

# COVID-19 Pandemic Redefining TB Elimination Timelines

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## ABSTRACT

**Introduction:** COVID-19 pandemic has affected the progress made so far in management of infectious diseases especially tuberculosis (TB). Stringent measures like lockdown made to contain the transmission of COVID-19 resulted in decreased access to TB diagnostic care. Aim: We aimed to explore the impact of COVID-19 on the TB services in Sirmour district of Himachal Pradesh.

**Materials and methods:** We did a retrospective study covering two years from April 2019 to March 2021 at CBNAAT site at DYSPGMC, Nahan to compare the number of patients seeking diagnostic TB services between two phases i.e. Phase I (April 2019 to March 2020) and Phase II (April 2020 to March 2021). The data was extracted from electronic entry and registers using a data collection form. Tuberculosis was diagnosed using GeneXpert on pulmonary and extrapulmonary samples.

**Results:** The number of patients seeking TB diagnosis dropped from 5162 in Phase I to 2065 in Phase II. The male to female ratio increased from 1.3:1 to 2.5:1 and rifampicin resistance rate decreased from 2% to 0.3%.

**Conclusion:** The direct and indirect effects of COVID-19 pandemic need to be reversed rapidly to achieve the target of ending TB by 2025 by bidirectional TB COVID-19 screening.

**Keywords:** Covid-19, Tuberculosis, Pandemic, MDR-TB, RR-TB, GeneXpert, SARS-Cov-2

## INTRODUCTION

In 2020, we were hit by the COVID-19 pandemic, which brought to surface the various inadequacies of public health system. This novel virus spread across the world causing high morbidity and mortality. Its high rate of transmission and no effective pharmaceutical cure left all countries with the option of population wide lockdown. On one hand, these measures helped the countries to halt the spread of virus and allowed them to strengthen their health system and build up necessary infrastructure. On the other hand, it severely affected the progress made in containing the infectious diseases specially tuberculosis (TB).<sup>1</sup> TB like COVID-19, is an airborne infection and the leading cause of mortality globally, with ten million new cases and 1.5 million deaths estimated in 2019.<sup>2</sup> India alone has the highest number of TB (27%) and multidrug resistant / rifampicin resistant tuberculosis (MDR/RR-TB) (24%) cases among the notified TB patients.<sup>3</sup> In recent decades, TB incidence and mortality have been decreasing steadily. But after the imposition of stringent lockdown, there was a striking reduction in TB notification rate.<sup>4</sup> Looking at National Health Mission and Nikshay trends, it is evident that TB services were seriously disrupted in India.<sup>1</sup> Lockdowns, though are likely to reduce community transmission but the household exposure is

increased and extended, thereby increasing the total burden of the disease. During the period from January to June, 2020, there was 62% decline in TB notification against estimated target due to the pandemic, the reduction being greater among children and females.<sup>1</sup> Limited access to health care, complete closure of public and most private transport, stigma associated with COVID-19 and shifting TB diagnostic infrastructure to the diagnosis of COVID-19 were some of the factors, which led to drop in the progress made so far in TB.

Our study included all the patients visiting the District Tuberculosis Centre (DTC) of Dr YS Parmar Government Medical College, Nahan from March 2019 to March 2021. We aimed to explore the impact of COVID-19 on the TB services in Sirmour district of Himachal Pradesh, India.

## MATERIAL AND METHODS

This was a retrospective record based study covering a period of two years from March 2019 to March 2021. The study involved patients seeking TB diagnostic care at Dr YS Parmar Government Medical College, Nahan, Himachal Pradesh, India. This is one of the two CBNAAT sites in District Sirmour of Himachal Pradesh and caters to the population of three of the five blocks of the district. The demographic and diagnostic data was extracted from electronic entry and registers using a data collection form. The study was approved by the institutional ethical committee. Tuberculosis was diagnosed using GeneXpert on pulmonary and extrapulmonary samples. We compared the number of patients seeking TB care between two periods i.e. from March 2019 to March 2020 (pre covid phase;Phase I) and from April 2020 to March 2021 (Covid phase: Phase II) The differences in number seeking diagnosis were compared between the two phases.

## RESULTS

A total of 5162 patients were screened in Phase I and the number of patients screened in Phase II was 2065, which is significantly lower than Phase I. The male to female

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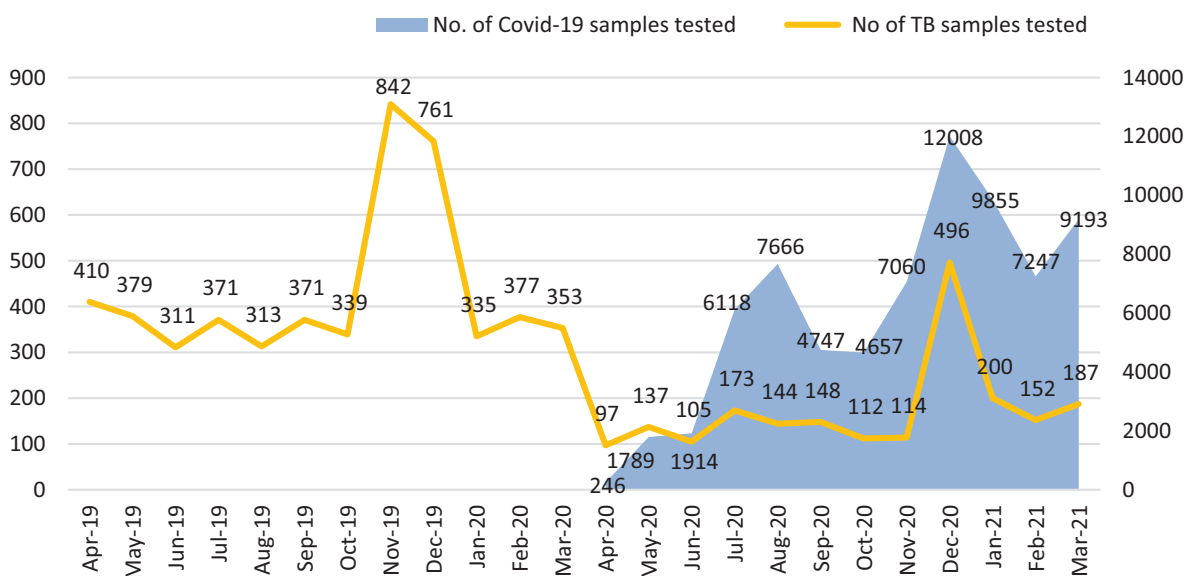
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	2019-2020			2020-2021		
	Total screened	TB positive	RRTB	Total screened	TB positive	RRTB
April	410	79	1	97	16	0
May	379	70	2	137	31	0
June	311	63	2	105	29	0
July	371	87	3	173	39	1
August	313	47	1	144	24	0
September	371	55	2	148	15	0
October	339	63	3	112	23	0
November	842	62	2	114	22	0
December	761	64	2	496	31	0
January	335	51	1	200	31	0
February	377	50	0	152	28	0
March	353	32	0	187	28	0
Total	5162	724	19	2065	317	1
Males	2987			1485		
Females	2175			580		

**Table-1:** TB screening rates in Phase I and Phase II



**Figure-1:** Number of patients screened for TB against a backdrop of COVID-19 testing in Sirmaur

ratio in Phase I was 1.3:1, which is increased to 2.5:1 in Phase II. In phase I, the percentage of patients aged less than 18 years was 7.4% which dropped to 4.8% in Phase II. Similarly, patients aged more than 60 years also decreased from 26.4% in Phase I to 8.1% in Phase II. Table 1 shows the number of patients screened during the two phases. The percentage of laboratory confirmed cases remained unchanged (14% in Phase I; 15% in Phase II). Rifampicin resistance was identified in 2% (19/724) and 0.3% (1/317) of TB cases in Phase I and II respectively. Sirmaur reported its first COVID 19 case on 7th April, 2020. Thereafter the number of COVID-19 cases increased gradually. Figure 1 shows the number of presumptive TB cases screened against a backdrop of COVID-19 testing in Sirmaur.

**DISCUSSION**

The number of people seeking TB diagnostic care at our CBNAAT site decreased to about half due to COVID-19 pandemic. The paediatric and the geriatric population

had significant decrease in number of patients seeking TB diagnostic care. The impact of such huge reduction in the notification of TB will be severe as a large number of undiagnosed and untreated cases will further increase the TB transmission especially among house hold contacts. Though such increase in number of TB cases will take months to manifest the disease, but their impact will last for years. Lockdown measures may be effective in reducing the incidence of influenza as observed in studies from Japan and New Zealand.<sup>5,6</sup> Lockdown might also have decreased the transmission of TB due to movement restriction but such reduction is unlikely to negate the impact of disruption of TB services.<sup>4</sup> It is suggested that for every month of lockdown, India will have to manage 232 665 excess TB cases and 71 290 excess TB deaths.<sup>4</sup> This increase in TB incidence and mortality will counter the achievements made so far in TB and delay the End TB Strategy timelines.<sup>7</sup> It is known that one untreated pulmonary TB patient can infect 10-15 individuals in a year. In COVID era when TB

patients were not able to access health services, there is high possibility of an intense transmission among the household contacts. Further, absence of timely management will not only cause significant morbidity in TB patients but also lead to an increase in TB related deaths and progression to MDR TB because of lack of diagnosis or non treatment or discontinuation of anti-TB medication caused due to the lockdown.

The treatment of MDR/RRTB is challenging and much costlier and one reason for its emergence is lack of prompt diagnosis and treatment of a TB case. The RR TB rate declined from 2% in phase I to 0.3% in Phase II. A previous study from the same institute had reported the RRTB rate to be 4.29% from September 2016 to April 2018.<sup>8</sup> If large number of MDR/RRTB cases remains undiagnosed and untreated, these could potentially spread this disease further. In addition, when these cases are diagnosed at a later stage they become all the more difficult to treat and have high mortality.

The numbers in Table 1 clearly indicate that there was a disruption of TB services, which extended even after the lockdown started easing out and the notification rates never reached the pre pandemic levels. The number of TB notification in Himachal Pradesh went up from 16485 in 2018 to 17988 in 2019 and then dropped to 13,423 in 2020.<sup>9,10</sup> A large segment of the health infrastructure was redirected in managing COVID-19 cases. This grossly limited the availability of routine services available for TB patients. The existing molecular platforms such as GeneXpert and TrueNAT were repurposed for COVID-19 testing and even the technical support was shifted to its diagnosis. The cessation of public and private transport made access to health facilities difficult thereby decreasing the number of people seeking TB diagnostic services even in the presence of symptoms. TB and COVID-19 have similar symptoms (cough and fever) and stigma associated with both delayed their diagnosis. Even after the Unlock started in a phased manner, people were hesitant to get tested for the fear of being tagged or quarantined. This was more pronounced in females wherein the notification rates were further lower. The stigma associated with TB and the subsequent refusal and concealment play important role in health seeking pattern of individuals. This stigma is more in women and generally associated with social stigma of the whole family. This is evident from a study from Vietnam showing women with long term cough choosing less qualified health care as their first choice.<sup>11</sup>

A study by Cilloni et al demonstrates that even short COVID-related lockdowns can generate long-lasting setbacks in TB control.<sup>4</sup> Supplementary measures such as some active case finding and contact tracing are needed to revert the adverse effects the COVID-19 pandemic. Active case finding (ACF) refers to screening of individuals with TB like symptoms. These individuals are identified and referred for TB diagnosis in contrast to passive case finding where the patient seeks diagnosis at a health facility. ACF is done every year in the winter months in Himachal Pradesh to enhance

the detection of TB but because of COVID-19, this service was affected. The government of Himachal Pradesh started the “Him Suraksha Abhiyaan” from 25<sup>th</sup> November to 27<sup>th</sup> December 2020 to consolidate the gains of the previous campaigns by reaching the entire population of the state with special focus on vulnerable populations.<sup>12</sup> This programme aimed to conduct sputum examination of chest symptomatic persons for TB through smear microscopy, CBNAAT and culture and to treat such additional infectious TB patients. This programme was further extended till 4<sup>th</sup> January 2021. This effort led to increase in TB notifications in the month of December, 2020 as is evident from table 1.

The target of ending TB by 2025 has been severely affected by this pandemic. The direct and indirect effects of COVID-19 on TB elimination need to be reversed or else we will have to redefine the target of End TB strategy. One of the policies to substantiate the goals achieved so far is a bidirectional TB COVID-19 screening and TB screening of all presumptive Influenza like illness and Severe Acute Respiratory Illness cases. However, given large numbers of TB and COVID-19 cases in our country, such planning will require greater ability for molecular testing and associated financial investment. Various apps available for COVID-19 could be utilized to drive people with TB symptoms to seek timely care. Lastly, we should strengthen our health system so that any further disruptions like COVID-19 pandemic do not affect the progress made so far in management of all infectious diseases.

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