

## Harnessing Advances in Tuberculosis Prevention and Treatment to End the Global Epidemic

### The Challenge

Tuberculosis (TB) is the leading infectious killer and leading cause of death among people living with HIV. Although TB incidence rates are declining, the current rate of decline is insufficient to end the global TB epidemic by 2035. Large gaps persist in identification of TB cases—including among child contacts—and in coverage of TB treatment and TB preventive treatment (TPT) among people living with HIV. In the era of differentiated service delivery, when many people living with HIV have fewer routine interactions with health care providers, new strategies are

needed to ensure efficient case-finding and high TPT coverage. In addition, countries require policy and implementation support to ensure widespread use of newer diagnostics, such as Xpert Ultra and urine lipoarabinomannan (LAM) assay, and new regimens for TPT and multi-drug resistant TB that will shorten treatment duration and improve tolerability.

## Technical Approach

A pioneer in the integration of TB and HIV services, ICAP provides comprehensive technical assistance to ministries of health and other partners to address national TB challenges and strengthen prevention, diagnosis, care, and treatment of TB and HIV.

Key elements of ICAP's technical approach include:

- Leveraging of TB screening as a gateway to both treatment and prevention (see Figure 1). This approach ensures that clients with TB receive treatment, while clients without TB are evaluated for and initiated on TPT as appropriate
- Ensuring integration and accessibility of HIV and TB services so that all people living with HIV receive TB screening, and all TB patients (including presumptive TB patients) receive HIV testing and are linked to appropriate follow-up services
- Ongoing assessment of the feasibility, acceptability, and effectiveness of combination strategies to improve the TB cascade (including early ART, increased uptake and completion of TPT, and integrated TB/HIV services for migrant mineworkers) and deployment of the best available strategies
- Quality improvement collaboratives to increase TPT coverage
- Implementation of infection prevention and control measures, including correct and consistent use of personal protective equipment, improved facility ventilation, and patient flows that minimize wait times
- Introduction of new-era diagnostics, including point-of-care urinary LAM for people with advanced HIV and new regimens to treat multi-drug resistant TB (MDR-TB)
- Integration of TB contact tracing with partner notification and index testing services for HIV
- Mainstreaming of TB services into maternal and child health settings, with an emphasis on preventing TB in children through systematic child contact management
- Deployment of community health workers and leveraging of national platforms for reproductive, maternal, newborn, and child health (RMNCH) to improve identification and management of pediatric TB cases



**FIGURE 1** ▶  
**ICAP's Integrated TB Prevention and Treatment Cascade**



## Case study

### Applying a Multi-Layered Strategy to Combat TB in Eswatini

#### Context

In 2014, the Kingdom of Eswatini (formerly Swaziland) had the third highest TB incidence rate and the highest proportion of TB patients known to be HIV-positive worldwide. The scale of the national epidemic, combined with suboptimal case detection and high rates of MDR-TB, was causing an estimated 2,400 deaths per year in a country with a population of just 1.3 million.

#### Approach

In 2015, ICAP began providing robust technical assistance to Eswatini's national TB program with the aim of reducing TB incidence and mortality. Working closely with the Ministry of Health, ICAP launched a multi-pronged strategy to confront the national TB crisis. Key interventions included:

##### Technical assistance for guideline and tool development

A national TB implementation plan and guidelines were developed to ensure that TB service provision in Eswatini reflects global best practices, including treatment of MDR-TB and provision of TPT to at-risk groups (e.g., people living with HIV and child contacts under five years of age). In 2019, guidelines were updated to facilitate the use of a new, shortened treatment regimen (3HP) for latent TB infection. Clinical tools and registers were updated to support systematic tracing of household contacts of TB patients, intensified TB diagnosis and contact tracing among pediatric patients, and rigorous follow-up of pregnant and breastfeeding women in RMNCH services across the full TB/HIV cascade.



##### Training and mentorship

Providers were trained on early identification of drug-resistant TB, diagnosis of pediatric TB, integration of TB and RMNCH services, management of MDR-TB using a shortened treatment regimen, and management of TB/HIV co-infection, including through provision of ART to all HIV-positive TB patients. Training was complemented with on-site clinical mentorship to help providers implement an enhanced package of care comprising intensified case finding, contact tracing, TPT, and infection prevention and control.

##### Expansion of TB management infrastructure

The National TB Control Programme was supported to systematically assess, renovate, equip, and accredit new sites for TB diagnosis and treatment, resulting in a 50 percent increase in the number of nationally accredited TB basic management units. Thirty-four GeneXpert machines were installed across the country to improve diagnosis and enable identification of rifampicin resistance near the point of care. ICAP provided wide-ranging technical assistance to the Ministry of Health to scale up systematic child contact investigation and management, expand access to comprehensive TB/HIV services, decentralize DR-TB clinical services, and introduce newer drugs for treatment of MDR-TB.

##### Enhanced monitoring and evaluation

ICAP deployed a technical officer to support the transition from paper-based to electronic reporting tools, resulting in improved timeliness and completeness of reporting and increased use of TB data to guide program activities and enhancements.

##### Outcome

From 2015 to 2019, Eswatini made remarkable progress confronting the TB epidemic. The case detection rate, which had idled below 60 percent for several years, rose to 84 percent. Incidence of TB declined rapidly—from 733 to 308 cases per 100,000 in just four years—and MDR-TB saw a similar decline. Prevalence of first-line drug resistance among newly diagnosed TB patients decreased from seven to three percent. ICAP is now supporting the Ministry of Health to address remaining gaps (e.g., uptake of TPT among people living with HIV who are enrolled in care remains low [16%] and, despite dramatic reductions in new cases, TB mortality rate remains high [14%]). This includes evaluating 3HP as an alternative TPT regimen; introducing a fixed-dose combination containing cotrimoxazole, vitamin B6, and isoniazid that has been piloted with success in one region of Eswatini; and conducting a country-wide mortality audit to investigate the reasons for persistently high TB mortality.

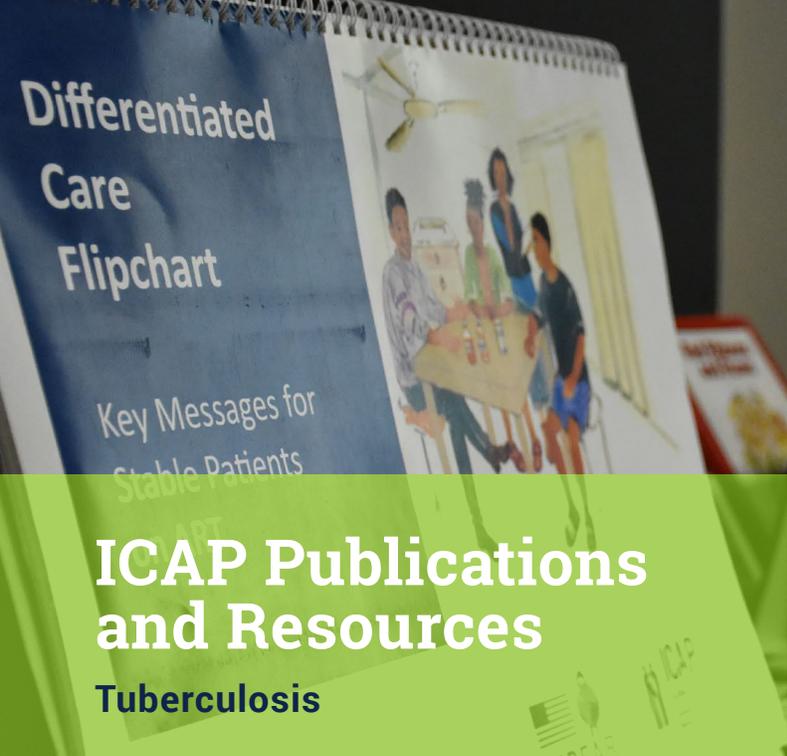


## Considerations for Implementation

Aggressive, coordinated, and evidence-based action is needed to close persistent gaps in TB case identification, treatment, and prevention among people living with HIV, and to propel high-burden countries toward the target of ending the global TB epidemic by 2035. Following are several considerations for expanding integrated and effective TB/HIV programs and services:

- In countries where HIV and TB programs are overseen by separate entities, proactive coordination is critical to create a supportive environment for TB/HIV interventions.
- Broad-based strategies, including engaging community health workers and leveraging national platforms for RMNCH services, can help create a foundation for successful identification and management of pediatric TB cases.
- Provider skepticism about the efficacy and safety of TPT and intermittent stockouts of isoniazid have contributed to low uptake of and adherence to TPT in some high-burden countries. Training and mentorship can bolster sound supply management practices, dispel myths about TPT, and reinforce the importance and benefits of TPT to providers. To be most effective, provider capacity building should be coupled with patient literacy activities that build awareness of TPT safety and benefits.
- Critical to effective infection prevention and control are health facility design decisions—including placement of windows and doors to maximize natural ventilation, and patient flows that minimize exposure to airborne disease—and occupational health interventions that promote proper use of personal protective equipment and routine TB screening and surveillance among health care workers.
- Integration of TB and HIV indicators enables monitoring of patient cascades across TB and HIV programs. Mobile apps can support improved patient tracking, contract tracing, and adherence reminders, especially among highly mobile populations like miners who require cross-border referrals and care.





# ICAP Publications and Resources

## Tuberculosis

ICAP Grand Rounds Webinar: Prevention of Tuberculosis in Children in High Burden Areas.

Available at:

<https://icap.columbia.edu/ptb-tb-ped>

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ICAP Grand Rounds Webinar: Multi-Drug-Resistant TB.

Available at:

<https://icap.columbia.edu/icap-grand-rounds-webinar-multi-drug-resistant-tb/>

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Hirsch-Moverman Y, Mantell JE, Lebelo L, et al. Tuberculosis preventive treatment preferences among care givers of children in Lesotho: a pilot study. *Int J Tuberc Lung Dis*. 2018 Aug;22(8):858–862.

Available at:

<https://www.ncbi.nlm.nih.gov/pubmed/29991393>

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CQUIN Community of Practice Meeting on Opportunities and Challenges for TB Prevention and Care.

Meeting report and presentations available at:

<https://cquin.icap.columbia.edu/resources/opportunities-and-challenges-for-tb-prevention-and-care-meeting-summary/>

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Howard A, Pimental de Gusmao E, Mafukidze A, et al. High Uptake of IPT with Integration of TB/HIV Services in RMNCH Settings in Manzini Region, Eswatini. Poster presented at: The Union World Conference on Lung Health, The Hague, October 2018.

Available at:

<https://icap.columbia.edu/ptb-tb-who>