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Considerations for simultaneous testing of COVID-19 and tuberculosis in high-burden countries



The COVID-19 pandemic has severely disrupted tuberculosis control efforts and services, particularly in countries with a high burden of tuberculosis.^{1,2} Resources dedicated to identifying and treating tuberculosis have been diverted to the COVID-19 response, with direct effects on tuberculosis programmes. Similarly, measures to prevent COVID-19 transmission, such as lockdowns, have made it harder for people to access tuberculosis testing and care. As a result, 2020 saw a drastic decline in the global number of people who were newly diagnosed and treated for tuberculosis and an increase in deaths from tuberculosis for the first time in more than a decade.² Simultaneous and integrated testing for COVID-19 and tuberculosis is an approach that could improve the detection of both diseases, help to close the gap in tuberculosis diagnosis left by the pandemic, and optimise the use of testing resources in resource-constrained settings.³

COVID-19 and tuberculosis are two infectious diseases that overlap in terms of their common symptoms (cough and fever) and risk factors for infection and complications. People and communities susceptible to tuberculosis are also likely to be at greater risk of SARS-CoV-2 infection due to overlapping sociodemographic factors, such as crowded living spaces and comorbidities like malnutrition and diabetes. Coinfection with SARS-CoV-2 and tuberculosis is also associated with poor outcomes: studies indicate that people with tuberculosis have a substantially greater risk of death from COVID-19 than those without tuberculosis.^{4,5} A further concern is that reduced immunity and lung inflammation from COVID-19, and the effects of corticosteroids used to treat COVID-19, might lead to the progression of *Mycobacterium tuberculosis* infection to symptomatic disease or the worsening of active tuberculosis.⁶

Access to diagnostic testing for COVID-19 and tuberculosis is an essential first step in the care cascade to reduce the transmission of both diseases and appropriately manage those affected by them. Consequently, there is a rationale for improving access to testing for COVID-19 and tuberculosis through the implementation of simultaneous testing, particularly in countries with a high burden of tuberculosis, to mitigate

the impact of the ongoing pandemic on tuberculosis services and identify people who might be at high risk from both diseases.

Several countries have trialled simultaneous testing strategies for COVID-19 and tuberculosis during the pandemic, including Indonesia,⁷ South Africa,⁸ Nigeria,⁹ and India.¹⁰ Notably, India's Ministry of Health and Family Welfare issued a rapid response plan to mitigate the impact of the COVID-19 pandemic on tuberculosis control efforts in September, 2020, which included COVID-19 screening for all patients diagnosed with tuberculosis and tuberculosis screening for all patients with confirmed COVID-19.¹⁰

FIND, the global alliance for diagnostics, have been working to address the paucity of diagnostics for tuberculosis and COVID-19 across low-income and middle-income countries. As part of these efforts, FIND have supported two simultaneous testing initiatives in India. The first, in partnership with the Confluence for Health Action and Transformation Foundation, is supplementing the reach and effectiveness of the COVID-19 response at five high-volume tertiary hospitals in Mumbai. The project enables the provision of rapid, onsite Truenat (Molbio Diagnostics; Verna, India) PCR testing for those who test negative for SARS-CoV-2 on rapid antigen tests but have symptoms suggestive of COVID-19 or tuberculosis, aiding patient management and the identification of COVID-19 and tuberculosis hotspots.

The second is being conducted in India's private health-care sector via the Joint Effort for Elimination of Tuberculosis (JEET), which is an innovative initiative for tuberculosis that connects private health-care facilities, laboratories, and medical practitioners with the national public health programme to improve access to affordable tuberculosis diagnostics and treatment. The JEET teams have worked to sensitise private sector health-care providers to tuberculosis and COVID-19 testing guidelines and key activities have included (1) establishing linkages for simultaneous testing in eligible patients with presumptive tuberculosis across private health facilities, (2) providing education on tuberculosis and COVID-19 diagnostic services and

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guidelines under the public sector, and (3) educating patients with tuberculosis of COVID-19-related precautions and symptoms.

These experiences in India have shown the value of simultaneous COVID-19 and tuberculosis testing, in terms of increasing access to diagnostics, and that operational workflows for COVID-19 and tuberculosis testing can work harmoniously when combined. Challenges encountered during the implementation of simultaneous testing largely related to shortages of staff and personal protective equipment, which at times limited the screening of patients at hospitals and in the field. Informed by FIND's experiences in India, we have outlined key topics for countries considering the implementation of simultaneous testing, divided into policy, operational, and technical considerations (appendix).

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Several research gaps exist around simultaneous testing. In particular, the development of integrated COVID-19 and tuberculosis tests (ie, those that can be done on one platform with the same sample) would help to streamline and increase the cost-efficiency of simultaneous testing. Other key areas that require further investigation include the evaluation of optimal settings for simultaneous testing (eg, in the community or a facility) and the diagnostic yield and cost-effectiveness of simultaneous testing (ie, the extent to which simultaneous testing of COVID-19 and tuberculosis enables the diagnosis of both conditions, and the relative costs and benefits of the intervention). Future efforts should also include the adaptation and validation of COVID-19 symptom screening apps, which consider factors such as geography, age, and risk profile, for use in tuberculosis diagnosis, and research into the optimal sampling strategy for COVID-19 and tuberculosis testing (eg, tongue swabs or saliva).

To conclude, although the COVID-19 pandemic might have set back progress in tuberculosis testing and care, there is an opportunity to leverage the innovations in mass testing implemented as part of the pandemic response to close tuberculosis testing gaps and help to control the transmission of both diseases. The implementation of innovative simultaneous testing strategies for tuberculosis and COVID-19 could improve access to testing among populations at greatest risk for

both diseases, and early simultaneous testing efforts suggest that the approach is feasible. The considerations shared here, informed by simultaneous testing projects in India, can provide a starting point for countries to design operational research projects to assess the impact of simultaneous testing guidelines for tuberculosis and COVID-19. Future work on the outlined research gaps would also be valuable to provide further evidence for these policies and bring about the development of integrated simultaneous testing for COVID-19 and tuberculosis.

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