

OPTIMISING INVESTMENT IN ROMANIA'S TUBERCULOSIS RESPONSE

This policy brief summarizes the findings of an allocative efficiency analysis and mathematical modeling effort using the Optima TB Model (<http://optimamodel.com/tb>), undertaken to support the Government of Romania in its national tuberculosis (TB) response.

The full report can be accessed at (<https://openknowledge.worldbank.org/handle/10986/32583>)

INTRODUCTION

In order to meet strategic TB targets, and to maximise what can be achieved with available TB resources, it is important to **assess the best funding allocations across the different TB interventions**. By considering both disease burden and defined objectives, an **optimal allocation distributes budgets in the most efficient way across interventions, using evidence on intervention costs and effectiveness**. The World Bank in collaboration with other partners has supported disease-specific allocative efficiency studies in more than 40 countries. TB allocative efficiency studies generally try to answer the question, “How can TB funding be optimally allocated to the combination of TB response interventions that will yield the highest impact?”

RATIONALE FOR A TB ALLOCATIVE EFFICIENCY ANALYSIS IN ROMANIA

Despite significant progress in many aspects of its TB response, Romania continues to experience the largest number of new TB infections in the European Union. Nationally, the TB incidence rate has been on a downward trajectory since 2002. In 2015 there were 15,183 notified TB cases, of which only 3.9% were drug-resistant. However, poor treatment outcomes for drug-resistant TB remain a significant challenge. In 2014, success rates for people receiving second-line treatment for MDR-TB were only 44%. Similarly, success rates for people receiving second-line treatment for extensively drug-resistant (XDR) TB were only 16% in 2014. Opportunities exist to significantly improve these outcomes with new treatment regimens including drugs such as Bedaquiline and Linezolid.

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This study aims to highlight opportunities to maximise the impact of TB spending in Romania by addressing the following questions:

1. **What is the epidemic trajectory of TB in Romania?**
2. **What is the likely impact of meeting national and international care cascade targets on the TB epidemic?**
3. **How can the TB treatment cascade be improved and resource allocation be optimized?**

The key findings from the analyses are detailed below.

KEY RESULTS

KEY MESSAGE 1: A large number of latent TB infections sustains the TB epidemic in Romania. Although diagnosis and treatment of active TB have immense benefits for patients, they will have limited impact on TB incidence.

Under current conditions, Optima TB estimates that the incidence of TB will steadily fall from a rate of 82 per 100,000 in 2015 to 65 per 100,000 by 2035. Optima TB estimates that there were 6.3 million latent TB cases in Romania in 2015 and the delayed activation of so-called 'late-latent' infections remains a key driver for active-TB incidence. The prevalence of latent TB cases is increasing in the 65+ population, likely due to the aging of people who have lived through periods of very high TB incidence and may carry latent TB infections for many years. Latent TB prevalence is projected to stabilise around 2020 in this older population, and to be stable or to decrease slightly across all other populations until 2035.

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Optimised allocations of TB expenditure are not projected to have a large impact on TB incidence. This is largely because TB incidence is primarily driven by people progressing to active TB from the large pool of latent-TB infections. As the national TB programme is focused on diagnosis and treatment of active TB, the interventions included in our analysis do not affect progression rates from latent-TB to active-TB. Reducing the incidence of TB will likely require broader strategies to address the social determinants of health, such as poverty levels, housing conditions and nutrition, which significantly impact progression to active TB.

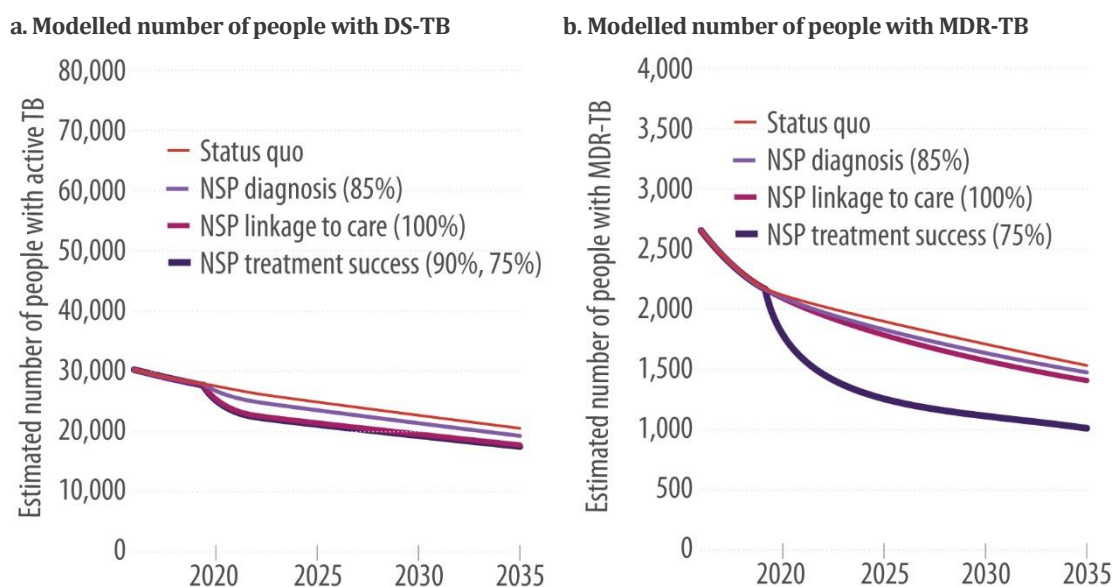
KEY MESSAGE 2: By meeting national care cascade targets, Romania could reduce the total number of active TB cases by up to 17% by 2035. By meeting national targets for MDR-TB, Romania could achieve a 34% reduction in the total number of MDR-TB infections.

A scenario analysis was conducted to investigate the potential impact of reaching 2020 National Strategic Plan (NSP) targets on key TB indicators:

- **TB screening and diagnosis:** The NSP aims to diagnose 85% of incident TB cases by 2020
- **TB treatment initiation (linkage to care):** The NSP aims for 100% of diagnosed cases to be linked to care
- **TB treatment outcomes:** The NSP aims for overall treatment success rates of 90% of TB patients on treatment. Additionally, the NSP targets treatment success for 75% of MDR-TB cases.

The results from the scenario analyses of the total number of active-TB infections are shown in **Figure 1ab** below. Meeting and sustaining the aforementioned 2020 NSP care cascade targets is projected to yield reductions in the total number of active TB cases of up to 17% by 2035. Similarly, meeting and sustaining the 2025 STOP-TB care cascade targets (diagnosis of 90% of new cases, treatment initiation of 100% of diagnosed cases, treatment success in 90% of treated cases) is projected to yield reductions in the total number of active TB cases of up to 12% by 2035 (detailed results available in full report).

Figure 1ab Modelled impact on the total number of active-TB infections of meeting NSP care cascade targets (2015–35)



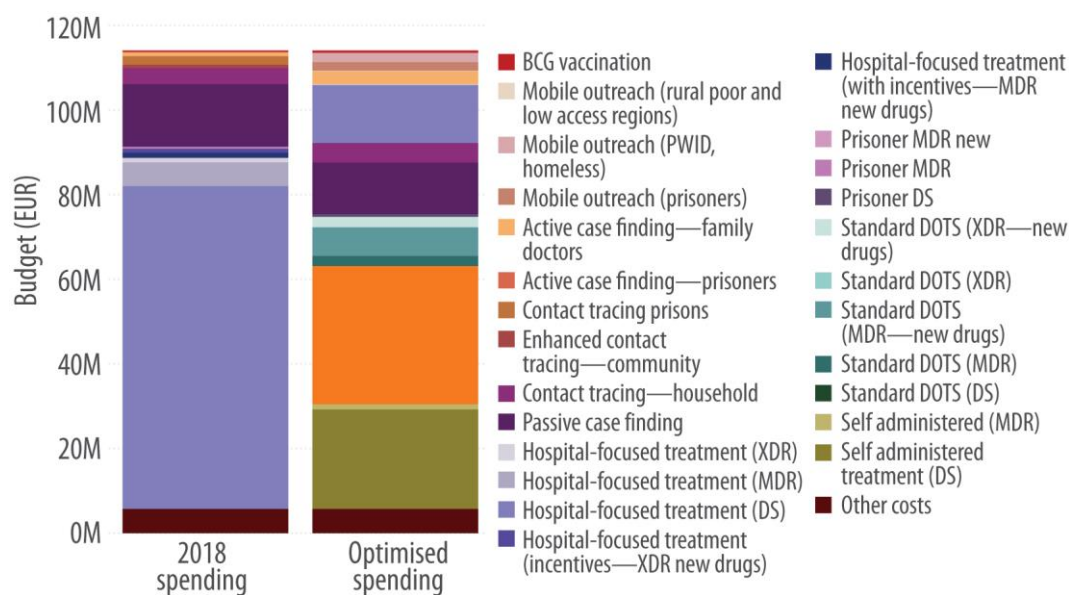
Source: Optima TB model analysis for Romania.

KEY MESSAGE 3: An optimized allocation of resources could result in a 45% reduction in active TB cases and a 40% reduction in TB deaths by 2030.

This analysis estimated that TB expenditure in Romania amounted to approximately EUR 115 million in 2018, comprised mainly of health insurance contributions (49%) and state funding through the Ministry of Health (40%). The analysis then determined the **mathematically optimal funding allocations** for Romania's National TB Programme (Figure 2). The optimal allocation aims to **simultaneously minimise the cumulative number of new active-TB infections, the total number of active-TB infections and TB-related mortality between 2018 and 2030**. These were modelled as combined optimisation objectives. An optimal allocation of TB funding would increase funding for case finding programmes, reduce hospital-focused treatment and increase funding for DR-TB drug regimens containing new drugs. For detailed results, see Table 11 in the full report.

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Figure 2 Optimal allocation of current TB expenditure to simultaneously minimise cumulative TB incidence, prevalence and deaths between 2018 and 2035 in Romania



Source: Optima TB model analysis for Romania.

Notes: 2018=base year (current allocation); Optimised budget: It was assumed that the budget of EUR 115 million that were available for TB-related programmes in 2018 would remain available on an annual basis up to 2035.

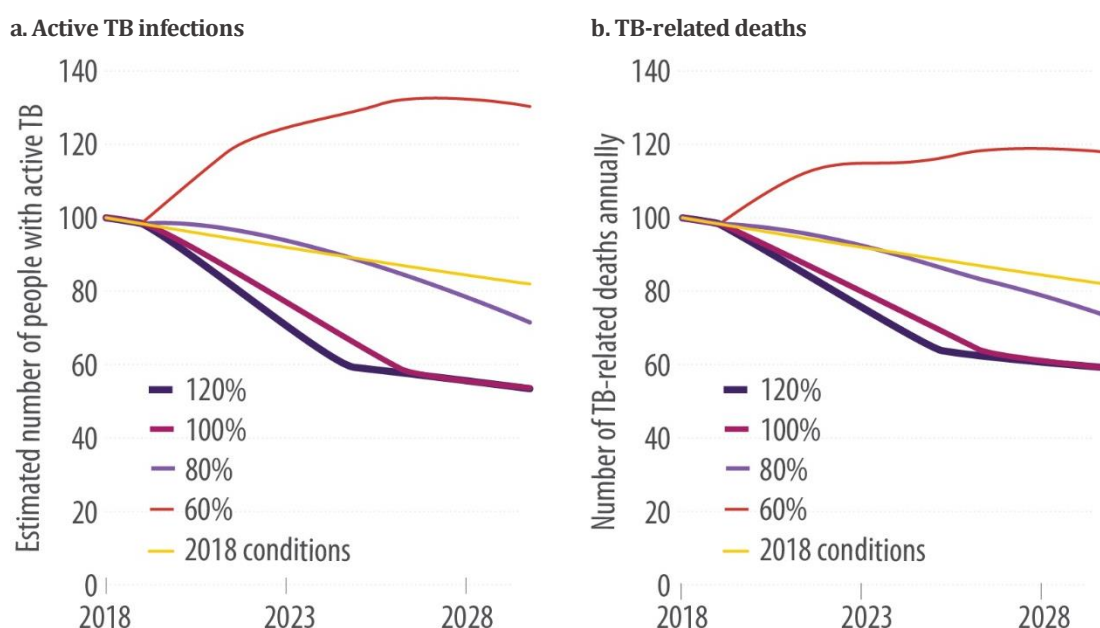
KEY MESSAGE 4: In order to make progress in Romania's TB response, it is imperative that current expenditure is maintained.

The analysis also explored the optimal investment pattern for **different levels of spending (Figure 3ab)**. While the optimised allocation of current expenditure is projected to yield significant gains, there are diminishing marginal returns to spending over 100% of the budget. Reductions in TB spending to 80% of current levels, if optimally allocated, could result in a similar epidemic trajectory to those currently observed under baseline conditions in Romania. Reductions in TB spending to 60% of current levels would have a significant negative impact.

Given the context of TB financing in Romania, it is not guaranteed that any savings from reduced hospitalisation would be reallocated to other TB expenditure. An optimal allocation of current expenditure involves reduced hospitalisation for TB treatment, which reduces costs without affecting outcomes. These savings amount to approximately 20% of total expenditure. Therefore, an optimisation of 80% of current expenditure was conducted to see the effect on conclusions. Under this reduced budget, active case finding and second-line drugs for XDR TB are too expensive to be part of the optimal allocation. As such, to maintain or improve Romania's TB response, it is imperative that current expenditure is maintained and any savings from particular budget lines are reallocated to cost-effective TB diagnosis and care interventions where possible.

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Figure 3ab Modelled impact of optimised allocations on the number of active TB infections and TB-related deaths under different amounts of spending, Romania (2018–30)



Source: Optima TB model analysis for Romania.

Notes: 2018=base year (current allocation); Optimised budget: It was assumed that the budget available for TB-related programmes in 2018 would remain available on an annual basis up to 2035. Different expenditure amounts refer to proportions of the 2018 level of spending.

RECOMMENDATIONS

A significant positive health impact could be achieved by sustaining 2018 TB financing of EUR ~115 million and allocating that funding optimally. An optimal funding allocation includes:

1. Reduced unnecessary hospitalisation for both DS-TB and DR-TB patients

- Reducing unnecessary hospitalisation, in line with WHO recommendations, will reduce costs without affecting outcomes, provided standard directly observed treatment (DOTS) is in place
- This could free up to 20% of current funding for other uses
- Potential further benefits exist, such as reduced nosocomial transmission and a reduced economic impact on patients

2. Build upon high success rates for DS-TB by using DOTS and ambulatory treatment

- Using a combination of DOTs and ambulatory treatment after a reduced initial hospitalisation period could reduce the cost of DS-TB treatment by up to EUR 20 million
- Both case detection and treatment success rates for DS-TB in Romania are among the highest in the region
- Improvements in outcomes are possible from increased adherence due to use of DOTs, which could be combined with small financial incentives for patients

3. Improve DR-TB treatment outcomes by reallocating funds to introduce new DR-TB regimens, including drugs such as Bedaquiline

- Increasing funding for DR-TB treatment by approximately EUR 12 million would enable the addition of new drugs, which significantly improve the likelihood of treatment success and reduce the time to smear conversion
- The model estimates that a reallocation of funding from old DR-TB regimens to new treatment regimens for eligible patients, could significantly improve treatment success rates

4. Maintain funding for household contact tracing

- Current estimated spending should be maintained to identify household members of all notified TB cases, who are at high risk of having active TB
- Earlier identification will improve outcomes and reduce the risk of further transmission

5. Increase coverage of enhanced contact tracing

- Contact tracing beyond the household, in high-risk community settings such as workplaces and schools, can help to improve diagnosis rates and shorten the time to diagnosis
- Currently this is only done for approximately 20% of notified cases but should be expanded to all active TB cases

6. Implementation of new active case finding programmes

- Despite a high diagnosis rate for TB, case finding in Romania has been primarily passive
- To further improve the diagnosis rate, active case finding programmes are likely to be an essential part of the TB response
- Approximately EUR 8 million should be spent to introduce new active case finding programmes in high incidence areas and target high-risk groups such as homeless people, prisoners and people who inject drugs
- This could improve the yearly diagnosis rate by up to 9%.
- This recognizes that those people whose TB remains undiagnosed are likely to be in vulnerable and hard-to-reach populations
- In addition to allocative efficiency arguments, there is therefore also an equity argument for funding active case finding programmes, as it means that populations targeted by outreach activities would receive care that would otherwise not be available to them

7. Poverty reduction and late latency burden

- There are still approximately 6 million people in Romania with late latent TB infections. This is the main driver of active TB incidence
- As the national TB programme is focused on diagnosis and treatment of active TB, the interventions included in our analysis do not affect progression rates from latent TB to active-TB
- Reducing the incidence of TB will likely require broader strategies to address the social determinants of health, such as income, housing or nutrition, which

significantly impact progression to active TB

- Community interventions
- Locally based care for TB patients, encompassing economic, psychological and peer support, will help to improve treatment outcomes
- Funding for existing pilots of community interventions should be expanded. Furthermore, locally based education campaigns are likely to facilitate the diagnosis of hard to reach populations. In future, such interventions should be funded by the government as donor-funding in Romania is not guaranteed



THESE CHANGES COULD RESULT IN A
45% REDUCTION IN ACTIVE TB CASES
AND A **40% REDUCTION IN TB DEATHS** BY 2030.

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