



Towards ending tuberculosis in Bangladesh

Aazia Hossain¹, Sharif Hossen Saimum², Sayera Banu³

¹ Manager, Knowledge Management, Program on Emerging Infections, Infectious Diseases Division, icddr,b

² Senior Manager - Communications, USAID's Alliance for Combating TB in Bangladesh, icddr,b

³ Senior Scientist and Head, Program on Emerging Infections, Infectious Diseases Division, icddr,b. sbanu@icddr.org

Background

Tuberculosis (TB), an infectious disease caused by the bacteria *Mycobacterium Tuberculosis*, has been a global epidemic for centuries. Until the onset of the COVID-19 pandemic, TB was the leading cause of death from a single infectious agent, ranking above AIDS in the world. In 2020 alone, the disease infected 9.9 million people, and over 1.5 million global deaths (1) were attributed to TB, with 44,000 of those deaths in Bangladesh. Bangladesh has had considerable success in TB control, yet it continues to be a high TB burden country. TB inflicts nearly a thousand people daily and kills around 120 people every day in Bangladesh. Over the years, the National Tuberculosis Control Programme (NTP), under

the Directorate General of Health Services of the Ministry of Health and Family Welfare, has been working relentlessly in their efforts to end TB and have made some remarkable achievements along the way. There are several partners working under the guidance of NTP to support them in catalyzing their efforts in ending TB by improving case detection through health systems strengthening. With this goal, icddr,b, a Bangladesh based international research institute through its different projects, aims to improve TB service delivery by mobilizing resources to fill existing gaps in the system, bringing in new improved tools and technology, and enhancing private sector and civil society engagement. However, there remains a plethora of challenges in tackling TB in Bangladesh.



Low Case Detection



One of the major challenges in TB control in Bangladesh is the poor case detection of the disease. In 2020, over a third of the total estimated TB cases in Bangladesh remained unnotified/undiagnosed. As a first step towards the ultimate goal of ending TB from Bangladesh, increasing case detection is mandatory so that no cases remain undiagnosed and everyone gets the required care and treatment. To increase TB case detection in the country, icddr,b has carried out several screening programs in various capacities. Alongside the more common community-based Active Case Finding (ACF) approach, facility-based ACF for TB has been employed in secondary and tertiary healthcare facilities in four divisions of Bangladesh. The approach is cost-effective as we screen for TB symptoms among outpatient departments' patients who come to the facility with some sort of illness, and a good number of them present TB-like symptoms.

The Issue of Childhood TB

Evidence suggests that childhood TB affects millions globally (2); additionally, TB is a major contributor to under-5 morbidity and mortality in TB endemic countries (3). Moreover, in settings with a high burden of TB, around 10–20% of all TB cases are expected to occur in children (4). But in 2020, the country's childhood TB notification rate was only 4% of all notified TB cases (5). Diagnosis of TB in children is often challenging for several reasons namely non-specificity of symptoms in young children; complexities in microbiological diagnosis due to child TB being paucibacillary in nature; difficulty in obtaining sputum for testing; and non-specificity in imaging tests and Mantoux test. In addition, there is also a general lack of awareness and sensitization

amongst healthcare providers about childhood TB in Bangladesh. Moreover, lack of community knowledge, awareness about TB in children and stigma associated with the disease play key roles in the low detection rate of the disease.



In addition to facility-based ACF in health facilities, icddr,b conducts hands-on sputum induction training for the physicians and healthcare providers, including providing sputum induction kits to these providers. Moreover, icddr,b has researched on stool sample testing as an alternative tool for detecting TB in children. Recently, World Health Organization (WHO) has recommended the testing to diagnose childhood TB. Presumably icddr,b's effort in the use of the method has played a key role in recommending it for wider use, especially in a backdrop when research data was not abundant. The method has been scaled up following training of the field staff members on the collection and transportation of stool samples. To sensitize healthcare providers about childhood TB and improve their clinical diagnostic capacity, we also work on orienting and training healthcare providers on childhood TB and in some cases, we have distributed necessary tools to ease detection of TB in children.



In an effort to increase knowledge and awareness, and to reduce stigma about childhood TB, icddr,b has taken several initiatives such as establishing Childhood TB Corners in some health facilities, designed in collaboration with Sisimpur (Bangladeshi adaptation of the popular American children's show, Sesame Street). By engaging and mobilizing grassroots-level communities through mid-media interventions, we are carrying out outreach campaigns on childhood TB with the aid of interactive puppet show and folk song performances.

Private Sector and TB

There is an assumption that most missing TB cases in Bangladesh are diagnosed and treated by the private health sector, and many may not follow the international standards of TB care (ISTC) (6). In this situation, to detect and manage those missing cases with ISTC and to notify those patients to NTP (as TB is a notifiable disease), successful implementation and expansion of Public-Private Mix (PPM) is an appropriate option.



icddr,b's TB Screening and Treatment Centres (TBSTCs) are another avenue of PPM to increase TB diagnosis. At present, icddr,b runs ten TBSTCs as a sustainable Social Enterprise Model (SEM) for TB care in the private sector in Bangladesh. The TBSTCs operate towards strengthening the PPM initiative of NTP to increase accessibility of care and improve quality of TB diagnostics in the private sector. This eventually contributes towards the overall improvement of TB management as part of the NTP's national TB control strategy. The TBSTCs offer digital chest X-ray and GeneXpert® tests for rapid

diagnosis of TB, treatment for the diagnosed TB patients as per NTP recommendations, and glucose testing for TB presumptives, all free of cost. TB presumptives are referred to the TBSTCs by a network of private practitioners, including general practitioners, chest diseases consultants, internal medicine specialists, other specialists and informal healthcare providers in the private sector. A major proportion of Bangladeshis seek healthcare for a multitude of ailments from informal healthcare providers, who form over 90% of all healthcare providers in the country (7). To further ramp up TB case detection and improve quality of service provision of informal healthcare providers, icddr,b continues to train and engage these providers on screening TB presumptives.



Individuals with weak immune systems such as diabetics are at a higher risk of being affected by TB. Diabetes triples a person's chances of developing TB and about 15% of global TB cases globally may be linked to diabetes⁷. icddr,b collaborates with Bangladesh Diabetic Association (BADAS) centers across Bangladesh and screen their patients for TB. BADAS has established a reliable referral mechanism with directly observed treatment (DOT) providers where patients with TB and diabetes are referred to the nearest DOT centers for TB treatment management. This initiative is strengthening the NTP's effort to identify missing TB cases in diverse populations, including high-risk groups.

Extra-Pulmonary TB

One of the challenges in TB control in Bangladesh is the gap in diagnosis and treatment of extra-pulmonary TB (EPTB). Although pulmonary TB is the most common type of TB, EPTB (TB that affects any organ of the body apart from the lungs) still accounts for a sizeable percentage of total TB cases. In 2019, there were over 55,000 EPTB patients, which was 18.9% of all notified TB patients in Bangladesh (9). Diagnosis of EPTB poses a multitude of challenges due to the diversity of symptoms with which EPTB may present, the low level of suspicion of clinicians, and difficulties in obtaining samples (10). To combat the challenges of diagnosing EPTB, extended services for EPTB diagnosis have been launched at two icddr,b TBSTCs and two external private diagnostic centers. The inclusion of EPTB screening and treatment at the TBSTCs are critical to increasing case detection and treatment of TB cases, and will eventually aid the overall mission of ending TB from Bangladesh.

Reaching the unreached



Although TB can affect anyone, there are certain pockets of the population who are more vulnerable to developing active TB cases than others. People living in poverty are more vulnerable to TB because of lack of awareness, overcrowded and substandard living conditions, poor nutrition, co-morbidities, and economic, geographical, social and cultural barriers to accessing TB services (11). The urban poor living in slum settlements of Bangladesh are thus at a high risk of contracting TB. To actively screen for TB in urban slums in Dhaka, Chattogram, Sylhet and Rajshahi metropolises, icddr,b TBSTCs are conducting ACF

through door-to-door visits and TB screening camps in selective slums and slum-like areas.

Tea garden workers are among some of the most marginalized communities in Bangladesh. They lead poor lives with low pay, poor working and living conditions, very limited education and healthcare facilities, and thus lag behind the rest of the population in terms of human development indicators (12). Access to quality healthcare is one of the resources that is very limited to this community and little is known about the status of the tea workers' health. icddr,b, through its partner, conducts TB screening among factory workers and tea garden workers in selected tea gardens and *punjis* (village of indigenous communities).



Drug-Resistant TB

With antimicrobial resistance on the rise globally, the number of people with drug-resistant TB (DR-TB) is also on the rise. Out of the 986 people who fall ill with TB each day in Bangladesh, 9 of them succumb to DR-TB. Reduction of conventional, lengthy drug resistant regimens can mean a major breakthrough for treatment and management of DR-TB patients. To initiate and rollout all oral shorter DR-TB regimen in Bangladesh, icddr,b developed the “All Oral Shorter DR-TB Regimen Expansion Plan”, developed a training package for physicians and healthcare providers, trained them, and scaled-up all oral shorter DR-TB regimen in Dhaka, Rajshahi, Mymensingh, and Sylhet divisions.

Prevention is Key

It is estimated that 27% of population of high TB endemic countries like Bangladesh may have latent or potentially existing but not presently evident or realized TB infection (13). While TB preventive treatment can reduce rates of progression from infection to active TB disease by about 60 to 90%, it is important to identify the people at risk early enough to allow for effective intervention. icddr,b, in partnership with the NTP, launched Tuberculosis Preventive Treatment (TPT) with the goal of ending TB epidemic in Bangladesh.



Under this initiative, free of charge TPT is offered free of charge to people who are being infected or at risk of developing active TB, such as the immediate household contacts of a bacteriologically confirmed TB patient, especially those who are immunocompromised and with co-morbidity (HIV, diabetes, renal diseases, etc.), children, elderly people, and so on. Following the successful implementation of the initiative at all the seven *upazilas* of Moulvibazar district, this is being gradually being scaled up across Bangladesh.

Conclusion

To achieve the ultimate goal of ending TB in Bangladesh and around the globe, we have a long way to go. The NTP is determined in its efforts and we believe that our small actions and interventions will aid in achievement of the goal. In addition, the commitment of the government and a multisectoral approach will be key in mitigating the current

problems the country is facing regarding TB control and prevention.

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