
| Nepal | | | Y | 296 541 |
| Nigeria | Y | Y | Y | 76 364 |
| Pakistan | Y | | Y | 471 395 |
| Papua New Guinea | Y | | Y | 10 695 |
| Peru | | | Y | 68 012 |
| Philippines | Y | Y | Y | 80 125 |
| Republic of Moldova | | | Y | - 14 278 |
| Russian Federation | | Y | | 320 617 |
| Sierra Leone | Y | | | - 1 544 |
| Somalia | | | Y | - 17 071 |
| South Africa | Y | Y | Y | 10 934 |
| Tajikistan | | | Y | - 3 564 |
| Thailand | Y | Y | | 1 133 |
| Uganda | Y | Y | | 43 465 |
| Ukraine | | | Y | 831 |
| United Republic of Tanzania | Y | Y | | - 4 865 |
| Uzbekistan | | | Y | - 39 201 |
| Viet Nam | Y | | Y | - 992 |
| Zambia | Y | Y | Y | 9 015 |
| Zimbabwe | | Y | | - 25 005 |
| Countries with data (49 max) | 30 | 30 | 30 | 49 |
| Total | | | | 508 331 |

| IOM MIGRATION PORTAL (25 JAN. 2023) | | | | |
|------------------------------------------------------|--------------------------------------------------------|------------------------------------------------|--------------------------------------------------|------------------------------------------------------|
| International migrant stock by sex as of 2020 (male) | International migrant stock by sex as of 2020 (female) | Total international migrant stock (as of 2020) | Refugee population host country (as of end 2021) | Refugee population from the country (as of end 2021) |
| 331 401 | 325 033 | 656 434 | 26 000 | 11 400 |
| 252 228 | 121 007 | 131 221 | 1 700 | 39 500 |
| 2 115 408 | 1 093 978 | 1 021 430 | 918 900 | 22 700 |
| 1 067 090 | 488 713 | 578 377 | 2 700 | 4 600 |
| 110 268 | 62 817 | 47 451 | 688 | 122 |
| 1 079 708 | 582 881 | 496 827 | 62 000 | 2 000 |
| 579 209 | 286 254 | 292 955 | 457 300 | 125 500 |
| 46 357 | 42 189 | 88 546 | 9 300 | 737 700 |
| 637 952 | 401 723 | 1 039 675 | 303 400 | 170 200 |
| 211 403 | 176 203 | 387 606 | 40 800 | 14 300 |
| 24 654 | 24 895 | 49 549 | 3 600 | 528 |
| 952 871 | 459 052 | 493 819 | 524 100 | 908 400 |
| 16 921 | 15 937 | 32 858 | 895 | 165 |
| 536 807 | 548 710 | 1 085 517 | 821 300 | 149 100 |
| 268 032 | 148 619 | 416 651 | 272 | 620 |
| 71 385 | 50 052 | 121 437 | 5 700 | 34 400 |
| 8 867 | 9 078 | 17 945 | 1 800 | 2 000 |
| 2 273 912 | 2 604 792 | 4 878 704 | 212 400 | 14 200 |
| 206 538 | 148 967 | 355 505 | 10 000 | 14 000 |
| 1 850 097 | 1 881 976 | 3 732 073 | 352 | 3 200 |
| 529 975 | 520 172 | 1 050 147 | 481 | 7 500 |
| 80 456 | 118 555 | 199 011 | 317 | 3 000 |
| 6 537 | 5 523 | 12 060 | 296 | 6 |
| 50 694 | 37 253 | 87 947 | 8 200 | 5 400 |
| 93 612 | 97 750 | 191 362 | 21 500 | 513 |
| 14 263 | 7 082 | 21 345 | | 2 500 |
| 165 490 | 173 360 | 338 850 | 4 800 | 90 |
| 41 898 | 34 548 | 76 446 | | 1 200 000 |
| 59 024 | 50 367 | 109 391 | 3 700 | 441 |
| 146 930 | 340 634 | 487 564 | 19 600 | 7 000 |
| 713 678 | 594 890 | 1 308 568 | 77 100 | 383 700 |
| 1 812 804 | 1 463 776 | 3 276 580 | 1 500 000 | 132 800 |
| 18 895 | 12 173 | 31 068 | 11 800 | 507 |
| 642 404 | 582 115 | 1 224 519 | 5 800 | 3 500 |
| 117 105 | 108 420 | 225 525 | 801 | 521 |
| 42 743 | 61 695 | 104 438 | 349 | 2 200 |
| 5 712 089 | 5 924 822 | 11 636 911 | 10 900 | 68 500 |
| 30 408 | 23 338 | 53 746 | 345 | 6 600 |
| 32 285 | 26 305 | 58 590 | 13 800 | 776 700 |
| 443 405 | 438 847 | 882 252 | 75 500 | 643 |
| 119 174 | 156 857 | 276 031 | 10 700 | 2 400 |
| 1 821 857 | 1 810 639 | 3 632 496 | 100 500 | 181 |
| 827 664 | 892 649 | 1 720 313 | 1 500 000 | 7 900 |
| 2 149 298 | 2 848 089 | 4 997 387 | 2 400 | 27 600 |
| 213 007 | 213 010 | 426 017 | 207 100 | 752 |
| 543 364 | 618 643 | 1 162 007 | 13 000 | 3 000 |
| 44 471 | 32 296 | 76 767 | | 317 700 |
| 529 975 | 520 172 | 1 050 147 | 75 200 | 255 |
| 529 975 | 520 172 | 1 050 147 | 9 500 | 8 100 |
| 49 | 49 | 49 | 46 | 49 |
| 30 174 588 | 27 707 028 | 51 692 212 | 7 076 896 | 5 224 644 |

People who use drugs

Globally, people who use drugs (PWUD) remain stigmatized and criminalized, which contributes to devastating health disparities, including extremely high rates of TB often together with HIV and/or viral hepatitis. The range of these health issues and the prevailing lack of integrated health services capable of delivering TB, HIV and harm-reduction services in one place largely contribute to the scope of the TB crisis in communities of PWUD.

While the impacts of the TB epidemic are most acutely felt in PWUD communities in Eastern Europe and Central Asia, evidence is emerging from South and South-East Asia and sub-Saharan Africa that suggests these issues are now universal.⁶⁷

An estimated 11.2 million people worldwide injected drugs in 2020. One in every eight people who injected drugs (PWID) was living with HIV, representing 1.4 million people.⁶⁸

According to UNODC, around 284 million people aged 15–64 used drugs worldwide in 2020, a 26 per cent increase over the previous decade.⁶⁹ Young people are using more drugs, with use levels today in many countries higher than in the previous generation. In Africa and Latin America, people under 35 represent the majority of people being treated for drug-use disorders.⁷⁰

Despite the scarcity of data on rates of TB among PWUD, risk factors such as HIV that increase their vulnerability to TB are well-documented.⁷¹

READ MORE:

67. Key populations brief: People who use drugs
https://stoptb.org/assets/documents/resources/publications/acsm/kp_peopleusedrugs_spreads.pdf

68. World drug report 2022
<https://www.unodc.org/unodc/en/data-and-analysis/world-drug-report-2022.html>

69. Ibid

70. Ibid

71. People who inject drugs
<https://www.who.int/teams/global-hiv-hepatitis-and-stis-programmes/populations/people-who-inject-drugs>



— Data on people who use/inject drugs and associated prevalence of HIV in TB high-burden countries

WHO 2022 TB HIGH-BURDEN COUNTRIES

| Countries | TB | TB/HIV | MDR/RR-TB |
|-------------------------------------|-----------|-----------|-----------|
| Angola | Y | | Y |
| Azerbaijan | | | Y |
| Bangladesh | Y | | Y |
| Belarus | | | Y |
| Botswana | | Y | |
| Brazil | Y | Y | |
| Cameroon | | Y | |
| Central African Republic | Y | Y | |
| China | Y | Y | Y |
| Congo | Y | Y | |
| DPR Korea | Y | | Y |
| DR Congo | Y | Y | Y |
| Eswatini | | Y | |
| Ethiopia | Y | Y | |
| Gabon | Y | Y | |
| Guinea | | Y | |
| Guinea-Bissau | | Y | |
| India | Y | Y | Y |
| Indonesia | Y | Y | Y |
| Kazakhstan | | | Y |
| Kenya | Y | Y | |
| Kyrgyzstan | | | Y |
| Lesotho | Y | Y | |
| Liberia | Y | Y | |
| Malawi | | Y | |
| Mongolia | Y | | Y |
| Mozambique | Y | Y | Y |
| Myanmar | Y | Y | Y |
| Namibia | Y | Y | |
| Nepal | | | Y |
| Nigeria | Y | Y | Y |
| Pakistan | Y | | Y |
| Papua New Guinea | Y | | Y |
| Peru | | | Y |
| Philippines | Y | Y | Y |
| Republic of Moldova | | | Y |
| Russian Federation | | Y | |
| Sierra Leone | Y | | |
| Somalia | | | Y |
| South Africa | Y | Y | Y |
| Tajikistan | | | Y |
| Thailand | Y | Y | |
| Uganda | Y | Y | |
| Ukraine | | | Y |
| United Republic of Tanzania | Y | Y | |
| Uzbekistan | | | Y |
| Viet Nam | Y | | Y |
| Zambia | Y | Y | Y |
| Zimbabwe | | Y | |
| Countries with data (49 max) | 30 | 30 | 30 |
| Total | 30 | 30 | 30 |

UNODC AND UNAIDS AIDSINFO DATA (25 JAN. 2023)

| Number of people aged 15-64 who inject drugs (UNODC) | Prevalence of HIV among PWIDs (UNAIDS) | Prevalence of HIV among PWIDs (%) (UNODC) | Number of PWIDs who are HIV+ (UNAIDS) (2021) | % of people aged 15-65 who use amphetamines (UNODC) | % of people aged 15-65 who use cocaine (UNODC) | % of people aged 15-65 who use ecstasy (UNODC) | % of people aged 15-65 who use opiates (UNODC) |
|------------------------------------------------------|----------------------------------------|-------------------------------------------|----------------------------------------------|-----------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|
| 60 250 | 6.1 | 6.9 | 60 300 | | | | |
| 29 626 | 2.4 | 18.1 | | | | | |
| 80 000 | 22.7 | 22.7 | 80 000 | | | | 0.8 |
| | | 8.2 | | | | | |
| 2 453 | | | 1 500 | | | | |
| 2 100 | | | | | | | |
| 1 930 000 | | 8.4 | | 0.6 | | | |
| 411 | | | | 0.6 | | | |
| 155 800 | 3.9 | 3.9 | 155 800 | | | | |
| 300 | | | 300 | | | | |
| | | 6 | | | | | |
| 1 793 | | | 1 800 | | | | |
| 52 500 | 9 | 6.3 | | | | | |
| 34 517 | 13.7 | 17.9 | 34 500 | 0.1 | 0.0 | 0.4 | |
| 94 600 | 8.3 | 8.3 | 85 300 | | | | 1.0 |
| | | 14.5 | 16 000 | | 0.1 | | 0.9 |
| | 14.3 | 14.3 | | 0.5 | | | |
| 2 600 | | | | | | | |
| 4 100 | | 14.4 | 4 100 | | | | |
| | 0 | 0 | | | | | |
| 4 500 | | 19.9 | | | | | |
| 93 215 | | 34.9 | 93 000 | | | | |
| 37 822 | 2.7 | 2 | 33 000 | | | | |
| 80 000 | 10.9 | 3.4 | 326 100 | 0.9 | 0.1 | 0.3 | 0.9 |
| 430 000 | | 38.4 | | | | | |
| | | 13 | | | 1.0 | | |
| | | 29 | 10 800 | | | | |
| 27 500 | 11.4 | 11.4 | 27 500 | | | | |
| 1 314 620 | 26 | 27.2 | | | | | |
| 1 500 | 4.2 | 8.5 | | | | | |
| 82 500 | 21.8 | 21 | 82 500 | | | | |
| 22 200 | 12.1 | | 22 200 | | | | 0.5 |
| 71 000 | | | | | | | |
| 7 356 | 17 | 45 | 7 400 | | | | |
| 350 300 | 20.9 | | 350 300 | 0.3 | 0.6 | 0.6 | |
| 30 000 | | 36 | | | | | |
| | 5.1 | | | | | | 1.0 |
| | 12.1 | | | | | | |
| 907 | | | | | | | |
| 31 | 20 | 27 | 19 | 6 | 5 | 3 | 6 |
| 5 004 470 | 4.6 | 9.0 | 1 096 300 | 0.1 | 0.0 | 0.0 | 0.1 |

Indigenous people

According to the World Bank, there are 476 million indigenous people globally, comprising about six per cent of the world's population.⁷² It is estimated that they account for 19 per cent of global extreme poverty. However, there is a lack of data about health and other key development indicators for indigenous people.⁷³

Data that are available show a prevalence of extreme poverty and severe health disparities, including TB, among indigenous people. Since indigenous populations face disproportionate levels of extreme poverty, they are susceptible to TB for reasons related to poor housing, lack of access to health care and services, cultural and linguistic barriers, and geographic remoteness.⁷⁴

Data on the incidence of TB in indigenous populations can be difficult to obtain because these groups are often marginalized. In some countries using a combination of different sources will produce a better picture of the TB situation for indigenous populations.

The table below contains information based on the International Work Group for Indigenous Affairs' *The indigenous world 2022 report*⁷⁵ and the WHO *Global tuberculosis report*⁷⁶ in the 49 countries identified by WHO as high-burden for TB.

READ MORE:

72. Indigenous peoples
<https://www.worldbank.org/en/topic/indigenouspeoples>

73. Key populations brief: Indigenous peoples
https://stoptb.org/assets/documents/resources/publications/acsm/6_27-unops-kpb-indigenous-web.pdf

74. Ibid

75. The indigenous world 2022
https://www.iwgia.org/doclink/iwgia-book-the-indigenous-world-2022-eng/eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzdWiiOiJpd2dpYS1ib29rLXR0ZS1pbmRwZ2Vub3VzLXdvcmxkLT1wM-jHtZW5nliwiaWF0IjoxNjUxMTM5NTg1LCJleHAiOiJlE2NTYyMjU0ODV9.jRnv3PeantFRZtJg4jph8xshK5Mh25Z3hlcPs9As_U

76. Global tuberculosis report 2022
<https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022>



— Data on indigenous people in TB high-burden countries

WHO 2022 TB HIGH-BURDEN COUNTRIES

| Countries | TB | TB/HIV | MDR/RR-TB |
|-------------------------------------|-----------|-----------|-----------|
| Angola | Y | | Y |
| Azerbaijan | | | Y |
| Bangladesh | Y | | Y |
| Belarus | | | Y |
| Botswana | | Y | |
| Brazil | Y | Y | |
| Cameroon | | Y | |
| Central African Republic | Y | Y | |
| China | Y | Y | Y |
| Congo | Y | Y | |
| DPR Korea | Y | | Y |
| DR Congo | Y | Y | Y |
| Eswatini | | Y | |
| Ethiopia | Y | Y | |
| Gabon | Y | Y | |
| Guinea | | Y | |
| Guinea-Bissau | | Y | |
| India | Y | Y | Y |
| Indonesia | Y | Y | Y |
| Kazakhstan | | | Y |
| Kenya | Y | Y | |
| Kyrgyzstan | | | Y |
| Lesotho | Y | Y | |
| Liberia | Y | Y | |
| Malawi | | Y | |
| Mongolia | Y | | Y |
| Mozambique | Y | Y | Y |
| Myanmar | Y | Y | Y |
| Namibia | Y | Y | |
| Nepal | | | Y |
| Nigeria | Y | Y | Y |
| Pakistan | Y | | Y |
| Papua New Guinea | Y | | Y |
| Peru | | | Y |
| Philippines | Y | Y | Y |
| Republic of Moldova | | | Y |
| Russian Federation | | Y | |
| Sierra Leone | Y | | |
| Somalia | | | Y |
| South Africa | Y | Y | Y |
| Tajikistan | | | Y |
| Thailand | Y | Y | |
| Uganda | Y | Y | |
| Ukraine | | | Y |
| United Republic of Tanzania | Y | Y | |
| Uzbekistan | | | Y |
| Viet Nam | Y | | Y |
| Zambia | Y | Y | Y |
| Zimbabwe | | Y | |
| Countries with data (49 max) | 30 | 30 | 30 |
| Total | | | |

THE INDIGENOUS WORLD 2022 (2 FEB. 2023)

WHO (25 JAN. 2023)

| Year | % of total population | Number of indigenous people | Total number of people with TB (all forms) notified in 2021 |
|------|-----------------------|-----------------------------|-------------------------------------------------------------|
| | | | 63 970 |
| | | | 4 944 |
| 2011 | 1.8 | 1 586 141 | 307 561 |
| | | | 1 696 |
| 2016 | 3.2 | | 2 368 |
| 2010 | | 896 900 | 88 099 |
| | | | 22 866 |
| | | | 13 428 |
| | | | 593 743 |
| | | | 12 152 |
| | | | 93 597 |
| | | | 215 787 |
| | | | 2 049 |
| | | | 104 854 |
| | | | 5 201 |
| | | | 19 092 |
| | | | 2 505 |
| | 8.6 | | 2 116 976 |
| | | | 443 235 |
| | | | 10 008 |
| 2011 | 25 | 9 650 000 | 77 854 |
| | | | 5 199 |
| | | | 4 553 |
| | | | 7 441 |
| | | | 14 594 |
| | | | 2 823 |
| | | | 98 485 |
| | | | 65 125 |
| 2021 | 8 | 2 678 191 | 6 864 |
| 2011 | 36 | 10 872 000 | 28 677 |
| | | | 207 785 |
| | | | 343 024 |
| | | | 30 180 |
| 2007 | | 4 000 000 | 26 437 |
| 2011 | 15 | 14 100 000 | 328 497 |
| | | | 2 248 |
| | | | 79 686 |
| | | | 17 669 |
| | | | 17 504 |
| | 1 | 5 900 000 | 181 864 |
| | | | 4 299 |
| 2002 | 9.7 | 6 100 000 | 72 851 |
| | | | 76 268 |
| | | | 19 793 |
| | | | 87 415 |
| | | | 15 450 |
| | 14.7 | | 78 935 |
| | | | 50 825 |
| 2021 | 0.0 | 4 533 | 16 541 |
| | 11 | 11 | 49 |
| | | | 6 093 017 |

Children

In 2021, 1.2 million children fell ill with TB.⁷⁷ The treatment success rate for children (aged 0–14 years) in 2020 was 88 per cent.⁷⁸ However, sub-optimal diagnostic methods and poor screening compliance by medical practitioners mean that children face even greater barriers to accessing TB care than adults. Children are often a vulnerable population within other, already-vulnerable populations – especially PLHIV.⁷⁹

Globally, data on children are easily available. Information on TB in children can be accessed from various sources:

- WHO's *Global tuberculosis report 2022*⁸⁰ provides information on TB case notifications, people with TB tested for HIV, TB/HIV co-infection, HIV treatment (ART) and TB preventive treatment (co-trimoxazole and isoniazid preventive therapies) in over 200 countries/territories.
- The WHO Global Health Observatory⁸¹ provides information on coverage of Bacille Calmette-Guérin (BCG) vaccination against TB among one-year olds, and the number of incident TB cases in children 0-14 years.

Other useful resources for information on children and TV:

- UNAIDS AIDSInfo⁸² provides numbers for children aged 0-14 years living with HIV.
- UNICEF Data⁸³ provides information on topics including immunization and HIV/AIDS.

The table below shows data available for the 49 countries TB high-burden countries.

READ MORE:

77. Fact sheet: Tuberculosis

<https://www.who.int/news-room/fact-sheets/detail/tuberculosis>

78. Global tuberculosis report 2022

<https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022>

79. Key populations brief: Children

https://www.stoptb.org/sites/default/files/kpbrief__children_eng_web.pdf

80. Global tuberculosis report 2022

<https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022>

81. WHO Global Health Observatory

<https://www.who.int/data/gho/>

82. AIDSinfo

<https://aidsinfo.unaids.org/>

83. Immunization coverage 2023 estimates dashboard

<https://data.unicef.org/>



— Data on children in TB high-burden countries

| WHO 2022 TB HIGH-BURDEN COUNTRIES | | | | WORLD BANK (26 JAN. 2023) |
|-----------------------------------|-----------|-----------|-----------|-------------------------------------------|
| Countries | TB | TB/HIV | MDR/RR-TB | Total population of children (0-14 years) |
| Angola | Y | | Y | 15 588 500 |
| Azerbaijan | | | Y | 2 425 450 |
| Bangladesh | Y | | Y | 44 799 780 |
| Belarus | | | Y | 1 572 940 |
| Botswana | | Y | | 851 970 |
| Brazil | Y | Y | | 44 024 040 |
| Cameroon | | Y | | 11 540 520 |
| Central African Republic | Y | Y | | 2 629 450 |
| China | Y | Y | Y | 249 536 790 |
| Congo | Y | Y | | 2 416 090 |
| DPR Korea | Y | | Y | 4 921 230 |
| DR Congo | Y | Y | Y | 44 614 750 |
| Eswatini | | Y | | 417 640 |
| Ethiopia | Y | Y | | 48 066 300 |
| Gabon | Y | Y | | 852 730 |
| Guinea | | Y | | 5 660 870 |
| Guinea-Bissau | | Y | | 835 870 |
| India | Y | Y | Y | 361 569 240 |
| Indonesia | Y | Y | Y | 69 742 690 |
| Kazakhstan | | | Y | 5 611 490 |
| Kenya | Y | Y | | 20 351 590 |
| Kyrgyzstan | | | Y | 2 306 300 |
| Lesotho | Y | Y | | 777 940 |
| Liberia | Y | Y | | 2 129 950 |
| Malawi | | Y | | 8 583 540 |
| Mongolia | Y | | Y | 1 085 720 |
| Mozambique | Y | Y | Y | 14 012 750 |
| Myanmar | Y | Y | Y | 13 385 960 |
| Namibia | Y | Y | | 916 070 |
| Nepal | | | Y | 8 827 830 |
| Nigeria | Y | Y | Y | 92 372 970 |
| Pakistan | Y | | Y | 85 480 180 |
| Papua New Guinea | Y | | Y | 3 440 790 |
| Peru | | | Y | 8 877 310 |
| Philippines | Y | Y | Y | 34 889 270 |
| Republic of Moldova | | | Y | 517 970 |
| Russian Federation | | Y | | 25 418 650 |
| Sierra Leone | Y | | | 3 316 880 |
| Somalia | | | Y | 8 063 870 |
| South Africa | Y | Y | Y | 17 029 520 |
| Tajikistan | | | Y | 3 550 260 |
| Thailand | Y | Y | | 11 313 240 |
| Uganda | Y | Y | | 20 722 070 |
| Ukraine | | | Y | 6 666 750 |
| United Republic of Tanzania | Y | Y | | 27 729 190 |
| Uzbekistan | | | Y | 10 499 310 |
| Viet Nam | Y | | Y | 21 974 310 |
| Zambia | Y | Y | Y | 8 424 530 |
| Zimbabwe | | Y | | 6 540 280 |
| Countries with data (49 max) | | | | 49 |
| Total | 30 | 30 | 30 | 1 381 222 470 |

| UNAIDS (26 JAN. 2023) | | WHO GLOBAL HEALTH OBSERVATORY (26 JAN. 2023) | |
|--------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Number of children living with HIV (0-14 years) (2021) | % of live births who received BCG vaccine (2021) | Number of incident TB cases in children 0-14 years (2021) | % of children who are household contacts of bacteriologically-confirmed TB cases on preventive treatment |
| 36 000 | 56 | 16 000 | |
| 500 | 95 | 360 | 100 |
| 500 | 99 | 30 000 | 38 |
| 500 | 98 | 110 | 77 |
| 6 600 | 98 | 520 | |
| | 63 | 5 100 | 56 |
| 33 000 | 77 | 4 900 | 51 |
| 6 000 | 61 | 4 200 | 50 |
| | 99 | 36 000 | |
| 12 000 | 81 | 2 500 | 4 |
| | 95 | 11 000 | 99 |
| 63 000 | 67 | 43 000 | 52 |
| 7 200 | 97 | 320 | 63 |
| 42 000 | 68 | 16 000 | 76 |
| 2 500 | 86 | 1 200 | |
| 11 000 | 72 | 2 000 | 95 |
| 3 700 | 34 | 1 200 | 14 |
| 70 000 | 84 | 356 000 | 24 |
| 19 000 | 81 | 89 000 | 3.7 |
| 500 | 94 | 700 | 55 |
| 83 000 | 97 | 16 000 | 32 |
| 500 | 97 | 720 | 11 |
| 9 700 | 96 | 1 200 | 92 |
| 2 500 | 81 | 2 600 | 7.2 |
| 58 000 | 89 | 3 800 | 47 |
| | 99 | 1 200 | 8.3 |
| | 79 | 18 000 | 89 |
| 9 700 | 48 | 19 000 | 6.6 |
| 7 600 | 99 | 1 200 | 58 |
| 1 200 | 95 | 4 400 | 36 |
| 170 000 | 75 | 69 000 | 12 |
| 4 600 | 93 | 81 000 | 3 |
| 3 500 | 42 | 12 000 | 27 |
| 1 500 | 87 | 2 900 | 29 |
| 750 | 47 | 100 000 | 5.5 |
| 200 | 98 | 180 | 47 |
| | 95 | 3 700 | 100 |
| 11 000 | 74 | 2 600 | |
| 850 | 37 | 8 900 | |
| 270 000 | 86 | 30 000 | 57 |
| 940 | 98 | 560 | 100 |
| 2 000 | 99 | 3 500 | 100 |
| 88 000 | 83 | 13 000 | 50 |
| 2 700 | 86 | 1 200 | 100 |
| 96 000 | 75 | 22 000 | 75 |
| 6 100 | 99 | 3 000 | 67 |
| 4 900 | 88 | 6 100 | 52 |
| 66 000 | 92 | 8 400 | 35 |
| 72 000 | 88 | 3 600 | 50 |
| 43 | 49 | 49 | 43 |
| 1 287 240 | 82.2 | 1 059 870 | 44.0 |

Urban poor

According to UN-Habitat, over 1 billion people globally live in slums.⁸⁴ In developing countries, the urban poverty rate can be as high as 80 per cent in some areas.⁸⁵ In 2023, an estimated 56 per cent of the world's population lived in urban areas, with that number projected to increase to nearly 70 per cent by 2050.⁸⁶

The urban poor often lack access to safe and affordable housing, clean water, adequate sanitation, healthcare and education. This can lead to a range of health and social problems, including malnutrition and disease, as well as increasing their vulnerability to TB.

UN-Habitat Urban Indicators Database⁸⁷ provides information on urbanization, housing and human settlements, with statistics at global, regional and country levels on the urban poor, including data on slum populations and the urban poverty rate.

The World Bank⁸⁸ collects and reports data on poverty, inequality and other development indicators. Its databases provides urban poverty statistics for developing countries, as well as data on poverty reduction programmes and initiatives.

The UNDP *Human development report*⁸⁹ provides annual ranking of countries based on a range of indicators, including poverty rates, access to basic services and income inequality.

READ MORE:

84. World cities report 2022: Envisaging the future of cities
https://unhabitat.org/sites/default/files/2022/06/wcr_2022.pdf

85. Judy L. Baker "Urban Poverty: A Global View" (2008), The World Bank, Washington D.C.

86. Urban development overview
<https://www.worldbank.org/en/topic/urbandevelopment/overview>

87. UN-Habitat Urban Indicators Database
<https://data.unhabitat.org/>

88. World Bank Open Data
<https://data.worldbank.org/>

World Bank Poverty and Inequality Platform
<https://pip.worldbank.org/home>

89. The human development report 2021-22
<https://hdr.undp.org/content/human-development-report-2021-22>



— Data on the urban poor in TB high-burden countries

WHO 2022 TB HIGH-BURDEN COUNTRIES

| Countries | TB | TB/HIV | MDR/RR-TB |
|-------------------------------------|-----------|-----------|-----------|
| Angola | Y | | Y |
| Azerbaijan | | | Y |
| Bangladesh | Y | | Y |
| Belarus | | | Y |
| Botswana | | Y | |
| Brazil | Y | Y | |
| Cameroon | | Y | |
| Central African Republic | Y | Y | |
| China | Y | Y | Y |
| Congo | Y | Y | |
| DPR Korea | Y | | Y |
| DR Congo | Y | Y | Y |
| Eswatini | | Y | |
| Ethiopia | Y | Y | |
| Gabon | Y | Y | |
| Guinea | | Y | |
| Guinea-Bissau | | Y | |
| India | Y | Y | Y |
| Indonesia | Y | Y | Y |
| Kazakhstan | | | Y |
| Kenya | Y | Y | |
| Kyrgyzstan | | | Y |
| Lesotho | Y | Y | |
| Liberia | Y | Y | |
| Malawi | | Y | |
| Mongolia | Y | | Y |
| Mozambique | Y | Y | Y |
| Myanmar | Y | Y | Y |
| Namibia | Y | Y | |
| Nepal | | | Y |
| Nigeria | Y | Y | Y |
| Pakistan | Y | | Y |
| Papua New Guinea | Y | | Y |
| Peru | | | Y |
| Philippines | Y | Y | Y |
| Republic of Moldova | | | Y |
| Russian Federation | | | |
| Sierra Leone | Y | | |
| Somalia | | | Y |
| South Africa | Y | Y | Y |
| Tajikistan | | | Y |
| Thailand | Y | Y | |
| Uganda | Y | Y | |
| Ukraine | | | Y |
| United Republic of Tanzania | Y | Y | |
| Uzbekistan | | | Y |
| Viet Nam | Y | | Y |
| Zambia | Y | Y | Y |
| Zimbabwe | | Y | |
| Countries with data (49 max) | 30 | 30 | 30 |
| Total | | | |

| UN-HABITAT WORLD CITIES REPORT (2022) | | UN HABITAT (2018) (2 FEB. 2023) | WHO (2 FEB. 2023) | |
|------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------|-------------------------------------------------|
| Proportion of urban population living in slum (households) | Urban population living in slum households (2020) (thousands) | Urban population living in slums by country or area (1990-2018) | Total TB (all forms) patients notified in 2021 | TB incidence rate per 100 000 population (2021) |
| 62.6 | 13 733 | 9 476 | 63 970 | 325 |
| | | | 4 944 | |
| 51.9 | 33 619 | 29 025 | 307 561 | 221 |
| 2.3 | 170 | 3 358 | 1 696 | |
| 39.6 | 678 | | 2 368 | |
| | | | 88 099 | 48 |
| 32.7 | 4 882 | 3 422 | 22 866 | |
| | | 1 930 | 13 428 | 540 |
| | | | 593 743 | 55 |
| 44.2 | 1 708 | 1 708 | 12 152 | 370 |
| | | | 93 597 | 337 |
| 78.4 | 32 010 | 30 018 | 215 787 | 318 |
| 10.8 | 38 | | 2 049 | |
| 64.3 | 15 733 | 14 775 | 104 854 | 119 |
| | | 674 | 5 201 | 513 |
| 49 | 2 485 | 2 392 | 19 092 | |
| 60.8 | 538 | 647 | 2 505 | |
| 49 | 236 771 | 160 330 | 2 116 976 | 210 |
| 19.4 | 29 929 | 44 859 | 443 235 | 354 |
| 0.8 | 86 | 1 112 | 10 008 | |
| 50.8 | 7 609 | 6 354 | 77 854 | 251 |
| 2.4 | 57 | 189 | 5 199 | |
| 25.6 | 172 | 394 | 4 553 | 614 |
| 63.8 | 1 698 | 1 654 | 7 441 | 308 |
| 49.8 | 1 760 | 2 172 | 14 594 | |
| 17.9 | 394 | 792 | 2 823 | 428 |
| 55 | 6 583 | 8 444 | 98 485 | 305 |
| 58.3 | 9 947 | 9 404 | 65 125 | 360 |
| | | 554 | 6 864 | 457 |
| 40.3 | 2 508 | 2 882 | 28 677 | |
| 49 | 52 466 | 52 605 | 207 785 | 219 |
| 56 | 43 345 | 27 954 | 343 024 | 264 |
| | | | 30 180 | 424 |
| | | 8 396 | 26 437 | |
| 36 | 22 144 | 22 144 | 328 497 | 650 |
| | | 1 213 | 2 248 | |
| 50.6 | 1 749 | 1 936 | 17 669 | 289 |
| | 5 025 | 5 025 | 17 504 | |
| 24.2 | 9 571 | 10 059 | 181 864 | 513 |
| 17.1 | 445 | 583 | 4 299 | |
| 6.8 | 2 426 | 8 471 | 72 851 | 143 |
| 54 | 6 360 | 4 838 | 76 268 | 163 |
| | | 5 497 | 19 793 | |
| 40.9 | 9 040 | 8 021 | 87 415 | 208 |
| | 9 556 | 9 556 | 15 450 | |
| 5.8 | 2 118 | 4 670 | 78 935 | 173 |
| 48.3 | 4 023 | 4 853 | 50 825 | 307 |
| 21.6 | 1 229 | 1 579 | 16 541 | 190 |
| 39 | 37 | 42 | 6 093 017 | 9723 |



ANNEX C

Population size estimation to fill data gaps

Given the gaps in data used to inform the planning of TB programmes, it is essential that actionable data be collected on TB KVP. There are limited *quantitative data* on TB prevalence, exposure and barriers to service access for TB KVP (such as stigma and discrimination), and existing data vary greatly in quality. The way quantitative data are collected affects researchers' ability to interpret the results.⁹⁰

This Annexe provides recommendations for how to collect and analyze data from TB KVP (many of which are considered hard-to-reach for research purposes), to guide improvements in TB prevention policy, planning responses and monitoring of progress and accountability in achieving TB programme goals and objectives. Specifically, this document focuses on two important methodological topics:

1. Sampling TB KVP (especially those that lack what are known as sampling frames),
2. Estimating the sizes of TB KVP ('population size estimations').

Studies of TB KVP are usually specialized and geographically focused. Because TB KVP are often difficult to find in general

populations, sampling them through nationwide household or *cluster surveys* would be exceedingly expensive.⁹¹ In some cases, multiple surveys of KVP in different geographic areas can be extrapolated to provide approximations for national estimates of that key population.

As you review the different methods described below, keep in mind the two standard objectives for sampling TB KVP:

- to estimate the prevalence of TB,
- to measure exposure, risks, stigma, discrimination, service coverage and other factors related to TB.

The objective will impact how the population is sampled. All methods presented in this section involve active participation from TB KVP themselves, and adhere to the human rights-related principles of research: privacy, confidentiality and informed consent.

READ MORE:

⁹⁰The sampling methods described in this section are for collecting quantitative, rather than qualitative, data from KVP.

⁹¹ Kalton G, Anderson DW (1986) "Sampling Rare Populations" Journal of Royal Statistical Society Series A. 149(1):65.

1. Traditional probability

Sampling is the element of statistics concerned with the selection of individuals from a population of interest.⁹² Ideally, the goal is to collect data from a much smaller proportion of a population and, because of the way the data are collected, have the information from those data describe the entire population sampled (not just the sample). Sampling methods are classified as either probability or non-probability.

- In probability-based sampling, each member of the population has a known probability of being selected. Probability-based sampling methods include *random sampling*, *systematic sampling*, *stratified sampling* and, for KVP, can include *respondent-driven sampling* (RDS) and *time-location sampling* (TLS).
 - When implemented correctly, probability-based sampling yields unbiased estimates and has high external validity.
 - Most probability-based sampling relies on the population being able to be listed in its entirety, so that everyone has an equal chance of selection from that list.
 - The advantage of probability sampling is that *sampling errors* can be calculated (i.e. the degree to which a sample differs from the population).

- In non-probability sampling, members are selected from the population in some non-random manner. Non-probability sampling methods include *convenience sampling*, *judgment sampling*, *quota sampling* and *snowball sampling*, and it often yields biased estimates.
 - In non-probability sampling, the sampling error is unknown.

In TB high-burden countries, efforts to control TB transmission and monitor programmatic success mean that NTPs are interested in KVP, some of which are considered *hard-to-reach* or hidden with regards to sampling. Such populations include sex workers and men who have sex with men, as well as some of the groups mentioned in this guidance as TB KVP: migrants, miners, people who use drugs (PWUD) and people living with HIV (PLHIV). In addition, these subpopulations often lack sampling frames (the membership of the group cannot be comprehensively known), are rare in the population and/or belong to groups that are stigmatized and/or illegal (such that they prefer to remain 'hidden' and do not necessarily want to be identified as members of these groups). This prevents researchers from obtaining unbiased estimates of important indicators because of the difficulty of using probability sampling methods.

READ MORE:

92. Cochran W.G. (1977) "Sampling Techniques", 3rd Edition, John Wiley & Sons, Hoboken

1.1 TRADITIONAL PROBABILITY SAMPLING

Traditional probability sampling
Traditional random sampling techniques require that the population has a list of members, also known as a sampling frame. This sampling frame is used to set up the selection of participants. If possible, these sampling methods should be used in place of convenience sampling methods. Three commonly-used random sampling techniques are briefly *described below*.

1.1.1 Simple random sampling

When a sampling frame is available, the most robust methods to use are *simple random sampling* or *multilevel cluster sampling*. Using a sampling frame, a simple random sample is one in which all subjects in the frame have an equal probability of being chosen. An example of this would be to select out of a hat the names of 100 employees, from a company with 400 employees.

1.1.2 Systematic sampling

Systematic sampling relies on the target population being arranged according to some ordering scheme, and then selecting people from that ordered list at regular intervals.

For example, a mill in a certain city might have 400 employees who are migrants. If you want to sample 100 of those migrants, you will calculate 400/100 to select the *sampling interval*. This would result in selecting every fourth person on the list until the sample size is reached. Keep in mind that the list of subjects will finish before the sampling is complete so you will need to loop around to where the list started before you reach your sample size (but you will not end up sampling the same person twice).

1.1.3 Stratified sampling

Stratified sampling is used when the population has important subgroups – such as men and women, or migrants from several different countries – and you do not want your sample to include subjects from only one subgroup. All subjects are organized in their appropriate strata (for instance, migrants from country X, country Y and country Z). Each stratum is then sampled as an independent subpopulation, from which each subject is randomly selected using simple random or systematic random sampling.

1.1.4 Cluster sampling

Many TB prevalence surveys are conducted using *multilevel cluster sampling*.⁹³ Cluster sampling is useful for sampling large geographic areas or subjects from groups – for example, sampling migrant workers at several mills in a large city.

In cluster sampling groups (or clusters) are selected and then, from each cluster, individual subjects are sampled by either simple random or systematic random sampling. In some cluster surveys, all eligible subjects will be sampled from each cluster. If sampling from multiple levels of clusters – for instance, one level of clustering could be cities in a province and the next level could be factories in a city – the method is called multilevel cluster sampling.

READ MORE:

93. Tuberculosis prevalence surveys: A handbook <https://apps.who.int/iris/handle/10665/44481>

1.2 NON-PROBABILITY SAMPLING

1.2.1 Convenience sampling

Convenience sampling or purposive sampling involves sampling people who are relatively easy to find or approach. This type of sampling, much-used in qualitative research, should be avoided in the process of preparing a KVP population size estimate because it samples a select part of the population, resulting in information only specific to the subjects in the sample.

Although convenience sampling is easier to conduct than probability sampling, data collected through convenience methods produce biased samples that are not generalizable to the population from which the sample was drawn. For instance, if you were to sample workers from a migrant background as they leave their workplaces using a convenience method (e.g. interviewing those who will stop and talk with you), it may be that everyone with children is in a hurry to get home and only people without children have time to stop and talk. This would result in an unrepresentative sample.

1.2.2 Chain-referral sampling

Chain-referral sampling, also known as *snowball sampling*, relies on asking initial subjects to recruit their peers.⁹⁴ In some cases subjects who know more people are allowed to invite as many others as they can, sometimes resulting in certain types of people being overrepresented in the sample. For instance, if migrants living in city X who use drugs and go out drinking know more people, and they happen to also be more prone to risky behaviours linked to TB, then the sample may end up including more of these types of people. The interpretation of results for migrants living in city X will be skewed to those who use drugs and go out drinking, rather than to the wider migrant population of city X.

1.2.3 Institution-based surveys

These are surveys of people who are located at or through an institution – for instance, people who use drugs may be sampled via drug rehabilitation or needle-exchange programmes. Although some effort may be made to randomize the selection of those using the service, the results will still represent those who are associated with the sampled service (for example people who use services may be wealthier, have more time, or be healthier or better-educated).

READ MORE:

94. Some problems of inference from chain data
http://www.columbia.edu/itc/hs/pubhealth/p8462/misc/erickson_lect4.pdf

1.3 INNOVATIVE PROBABILITY-SAMPLING METHODS FOR TB KVP

Because KVP often do not have sampling frames, innovative probability-based sampling methods have been developed for these populations. There are two recommended probability methods for sampling hidden or highly marginalized populations: *respondent-driven sampling* (RDS) and *time-location sampling* (TLS) (also known as venue-day-time sampling). Each method should be considered in place of convenience, non-probability sampling methods.

1.3.1 Respondent-driven sampling (RDS)

RDS samples the population as a network, relying on people to recruit their peers through a systematic recruitment process. If the population to be sampled is deemed to know each other,⁹⁵ and it is possible to find a small number of members of the population to initiate sampling, then RDS may be a good option.

RDS is a modified form of chain-referral sampling, whereby people recruit their peers using unique, code-numbered coupons. This method relies on members of TB KVP belonging to social networks and being able to recruit their peers into a survey.

Recruitment begins with a small, diverse and influential group of 'seeds' (eligible respondents) selected by the researchers. Since seeds are expected to initiate recruitment, they should know a lot of other people (i.e. have large social networks). Each seed receives a set number of recruitment coupons (usually two or three) to give to their peers, who then present the coupon at a specific

physical location to enrol in the survey. Eligible recruits who finish the survey process are, in turn, given a set number of coupons to then recruit their peers. The recruited peers of seeds who enrol in the survey become wave one respondents, and the recruits of wave one respondents become wave two respondents. The population of interest needs to be large enough to avoid duplicates.⁹⁶

Peer-to-peer recruitment continues through successive waves until the calculated sample size is reached. In the end, the waves produced by effective seeds make up recruitment chains of varying lengths. The goal is to create long recruitment chains (often as many as eight or more people) made up of multiple waves. There are nominal incentives for peer recruitment and survey participation throughout the recruitment process. Incentives, along with modified peer pressure (such as someone enrolling in the survey to please their recruiter), encourage people to take part and, in turn, to influence their peers to do so as well. In RDS, coupons are used to:

1. Provide information about the study, time and location of the study site to potential recruits (with consideration for language and modality of communication).
2. Link recruits and their recruiters through a unique numbering system.
3. Track the overall progress of recruitment and manage incentive payments to participants and recruiters.

READ MORE:

95. For instance, people who use drugs buy drugs from, sell drugs to, and use drugs with each other. In addition, they have a wide range of relationships with each other (friendships, domestic relationships – roommates, spouses, lovers – and so on).

96. Use statistical packages from the Hard-to-Reach Population Methods Research Group
<http://www.hpmsg.org/>

The table below describes some of the challenges in using RDS, and recommendations on how to use it well, to sample TB KVP.

— Challenges in and recommendations on using RDS to sample TB KVP⁹⁷

| Challenges | Recommendations |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Popularity of RDS has resulted in flaunting the rigorous adherence to implementation and analysis requirements. | Review and understand relevant materials on conducting RDS; use the RDS guidance; ⁹⁸ seek out other researchers who have successfully used RDS; obtain professional technical assistance; use a written protocol that has been reviewed by experts; ensure adherence to the protocol. |
| Ensuring that recruitment chains are long within sample-size and time-frame constraints. | Ensure very long recruitment chains (ideally >8 waves); pay careful attention to the number, degree and diversity of selected seeds; ensure ample number of seeds who are at high risk for TB to capture enough relevant respondents for analysis. |
| Selection of seeds to maximize equilibrium attainment. | Conduct pre-survey research to select seeds who are broadly representative of the TB key population. |
| Determining appropriate incentives to maximize participation. | Conduct pre-survey research to determine appropriate types of incentives; assess the economic value of goods in each setting; ask TB key populations their motivation for participating in an RDS survey to plan incentives for future studies; be creative. |
| Determining the appropriate incentive to minimize repeaters. | Conduct pre-survey research to determine appropriate types of incentives; assess the economic value of goods in each setting; explain to recruiters that if they give their coupon to someone found to be ineligible due to prior participation, they will not receive a recruitment incentive for that person; be creative. |
| Managing multiple data-collection sites and staffing. | Assess the reasoning behind having multiple recruitment sites; hire staff with either personal or work experience with key populations; have designated staff roles with adequate training; develop a communication protocol to ensure cross-over among sites and to coordinate data collection. |
| Verification of membership in the sampled group. | Hire and train a 'screener' whose only job is to verify eligibility and enrol participants; use members of TB key populations as screening staff; develop screening questions to which only the key populations can accurately respond. |

There are a few RDS innovations used by HIV programmes that might be considered. For example, web-based RDS is highly efficient and effective, and referral chains can be processed quickly (reasonable estimates suggest 20 times faster than traditional RDS). Another is RDS using social media platforms.

READ MORE:

97. Adapted from: Update for sampling most-at-risk and hidden populations for HIV biological and behavioral surveillance. https://www.researchgate.net/publication/259758910_Update_for_sampling_most-at-risk_and_hidden_populations_for_HIV_biological_and_behavioral_surveillance

98. Johnston, LG and Malekinejad M. (2015) "Respondent-Driven Sampling for Migrant Populations" in Migration and Health: A Research Methods Handbook. Eds. Castaneda VMB, Rodriguez-Lai Schenker; Applying respondent driven sampling to migrant populations: Lessons from the field see Introduction to HIV/AIDS and sexually transmitted infection surveillance (Module 4): Introduction to respondent-driven sampling https://applications.emro.who.int/dsaf/EMRPUB_2013_EN_1539.pdf

99. Resource guide: Time location sampling (TLS) <https://globalhealthsciences.ucsf.edu/sites/globalhealthsciences.ucsf.edu/files/tls-res-guide-2nd-edition.pdf>

100. Adapted from Update for sampling most-at-risk and hidden populations for HIV biological and behavioral surveillance https://www.researchgate.net/publication/259758910_Update_for_sampling_most-at-risk_and_hidden_populations_for_HIV_biological_and_behavioral_surveillance

1.3.2 Time-location sampling (TLS)

TLS relies on population members being accessible at visible sites. When these sites can be completely listed and the population enumerated through a mapping exercise, then sites can be randomly selected and sampled as clusters.

TLS can be used to sample TB KVP when they tend to gather or congregate in identifiable and accessible locations, such as certain street corners, markets, transport hubs or other places.⁹⁹ The method entails identifying days and times when TB KVP congregate at these locations, constructing a sampling frame of time and location units (the primary sampling units), randomly selecting from among these and then visiting during these time and location units, and systematically reaching (often referred to as "intercepting") members of TB KVP and collecting information from those who provide informed consent. The total number of TB KVP at each location provides a sampling weight that can be

used a priori, to draw a self-weighting sample, or *post priori*, in analysis.

Data collection may take place at the venue, if space (or the venue owner) permits, at a mobile site near the location (such as a van), or by making appointments for TB KVP to come to a designated study site. The major contribution of TLS over other cluster-sampling methods is the ability to account for the fact that populations of interest are not statically associated with a particular location, and often move between multiple locations during a single day. As such, TLS allows researchers to construct a sample with known properties, make statistical inference to the larger population of location visitors, and theorize about the introduction of biases that may limit generalization of results to the target population.

The table below describes some of the challenges and recommendations in using TLS to sample TB KVP.

— Challenges in and recommendations on using TLS to sample TB KVP¹⁰⁰

| Challenges | Recommendations |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Representativeness of TB key populations found at accessible locations. | Conduct high-quality pre-survey research to understand TB key populations of interest and where they are to be found. |
| Lack of appropriate analyses based on cluster sampling. | Retain a statistician; use correct analyses; use appropriate weighting. |
| Systematic bias if locations are missed. | Assess potential for missed locations and minimize these; account for potential biases in reporting. |
| Bias if certain populations sub-groups do not attend locations | Assess potential for missed subpopulations, especially people with more illness or who experience the most significant barriers to accessing services, and minimize these; account for potential biases in reporting. |
| Venue owners may block access. | Meet with venue owners/gatekeepers before sampling; document those sites where access is not granted and collect as much information as possible about the types of individuals missed. |
| Venue owners may allow you to speak briefly with relevant people and then ask you to meet them after-hours or at another venue. | Meet with venue owners/gatekeepers before sampling; be prepared to make appointments to meet with individuals off-site; keep track of those who are approached at the venue and who do not show up for an off-site appointment. |
| Safety issues. | Develop and implement protocols to maintain the safety of staff, especially when engaging people, and respondents in the field; include security personnel on the interview team if needed. |

The type of key population and whether they have a sampling frame will dictate the most robust sampling method to use. In the table below, the most appropriate sampling method is suggested for each of the TB KVP highlighted in this document.

— Types of KVP and recommended sampling methods for each¹⁰¹

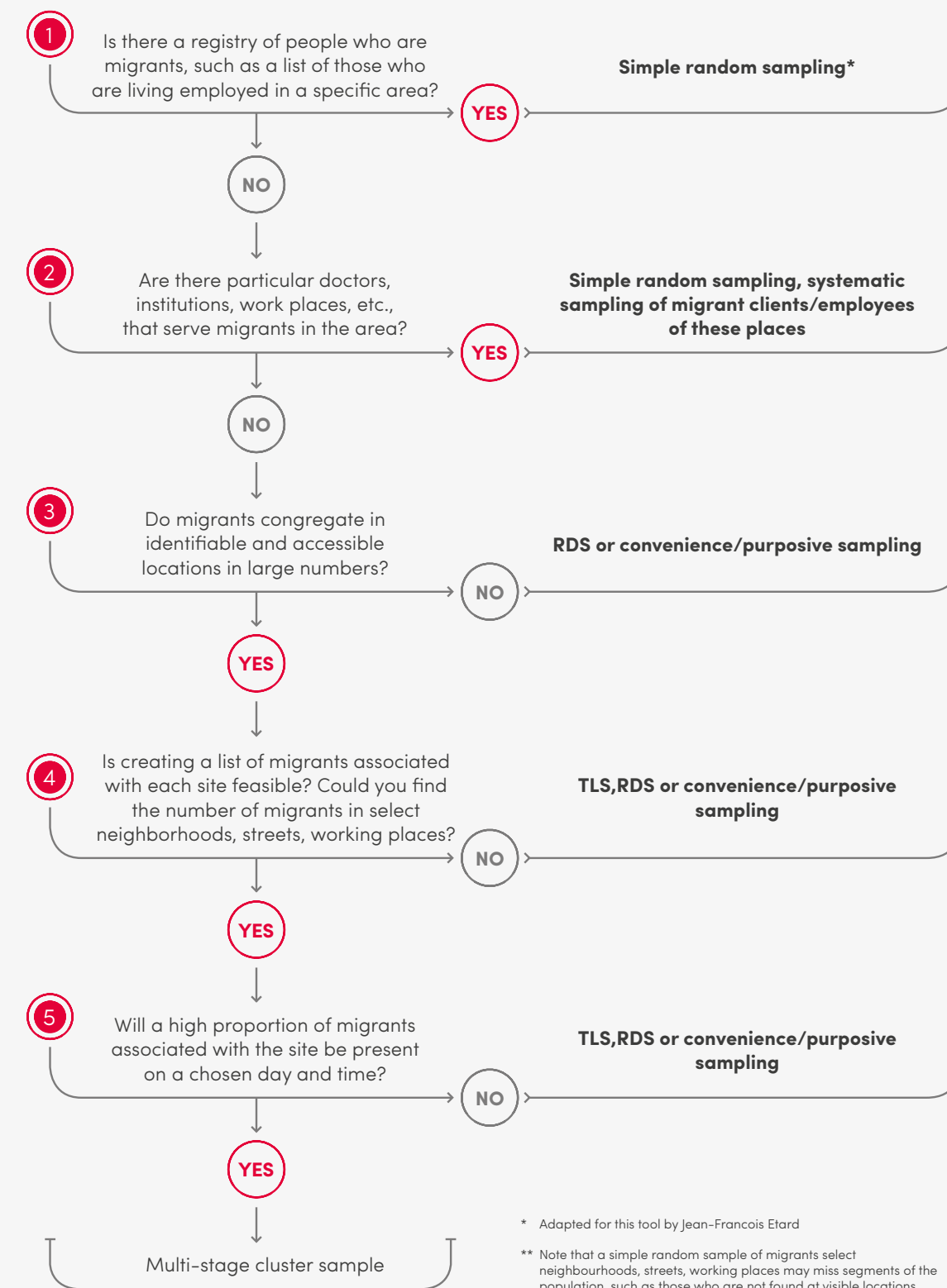
| KVP | Sampling method | Sampling method |
|------------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Documented migrants and refugees in camps (sampling frame) ¹⁰² | Sampling of all migrants (census) Random sampling | Often captured through screening when leaving or returning to a country |
| Undocumented migrants and internally displaced people (no sampling frame) ¹⁰³ | RDS TLS | Data on irregular and internal migrants and internally displaced people are largely absent |
| Miners in the formal sector or unionized (sampling frame) | Sampling of all miners (census) Random sampling | Often screened through their work in the mines |
| Miners in the informal sector or not unionized (no sampling frame) | RDS TLS | Usually sampled using convenience methods |
| Prisoners (assuming there is a sampling frame) | Sampling of all prisoners Random sampling | Often screened while in prison; qualitative methods ¹⁰⁴ |
| Detainees (assuming there is a sampling frame) | Random sampling | Often screened while in detention; qualitative methods ¹⁰⁵ |
| PWUD | RDS TLS ¹⁰⁶ | Limited data on TB |
| PLHIV | RDS TLS Random sampling (at institutions only) | Often screened for TB at clinics or hospitals (but missing those who do not visit these settings) |

Selecting the most appropriate sampling method requires assessing numerous factors such as whether there is a sampling frame or list of TB KVP, whether the population is socially networked, or whether they spend time at venues that can be mapped and approached. The figure below presents an algorithm for selecting a sampling method using the example of a migrant population.¹⁰⁷

READ MORE:

- 101. Adapted for this tool by Jean-Francois Etard
- 102. Migrants who are based in refugee camps, documented or listed at their place of work.
- 103. Internally displaced people who are not in camps, and undocumented migrants.
- 104. HIV in prisons: Situation and needs assessment toolkit https://www.unodc.org/documents/hiv-aids/publications/HIV_in_prisons_situation_and_needs_assessment_document.pdf
- 105. Ibid
- 106. Methods will vary based on what type of drug is used, or by drug-taking behaviour. For instance, if PWUD are identifiable at visible locations, it is possible to use TLS. If they are socially networked, then it is possible to use RDS.
- 107. For a complete description of all sampling methods described and further details on this figure see "Surveillance of Most at Risk Populations" <https://globalhealthsciences.ucsf.edu/our-work/epidemiological-surveillance>

ALGORITHM FOR SELECTING A SAMPLING METHOD IN AN EXEMPLAR POPULATION*



* Adapted for this tool by Jean-Francois Etard

** Note that a simple random sample of migrants select neighbourhoods, streets, working places may miss segments of the population, such as those who are not found at visible locations.

Eligibility criteria

A clear definition of the population being surveyed is essential to research design and for interpretation of the data and the estimates produced from the analysis. Eligibility criteria describe the characteristics required for inclusion in a study. Aside from *age*, other characteristics used to define eligibility for studies of TB KVP might include *sex* (biological and physiological characteristics that define males and females), *sexual orientation*, *risk behaviour*, *reference period of behaviour* (i.e. used drugs in the past six months, has been in prison for at least one month), *geographic area or residence*, *period of exposure to TB and HIV status*.

Sample-size calculations

These depend on the survey's objectives and sampling design. As noted previously, there are usually two objectives for surveying key TB populations: to estimate TB prevalence and/or to measure exposures associated with TB disease, risk or barrier.

Because TB prevalence is usually very low, even in KVP, large sample sizes are often needed to capture enough people to measure. It is recommended to only sample TB KVP that are estimated to have a TB prevalence of one per cent or higher. If the objective is to measure exposures associated with TB, or programme coverage, then the sample size may be more manageable.

Include TB KVP

Members of TB KVP should be included in survey planning, design, data collection, analysis and dissemination. Members of TB KVP have been effective as team members for studies using all sampling methods. TB KVP are essential participants in the process of developing an effective questionnaire that makes sense to the population under study. They can also

be helpful in screening out people who are not part of a TB key population being studied. Most importantly, TB KVP are uniquely knowledgeable in interpreting findings and in figuring out how to use data to design prevention, diagnosis, treatment and care programmes best suited to their needs.

Children of TB KVP

Although most surveys will focus on collecting samples and creating population size estimations from adult TB KVP, understanding disease vulnerabilities among younger members of KVP should not be ignored. Previous research has used the methods described above for sampling hard-to-reach TB KVP and successfully included participants as young as 15 years¹⁰⁸ in adult surveys; these methods have also been employed in special surveys of children (with or without parents) of TB KVP, usually as young as 10 years old.^{109,110,111}

Responding to ethical barriers and the difficulties in sampling children who may be a member of or are related to someone who is a member of, a TB KVP, demands more discussion among those researching TB-related topics about how to best (and safely) include young TB KVP in surveys that address their risk of disease. If conducting surveys only among adult TB KVP, consider including questions that measure TB risk and exposure among their children.

READ MORE:

108. UNICEF, UNESCO, UNFPA, UNAIDS (2013) "Young KVP at Higher Risk of HIV in Asia and the Pacific: Making the Case with Strategic Information" Bangkok, Thailand: UNICEF East Asia and Pacific Regional Office
<https://www.childrenandaids.org/node/632>

109. Using time-location sampling for HIV surveillance in street youth
<https://www.slideserve.com/Patman/using-time-location-sampling-for-hiv-surveillance-in-street-youth>

110. Read more: Respondent-driven Sampling: A New Method for Studying Street Children with Findings from Albania" Vulnerable Child Youth Studies 2010 Apr 7;5(1):1-11

111. Bjørkhaug I and Anne Hatley A (2009). "Utilisation of Respondent Driven Sampling Among a Population of Child Workers in the Diamond Mining Sector of Sierra Leone." Global Public Health volume 4: Issue 1.

2. Population Size Estimation methods

Estimating the size of TB KVP is essential for informing decision-makers and programme managers of the extent to which TB KVP are contributing to the TB epidemic, as well as how to target interventions, plan services and measure programme coverage in ways that are specific to these populations. For populations with sampling frames, population size estimation can simply be a count of those on the lists.

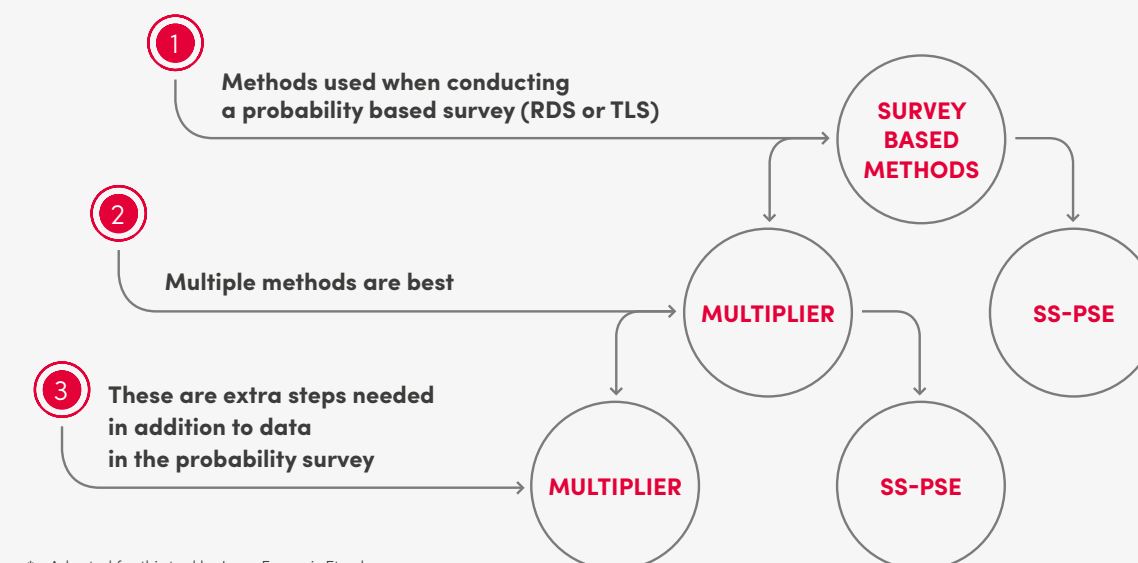
To obtain population size estimates for TB

KVP that are without sampling frames, a sample size estimation might be needed alongside a survey. Several methods can be used when conducting a probability-based survey: multiplier, successive sampling-population size estimation (SS-PSE) and capture-recapture (see figure below).¹¹²

READ MORE:

112. Population size estimation methods: Searching for the Holy Grail
<https://publichealth.jmir.org/2020/4/e25076/>

SELECTING A SAMPLING METHOD FOR A POPULATION SIZE ESTIMATE FOR TB KVP WITHOUT SAMPLING FRAMES*



* Adapted for this tool by Jean-Francois Etard

2.1 MULTIPLIER METHODS

The *unique object* and *service multiplier* methods involve overlapping independent population counts to extrapolate the overall population size.¹¹³

2.1.1 Unique object multiplier

The unique object multiplier involves distributing unique objects to members of the target key population at some time prior to initiating a probability-based survey (TLS, RDS) study.

The number of objects distributed is counted (first multiplier) and used in a calculation with the proportion of those who reported receiving the object (second multiplier) to derive a population estimation. Unique objects should consist of an item that is of minimal monetary value (so people neither give them away nor sell them) and is easy to remember. Examples of unique objects include plastic key chains, a scarf, a card with a memorable slogan and picture on it, a bracelet, a pendant or a flashlight.

Unique objects are distributed in each survey city by non-government organization (NGO) staff, hired personnel or others, to people matching the eligibility criteria. No person should receive more than one object and each person who receives an object should be told to remember the object, not to give it away or sell it. Those distributing the unique objects will record data about how many objects were distributed; how many were refused, and the reasons for any refusals. The distribution of 500 unique objects is recommended. To measure how many participants received a unique object, each participant will be asked during the survey: "Did you receive a XXXXX in the week of [dates of distribution of unique object] that was given to you by XXXX?"

2.1.2 Service multiplier

The service multiplier uses service data consisting of the unique counts of population members who receive a service in each survey city during a specified six-month period. The second multiplier is enumerated during the later probability-based survey by asking each respondent whether they had exposure to the service at least once during the same specified six-month period. Service data will include what types of services the population is likely to use. To measure how many participants received services, they will be asked during the survey: "Did you visit [specific name service here] during [specified six-month period]?"

2.1.3 Unique event multiplier

A meeting is organized (ideally by a TB KVP network), and the number of people who attend from participating key population(s) is recorded. During the later survey, participants are asked if they attended the meeting.

An example is presented in the next page of using the service multiplier method among francophone sub-Saharan African migrants in Rabat.¹¹⁴

READ MORE:

113. Unique object and unique event multipliers operations manual <https://globalhealthsciences.ucsf.edu/sites/globalhealthsciences.ucsf.edu/files/ibbs-unique-object-event-op-man.pdf>

114. Sex differences in HIV prevalence, behavioral risks and prevention needs among anglophone and francophone sub-Saharan African migrants living in Rabat, Morocco https://www.researchgate.net/publication/279630517_Sex_Differences_in_HIV_Prevalence_Behavioral_Risks_and_Prevention_Needs_Among_Anglophone_and_Francophone_Sub-Saharan_African_Migrants_Living_in_Rabat_Morocco



CASE STUDY ON THE USE OF SERVICE MULTIPLIERS IN A POPULATION SIZE ESTIMATION PROCESS

In 2013, a survey using RDS was conducted among males and females, 18 years and older, originating from francophone sub-Saharan African countries and living and/or working in an irregular administrative situation in Rabat and residing at least 3 months in Morocco. During the survey, participants were asked if they had visited a local non-governmental organization (NGO) between June 1 and December 31, 2012 (a distinct period of time just before the survey commenced). Twenty two percent of participants reported visiting this NGO. In addition, the same local NGO was asked to calculate the number of francophone sub-Saharan African migrants who had visited the NGO between June 1 and December 31, 2012. The NGO calculated that 916 francophone sub-Saharan African migrants had visited the NGO. The final calculation was $919/0.22$ resulting in a population size estimation of 4,427 francophone sub-Saharan African migrants in Rabat.

2.2 SUCCESSIVE SAMPLING-POPULATION SIZE ESTIMATE (SS-PSE)

The SS-PSE method can only be used in surveys using RDS. This method uses size data on each participant's social network, gathered during the survey, to quantify population sizes by assuming that the network size distribution of successive waves reflects a depletion of the population. The estimates use a Bayesian framework (which quantifies uncertainty about unknown quantities by relating them to known quantities) incorporating information about a 'guess' or prior knowledge of the size of the sampled population. Prior knowledge might come from expert opinion, previous surveys and other sources. The Bayesian framework also allows the computation of probability intervals; inputs needed include the size of participants' social networks, their date of enrolment and who recruited whom (standard data collected during RDS surveys). Estimates are calculated in RDS Analyst software.¹¹⁵

2.2.1 Wisdom of the crowds

These estimates are elicited by asking participants, in each of the survey cities, their best guess about the most likely highest, lowest and accurate number of members in their respective populations in each city. This method may be the least accurate of all but can help to triangulate and validate other population size estimation methods and can be used as a basis for a prior for SS-PSE.

2.2.2 NGO and expert 'best guesses'

This method uses enumeration based on the estimates of key informants and NGOs working with the survey population in each of the study cities. Key informants and NGOs at each survey site will be asked about the most likely highest, lowest and accurate number of members in the population in each survey township. This information can be used as a basis for a prior for SS-PSE.

READ MORE:

115. Available from the Hard-to-Reach Population Methods Research Group <http://hpmrg.org/rdsanalyst/>

2.3 CAPTURE-RECAPTURE

Capture-recapture, also known as a 'mark and recapture' or 'capture and release', is implemented in the following manner:¹¹⁶

- Map all the sites where members of the key population group can be found.
- Go to these sites and engage and identify (some refer to this as "tagging") all the members of the population at the site by giving them some memorable but inexpensive item (as noted previously, examples include plastic key chains, a scarf, a card with a memorable slogan and picture on it, a bracelet, a pendant or a flashlight).
- Keep a count of the number of people tagged.
- Return to the same sites a week later and retag all of the people encountered. Count the individuals who were counted in the first sample versus those who are being counted for the first time in the second sample.

Capture-recapture formula.

We recommend the following:

- $N = MT/R$
- Where:
- N = estimated total population size
- M = number of population members tagged/marked at first visit
- T = total number of population recaptured during second visit
- R = number of population members tagged/marked recaptured during second visit

There are other innovative methods, primarily used by HIV programmes, that are worth considering in specific situations with TB KVP. For example, *the Respondent Driven Sampling (RDS) adjustment to the Reverse Tracking Method (RTM)*. It is a promising methodology that combines venue mapping data with RDS data to estimate the population size (adjusted for double counting and non-attendance biases). It can be easily integrated into RDS studies, producing plausible population size estimates, and can also validate and update key population maps for outreach and venue-based sampling.¹¹⁷

READ MORE:

116. Guidelines on estimating the size of populations most at risk to HIV http://apps.who.int/iris/bitstream/10665/44347/1/9789241599580_eng.pdf

117. Paul Wesson et al, Estimating the population size of female sex workers in Namibia using a respondent-driven sampling adjustment to the reverse tracking method: A novel approach (August 2018) *JMIR Public Health and Surveillance* 5(1) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6437614/>

PEOPLE LIVING WITH HIV / PRISONERS / DETAINEES
 MINERS / PEOPLE WITH SILICOSIS / MIGRANTS / REFUGEES
 INTERNALLY DISPLACED PEOPLE / NOMADIC POPULATION
 PEOPLE WHO USE DRUGS / PEOPLE WHO USE TOBACCO
 PEOPLE LIVING IN POVERTY / PEOPLE WITH DISABILITIES
 PEOPLE WITH ALCOHOL DEPENDENCY / SEX WORKERS
 LGBTQIA+ PEOPLE / INDIGENOUS PEOPLES / CHILDREN
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