

**Programmatic innovations to address  
challenges in tuberculosis prevention  
and care during the COVID-19  
pandemic**





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**World Health  
Organization**

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## **Abbreviations and acronyms**

DOT	directly observed treatment
DR-TB	drug-resistant tuberculosis
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
NTP	National Tuberculosis Programme
TB	tuberculosis
Union	International Union against Tuberculosis and Lung Disease
VOT	Video-supported TB treatment



## Introduction

By mid-March 2021, over 122 million people had been diagnosed with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, and at least 2.7 million people had died (1). The epidemiology of the COVID-19 pandemic is also evolving in countries that also have a high burden of tuberculosis (TB) (1, 2). Determinants of adverse outcomes of COVID-19 include old age, smoking and comorbid conditions such as lung and heart diseases, diabetes and conditions that affect the immune system. As a disease of the lung, TB has also been associated with higher mortality in COVID-19 patients. Most notably, in a recent population cohort study of 3.5 million public sector patients in South Africa, the risk for mortality among current or previous TB patients infected with SARS-CoV-2 was higher than that of those without TB (adjusted hazard ratio [95% CI]: 2.70 [1.81; 4.04] and 1.51 [1.18; 1.93], respectively) (3). Studies in Italy and the Philippines have described the clinical progression of COVID-19 in patients with concurrent or previous TB (4-6).

Public health measures to contain the pandemic are adversely affecting TB service provision in many countries. WHO's Global TB report documented fewer monthly notifications of TB disease in 14 high-TB burden countries, at times for successive months and coinciding with measures to limit population mobility in response to the pandemic (2). If this situation is left unchecked, modelling predicts that such disruptions in TB detection and treatment could significantly increase mortality from the disease, reversing global progress in reducing TB deaths by 5–8 years, and result in an additional 6.3 million TB cases globally between 2020 and 2025 (7, 8). The global resolve to end TB is therefore a necessity to prevent further resurgence of the epidemic. This requires maintaining a continuity of services, as well as maximizing efforts in existing prevention and treatment strategies to put the world back on track in realizing the goals and targets of the End TB Strategy and the Sustainable Development Goals. Loss of revenue and the impending economic contraction are bound to affect high-TB-burden countries disproportionately, as most already have extensive health inequality, weak health-care infrastructure, poverty and poor coverage of social protection (9).

## Compendium of resources on tuberculosis and COVID-19

To avoid a reversal of progress towards eradicating TB, new knowledge and lessons from successful programmatic innovations are urgently needed to improve TB prevention and care in the context of the pandemic. To support evidence-based adaptation of TB services to the contexts created by the pandemic, the WHO Global Tuberculosis Programme therefore established a compendium of resources on TB and COVID-19 (10), which comprises a list of research projects on TB and COVID-19 in various countries reported to WHO by the investigators and an inventory of peer-reviewed or preprint manuscripts that describe the impact of the pandemic on epidemiological, clinical and laboratory perspectives of TB and on TB disease course, treatment and prognosis (Table 1). WHO is also working in partnership with its Collaborating Centre for TB and lung disease in Tradate (Italy) to review de-identified data on patients to better understand disease progression in patients with concurrent or previous TB infected with SARS-CoV-2 (11).

**Table 1. Publications on TB and COVID-19 (10), 1 January 2020 – 25 March 2021<sup>a</sup>**

Category	Description	No. of publications by type of analysis						
		Total	Predictive modeling	Primary <sup>b</sup> analyses	Secondary <sup>c</sup> analyses	Perspectives	Review	Protocol
Basic science	Basic science (e.g. biomarkers, immunology) of TB and COVID-19	20	0	12	1	1	6	–
BCG vaccination	Discussion of BCG vaccination as an intervention against COVID-19	125	8	2	67	26	18	4
Epidemiology	Studies that directly or indirectly inform knowledge on the co-epidemiology of past or current TB disease and SARS-CoV-2 infection	80	21	16	37	1	3	2
Clinical observations	Studies of disease progression and outcomes among co-infected patients	69	–	61	8	0	–	–
Prevention and infection control	Use of protective equipment and other infection prevention and control measures in health care and community settings for both TB and COVID-19	22	1	8	7	3	3	–
Screening and diagnosis	Impact of the pandemic on TB screening and diagnosis	59	–	20	33	4	2	–
TB programme management	Direct and indirect impacts of the pandemic on TB prevention and care services	216	4	18	48	111	31	4
TB research management	Impact of the pandemic on research on TB	4	–	2	–	2	–	–
Treatment	Research on COVID-19 treatment that is relevant for TB patients	14	–	6	4	2	2	–
Zoonotic TB	Impact of the pandemic on management of zoonotic TB	6	–	2	1	3	–	–

<sup>a</sup> The search terms and eligibility criteria for including these manuscripts are stated in the compendium (10).

<sup>b</sup> Primary analysis: original analysis of primary data to answer a research question

<sup>c</sup> Secondary analysis: re-analysis of existing data to answer a research question

## Country case studies on programmatic innovations for TB prevention and care

Most of the literature on TB and COVID-19 consists of descriptive research or expert views, with very few innovative approaches to addressing challenges in programmatic management of TB caused or exacerbated by the pandemic (Box 1).

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### **Box 1. Publications on programmatic innovations to address TB prevention and care during the COVID-19 pandemic (1 January 2020 – 25 March 2021)**

Between January 2020 and 25 March 2021, WHO documented 216 publications on the impact of COVID-19 on TB services, of which around 30% included primary or secondary analysis of data. The remaining publications were perspectives or reviews (65%), modelling studies and protocols (5%). Further publications were exploratory, such as those that described or predicted potential effects of the pandemic or lockdown measures on the epidemiology of TB and those that explored application of artificial intelligence for differential diagnosis of COVID-19 and TB. Only a very small percentage of countries had reported innovative approaches to address the changing demands of TB service provision, such as home delivery of TB medications, dual screening for TB and COVID-19, telemedicine and digital adherence technologies.

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Experience can provide evidence for innovative approaches and strategies to maintain and scale up high-quality TB services. WHO therefore called for case studies on programmatic innovations that address emerging challenges in TB prevention and care during the pandemic in order to collect and disseminate the findings to the TB community (Box 2) (12). The case studies presented in this report are part of WHO's work to enhance learning, innovation and the sustainability of national TB programmes affected by the COVID-19 pandemic. The lessons learnt from these country activities to ensure the continuity of essential services like TB care in the face of the crippling crisis may also inform strategies for minimizing the impact of future emerging pathogens on health services. In view of the significant challenges of the pandemic, all stakeholders have a role in supporting programme recovery. Scientists must document and share best practices in screening, diagnosis, treatment and care of people with TB; national TB programmes should ensure provision of sustained, prioritized access of presumptive TB patients to diagnostic testing and optimal care; clinicians should continue to be vigilant in studying and documenting how COVID-19 affects the clinical management of TB; and civil society and affected communities can empower patients to seek care and also combat misinformation and discriminatory narratives. Trustworthy, data-driven messages will be all the more important in the future to advocate judiciously for resources as the financial climate becomes less favourable.

### **Box 2. Case studies**

In response to the call for case studies, the WHO Global Tuberculosis Programme received submissions between November 2020 and February 2021. A total of 23 case studies relevant to the call were accepted from 19 countries in the six regions of WHO. The studies are presented below in alphabetical order by country name. All the studies were reported by countries or institutions. WHO was not involved in the design, financing or implementation of the initiatives, nor did it undertake validation of the veracity of the reported findings. The person in charge of each case study is identified by name.

## **Case study 1. Brazil: Telemonitoring of tuberculosis patients in Manaus during the COVID-19 pandemic**

### **1.1 Contact person**

Maiko Tonini

### **1.2 Thematic areas**

Digital health; treatment

### **1.3 Background of the project**

Achieving epidemiological and operational targets in TB prevention and care requires investments in integrated surveillance and patient support management, including innovative means to improve adherence and treatment outcomes. As our local health care system is under increasing strain during the COVID-19 pandemic, telemonitoring allows us to provide support, learning and monitoring of patients while maintaining physical distancing. We describe the use of telemonitoring to improve follow-up of TB patients in primary health-care units in the city of Manaus during the COVID-19 pandemic.

### **1.4 Intervention and methods**

The Municipal Secretary of Health of Manaus established a telemonitoring platform in which data on TB cases are extracted from local and national databases and electronic patient records. Guidelines were set for operationalizing the service and for standardizing data entries, and 35 telemonitoring operators received three training sessions on TB management. Educational materials were also developed for patients and are sent via messaging apps after the first contact. Databases are mined biweekly (automatically or manually) to identify eligible TB patients. We select and prioritize TB patients who are: (i) notified by hospitals but have no treatment follow-up in primary health-care units; (ii) followed in primary health-care units but are late in collecting their medication; and (iii) those < 3 months into treatment. Eligible cases receive a phone call twice a week or more frequently, according to the operators' assessment. When an operator judges that a personal evaluation is required, the patient is referred to their respective primary health-care unit, and the reason for referral is recorded in the electronic patient record.

Initially, all cases will be followed-up until the third month of treatment, as this is a critical period for treatment adherence. At the end of this period, the operator evaluates adherence and recommends discharge or continuation of telemonitoring. Patients may be re-enrolled in the service any time if they fail to retrieve their medication.

The indicators used to evaluate the effectiveness of our intervention are the proportion of patients who respond to at least half the calls and the proportion of treatment success among monitored TB patients.

### **1.5 Results**

Between the second week of November 2020 and the first week of January 2021, 185 patients were enrolled in telemonitoring; 41.1% were 20-40 years old and 61.1% were male. Two or more follow-up calls have been made to 41.6% of those enrolled. Of these, 96% answered at least 50% of the programmed calls. Given the recent implementation of this project, data collection is ongoing, including on treatment outcomes.

### **1.6 Timeline and funding source**

Start date: 8 July 2020

End date: No date has been set for the end of the project. The activity is now conducted continuously.

Funding source: Municipal Secretary of Health of Manaus

## **1.7 Additional information**

The Municipal Secretary of Health created the telemonitoring platform to tackle COVID-19, but we saw it as an opportunity for TB care. Our approach to TB telemonitoring harnessed the capabilities of the available information systems. It was viable because we leveraged an existing structure of well-trained operators put in place to fight COVID-19. As the basic design is relatively low-tech (the main requirements being operators and patients with access to a telephone line), we consider that this experience could readily be replicated elsewhere. This work was developed by the Municipal Secretary of Health of Manaus.

## **Case study 2. Brazil: Video system for telemonitoring and directly observed treatment for tuberculosis**

### **2.1 Contact person**

Maiko Tonini

### **2.2 Thematic areas**

Digital health; treatment

### **2.3 Background of the project**

Directly observed treatment (DOT) improves treatment adherence and outcomes for TB patients; however, DOT requires frequent visits and significant time from health-care professionals, which is difficult to accommodate in the context of the COVID-19 pandemic. To decrease the cost and demand for in-person DOT, we developed a telemonitoring platform for TB treatment: a video system for telemonitoring and directly observed treatment for tuberculosis (VOT). The system is available at four primary health-care units and at the Hospital das Clínicas in Ribeirão Preto, São Paulo.

### **2.4 Intervention and method**

Adults being treated for TB who agreed to participate in the project were enrolled and instructed in use of VOT to record their daily medication intake. The app also allows patients to ask questions to health-care professionals and researchers about their treatment. Caregivers follow all patients and validate their medication intake on the web. This study is descriptive and exploratory, examining treatment adherence and other advantages and limitations of the app and approach.

### **2.5 Results**

VOT has been in use since March 2020, coinciding with community transmission of COVID-19 in Brazil and the imposition of social distancing. The app reduced the need for DOT home visits by 43%, while maintaining the continuity of treatment and also protecting both patients and caregivers against the new coronavirus. Implementation of VOT at the Hospital das Clínicas enabled monitoring of cases of drug-resistant TB (DR-TB) living outside Ribeirão Preto in areas unable to offer traditional DOT. The number of directly supervised medication intakes increased dramatically with the use of VOT, with 80% of all planned intakes validated.

### **2.6 Timeline and funding source**

Start date: 1 March 2020

End date: 1 March 2021

Funding source: This work was financed by the researchers, who subscribed to the proposal and resources of the Research Teaching Support Foundation of the Hospital das Clínicas da Faculdade de Medicina de Ribeirão Preto – Universidade de São Paulo.

## **2.7 Additional information**

DOT has had to be scaled down or suspended in many places due to the spread of the COVID-19 pandemic, which has disrupted TB care provision. Implementation of VOT in Ribeirão Preto reversed this scenario, improving care to pre-pandemic levels. VOT also allowed extension of care to patients with pre-existing conditions (transplants, cancer) who required treatment for latent TB; they are usually not covered by DOT but can benefit from this support and monitoring. Another advantage reported by VOT patients was that they could take their medication under supervision without having to wait for a visit from a caregiver.

We debunked some preconceptions about VOT use by demonstrating, for example, good adherence by patients without previous technological skills, including older adults and vulnerable groups such as homeless people and people who abuse drugs. We found that the best way to ensure proper use of the application is to provide training to anyone willing to use it. Patients who did not agree or were unable to participate continued to receive care by traditional DOT. This work was developed by researchers of the University of São Paulo.

## **Case study 3. Colombia: Tuberculosis prevention and control in Colombia during the COVID-19 emergency**

### **3.1 Contact person**

Oscar Andres Cruz Martinez, Ministerio de Salud y Protección Social Colombia

### **3.2 Thematic area**

Health-care staff training

### **3.3 Background of the project**

TB continues to be a priority for national public health in Colombia, which has the fifth highest case load in the Region of the Americas. In 2019, 14 886 cases of TB were reported to the National Tuberculosis Prevention and Control Programme, with rates of 27.3 cases and 2.1 deaths per 100 000 inhabitants. As of 26 August 2020, a total of 562 128 cases of COVID-19 and 17 889 deaths had been reported, with 21 000 COVID-19 cases among health workers; 404 cases were TB–COVID-19 co-infections.

Public health measures to contain the COVID-19 pandemic resulted in low presentation of people with respiratory symptoms to health services and closure of facilities in order to prevent transmission among staff. As a result, the TB detection rate was 9% lower in the first half of 2020 than in the same period in 2019, and the decrease in the rate of diagnosis of TB was 31.9% among children under 15 years, 31.5% among populations deprived of liberty, 19.7% among indigenous people and 2.9% among people with TB and HIV infection. Detection of TB and COVID-19 must be encouraged, especially in vulnerable populations and in those with a high risk of transmission. Financial, technical and human resources for TB activities must be maintained, with centralized procurement of TB medicines, promotion of infection control and civil society participation in addressing the two diseases.

This case study describes the activities of the National Tuberculosis Prevention and Control Programme to maintain and sustain TB services during the COVID-19 health emergency.

### **3.4 Intervention and methods**

US\$ 2.1 million were allocated to sustain and strengthen human resources required to maintain the continuity of TB services, through:

- virtual training for community leaders, with creation of a virtual TB social observatory and adoption of a declaration of the rights and duties of people affected by TB;

- integrating prevention of TB and COVID-19 by promoting use of face masks, hand-washing and physical distancing and dissemination of guidelines on administrative, environmental and personal protective measures for infection control;
- strengthening molecular diagnosis of TB;
- effective drug supply management;
- a mixed virtual, home and community treatment and supervision approach; and
- continuous monitoring and evaluation of activities.

### **3.5 Results**

More than 1000 health workers were trained virtually, and the Programme has maintained the continuity of services, including for people with DR-TB.

### **3.6 Timeline and funding source**

Start date: 1 January 2020

End date: first quarter of 2021

Funding sources: Ministry of Health, WHO Regional Office for the Americas, the Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund), TB Alliance and Partners in Health

## **Case study 4. Dominican Republic: Directly observed treatment during COVID-19**

### **4.1 Contact person**

Clara Rosa De la Cruz

### **4.2 Thematic areas**

Digital health; monitoring and evaluation

### **4.3 Background of the project**

The aim of the project was to ensure DOT during the global COVID-19 pandemic, respect physical distancing measures so that TB patients can avoid exposure and transmission and also continue diagnosis and protection from COVID-19 of everyone affected by TB. The target was to ensure treatment of 1381 patients with active TB throughout the country.

### **4.4 Intervention and methods**

The intervention consisted of family-supported DOT and VOT. A patient list and a monitoring matrix were created, and teams were formed. TB managers in regional health services, area coordinators and TB service managers decided whether home DOT or VOT would be used. The provincial health directorate verified compliance, and supervisors from the National Health System and the National Tuberculosis Control Programme conducted monitoring. Phone calls were made to all patients and to managers of TB services, and the list of patients contacted by the regional health services was verified.

### **4.5 Results**

Monitoring was conducted in two phases: 79% of patients were contacted in May 2020 and 68% in August 2020. Video calls were the most widely used method for confirming administration of home DOT, followed by video recordings. In a significant number of cases, no method was used to confirm that medications were being taken. The database held a total of 1381 TB patients, of whom 1095 were contacted (79%). Of these patients, 940 were still in treatment at the time of the call (86%). Of the 940 patients treated, 749 (80%) reported taking medications under home DOT, 20% reported taking medications in health facilities, and 433/940 (46%) reported no verified DOT.

#### **4.6 Timeline and funding source**

Start date: March 2020

End date: August 2020

Funding source: Domestic, International Monetary Fund

#### **4.7 Additional information**

Although a large proportion of patients were monitored by video calls, it became clear that health workers at all levels (National Tuberculosis Control Programme and National Health System central technicians, mid-level regional health services, local TB service managers and area coordinators) required software, tablets and laptops to conduct virtual DOT. In May 2020, the International Monetary Fund provided additional resources to mitigate the impact of COVID-19 on patients with TB, and we saw this as an opportunity to acquire electronic devices to ensure DOT by video call. We are also using International Monetary Fund resources to hire community agents to take DOT and necessary information to people with TB and HIV. These activities are under way.

### **Case study 5. Ethiopia: Safeguarding essential TB services by proactive COVID-19 impact mitigation in two remote areas**

#### **5.1 Contact person**

Degu Jerene Dare

#### **5.2 Thematic areas**

Treatment; screening and diagnosis; digital health

#### **5.3 Background of the project**

The undesirable effects of the containment and other aggressive public health and social measures that Ethiopia took against COVID-19 in early April 2020 became evident almost immediately. It was a serious blow to a small project on childhood TB in Kaffa and Bench-Sheko areas, about 500 km south of Addis Ababa, as the project was about to begin. We implemented a package of mitigation measures that enabled rapid resumption of TB services before any major impact. Our objectives were to make health facilities safer for patients and providers, to facilitate specimen transport with digital applications and to support integrated screening for COVID-19 and TB.

#### **5.4 Intervention and methods**

First, we conducted a rapid situation analysis to identify the factors that had led to a dramatic decrease in the patient flow. We started by assisting in updating the national TB screening algorithm by the addition of bilateral screening for COVID-19. Then, we provided personal protective materials to make service outlets safer for both patients and health workers, oriented health workers in use of personal protection and mitigation measures and organized training, either remotely or in small groups, with appropriate social distancing. We prepared a standard package of slides for use during every training or meeting opportunity. We also used every contact with the media to raise awareness not only about COVID-19 but also about the availability of TB services under safe conditions. A digital application was introduced to facilitate specimen transport.



## 5.5 Results

TB service use peaked to near pre-COVID-19 levels within 3–4 months of initiating the mitigation measures. Between September and December 2020, 1629 patients with presumptive TB were screened for TB in the two project zones. Of those screened, 326 (20%) had some form of TB and were directed to treatment. Bacteriologically confirmed TB constituted 54% (175) of all cases detected, 22% (71) were clinically diagnosed TB, and 24% (80) of cases were extra-pulmonary. Twenty (6%) patients were co-infected with HIV. Children under 15 years of age constituted 8.6% (141) of all presumptive TB cases screened, but only 4.9% (16) had any form of TB. Of 1629 patients with presumptive TB enrolled in the two zones, 1027 (63%) were also screened for COVID-19 symptoms or contacts. Similarly, 161 patients with suspected COVID-19 were screened for TB. Health facility staff quickly learnt to use the digital specimen referral application, which resulted in a noticeable improvement in the turnaround time of results. Implementation is still under way, and more information will become available in the coming months.

## 5.6 Timeline and funding source

Start date: 1 July 2020

End date: 31 December 2021

Funding source: Private donor

## Case study 6. Guatemala: Contingency plan for addressing and monitoring tuberculosis cases during the national COVID-19 emergency

### 6.1 Contact person

Hibeb Silvestre

### 6.2 Thematic area

Digital health

### 6.3 Background of the project

The overall objective was to provide guidance and training to health workers in the Ministry of Public Health and Social Assistance network who are providing TB care during the COVID-19 pandemic in Guatemala. The specific objectives are to ensure the continuation of comprehensive care for people with TB by DOT or VOT, to improve specialized training in COVID-19 and to track and monitor TB and COVID-19 co-infection in the country's health services network.

### 6.4 Intervention and methods

Facilitators in the programme network made random weekly phone calls to patients to verify that DOT was being implemented. In addition, with support from health workers, the facilitators made weekly reports on patients in treatment and on the DOT strategy used in each situation and also reported TB cases with suspected COVID-19 and new TB–COVID-19 cases. The programme consolidated the information.

### 6.5 Results

Between 24 March and 31 December 2020, 1277 health-care staff were trained virtually in TB- and COVID-19-related topics, and 20 TB “situation room” presentations were made. Four treatment monitoring schemes were used: 756 patients received institutional DOT, 362 home-based DOT, 65 community-supported DOT, 210 family-supported DOT and 20 VOT. Of 169 people with TB screened for COVID-19, 52 were co-infected with SARS-CoV-2.

## **6.6 Timeline and funding source**

Start date: 24 March 2020

End date: 31 December 2020

Funding sources: The Global Fund and Ministry of Health

## **6.7 Additional information**

Although Guatemala is no longer in a state of emergency, the programme continues to conduct the interventions that were effective, such as provision of virtual training.

## **Case study 7. India: TB Reach – Engaging informal private health-care providers in enhanced tuberculosis detection**

### **7.1 Contact person**

Tunisha Kapoor

### **7.2 Thematic areas**

Screening and diagnosis; treatment; digital health

### **7.3 Background of the project**

According to the 2020 WHO Global TB report (2), TB notifications in India fell by 25–30% between January and June 2020 from those in the same period in 2019, as both direct and indirect impacts of the pandemic. To address this, the Clinton Health Access Initiative is working with 1MG, a digital consumer health-care platform, to increase access to high-quality cartridge-based nucleic acid amplification diagnostic tests, home delivery of medications and a refill monitoring service. The latter two services are being pilot-tested in Ahmedabad, Delhi and Surat, and all three objectives are being tested in Faridabad.

### **7.4 Intervention and methods**

Increased smartphone use coupled with high-speed Internet and a positive environment for digital technology in India have created a favourable ecosystem for digital health. The aim of our strategy was to provide maximum services to patients at home, including sputum sample collection, medication delivery and counselling. 1MG periodically reminded patients of their upcoming visit to a doctor and medication refill times to ensure adherence to treatment. A call centre was set up to manage services and provide periodic remote counselling to patients. An incentive model of engagement with health providers linked patients to the pilot ecosystem.

### **7.5 Results**

As of January 2021, about 2500 patients had been enrolled in the pilot projects. About 60–70% of the people approached agreed to participate. One of the reasons for not accepting this service was reported as stigmatization, as patients did not want to reveal their illness to others. Our service provided 250 cartridge-based nucleic acid amplification diagnostic tests and 4500 drug deliveries. Test results were delivered to patients within 2.5 days of home sample collection, and medicines were delivered to patients' homes within about 1.5 days. The project has demonstrated some early successes: (i) reducing the turnaround time for laboratory results by changing from hard-copy to SMS delivery; (ii) recording patients' longitudinal treatment journey; and (iii) introducing refill reminders to reduce disruptions in treatment.

## **7.6 Timeline and funding source**

Start date: 1 June 2020

End date: 31 December 2021

Funding sources: The Global Fund; Bill & Melinda Gates Foundation

## **7.7 Additional information**

For-profit organizations offering convenient doorstep delivery of medicines and diagnostic services have mushroomed across the country over the past few years. These new-age organizations use robust technology platforms to offer services ranging from drug delivery, sample collection and transport and patient counselling to online consultations. This pilot study has demonstrated that collaboration among stakeholders – the programme partner (Clinton Health Access Initiative), the implementation partner (1MG), the public sector, a private laboratory network and private health care providers – can create innovative channels of service delivery and care. In a patient-centred approach, the focus has been to improve the quality of service delivery and to ensure that patients have access to various benefits. During the remainder of the project, we will improve patient engagement, increase the number of diagnostic tests and HIV and diabetes testing and further improve the speed of delivery of laboratory results and medicines.

## **Case study 8. India: Fighting the battle against tuberculosis amidst the COVID-19 pandemic: Experience from rural Bihar**

### **8.1 Contact person**

Dyuti Sen

### **8.2 Thematic areas**

Screening and diagnosis; treatment; management of co-morbidity; digital health; socio-economic support; resource management; leadership and management

### **8.3 Background of the project**

Innovators in Health (India) is conducting active case-finding, covering 53% of Samastipur district in Bihar, India. The target population are the poor and vulnerable, for whom financial, physical and technological barriers threaten case-finding, adherence to treatment and confidence in the public health system. The aim of the project is to improve people's access to the National TB Elimination Programme by extending the role of Government community health workers from treatment supervision to the entire chain of TB care and by improving early case detection, diagnosis and care.

### **8.4 Intervention and methods**

The COVID-19 pandemic adversely affected TB diagnosis in the public health system, as TB laboratory personnel were assigned to the COVID-19 response. To meet demands, we purchased an additional GeneXpert machine and hired further laboratory personnel, while the district supplied cartridges. We also facilitated sputum collection from patients' homes. We supported 852 community health workers in improving treatment adherence by providing personal protective equipment and a standard operating procedure so that they can continue their field activities safely. We provided telephone follow-up to monitor treatment adherence and to provide patient counselling and collaborated with district officials to supply medicines on time. We procured additional drugs from the private sector to avoid treatment disruptions in times of emergency stock-outs. We used software for computer-aided detection of TB on digital chest radiographs, given the shortage of proficient human readers.

## **8.5 Results**

Our intervention increased the testing capacity of the TB programme from about 30 to about 50 samples/day, with Xpert MTB/RIF testing for all patients with presumptive disease. The programme also ensured co-morbidity testing for HIV and diabetes in private laboratories. As a result, the project has complied with its case-finding targets, despite the multiple challenges posed by the pandemic. Between April and December 2020, 1817 cases of TB were diagnosed in our intervention area, representing 76% of all cases in the district [Source: Nikshay current facility].

Monitoring of treatment adherence and counselling were offered to 1756 people by telephone follow-up. The project team engaged with TB officials to ensure a regular supply of TB drugs and timely registration of patients in the National TB Elimination Programme's Nikshay portal. The overall rate of treatment initiation was > 95%, and the treatment success rate was 90%. The project also conducted public fund-raising to provide nutritional support to 700 vulnerable TB patients who had lost their livelihoods due to the direct or indirect impact of the pandemic.

## **8.6 Timeline and funding source**

Start date: 16 October 2019

End date: 30 September 2021

Funding sources: Stop TB Partnership; TB REACH; Wave 7 and Nalanda Charitable Foundation

## **8.7 Additional information**

The project maintained a people-centred approach throughout the challenges posed by the pandemic. This resulted in minimum travel and rapid diagnosis. The project continued case-finding during the crisis because of its constant engagement with government stakeholders and community health workers.

## **Case study 9. India: Roping informal private health-care providers for enhanced tuberculosis detection**

### **9.1 Contact person**

Ramesh Dasari

### **9.2 Thematic areas**

Prevention; screening and diagnosis

### **9.3 Background of the project**

The aim of India's National Strategic Plan 2017–2025 is to eliminate TB by 2025. Although private provider engagement has emerged as an important strategy, informal providers who are relied upon for initial medical care are not part of this strategy. The project "Roping informal private health-care providers for enhanced TB detection" was initiated to demonstrate a model for engaging informal providers to increase TB detection. The project was implemented in eight TB units in the southern Indian state of Telangana. The project mapped TB providers and enrolled and trained 755 providers in TB care and provided support during field visits to identify and refer individuals with TB-like symptoms for testing at National TB Programme (NTP) clinics.

### **9.4 Intervention and methods**

During the period October 2018–December 2019, the project mapped 1614 informal providers, of whom 755 were enrolled from eight units in the intervention area. Enrolled providers screen people for TB and register them with a mobile-based digital application. Project staff track and facilitate TB testing for registered individuals. During the COVID-19 outbreak, however, people remained at home, ignoring TB symptoms

because of fear of COVID-19, compounded by restricted movement and other conditions resulting from lockdown. The project organizers consulted with providers on strategies to reach people at home, including providers' visits to people's homes, sample collection and transport, tele-counselling to connect people with providers and NTP services and transporting individuals with TB-like symptoms to testing facilities.

## **9.5 Results**

From a target population of 893 086, informal providers referred 9245 patients, of whom 8939 (97%) presented for testing and 1147 were diagnosed with TB (966 bacteriologically confirmed and 181 clinically confirmed). An increase in the number of notifications was reported in the fourth quarter of 2019, to 1748, from a baseline of 1110 in the second quarter of 2018 and 730 in the fourth quarter of 2017, comprising both public and private sector notification. A total of 1147 people of all forms of TB are attributed to the project. The project reached 37% of women for testing, and all women and children with diagnosed TB were initiated on treatment, in compliance with the agreed gender action plan. In April–September 2020, despite many difficulties due to COVID-19, the project increased the number of TB notifications to 32%, from 24% in October 2019–March 2020. Similarly, 31.4% of samples were transported as compared with 15.7% in the previous period, and 282 individuals were transported to testing facilities by arranging transport. These activities led to testing of 99% of referrals. Project staff worked in coordination with NTP staff to ensure that all diagnosed patients were initiated on treatment, with a timely supply of drugs. Enrolled providers provided follow-up, treatment adherence and contact screening services during visits to patients' homes. The number of all forms of TB referred through the project was reduced from 859 before COVID-19 to 746 during COVID-19 (13%); however, this is much lower than the overall reduction of all new case notifications by the NTP during this period (35%).

## **9.6 Timeline and funding source**

Start date: 19 July 2018

End date: 31 March 2021

Funding source: Stop TB Partnership Wave 6

## **9.7 Additional information**

Informal health care providers are also referred to as “rural health care providers”, “not fully qualified providers” and “unlicensed health care providers”. Informal providers provide the bulk of initial medical care for people in low-income communities, especially in countries like India; however, the care they provide is sometimes characterized as non-diagnosis, misdiagnosis or delayed diagnosis and/or treatment. The project received a grant from the Stop TB Partnership to extend the project to another 11 units in five new districts in Telangana from January 2020. The project is also attempting to secure funding from local businesses and the NTP.

## **Case study 10. India: Using an active compliance and treatment strategy in a digital health approach to improve tuberculosis prevention and care among rural women in Mewat district during COVID-19**

### **10.1 Contact person**

Subhi Quraishi

### **10.2 Thematic areas**

Prevention; screening and diagnosis; treatment; monitoring and evaluation; digital health; gender and equity

### **10.3 Background of the project**

ZMQ Development is implementing an innovative technology-linked approach for active case-finding, reporting of adherence and treatment management for rural women in Mewat district, India. The project, known as Active Compliance and Treatment Strategy for TB, is using a digital platform (MIRA Channel for RMNCH+A) to reach rural women house-to-house to build awareness and promote active screening and testing for TB.

### **10.4 Intervention and methods**

To improve TB case-finding, screening, treatment and care during COVID-19, the following interventions packages are delivered door-to-door to rural women:

- sputum collection, laboratory results and medications;
- a digital TB “storyteller” to raise awareness of TB and COVID-19;
- a self-screening tool for TB to increase awareness and self-referral for testing; and
- a mobile patient adherence and treatment management toolkit, which enables patients to provide confirmation of adherence remotely via VOT and to track their treatment.

The project also follows up patients with phone calls and provides information on TB and COVID-19 in community centres.

### **10.5 Results**

The project is under way and will be analysed in the third quarter of 2021. Thus far, improvements have been seen in awareness of the causes and symptoms of TB and in the prevention and treatment rates among rural women in Mewat. The model has helped to improve testing, notification and treatment adherence. The final report will include an analysis of improvements in awareness, screening, diagnosis, adherence and treatment outcomes.

### **10.6 Timeline and funding source**

Start date: 1 January 2020

End date: 30 September 2021

Funding sources: Stop TB Partnership and Global Affairs Canada

## **Case study 11. Kenya, Malawi and Zimbabwe: Impact of COVID-19 on tuberculosis and HIV services: a public health surveillance project**

### **11.1 Contact person**

Anthony D. Harries

### **11.2 Thematic areas**

Screening and case finding; treatment; monitoring and evaluation

### **11.3 Background of the project**

The aim of the project is to determine the impact of the COVID-19 pandemic on TB case detection and TB treatment outcomes by strengthening real-time surveillance in selected health facilities in Nairobi (Kenya), Lilongwe (Malawi) and Harare (Zimbabwe). The specific objectives are: i) to compare monthly aggregate numbers of TB cases with presumptive and registered cases, stratified by age, sex and TB type, between March and August 2019 (before COVID-19) and between March and August 2020 (during COVID-19); and ii) to examine trends in TB case detection and treatment outcomes during the COVID-19 period associated with interventions designed to mitigate the impact of SARS-CoV-2 on TB services.

### **11.4 Intervention and methods**

We work with the NTPs to collect and validate TB programme data from selected health facilities each month for the previous month with EpiCollect5. For TB treatment outcomes, data are collected for a specific month for the cohort of TB patients started on first-line treatment 8 months previously. We are also collecting data for the same months of the previous year as our pre-COVID-19 control. We have purposively selected 18 health facilities in Nairobi, 8 in Lilongwe and 10 in Harare. Monthly reports, including a narrative explaining observed changes, are prepared and shared each month with the national authorities.

### **11.5 Results**

For the three countries combined and between the pre-COVID-19 and COVID-19 periods, there was a 51% decrease in the number of cases of presumptive TB (80% for children, 45% for adults, 57% for females and 43% for males). There was a 30% decrease in the number of registered TB cases (31% for bacteriologically confirmed presumptive TB, 34% for clinically diagnosed presumptive TB and 23% for extrapulmonary TB). There was an overall 5% decrease in treatment success, due mainly to increases in “not evaluated outcomes”. Kenya partially reversed the initial decrease in presumptive TB, registered TB and treatment success by fast-tracking and prioritizing TB screening and active case-finding and contact-tracing in community hot spots. In Malawi, the success of TB treatment has been maintained with technical support in evaluating end-of-treatment outcomes. In Zimbabwe, the effects of COVID-19 have been compounded by health-facility closures and health-worker strikes.

### **11.6 Timeline and funding source**

Start date: 1 May 2019

End date: 28 February 2021

Funding sources: Vital Strategies; Resolve (USA)

### **11.7 Additional information**

This public health surveillance project in three African countries was agreed in May 2020, and data collection started the following month. It is a collaboration between the Centre for Operational Research (International Union against Tuberculosis and Lung Disease, the Union), the national TB and HIV programmes in Kenya, Malawi and Zimbabwe, the Special Programme for Research and Training in Tropical Diseases and Vital Strategies (USA). The project will run until February 2021, by which time we will have monthly validated data on TB and HIV between March 2019 and January 2021, which will allow monthly comparisons of data between

the pre-COVID-19 and COVID-19 periods. The main purpose of the project is to collect, validate and report data on TB case detection and general HIV testing (not included in the WHO case study application) every month rather than quarterly, and to determine whether strengthened real-time surveillance is feasible and useful to programme staff to counteract the negative effects of COVID-19. We have submitted a mid-term report to our stakeholders that provides a direct comparison of 6-month aggregated TB numbers between March and August 2019 (pre-COVID-19) and March and August 2020 (COVID-19) and also presents trends in key TB parameters in the COVID-19 period related to interventions to mitigate the impact of COVID-19 on TB services.

## **Case study 12. Mozambique: Experience of using technology to tackle potential disruption of tuberculosis services due to COVID-19 in Maputo City, 2020**

### **12.1 Contact person**

Ivan Manhiça

### **12.2 Thematic areas**

Prevention; screening and diagnosis; digital health

### **12.3 Background of the project**

To stop the surge of COVID-19 cases, the Government of Mozambique decreed a state of national emergency between 30 March and 28 July 2020. The public health measures reduced population movement, which also reduced community based TB interventions. To ensure continuity of services during the state of emergency in Maputo City, the NTP developed an approach to raise awareness on TB and COVID-19 among TB patients and the general population, to integrate community based TB interventions into COVID-19 services and to strengthen provision of TB treatment and support for adherence to medication.

### **12.4 Intervention and methods**

To raise awareness, the NTP used the mass media, including television shows, radio programmes, leaflets and social media messaging. To ensure continuation of active case-finding and contact-tracing, the NTP issued recommendations for integrated TB–COVID-19 approaches. To ensure provision of TB treatment and support for adherence to medication, NTP relied on telemedicine for symptomatic screening and referral of children under 5 years of age for TB preventive treatment. Telemedicine was also used to reinforce adherence to treatment and reach patients who were lost to follow-up.

### **12.5 Results**

Between 30 March and 30 August 2020, 2174 patients were telephoned to strengthen their adherence and to trace contacts; 11 patients who had been lost to follow-up were reconnected to services; however, 234 patients could not be supported with telemedicine because of difficulty in accessing telephone services. Although the number of cases referred by community health-care workers decreased by 27.5% during the second quarter of 2020 as compared with the same period in 2019, the intervention overcame this decrease. By June 2020, the number of cases started to rise, and the trend continued to increase to achieve an 8.7% increase in referrals during the third quarter as compared with the same period in 2019. Similarly, the number of children under the age of 5 who started TB preventive treatment had decreased by 46.5% in the second quarter of 2020 to 1094 but recovered and even increased by more than 100% in the third quarter as compared with the same period in 2019 due to our intervention.

### **12.6 Timeline and funding source**

Start date 30 March 2020

End date: 30 August 2020

Funding source: The Global Fund



## **Case study 13. Myanmar: Initiation of a mobile payment platform to support people with drug-resistant tuberculosis during the COVID-19 pandemic**

### **13.1 Contact persons**

Kyi Pyar Soe; Pyae Phyo Wai

### **13.2 Thematic area**

Socio-economic support

### **13.3 Background of the project**

The COVID-19 pandemic has disrupted the provision of care and support to people with DR-TB. The Union adapted its strategy to provide socio-economic and psychosocial support to people with DR-TB during this time in two ways: (i) by providing socio-economic support with an innovative cash-transfer payment via Wave Money (initiated in July 2020), including for DR-TB patients affected by COVID-19, and (ii) with psychosocial support through telecounselling during the time of diagnosis to reduce loss to follow-up and to minimize hardship for patients.

### **13.4 Intervention and methods**

Registered DR-TB patients have been receiving financial support under the Union's Community-based MDR-TB Care project through home visits and automated teller machines (ATMs) since 2015. To cope with the challenges posed by the pandemic, the Union used the Wave Money platform to transfer monetary support to patients via mobile phone or through local agents. The support includes a supplement of MMK 5000 to cover communication costs for obtaining telecounselling during the COVID-19 pandemic. Patients co-infected with COVID-19 and those identified as contacts receive an additional MMK 100 000 to reduce additional catastrophic costs. This new monthly cash transfer has now been initiated in 12 townships: six in Mandalay region, three in Shan state, two in Sagaing region and one in Magway region.

### **13.5 Results**

More than 95% of DR-TB patients have received monetary support in this manner. Use of the Wave Money system has enabled cash transfers directly to patients, thereby saving time and transport costs for both staff and patients and reducing physical contact during direct disbursement of cash. These interventions have reduced loss to follow up and reduced the hardship and suffering of DR-TB patients, including those co-infected with COVID-19 or identified as contacts.

### **13.6 Timeline and funding source**

Start date: 1 July 2020

End date: 30 June 2021

Funding source: The Global Fund

### **13.7 Additional information**

The Union is an international scientific non-profit organization based in Paris, France, established in 1920. Its mission is to bring innovation, expertise, solutions and support to address health challenges in low- and middle-income countries, with the vision of health solutions for the poor. The Union Myanmar was established in Mandalay in 2005 and provides integrated HIV care and prevention, active TB case-finding and case-holding and a community-based multi-drug-resistant TB programme, in support of the Department of Public Health, Ministry of Health and Sports.

## **Case study 14. Nigeria: Early experience with an integrated community programme for active COVID-19 and tuberculosis case finding**

### **14.1 Contact person**

Bethrand Odume

### **14.2 Thematic areas**

Treatment; screening and diagnosis

### **14.3 Background of the project**

We coordinated, designed and implemented an integrated platform for diagnosis of TB and COVID-19. We describe the enabling factors and best practices and report the results of screening and testing for COVID-19, TB and HIV and access to care.

### **14.4 Intervention and methods**

The KNCV TB Foundation Nigeria, funded by the United States Agency for International Development, provides comprehensive TB care on the basis of existing structures and resources in partnership with the Kaduna State Government. An integrated community-based COVID-19 and TB case-finding intervention was provided from a mobile diagnostic van equipped with GeneXpert and digital X-ray between June and July 2020. Before implementation in the field, an integrated TB and COVID-19 testing algorithm and recording tools were developed by TB partners in collaboration with the laboratory task force of the Presidential Task Force on COVID, followed by capacity-building, provision of Xpert Xpress SARS-CoV-2 cartridges and personal protective equipment.

### **14.5 Results**

Of 1931 people enrolled and 1928 (99.8%) screened with CAD4 TB X-ray, 83 were found to have presumptive TB, and 11 (13%) cases were diagnosed with GeneXpert. From the people screened, 1252 nasopharyngeal swabs were collected and tested for SARS COV-2, and all were screened for HIV; 183 (15%) cases of COVID-19 and 12 (1.0%) cases of HIV infection were diagnosed. The rate of COVID-19–HIV co-infection was 0.5%; there were no cases of COVID–TB co-infection.

### **14.6 Timeline and funding source**

Start date: 1 June 2020

End date: 30 July 2021

Funding source: United States Agency for International Development and Kaduna State Government

### **14.7 Additional information**

Factors that contributed to the success of the intervention include building on an existing structure, multi-stakeholder collaboration, integrated tools for reporting, community sensitization about TB and COVID-19, screening for other diseases, political will and subnational government support.

## **Case study 15. Pakistan: Multipronged approach to continue TB services during the pandemic**

### **15.1 Contact person**

Aamna Rashid

### **15.2 Thematic areas**

Prevention; screening and diagnosis; treatment; monitoring and evaluation; digital health

### **15.3 Background of the project**

Mercy Corps has been a principal recipient of Global Fund grants since 2007. In 2010, Mercy Corps began implementing public–private interventions for TB case-finding and quality-assured, standardized, free of cost diagnosis and treatment of TB patients. The case-finding approaches include targeted detection projects in clinics, large private hospitals, “outreach chest camps” for vulnerable populations, self-referrals through interactive voice calls, engagement of female health workers, transport of sputum specimens by community riders and awareness-building forums.

Public health measures to control the COVID-19 pandemic, such as movement restrictions on field staff, public transport shutdowns, restricted health-care-seeking because of fear of contracting COVID-19, stigmatization, health-care staff ill with COVID-19 and fewer community referrals, resulted in a decrease in TB case notification in Pakistan. In the early weeks of the lockdown (March 2020), about half of the general practitioners engaged in the public–private interventions closed their facilities, resulting in a 39% decrease in case registrations in the following months in Mercy Corps’ programme districts. This presented a challenge, as many people in Pakistan (80%) contact the private healthcare sector in case of illness.

### **15.4 Intervention and methods**

Mercy Corps conducted a rapid situation assessment to understand the reasons for the closure of services and the support necessary to resume work. The reasons reported for closure of private clinics were the increased numbers of COVID-19 cases; shortages of personal protective equipment; cases of COVID-19 among health-care providers, with increased risk due to age and comorbid conditions; insufficient space in facilities to maintain social distancing and insufficient capacity to impose infection prevention measures; reduced overall demand for outpatient services; On the basis of this assessment and suggestions by health-care providers, Mercy Corps implemented the following to ensure the continuity of services and the safety of teams during the COVID-19 pandemic:

- dissemination of guidelines for programme adaptation;
- dissemination of guidelines for infection prevention and triage;
- interactive voice calls to raise awareness and improve self-referrals in communities;
- delivery of medicines to TB patients at their doorsteps;
- follow-up of patients in the private sector remotely through telephone (including for household contact screening);
- provision of personal protective equipment and hygiene products to 1,402 private general physicians, paramedics and laboratory technicians and to 206 field team members; and donation of 744 personal protective equipment kits to the Government of Balochistan for their front-line health-care workers engaged in COVID-19 management;
- dissemination of a flyer to increase awareness on TB and COVID-19 and reduce stigmatization; and
- enhanced remote stakeholder coordination, monitoring, evaluation and learning.

### **15.5 Results**

Mercy Corps’s timely response and adaptation to COVID-19 enabled the public–private programme to continue its TB services: 98% of TB patients were able to continue their treatment without interruption in districts covered by the programme. Between 1 April and 23 December 2020, 29,445 patients were diagnosed and treated, 9,785 patients received various types of follow-up interventions, and 41,389 household contacts were screened for TB.

### **15.6 Timeline and funding source**

Start date: 1 January 2018

End date: 31 March 2021

Funding source: The Global Fund

## **Case study 16. Paraguay: Virtual training to strengthen implementation of the End TB strategy during COVID-19**

### **16.1 Contact person**

Sarita Aguirre

### **16.2 Thematic area**

Health-care staff training

### **16.3 Background of the project**

Paraguay was under nationwide lockdown for 54 days. Outpatient clinics and laboratories were closed, resulting in a 50% drop in TB case detection (> 250 cases per month). The National Tuberculosis Control Programme adapted virtual training of health-care staff to mitigate the impact of the pandemic on continuation of TB services.

### **16.4 Intervention and methods**

The National Tuberculosis Control Programme began virtual training for doctors and heads of local TB services, including for populations deprived of liberty and indigenous populations. The topics covered were general information on TB, diagnosis, treatment, bacteriological and clinical monitoring, adverse drug reactions, contact-tracing, preventive therapy, infection control and recording and reporting. Active case finding was recommended to mitigate the impact of the COVID-19 pandemic.

### **16.5 Results**

Approximately 500 health professionals have been trained in all aspects TB prevention and care. Although the impact of this intervention is still being evaluated by the national oversight and monitoring team, a 20% increase in monthly TB case-finding has been observed.

### **16.6 Timeline and funding source**

Start date: 15 September 2020

End date: 15 December 2020

Funding source: National Tuberculosis Control Programme

### **16.7 Additional information**

In early March, the Central Public Health Laboratory recommended that respiratory samples be processed only in certified biosafety cabinets; however, only two cabinets were available in the country. By the end of March, we had equipped 17 of 131 laboratories that conduct TB smear tests, and, as of October, GeneXpert was universalized as the first diagnostic test for all suspected cases of TB, doubling the number of cases diagnosed with this method. This, with improved knowledge of professionals, will allow us to start 2021 with strengthened capacity to diagnose TB cases.

## **Case study 17. Philippines: Standard short oral regimen for drug-resistant tuberculosis during the COVID-19 pandemic**

### **17.1 Contact person**

Donna Mae Gaviola

### **17.2 Thematic areas**

Treatment; digital health

### **17.3 Background of the project**

The treatment outcomes of patients with DR-TB remain unsatisfactory in the Philippines. In 2018, only 65% of patients were treated successfully, due mainly to a high proportion of loss to follow-up because of adverse drug reactions. To improve the treatment outcomes of patients with DR-TB, the NTP adopted the shorter all-oral bedaquiline-containing regimen in March 2020, following the recommendations of WHO.

### **17.4 Intervention and methods**

Pursuing the experience of the NTP in introducing novel regimens such as the standard long all-oral regimens, the country adopted the short all-oral bedaquiline-based regimen transition plan immediately after release of the WHO rapid communication on its use in December 2019. The plan was reviewed by the technical sub-working group for Programmatic Management of Drug-resistant TB in January 2020, and the treatment guidelines were promptly revised according to a re-estimation of the anti-TB drug requirement, particularly for bedaquiline. In February 2020, to ensure implementation of the new treatment, a memo was issued and orientation of health workers begun. On 15 March 2020, because of the COVID-19 pandemic, enhanced community quarantine was imposed in most regions of the country, resulting in cancellation of face-to-face orientation. Hence, virtual synchronous orientation of health workers was conducted.

### **17.5 Results**

Enrolment of eligible patients with DR-TB onto the standard short all-oral regimen began in March 2020, with 186 patients. As more health workers became trained in the change to DR-TB treatment and with continuous imposition of community quarantine, restricting the movement of patients for clinic visits, the all-oral regimens were rapidly accepted by both health workers and patients. Enrolment for the standard short all-oral regimen increased to 364 patients between April and June 2020 and further increased to 467 patients between July and September and to 449 between October and December, for a total of 1466 patients initiated on this treatment in 2020.

### **17.6 Timeline and funding source**

Start date: 1 January 2020

End date: 31 March 2020

Funding source: Technical support from United States Agency for International Development; logistical support from the Global Fund

## **Case study 18. Russian Federation: Preventive therapy for drug-resistant tuberculosis contacts in high-risk populations: Experience from Vladimir oblast**

### **18.1 Contact person**

Grigory Volchenkov

### **18.2 Thematic areas**

Prevention; screening and diagnosis; treatment

### **18.3 Background of the project**

The goal is to accelerate a decrease in TB morbidity and mortality in Vladimir oblast (Vladimir City and Kovrov and Murom rural districts) by implementing a comprehensive package of services based on the search, treat and prevent strategy. The objectives include provision of TB preventive therapy to people infected with TB, early detection of TB and effective treatment with contemporary methods of TB care based on a patient-centred approach, including during COVID-19. The project is implemented by the Vladimir oblast centre for phthisiopulmonology and the oblast AIDS centre.

#### **18.4 Intervention and methods**

The project is focused on vulnerable groups: high-risk contacts of TB patients, homeless people and people living with HIV. All people diagnosed with TB received prompt treatment. People without active TB but who are eligible for TB preventive therapy were given appropriate treatment according to the results of drug-susceptibility testing of the index case. Eligible people who refuse TB preventive therapy are followed monthly and after 12 and 24 months, as applicable. All treatment is administered under strict DOT by community health-care workers.

#### **18.5 Results**

As of 30 September 2020, 3500 people in the target groups had been screened for TB. Of 420 people suspected of having TB disease, 21 (5%) had confirmed active TB. Of 398 people eligible for TB preventive therapy, 280 (70%) completed a full course, 40 (10%) stopped because of adverse events, 51 (13%) discontinued therapy, and 27 (7%) are still under therapy. One person who declined and one person who discontinued TB preventive therapy but none of those who completed or continued treatment developed TB. The study showed that homeless people were at increased risk of TB: 71% of people diagnosed with active TB and 33% of those lost to follow-up were homeless.

#### **18.6 Timeline and funding source**

Start date: 1 January 2019

End date: Ongoing

Funding source: Vladimir oblast TB programme, Eli Lilly Foundation Global Health Partnership, TB REACH, Stop TB Partnership, United Nations Office for Project Services

### **Case study 19. South Africa: Intensified shielding intervention package to help eliminate the ongoing pandemic in Khayelitsha “seCovid eKhayelitsha”: Multipronged approach to lessening the impact of COVID-19 on people living with and exposed to rifampicin-resistant tuberculosis in Khayelitsha**

#### **19.1 Contact person**

Erika Mohr-Holland

#### **19.2 Thematic areas**

Prevention; treatment; socioeconomic support

#### **19.3 Background of the project**

Khayelitsha is a peri-urban township located outside Cape Town, South Africa, which is an epidemic hot-spot for HIV and TB, including rifampicin-resistant forms of TB. Cape Town was also the initial epicentre of COVID-19 in South Africa. Médecins Sans Frontières has been working with the Department of Health to provide services to people living with rifampicin-resistant TB for the past 10 years and joined the Department of Health to offer interventions to decrease the impact of COVID-19 on these people and their households.

#### **19.4 Intervention and methods**

As people with TB are probably at increased risk of poor outcomes of COVID-19, a multi-layer intervention was used to limit visits to health facilities. Médecins Sans Frontières collaborated with teams from the Department of Health to provide home care, telephone consultations, food and care packages and access to preventive therapy for vulnerable household contacts. Impact was assessed by monitoring enrolment and participant satisfaction.

## **19.5 Results**

A total of 232 telephone consultations were held. Thirty people received home care for rifampicin-resistant TB, with priority for people with diabetes and those over the age of 55. Nutrition support and infection prevention packs (including masks, sanitizer, bleach and information) were distributed to 116 families. High-risk household contacts of 52 people with rifampicin-resistant TB were given preventive therapy after TB disease was ruled out. Participants reported a high degree of satisfaction with the programme and reported that they felt “less isolated” and better “cared for”.

## **19.6 Timeline and funding source**

Start date: 1 April 2020

End date: 19 October 2020

Funding source: Médecins Sans Frontières

## **19.7 Additional information**

“seCOVID eKhayelitsha” means “end COVID-19 in Khayelitsha. The team has another project called “TB NET” (neighbourhood expanded testing) to increase and promote TB testing in neighbourhoods with new incident TB cases.

## **Case study 20. Ukraine: Prevention of emotional burn-out among health-care staff in tuberculosis services**

### **20.1 Contact person**

Yana Terleyeva

### **20.2 Thematic areas**

Health-care staff training; managing co-morbid conditions such as COVID-19, HIV, diabetes and mental health

### **20.3 Background of the project**

Physicians are among the most vulnerable to emotional burn-out. The COVID-19 pandemic has increased the burden on health-care workers, particularly TB staff, who are facing an increased risk of infection. The Public Health Centre of the Ministry of Health initiated a number of measures to mitigate burn-out among TB care workers in the context of the COVID-19 pandemic.

### **20.4 Intervention and methods**

The main interventions were disseminating thematic reading materials describing the main signs of burn-out and ways to overcome it through social networks and medical groups; 10-day virtual training in prevention of emotional burn-out and self-help techniques; thematic sessions on the topic in other meetings, training and webinars by clinical mentors, palliative care staff and others; and recommendations on the topic by the Centre’s specialists during technical support visits.

### **20.5 Results**

The intervention was provided for medical workers in all regions of the controlled territory of Ukraine. Over 150 TB health-care staff received training. Direct feedback from the trainees showed improved emotional competence and psycho-emotional state; greater awareness of the symptoms of professional burn-out and self-help techniques; greater awareness among the leaders of health institutions of the importance of

programmes for the prevention of burn-out; and greater awareness of mental health among health-care staff of TB institutions in Ukraine.

#### **20.6 Timeline and funding source**

Start date: 1 May 2020

End date: 31 December 2020

Funding sources: Ministry of Health, the Global Fund

#### **20.7 Additional information**

Given the importance of this topic and high demand from health professionals, the Centre plans to expand its activities in 2021 by supporting additional health-care staff, including primary health-care workers and other people involved in the treatment and care of TB patients.

### **Case study 21. Uruguay: Use of digital technologies for tuberculosis management during the COVID-19 pandemic**

#### **21.1 Contact person**

Mariela Contreras

#### **21.2 Thematic areas**

Treatment; digital health

#### **21.3 Background of the project**

During the COVID-19 pandemic, TB treatment has been monitored by VOT in all health centres of the Honorary Commission to Fight Tuberculosis and Prevalent Diseases, the entity responsible for implementing the NTP. The objectives of the project were to determine acceptance of VOT among health workers and patients, to evaluate adherence to treatment and outcomes in patients monitored by VOT and to evaluate the effectiveness of video calls for clinical monitoring of adverse drug reactions.

#### **21.4 Intervention and methods**

Smartphones with Internet access were provided to all Commission health centres in the country. Patients were offered the option of monitoring treatment by VOT, synchronously or asynchronously, or by DOT. The requirements for using VOT were having a smartphone with Internet access and authorizing use of the method. The intervention was evaluated in two surveys of Commission centre managers with Google Forms and by monitoring data from the National TB Registry.

#### **21.5 Results**

During the intervention, 568 patients were treated. In the first survey, 227 of 251 patients (90%) were monitored, of whom 118 (52%) by VOT. During the second survey, 263 of 317 patients (83%) were monitored, of whom 145 (55%) by VOT. In Montevideo, where 55% of the country's TB cases are treated, 98% of cases were monitored, with 58% by VOT. The suitability of this intervention was considered positive by 70% of health workers and 60% of patients; 18% of the health workers did not support the intervention, and 12% were neutral. The numbers of patients who attended the centres in Montevideo and elsewhere in the country were similar, implying a limited impact of the pandemic on TB services. Doctors used telemedicine for clinical monitoring and active surveillance of adverse drug reactions in 52% of patients.

#### **21.6 Timeline and funding source**

Start date: 1 April 2020



End date: 31 October 2020

Funding source: Honorary Commission to Fight Tuberculosis and Prevalent Diseases

### **21.7 Additional information**

Uruguay declared a health emergency due to COVID-19 in March 2020. The health authorities stipulated voluntary confinement of the population, mainly at-risk groups, and called for limited face-to-face activities, including outpatient health care. The NTP planned strategies to comply with the restrictions on the mobility of health workers and patients. One such intervention is VOT monitoring. Uruguay is in a privileged position in terms of Internet connectivity and access to technology. According to the National Statistics Institute, 81% of Uruguayan households had fixed Internet service in 2019, and three of four Uruguayans used smartphones. This has favoured use of VOT during the pandemic. Future activities include improving the quality of VOT monitoring by optimizing its application; measuring the impact of VOT on treatment of patients; and identifying the profile of patients who are not eligible for VOT in order to conduct appropriate follow-up with the participation of health workers, family members and social institutions. During the COVID-19 pandemic, the NTP has had an opportunity to integrate various technological resources into TB control by prioritizing patient-centred care.

## **Case study 22. Uruguay: Continuing training of health workers to tackle two pandemics: tuberculosis and COVID-19**

### **22.1 Contact person**

Mariela Contreras

### **22.2 Thematic areas**

Health-care staff training; digital health

### **22.3 Background of the project**

The aim of the project was to improve the training of medical, technical and administrative health workers to prevent, diagnose, treat and care for both TB and COVID-19 patients. The specific objectives were to promote a culture of continuing training among workers in the Honorary Commission to Fight Tuberculosis and Prevalent Diseases through digital platforms and to provide regular technical and scientific information on TB and COVID-19 to stakeholders.

### **22.4 Intervention and methods**

The NTP used various digital platforms for continuing training of Commission workers, including text documents, audiovisual productions and virtual sessions. Materials were selected that best suited the national situation and were supported by the best scientific evidence. Relevant technical and non-technical topics were prioritized, and the materials were disseminated. The project was evaluated indirectly by the use of continuing education materials and participation in training on digital platforms.

### **22.5 Results**

The NTP has 19 doctors, 139 nurses and 8 administrators. These staff members were provided with:

- four virtual training sessions on TB and COVID-19 on Zoom, focusing on prevention measures and strategies to maintain NTP operations, in which 86% of the targeted audiences participated;
- an open-access scientific–technical information section on the institutional website containing nationally produced materials and materials from international organizations (e.g. WHO, the Union);

- a private institutional YouTube channel for subscribed officials, with NTP audiovisual material and authorized international TB courses for a total of 23 h of training; there were an average of 105 views per video;
- monthly virtual meetings to discuss clinical cases and questions on the TB–COVID-19 platforms; and
- periodic WhatsApp updates on the COVID-19 situation and recommended health measures sent to health workers.

## **22.6 Timeline and funding source**

Start date: 1 April 2020

End date: 31 October 2020

Funding source: Honorary Commission to Fight Tuberculosis and Prevalent Diseases

## **22.7 Additional information**

Training health workers to keep them up to date on TB issues is a priority for the NTP, as it improves the quality of patient care. Although continuing education is a worker’s right, a culture of training must be created, with facilitated access. Up to March 2020, when the COVID-19 health emergency was declared, training was inconsistent and conducted only face to face, with high costs and commitment of time. When the mobility of health workers was restricted by pandemic control measures, new continuing education strategies were planned to provide information on SARS-CoV-2 and to situate TB in the new context. Digital platforms facilitated access to information, encouraged debate and discussion and enabled the development of skills and competence. Because of the abundant technical information available on the Internet and the importance of keeping up with scientific advances, it is important to select only of those materials suitable for the situation and context of the country. The goal of the NTP is to create a virtual learning platform for continuing education and knowledge assessment. Extensive Internet coverage throughout the country and access to digital technologies in health services are strengths that will support the projected activities.

## **Case study 23. Zambia: Sustaining tuberculosis interventions amidst COVID-19**

### **23.1 Contact person**

Patrick Lungu

### **23.2 Thematic area**

Monitoring and evaluation

### **23.3 Background of the project**

The first COVID-19 cases in Zambia were reported on 18 March 2020, and the following 8 weeks saw an 18% reduction in weekly TB notifications throughout the country due to fewer hospital visits because of the movement restrictions imposed in response to the pandemic. The Ministry of Health’s National Tuberculosis and Leprosy Programme conducted weekly surveillance of key performance indicators of TB services, including notifications of both drug-sensitive and DR-TB at national, provincial and district levels, as COVID-19 was anticipated to impact them adversely.

### **23.4 Intervention and methods**

Weekly interactive discussions were set up virtually with at least 80 participants. Key performance indicators were summarized with regard to established weekly performance targets and shared with all districts before the virtual discussion for validation and analysis and to prompt further action and response.

### **23.5 Results**

The weekly meeting was used to track progress against the set targets and to identify and address emerging challenges to the TB response, such as the availability of GeneXpert cartridges and anti-TB medicines. The data indicated gaps, allowing us rapidly to find solutions to restore the services. High-performing districts and provinces were given the opportunity to share best practices with others, and low-performing districts shared their challenges and identified the necessary support. All the districts implemented best practices in case-finding. Notifications of TB increased consistently thereafter, resulting in notification of more cases (7.5–10.8% increase) in 2020 than in 2019, 2018 and 2017.

### 23.6 Timeline and funding source

Start date: 7 May 2020

End date: 31 December 2020

Funding sources: Combinations of domestic resource, Global Fund, United States Agency for International Development and World Health Organization.

## Way forward

In the short term, joint work on both TB and COVID-19 has provided critical opportunities to contribute to the clinical management of COVID-19 and to also mitigate the impact on TB. Already, the case studies in this report reveal that

- Telemedicine and VOT practices have multiplied during the COVID-19 pandemic: These new models of care are being successfully used for screening, contact investigation and psychosocial care of people affected with TB or TB/ COVID-19;
- Monitoring and evaluation mechanisms are being improved to help estimate the progression of the TB epidemic in *real-time*, in the context of the COVID-19 pandemic; and,
- Better public-private sector alliances and community engagement are being forged to deal with the unprecedented threats of COVID-19 and TB.

This could continue in the coming months with joint screening, contact investigation and surveillance and application of digital health technologies and other innovative strategies to ensure equitable provision of health care. This could minimize the impact of the pandemic on financing for TB services and research. Even before the pandemic, the budgetary allocation for TB services and research was at no time commensurate with the global burden of the disease and always fell short of estimated needs (2, 13). The pandemic has exposed further gaps in TB prevention and care that must be addressed by research, including the lack of rapid point-of-care diagnostics for use in the community, lack of effective vaccines to prevent the spread of TB, lack of patient-centred management approaches, such as support for adherence with digital technology, and lack of efficient sample collection and transport systems (14). To re-accelerate progress, governments should help ensure that the funding requirements for TB services and research are not compromised.

Long-term recovery will be greatly facilitated by technical and financial cooperation with international technical agencies, multinational banks, funding agencies, philanthropic organizations and the private sector. In September 2020, the United Nations Secretary-General released a progress report on implementation of the United Nations political declaration on TB (15), reiterating that current investments in TB services and research must be doubled to achieve global TB targets. Economically advanced countries have committed 0.7% of their gross national product as official development aid to developing countries (16). Implementation of these commitments, with well-prioritized strategies and capacity-building could ensure the recovery of the health and social well-being of vulnerable people in high-burden countries. Funding agencies for TB programmes, such as the Global Fund, should also increase financing for these countries with larger allocations or innovative use of resources. WHO will continue accepting case studies, with a view to publish a followup report later in the year.

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