

# COVID-19 and Tuberculosis: A perspective of Bangladesh

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## Article Info

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## Abstract

Tuberculosis is our old enemy while COVID-19 (Coronavirus disease 2019) is a novel one. Both diseases have many similarities in terms of target organ affected, transmission, clinical presentations. COVID-19 is a fast-track novel pandemic while tuberculosis is a slow-moving pandemic. As control measures, countries all over the globe have enforced lockdown to halt the spread of the SARS-CoV-2 virus, but this stringent method has a negative impact on access to the health care delivery system. It seems that there is a dropping of new case findings, but modeling projection by WHO estimates that the total number of tuberculosis cases will rise by 2025. Bangladesh is a high Tuberculosis burden country in the south Asia region. World-wide COVID-19 has a negative impact on tuberculosis diagnosis and management strategy. Bangladesh has impending threat to rise in tuberculosis case in future because of lockdown process, densely populated nation, poverty, reallocation of tuberculosis diagnostic facility and trained staff to diagnose COVID-19 and collapse of DOTS (directly observed treatment, short-course) program of NTP (national tuberculosis control program), rampant use of immunosuppressant's including steroid, biologics. Prompt tuberculosis case detection, digital supervised drug delivery, avoidance of injudicious use of steroids, biologics to treat COVID-19, and testing for both COVID-19 and tuberculosis should be simultaneously undertaken to tackle this overwhelming situation. Eradication of psycho-social stigma about these two diseases is essential for preventing a perfect storm.

## Introduction

Originated from Wuhan, China in November 2019 SARS COV-2 has spread globally. This viral pandemic is causing death to millions and endangering billions of life. Bangladesh is a highly populated country. A huge infectious disease burden exists here. Since the first case was detected on 8 March 2020,<sup>1</sup> it has been relentlessly increasing through the rise and fall of infection wave and appearance of newer mutant variants. Immunosuppression inflicted by COVID-19 disease itself and also by drugs used to treat it has put the vulnerable population at the risk of other infections including tuberculosis. Transmission of COVID-19 as well as TB occurs by aerosol droplets.<sup>2</sup> Lockdown strategy has been implemented to limit the spread of COVID-19<sup>3</sup>, but due to movement restrictions suspected tuberculosis patients cannot reach the diagnostic facility. There is also interruption of supervision of anti-tuberculosis drug delivery and adherence from DOTS corner. In addition laboratory staff and instruments used to

diagnose tuberculosis is repurposed to COVID-19 diagnosis. Bangladesh is a high tuberculosis burden country. Apparently, it seems that tuberculosis case detection has been dropping but the impact of COVID-19 management and prevention strategy might raise the magnitude of tuberculosis in the future. Before being late our national tuberculosis control program must be strengthened to halt the situation.

## The magnitude of the problem

Tuberculosis is a global burden especially for an underdeveloped and developing country like Bangladesh. Bangladesh is a high TB and MDR-TB (multi-drug resistant tuberculosis) burden country; it has one of the highest incidences of TB cases in the world. The estimated incidence of TB per 100,000 is 221 in Bangladesh, with a mortality rate of 24 per 100,000 populations.<sup>4</sup> Among all TB cases in Bangladesh, 80% are pulmonary TB. According to Global TB Report 2020, 0.7% of new cases and 11% of prior treated cases are

MDR-TB, which has an incidence rate of 2.0 per 100,000 populations in Bangladesh.<sup>4</sup> The national MDR-TB prevalence is estimated at 1.6% among new TB cases and 29% among previously treated TB cases.<sup>5</sup> As per WHO report tuberculosis is the 13th leading cause of morbidity and mortality.<sup>6</sup> An estimated 10 million people fell ill with tuberculosis around the world in 2019. About 87% of new TB cases were found in 30 countries that have huge TB burden. Eight countries account for two-thirds of the total, and among them India has highest TB incidence, followed by Indonesia, China, the Philippines, Pakistan, Nigeria, Bangladesh, and South Africa. A total of 1.4 million people died from TB in 2019 (including 208000 people with HIV).<sup>6</sup>

### **Possible reasons behind the resurgence of tuberculosis in the COVID-19 pandemic**

Immunosuppression by drugs (steroids, biologics) used to treat COVID-19 or the disease itself can result in tuberculosis reactivation. COVID-19 has disrupted tuberculosis related health care services for example; delay in case of diagnosis, impaired infection control measures, decrease BCG vaccination, reduced care for predisposing conditions, active case finding, reduced tuberculosis diagnostic testing, disruption to medicine production/transportation, reduced nutritional and mental health support, reduced care for drug reactions and comorbidities.<sup>7</sup> COVID-19 pandemic also increases the poverty-related TB risk factors like; household crowding, population density, poor ventilation, increasing household TB exposure, under-nutrition<sup>8</sup>, psychological stress, social stigma, and discrimination. Poverty is heightened by unemployment and economic crisis.<sup>9</sup> Substance misuse (smoking, alcohol, and drugs) might increase the risk of TB infection, TB disease, and post TB sequelae.

### **Impact of lockdown on case detection and care of tuberculosis**

Impairment of TB services can influence all stages of TB care. Lockdown process would delay in seeking the care of individual suffering from TB symptoms. In addition those who can visit a health care facility, the diagnostic and laboratory capacity needed to support TB diagnosis may be disrupted because of the repurposing of diagnostic tools and laboratory staff of tuberculosis to COVID-19 diagnosis.<sup>10</sup> Those already on TB treatments, there is also concerns that lockdown may interfere with the supply of the TB medications. Globally, a 3-month lockdown followed by a 10-months restoration could lead to an additional 6.3 million cases of TB between 2020 and 2025, and more than one million tuberculosis-related deaths during this period.<sup>11</sup>

STOP TB partnership has conducted an analysis regarding impact of COVID-19 on tuberculosis before and after lockdown in different countries. India noticed an 80% fall in daily tuberculosis case detection, relative to pre-lockdown levels. South Africa also reported 50% fall in numbers of

tuberculosis cases.<sup>11</sup> Reason behind the fall of daily TB detection rate may be due to delays in reporting, lack of access to diagnosis and treatment. If the diagnosis of tuberculosis is missed in COVID-19 pandemic, there will be more chance of community transmission of tuberculosis. Therefore, while lockdown is an important step to reduce the impact of COVID-19, it is essential to think over the potential long-term consequence of these measures on TB.<sup>12</sup>

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## **Diagnosis**

Accurate diagnostic tests are essential for both TB and COVID-19. Tests for the two conditions are different and both should be made available for individuals with respiratory symptoms, which may be similar for the two diseases.<sup>13</sup> There are lack of information about COVID-19 and TB co-infection profile, so it should be anticipated that these category of patient may have worse prognosis if TB treatment is interspersed. TB patients should continue their prescribed medications, as well as take protective measures to prevent COVID-19. People ill with COVID-19 and TB show similar symptoms such as cough, fever, and difficulty in breathing. Both diseases affect the lungs initially and both microorganisms transmit mainly via close contact. But the incubation period of tuberculosis is longer, often with a slow onset. The  $R_0$  is the expected number of cases directly generated by one case in a susceptible population. The  $R_0$  of TB is 3 and the  $R_0$  of COVID-19 is 2.4.<sup>14</sup> Diagnosis of COVID-19 is based on positive RT-PCR of nasopharyngeal or oropharyngeal sample<sup>15</sup> while for tuberculosis we go for sputum ZN stain, Gene Xpert, which is a PCR based molecular test, and AFB culture of sputum. The clinical spectrum of presentation of COVID-19 are mild (influenza-like illness), moderate (pneumonia without hypoxemia), severe (pneumonia with hypoxemia), and critical (requiring mechanical ventilation).<sup>16</sup>

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## **Treatment and care**

TB program staff with their experience and capacity, including inactive case finding and contact tracing, are well placed to share knowledge, expertise, and to provide technical and logistical support.<sup>17</sup> Outpatient management should be chosen preferably over hospital treatment for TB patients (unless serious conditions are requiring hospitalization) to reduce the chance of transmission. Provision of anti-tuberculosis treatment, in line with the latest WHO guidelines, must be ensured for diagnosed tuberculosis case including those with suspected and confirmed COVID-19 disease.<sup>18</sup> Adequate stocks of TB medicines should be provided to all patients and ensure treatment completion without having the frequent visit of TB clinic for collecting medicines. The use of digital health technologies should be

intensified to support patients and programs through improved communication, counseling, care, and information management, among other benefits. In line with WHO recommendations, technologies like electronic medication monitors and video-supported therapy can help patients to complete their TB treatment.

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## Prevention

Preventive Measures must be taken to limit the transmission of both TB and COVID-19 as per WHO guidelines<sup>18</sup>. Irrespective of transmission method of the two diseases administrative, environmental and personal protective steps are applicable to both (e.g. basic infection prevention and control, cough etiquette, patient triage).<sup>19</sup> Assistance of TB preventive issues should be maintained as much as possible. Governments, citizens, media, and communities have an important role to play in preventing and stopping social stigma.

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## Conclusion

The immunological function temporarily inhibited by COVID-19 and immunosuppressive drugs results in reactivation of mycobacterium tuberculosis. Furthermore, it may intensify the course of illness of co-infected population. We should be aware of the short-term increase in the TB epidemic following end of the COVID-19 pandemic. To prevent and control tuberculosis, adequate measures should be undertaken to strengthen the existing health care delivery system dedicated to tuberculosis management.

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