

Health Service Contracting in the Prevention and Treatment of Tuberculosis: A Scoping Review

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Abstract: Tuberculosis (TB) continues to be a worldwide health issue that demands a comprehensive and coordinated approach to management. The complexity of TB control requires cross-sector involvement, including collaboration with non-governmental organizations and the private sector. One widely applied approach is health service contracting to provide TB health services. This study aims to provide insight into the best practices of health service contracting in TB management that can be adopted to accelerate TB elimination at the national and global levels. This study used a scoping review method concerning the 2020 PRISMA Flow Diagram guidelines. Article searches were carried out systematically through SAGE Journals, ScienceDirect, PubMed, Scopus, EBSCO, and Cambridge Core databases. Articles were selected based on predetermined inclusion and exclusion criteria. A total of 10 articles were selected and analyzed to identify the contribution of health service contracting in TB management. The results showed that the involvement of the private sector, civil society organizations, and non-governmental institutions increased service coverage, reached populations that were difficult to access, and accelerated the process of detecting and treating TB cases. Several studies also reported increased case reporting, treatment adherence, and efficiency in resource use. Health service contracting is a potential strategy for strengthening the TB service system. With the involvement of various parties, this approach can strengthen the national response to TB and contribute to global efforts to eliminate TB.

Keywords: health service contracting, preventive, treatment, tuberculosis

Introduction

Tuberculosis (TB) continues to pose a major global health challenge. As reported by the WHO in its 2023 annual update, TB was responsible for an estimated 1.3 million deaths globally in both 2020 and 2021. It remains the leading cause of death among individuals with HIV, accounting for 167,000 fatalities in 2022. In that same year, around 7.5 million people were diagnosed with TB, the highest figure recorded since global TB surveillance began in 1995. Of these cases, 46% occurred in Southeast Asia, 23% in Africa, and 18% in the Western Pacific. Currently, an estimated 10.6 million people are living with active TB worldwide, including 5.8 million men, 3.5 million women, and 1.3 million children. Additionally, about 25% of the global population is infected with TB, with 5% to 10% developing active disease.¹ In Indonesia, TB incidents in 2021 reached 969,000 cases, with a death toll of 144,000. Although it had decreased, cases increased again during the 2020–2021 period. In addition, there is still a gap in case notifications, where around 25% of cases have not been reported, indicating the need to improve the detection and reporting system. Cases of drug-resistant TB (MDR/RR-TB) have also increased, adding to the complexity of handling this disease.^{2,3}

TB transmission generally occurs through airborne droplets containing *Mycobacterium tuberculosis* bacteria and can spread rapidly, especially in closed spaces. Infection can be latent or develop into active disease, depending on the body's resistance and the virulence of the bacteria. TB management requires long-term treatment with complex regimens, as well as additional challenges such as patient compliance, drug interactions, and the presence of comorbidities such as HIV.^{4–6} TB management is complex. The CDC and WHO guidelines offer comprehensive recommendations covering dosing protocols,

the use of first- and second-line anti-TB medications, potential drug interactions, handling treatment interruptions, managing treatment side effects, as well as guidance for culture-negative TB, extrapulmonary TB, TB-HIV co-infection, and special populations such as children, the elderly, pregnant and breastfeeding individuals, and those with comorbid conditions.

TB therapy aims to control the disease and eliminate transmission in all cases. Historically, anti-TB treatment regimens have involved several months of therapy, making it difficult for many patients to remain adherent. This issue is widespread and especially severe in regions with high TB rates, limited public health resources, and low awareness about TB. While clear and standardized treatment guidelines help enhance global implementation, the conventional 6-month regimen may be overly lengthy for some individuals, yet insufficient for others.^{7,8} At the global level, initiatives like the End TB Strategy aim to reduce TB-related deaths by 90% and cut the incidence rate by 80% by 2030, using 2015 as the baseline. Nationally, the Indonesian Ministry of Health has launched the 2020–2030 Tuberculosis Elimination Roadmap, setting a target to lower TB incidence to around 65 cases per 100,000 people by 2030.^{1,3}

Facing the complexity of TB management, cross-sector involvement is essential, including collaboration with non-governmental organizations and the private sector. One approach increasingly being considered is Health service contracting, which is the involvement of third parties in implementing health programs, especially for early detection, treatment, and community education regarding TB. Health service contracting is common in many middle-income countries and is increasingly common in low-income countries. In many of these countries, government-run health services are inadequate or inaccessible. Private health organizations, on the other hand, are often more extensive and sometimes well-funded by international donors. This strategy is operationalized in various ways, but at its core is a contract between the government and a non-governmental health service provider (NGP), which details the mechanisms and conditions under which the NGP must provide health services on behalf of the government.⁹

By contracting with these organizations for health services, the government can make them available to a wider range of people, including those in rural and remote areas. Health service contracting can accelerate TB control and treatment.⁹ Therefore, this article reviews the role and effectiveness of health service contracting mechanisms in TB prevention and treatment efforts based on studies conducted in various countries. This review is expected to provide insight into best practices that can be adopted to accelerate the elimination of TB at the national and global levels.

Materials and Methods

This study employed a scoping review as its research method. The process of searching and selecting articles was conducted systematically, following the guidelines of the 2020 PRISMA Flow Diagram. Literature was sourced from databases such as SAGE Journals, ScienceDirect, PubMed, Scopus, EBSCO, and Cambridge Core. To guide the search, keywords were initially identified using the PCC (Population, Concept, Context) framework. The keywords used for each PCC component: P (Population) is “TB patients OR People with tuberculosis OR Communities at risk of TB”, C (Concept) is “Outsourcing health services OR Health service contracting”, and C (Context) is “Tuberculosis control OR TB treatment OR TB prevention”. The search used keywords and Boolean operators (AND and OR) to obtain relevant results. The inclusion criteria for articles in this study were articles published within the last 10 years (2015–2025), available in full-text access, written in English, and articles that resulted from direct research, including both qualitative and quantitative studies. Meanwhile, the exclusion criteria used were articles in the form of systematic reviews, literature reviews, or editorials, as well as articles irrelevant to health service contracting in the context of tuberculosis prevention and treatment.

The search results were based on a combination of keywords. After adjusting to the inclusion and exclusion criteria, 14 articles met the requirements for further analysis in this scoping review (Figure 1). Data extraction in this study was conducted by taking primary information covering the research objectives, methods used, types of interventions *Health service contracting*target population, results obtained, as well as challenges and successes of the TB program. Next, data synthesis was carried out using a narrative and thematic approach by grouping findings based on key themes such as increased case detection, contract effectiveness, funding barriers, private sector involvement, and impacts on vulnerable groups. The results from the 14 selected articles were then compared to identify patterns, similarities, and differences, so that relevant implications for TB control policies and practices can be drawn.

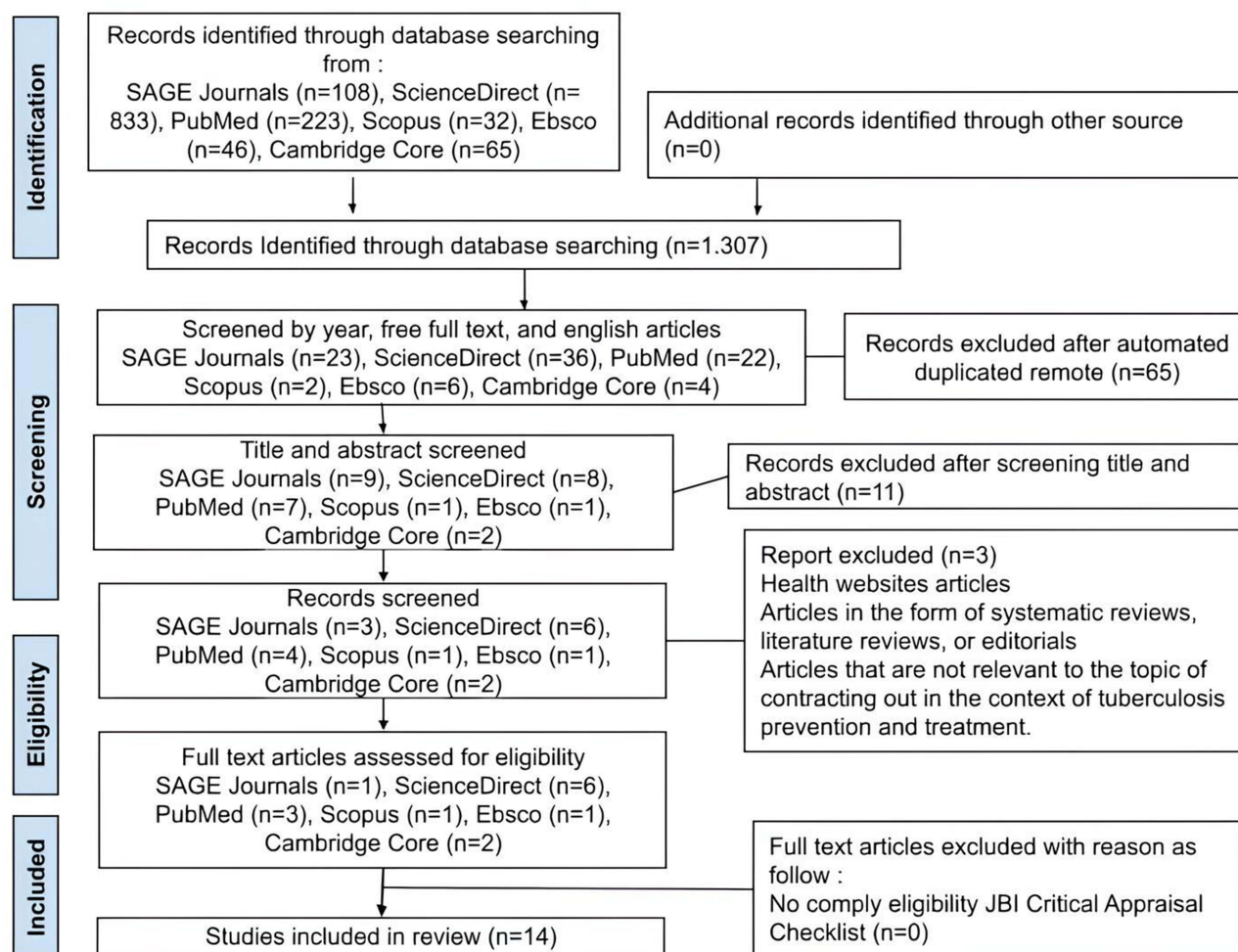


Figure 1 PRISMA Flow Diagram in this review.

Results

The following articles were obtained for analysis in this study (Table 1).

Discussion

Tuberculosis (TB) is the leading infectious cause of death globally and plays a major role in the development of antimicrobial resistance.²⁴ In 2015, the World Health Organization (WHO) introduced the END TB Strategy (2016–2035), a comprehensive framework for addressing tuberculosis. A central component of this strategy is the provision of integrated, patient-centered TB care and prevention, which emphasizes social support, enhanced community engagement, and the achievement of universal health coverage.²⁵ At the first United Nations (UN) High-Level Meeting on tuberculosis in September 2018, member states pledged to diagnose and treat 40 million individuals with TB and to provide Tuberculosis Preventive Treatment (TPT) to 30 million people by the end of 2022.²⁶ The structured implementation of Tuberculosis Preventive Treatment (TPT) is regarded as a crucial strategy for low TB-burden countries aiming to achieve TB elimination.²⁷ The World Health Organization (WHO) advises performing a situational analysis and assessing the TB burden among high-risk groups as a critical step in determining the appropriate target populations for Tuberculosis Preventive Treatment (TPT).²⁸

Table 1 Articles Resulting from Review

Author, Title, Research Method	Years	Results
Rashid et al ¹⁰ Case study	2025	Mercy Corps' PPM model has advanced Pakistan's End TB goals by increasing private sector engagement, improving case detection, and strengthening treatment adherence in underserved areas.
Dadu et al ¹¹ Descriptive	2024	PASS to End TB showcases effective collaboration between technical and financial partners to support national TB programs, adapt responses to local epidemiology, and build young professionals' capacity through expert mentorship.
Vasiliu et al ¹² RCT	2021	This study shows that community-based interventions can improve child contact screening and TB preventive therapy management, strengthening childhood TB prevention and care in high-burden, resource-limited settings.
Go et al ¹³ Descriptive	2018	Korea's TB control success stems from strong political will, strategic resources, clear policies, and improved reporting, patient management, and contact investigations, reducing incidence and preventing spread.
Lahiri et al ¹⁴ Observational study	2024	To strengthen TB surveillance, programs should complement Passive Case Finding with reinforced Active and Intensified Case Finding for early diagnosis and treatment. Though OPD-based screening has low detection rates, its low cost and easy implementation make it practical for high-traffic hospitals.
Kim et al ¹⁵ Descriptive	2025	Among 4,692 teachers screened, 20% had LTBI, increasing with age. Of 938 diagnosed, 31% started TPT, with a 77.7% completion rate—highest for 4R (87.5%) and 3HR (77.0%). Success was driven by organized processes, including education, designated treatment sites, and side effect management.
Zwerling et al ¹⁶ Analytic	2024	Community-wide screening reduced TB cases and was highly cost-effective, with an ICER of \$25.10/QALY (95% range: cost-saving to \$15,874) and >99% probability of cost-effectiveness at the \$50,000/QALY threshold.
Raviglione & Rieder ¹⁷ Descriptive	2021	Effective global TB control needs government–NGO collaboration, coordinated science, strong policies, community support, and WHO leadership. The Union should enhance its scientific role and coordinate NGOs to work in synergy with the WHO and researchers.
Alyaquobi et al ¹⁸ Descriptive	2025	Oman launched universal LTBI and TB screening in 2018, adding IGRA testing in 2024 after a post-COVID TB surge. Efforts now focus on sustained screening with digital systems, advanced diagnostics, public-private partnerships, and high-capacity testing to boost adherence and cut TB rates.
Bonnet et al ¹⁹ Cluster randomized trial	2023	From Oct 2019–Jan 2022, 899 TB patients identified 2,894 child contacts. Screening rates were higher in the intervention group (81.9%) vs control (47.3%), and TPT completion was also higher (79.9% vs 61.7%; OR 3.06, 95% CI 1.24–7.53).
Zhang et al ²⁰ Descriptive	2024	TB IPC policies and practices showed the most significant improvement early in implementation and did not vary consistently by facility characteristics. The training component of this project helped improve the capacity of health workers to manage the risk of TB transmission.
Doan et al ²¹ Descriptive	2019	The model projected that current strategies would not achieve Bulgaria's TB elimination targets. Discontinuing NGO activities or the "Open Doors" program would significantly increase TB incidence and mortality. Short-course MDR-TB treatment could reduce MDR-TB mortality by over 20% and be cost-saving, while shifting eligible patients to ambulatory care would save costs without affecting TB burden. Combining several interventions would lower mortality but still fall short of End TB Strategy targets.
Dewi et al ²² Descriptive	2016	The study found that early detection, timely initiation of treatment, patient-centered care, and strengthening healthcare systems significantly reduce TB transmission and mortality. Community engagement and consistent monitoring were identified as critical factors in achieving sustainable TB control.
Salve et al ²³ Descriptive	2018	The study demonstrates that strengthening early diagnosis, enhancing access to treatment, promoting patient adherence, and incorporating community-based approaches are crucial in reducing TB incidence and mortality. Collaborative efforts between healthcare providers, governments, and communities significantly enhance TB control outcomes.

The strategy modelling to achieve tuberculosis elimination by 2030 identified five central interventions that are:

- Achieve 80% LTBI treatment coverage by 2030 to manage latent TB effectively.
- Expand screening in high-risk groups and improve access to TB services for hard-to-reach populations.
- Ensure bacteriological confirmation for all suspected TB cases by 2030.
- Use rapid molecular testing (TCM) for 80% of TB suspects by 2030.
- Boost funding and resources to enhance TB service quality and treatment success, including for drug-resistant TB.²⁹

The involvement of various sectors, including health service contracting or third-party participation in TB prevention and treatment programs, plays a significant role in achieving the WHO's TB elimination targets. The health services contracting approach can enhance service quality by applying improved clinical standards, providing training for partner health workers, and strengthening supervision by contracting bodies such as governments or private institutions.

Based on a review of 14 articles, various TB prevention and treatment programs were found to have been developed in several countries through the following health services contracting mechanisms (Table 2).

Pakistan has implemented Public-Private Mix (PPM). In the context of tuberculosis (TB), the public-private mix (PPM) refers to a collaborative approach that brings together public sector entities such as government health services and hospitals, and private sector players, including private clinics, independent physicians, hospitals, pharmacies, and laboratories, to strengthen TB control efforts.^{30,31}

The Public-Private Mix (PPM) TB program in Pakistan has significantly increased private sector TB case notifications, from 22% in 2018 to 39% in 2023, with over 375,000 patients reached and a treatment success rate of 93%. This success has been driven primarily by the involvement of over 13,000 general practitioners (who account for 71% of private sector cases), innovations such as the “Riders for Health” specimen transport system that improves diagnostic accuracy, the implementation of TB Screeners in major hospitals that doubles case detection, and the use of mobile camps to reach remote communities. However, the program also faces several challenges, including weak compliance by private providers with mandatory TB notification, low bacteriological confirmation rates (only 37%) due to limited molecular testing, minimal implementation of TB Preventive Treatment (TPT), and a heavy dependence on donor

Table 2 Strengths and Weaknesses of Health Services Contracting Strategy

Health Services Contracting Strategy	Strengths	Weaknesses
Cross-sector collaboration (Public-Private Mix / NGO involvement)	• Expanded service coverage • Increases case notification • Accelerate detection and treatment	• Weak coordination • Varying service standards • High dependency on external donors
Enhanced case detection and active screening	• Earlier diagnosis • Faster treatment initiation • More effective prevention of transmission	• Limited resources • Low bacteriological confirmation • Inconsistent patient adherence
Community-based approaches	• Reduces access and cost barriers • Improves awareness and treatment adherence • Strengthens local networks	• Limited workforce capacity • Low incentives • Weak recording systems and poor integration with health services
Social support and incentives	• Increases long-term treatment adherence • Provides additional motivation for patients and health workers	• Dependent on external funding • Difficult to sustain if donor support declines
Role of policy and domestic funding	• Strengthens service integration • Ensures greater sustainability • Promotes more equitable access	• Weak implementation if policies are inconsistent • Domestic funding is often limited • Risk of reverting to donor dependence

funding that threatens long-term sustainability. These challenges are largely due to limited modern diagnostic facilities, weak policy enforcement, provider and patient resistance to TPT, and a lack of domestic funding.^{32,33}

India's Public-Private Mix (PPM) program for TB control has demonstrated success, with increased involvement of the private sector, including physicians, hospitals, and civil society organizations, leading to greater public access to diagnostic services, standard treatment, and referrals. This collaboration has also strengthened the national case reporting system and helped increase public awareness and trust in TB services. However, the program faces several challenges. Relationships between actors are often complex and unequal, with the public sector holding greater control while private providers feel undervalued or under-incentivized. Coordination and communication between the private sector, NGOs, and the government are not always smooth, leading to duplication of services and even loss of patients from follow-up. Furthermore, limited financial incentives and high administrative burdens discourage some private providers from fully participating, and uneven implementation across regions has resulted in varying program outcomes. The program's success stems from multisectoral collaboration that expands service coverage and reduces stigma, while its failure stems from structural barriers, inequitable relationships, and weak coordination and ongoing support.

In addition to Pakistan and India, Europe is also implementing the PASS program. The PASS (Prevention and Systematic Screening) program implemented in Europe is a WHO–USAID initiative to accelerate TB elimination by strengthening systematic screening and providing TB preventive treatment (TPT) to high-risk groups such as household contacts, people living with HIV, migrants, prisoners, and drug users, and is supported by cross-country collaboration, training of health workers, and the use of digital innovations such as artificial intelligence; this program has succeeded in strengthening country capacity in TB detection and prevention, but has still not achieved the established treatment and prevention targets due to the high burden of MDR-TB, service disruptions due to the COVID-19 pandemic and armed conflict, limited domestic funding, low integration of TB services with other health sectors, as well as constraints on the availability of new drugs and a lack of trained health workers to carry out TPT optimally.

A community-based tuberculosis program in Uganda has shown notable success in improving childhood TB control by increasing screening coverage, strengthening referrals, and enhancing parental awareness through the involvement of community health workers and networks. This approach enabled up to 81.9% of child household contacts to be screened compared to 47.3% in facility-based care, with preventive therapy completion rates reaching 96.2% versus 76.2% in the control group. These achievements were largely due to home visits that reduced barriers such as transportation costs and waiting times while also identifying unreported child contacts. Nonetheless, significant challenges remain, including low overall detection of active TB (around 0.5%), limited follow-up of symptomatic children due to lack of transport support, parental refusal to continue preventive therapy, weak recording systems, insufficient resources and incentives for health workers, inadequate funding, and poor access to modern diagnostics in remote areas where diagnosis still relies on clinical symptoms. Moreover, the program has not been fully integrated with broader child health services such as immunization and nutrition, which limits its early detection potential. Thus, while the community-based approach effectively increases awareness, access, and adherence, structural barriers in health infrastructure and service integration prevent it from reaching its full potential.³⁴

Korea's TB control program has significantly reduced TB incidence through strong national policies, active screening of at-risk groups, increased diagnostic and treatment capacity, including TPT for close contacts, and support from a national health insurance system that ensures patient access to TB services. This success demonstrates strong political commitment and strong service integration between hospitals, communities, and the health system. However, the program also faces limitations, as Korea still has the highest TB rate among OECD countries, a significant burden of MDR/XDR-TB, high rates of cases in the elderly population due to reactivation of latent infections, and social stigma that reduces treatment adherence. Furthermore, there is a gap between national policy and local implementation due to resource and logistical limitations. While strong policy and funding support are key to this success, limitations arise from demographic factors, drug resistance, social stigma, and implementation challenges on the ground.

In addition, South Korea also implemented a latent tuberculosis infection (LTBI) screening program for school-teachers in 2018. It successfully recruited 4,692 participants with an LTBI prevalence rate of 20% and achieved a fairly high preventive treatment (TPT) completion rate of 77.7% among those who initiated therapy, thanks to a comprehensive process involving initial education, informed consent, examinations at designated clinics and hospitals, and good side

effect management. However, the program's failure was seen in the low treatment initiation rate, with only 31% of teachers diagnosed with LTBI initiating therapy, leaving most individuals with LTBI without full protection from progression to active TB. This success was made possible by the support of national policies through the "TB-Free Korea Plan" program, strong coordination between institutions such as the KDCA, the Ministry of Education, schools, and full funding for screening and treatment. However, the obstacles that led to failure were mainly related to the asymptomatic nature of LTBI, which reduces patient motivation to start therapy, concerns about drug side effects, and challenges in maintaining long-term adherence to preventive treatment.

India's outpatient TB screening program (OPD-based intensified case finding) actively inquires about TB symptoms in patients attending polyclinics, even if their initial visit was not for TB. This approach has increased TB case detection by identifying symptomatic patients previously missed by passive methods, while simultaneously strengthening the capacity of health workers to more systematically identify and refer cases. This success is particularly evident in the increase in additional cases diagnosed earlier. However, the program faces several limitations, including low laboratory confirmation rates due to limited access to more accurate molecular tests, increased workload and resource requirements at health facilities, and patient compliance issues due to some suspected TB patients not returning for follow-up examinations. Furthermore, the program's coverage remains limited to select OPDs, thus not reaching the entire high-risk population. The program's success stems from the integration of active screening into routine services and staff training, while its limitations stem from resource constraints, uneven diagnostic infrastructure, and challenges with patient behavior in continuing examinations and treatment.

Canada's TB control program has successfully reduced TB rates in the general population through a universal health system that provides free diagnosis and treatment, with a success rate of drug-sensitive TB therapy exceeding 80%, thus suppressing community transmission. However, the program still faces serious limitations, as TB incidence remains disproportionately high among Indigenous peoples and immigrants from high-TB burden countries, while prevention strategies such as treatment for latent infection (TPT) have not been optimally implemented. This failure is primarily due to socio-structural factors such as crowded housing conditions, limited access to services in remote communities, socio-economic inequalities, and the impact of colonialism that exacerbates the vulnerability of certain groups. Therefore, despite the success of medical interventions, TB elimination in Canada is hampered by unresolved social root causes.

Collaboration between the government and non-governmental organizations (NGOs) in tuberculosis control has proven to have positive impacts, particularly in improving case detection, expanding treatment coverage, and reaching marginalized communities and remote areas often difficult to reach by the government health system. Through NGO involvement, patients receive not only medical services but also additional support in the form of education, counseling, and nutritional assistance that encourages treatment adherence. This synergy also strengthens the capacity of the national program by integrating formal, structured government policies with the flexibility of NGOs on the ground, closer to the community. However, the program also faces several limitations, including suboptimal coordination leading to overlapping activities, gaps in service quality between NGOs due to differing standards, high dependence on donor funding that threatens long-term sustainability, and weak data integration that hinders comprehensive TB case monitoring. The program's success is due to the shared commitment and complementary approaches between the government and NGOs, while limitations arise from structural issues, weak integration systems, and unaddressed funding challenges.

A latent tuberculosis (LTBI) screening and treatment program for migrants in Oman has successfully increased early TB detection using IGRA tests, which are more sensitive than conventional radiology examinations. This success is further supported by the provision of free, short-acting treatment regimens (3 months of rifampin-isoniazid) through primary care, along with multilingual education and a hotline, which encourages adherence and potentially reduces the risk of long-term transmission. However, the program has not been fully successful due to significant challenges, such as high migrant mobility that makes follow-up difficult, limited laboratory personnel and space, and low motivation of LTBI patients who feel well to complete therapy. Furthermore, diagnostic limitations due to the lack of a gold standard test to determine who will progress to active TB make it difficult to measure the program's impact on reducing TB incidence. Successes have been attributed to systematic innovation, government regulatory support, and free access, while limitations arise from structural and technical factors and the dynamic nature of the migrant population.

A continuous quality improvement program for tuberculosis infection prevention and control (IPC) in Chinese healthcare facilities has been shown to significantly improve the implementation of IPC practices, as evidenced by a 45% increase in composite scores, with the greatest improvements in the administrative, environmental, and respiratory protection components. This success was particularly pronounced in the first six months due to intensive training, ongoing mentoring, and the adaptation of the TB BASICS tool, which was later integrated into national guidelines. However, the program also has limitations, including slow improvement after six months due to the significant infrastructure investment required by some IPC measures, such as ventilation improvements. Not all controls could be fully implemented even after 18 months. The study was conducted only in a dedicated TB hospital, making the results difficult to generalize to general hospitals. Furthermore, the program did not directly measure the impact on TB transmission, and there were sustainability challenges due to limited funding and resources. This suggests that success was achieved thanks to strong system support, training, and supervision, while its limitations were more influenced by structural, financial, and limited implementation scope.

Bulgaria's TB control program has proven successful in reducing the incidence rate by nearly 50% in a decade, from 39.9 per 100,000 in 2010 to 19.9 per 100,000 in 2019. This success was supported by strategic investments in laboratory system modernization, including the use of GeneXpert and rapid resistance testing, as well as community-based programs that expanded access for vulnerable groups such as the homeless, migrants, Roma communities, and people living with HIV. Support from the Global Fund, along with the government, has also played a crucial role in strengthening service capacity and ensuring the sustainability of most interventions. However, the program still faces several limitations. Many key activities, particularly those reaching marginalized groups, remain heavily dependent on international donor funding, jeopardizing their sustainability when support declines. Furthermore, drug resistance (MDR-TB) remains a significant challenge, requiring long-term, costly therapy. Inequitable access to health services, particularly in rural areas, along with stigma and socioeconomic barriers, also prevent optimal coverage for vulnerable populations. This shows that Bulgaria's success in reducing TB rates is mainly due to external financial support, diagnostic modernization, and community interventions, while its limitations are more influenced by structural factors such as dependence on donors, service gaps, and the complexity of MDR-TB control.^{25,31,33}

Peru's TB control program has demonstrated significant success by combining a medical approach with social interventions that target key determinants of health, such as poverty, poor nutrition, and housing conditions. Through the involvement of community health workers and multisectoral collaboration, the program has improved case detection, accelerated treatment initiation, and strengthened patient adherence. Peru has also pioneered the management of MDR-TB by providing second-line drugs, a more structured treatment system, and socioeconomic support for patients, making its model often cited as a global example. However, limitations remain that hinder the program's full effectiveness. Socioeconomic factors such as poverty and overcrowding continue to increase the risk of transmission, while stigma and discrimination discourage some patients from seeking or completing therapy. Furthermore, access to health services in remote areas remains limited, and although MDR-TB is being better managed, treatment remains lengthy, expensive, and fraught with side effects. Sustainable funding is also a challenge, as some interventions rely on external support. While successes are attributed to a holistic approach that empowers communities and involves sectors beyond health, failures stem from structural barriers, social inequalities, and limitations in an unequal service system.

Thus, the experiences of these countries demonstrate that the success of TB control programs depends heavily on a combination of medical interventions, social support, cross-sector collaboration, and sustained political commitment and funding. Despite numerous positive achievements, such as increased case detection, successful therapy, and expanded service coverage for vulnerable groups, nearly all programs still face the same challenges: structural barriers, service gaps, drug resistance, and limited domestic resources and funding. This confirms that TB elimination cannot be achieved solely through a clinical approach but requires an integrated strategy that addresses the social, economic, and systemic roots underlying the high TB burden across various contexts.³³

To reduce the burden of tuberculosis (TB), policymakers and practitioners need to take comprehensive and sustainable steps. First, it is crucial to strengthen the integration of TB services with other health services such as HIV, immunization, and nutrition so that detection and prevention can be carried out simultaneously and more efficiently. Second, access to modern diagnostics such as rapid molecular tests (eg, GeneXpert) must be expanded to remote areas to ensure more accurate diagnoses and faster

initiation of treatment. Third, cross-sector collaboration through the Public-Private Mix (PPM) and partnerships with NGOs, communities, and the private sector needs to be strengthened, along with the provision of equitable incentives for service providers. Fourth, policies should focus on high-risk groups such as children, household contacts, people living with HIV, migrants, and the poor by conducting active screening and providing TB preventive therapy. Fifth, domestic funding must be strengthened to eliminate dependence on international donors and allocated to incentives for health workers, facility expansion, and drug availability. Furthermore, the use of digital technologies, such as patient monitoring applications, community-based specimen transportation, and artificial intelligence, can improve therapy adherence and case reporting. Finally, social determinants of health, such as poor nutrition, crowded living conditions, stigma, and discrimination, must be addressed through social support, counseling, and community education, so that patients have a conducive environment to complete treatment.^{32,34,35}

Conclusion

Health service contracting for TB services expands access, especially in areas with limited public health facilities, by involving private providers and community organizations. This approach improves case detection and treatment adherence while enhancing service quality through better standards, training, and supervision. It is particularly effective in resource-limited countries, increasing coverage and reaching vulnerable populations. Success depends on strong policies, effective monitoring, and institutional capacity, requiring close coordination between governments and local partners to achieve sustainable impact.

Policymakers need to strengthen the integration of TB services with other health programs (HIV, immunization, nutrition), expand access to modern diagnostics to remote areas, and enhance multisectoral collaboration through partnerships with the private sector, NGOs, and communities with equitable incentives. A primary focus should be placed on high-risk groups through active screening and preventive therapy, with sustainable domestic funding to avoid donor dependence. The success of outsourcing depends on strong political commitment, cross-sector coordination, clear clinical standards, effective monitoring systems, and a flexible, community-based approach. Future research should evaluate the effectiveness of long-term contracts, cost-effectiveness analyses, digital technology integration, socio-cultural factors influencing adherence, MDR/XDR-TB control strategies, the best incentive models, and the impact of TB integration with primary health care.

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