

## **Integrated, Patient Centred Model of HIV- TB Care and Prevention: India Case Study**

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Tuberculosis (TB) and Human Immunodeficiency virus (HIV) remain public health problem in several countries. In 2015, there were an estimated 10.4 million new (incident) TB cases worldwide, People living with HIV (PLHIV) accounted for 1.2 million (11%) of all new TB cases. There were an estimated 1.4 million TB deaths and 0.4 million deaths resulting from TB disease among people living with HIV.<sup>1</sup> India has second highest TB HIV burden in the world. An estimated 1.1 lakh HIV associated TB occurred in 2015 and 37,000 estimated died among them.<sup>2</sup>

TB remains one of the top ten causes of death worldwide. Globally, the proportion of TB patients who died during treatment was about four times higher among HIV-positive TB patients (11% versus 3%). Reasons for poor outcomes of HIV positive TB patients include delayed diagnosis of HIV-associated TB and delays in initiation of ART or TB treatment.<sup>3</sup>

The WHO End TB Strategy, calls for a 90% reduction in TB deaths and an 80% reduction in the TB incidence rate by 2030, compared with 2015. Collaborative TB HIV activities is included in the first pillar of the END TB strategy.<sup>4</sup> The Revised National TB control program and the National AIDS Control Organization (NACO) of Government of India jointly implement TB HIV collaborative activities in India. Co-ordination mechanisms between both the programs are established at national, state and district level. The National Framework for HIV TB in India recommends Intensified TB case finding, Infection control and TB preventive therapy as important activities to reduce the mortality and morbidity due to TB among PLHIV.<sup>5</sup>

Conventionally the TB services and HIV services have been functional separately and delivered through the Central TB Division and NACO by different service delivery structures as highlighted in Fig 1.

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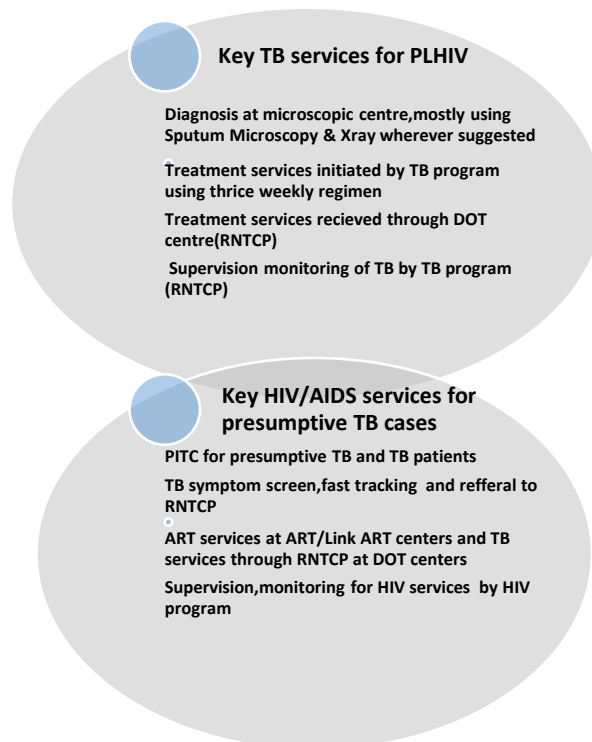


Figure 1: Schematic of the TB and HIV Services prior to “One Stop Service” Model

WHO encourages the integration of HIV and TB services considering the demonstrated improvements in TB treatment outcomes, including the timeliness of ART initiation? Studies also indicated that the Implementation of the “3 I’s” is suboptimal at HIV care and treatment sites, particularly at those without on-site or integrated TB treatment services.<sup>6</sup>

### “One Stop Service” Model Of Care:

In India, an innovative approach was jointly implemented by NACP and RNTCP, whereby PLHIV receive comprehensive HIV-TB services at same HIV care facility instead of receiving services from two difference programmatic settings. This comprehensive patient centric care approach was initiated by Government of India at 30 high patient load Anti-retroviral centres in five HIV burden states in India. The model of care included 3I’s i.e. Intensified case finding, Infection control and Isoniazid preventive therapy- integrated package of services at same facility. This model includes integrated services for the prevention, diagnosis, treatment and care of TB and HIV. The model of care is depicted in Fig 2 & 3.

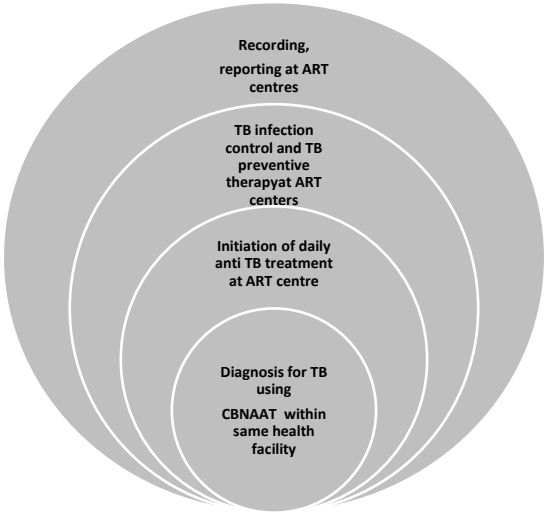


Figure 2: Schematic of the TB and HIV Services after “One Stop Service” Model

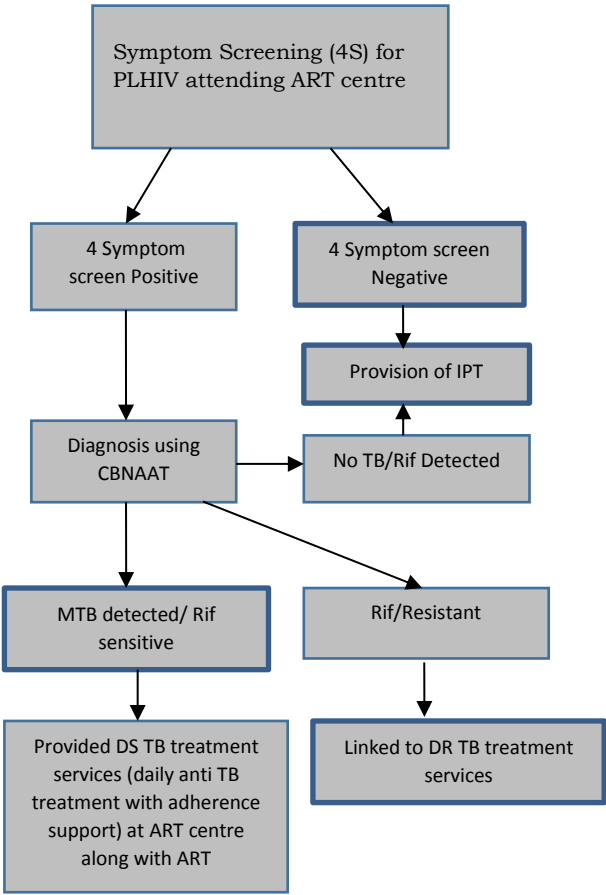


Figure 3: Flow of Diagnostic and Treatment Protocol for PLHIV attending ART centre as per “One Stop Service” Model

The activities were implemented after structured training program for TB & HIV key staff at National Tuberculosis Institute Bangalore, state and district level. All the staffs was trained in the components of service delivery using TB HIV training module developed jointly by NACO and Central TB Division.<sup>7</sup>

### **Intensified TB Case Finding:**

WHO recommends adults and adolescents living with HIV who report any one of the symptoms of current cough, fever, weight loss or night sweats may have active TB and should be evaluated for TB. Similarly Children living with HIV who have any of the following symptoms – poor weight gain, fever or current cough or contact history with a TB case – may have TB and should be evaluated for TB. It is recommended wherever WHO approved molecular tests (e.g. Xpert MTB/RIF) is available; they should be the primary diagnostic test for TB in people living with HIV.<sup>8</sup>

At the 30 ART centres, Cartridge Based Nucleic Acid Amplification Test (CBNAAT) is co-located at the designated Microscopic Centre (DMC) within the same facility. PLHIV screened positive for four symptoms screen are subjected to free CBNAAT diagnosis. If the patient is found positive for drug sensitive TB the patient is linked to daily anti TB treatment. The patient is linked to treatment service at the ART centre and receives medications as monthly refill at the ART centre along with the ART services. If the patient is found to be Rif /Resistance, patient is linked to the drug-resistant TB treatment at DR TB centre as per national guidelines. Guidelines for management of TB cases at ART were developed and trainings were conducted.<sup>9</sup>

This strategy has been successful in reducing the delays in the initiation of treatment, frequency of visits; out of pocket (OOP) expenses for patients and provides convenience in terms of access to package of services at a single facility. Performance of the TB case finding has improved significantly after the implementation of the strategy, especially early diagnosis of Rif/R.<sup>10</sup>

### **Infection Control:**

PLHIV have greater risk for developing TB. TB infection at HIV care facilities is critical due to heightened risk of TB, drug-resistant TB transmission among PLHIV and outbreaks reported in some countries.<sup>11</sup>

WHO policy on TB infection control at health-care facilities recommends combination of administrative, environmental and personal protection measures to reduce the transmission of TB at HIV care facilities.

National guidelines on Airborne Infection Control (AIC) in healthcare and other settings highlight a set of measures for Anti-retroviral centres.<sup>12</sup> Strengthening airborne infection control at these centres has been priority of NACP. The package of services under the integrated services for TB HIV include AIC as an important component of preventive measures. Training for implementing airborne infection control measures at all level was completed by the programme with assessment of the airborne infection control measures at the high burden ART centres. Focal point for implementing the recommendations of assessments was designated at each of

the ART centres. Regular monitoring of the progress of the AIC activities was done at all levels.

### **Isoniazid Preventive Therapy:**

WHO recommends initiation of TB prevention with Isoniazid preventive therapy to reduce the burden of TB in PLHIV.<sup>13</sup> The National Framework for HIV TB collaborative activities in India, Standards of TB care in India also recommend IPT as part of a comprehensive package of HIV TB care. Isoniazid is given to individuals with latent infection with Mycobacterium tuberculosis in order to prevent progression to active disease. It is critical to exclude active TB disease before starting IPT. As recommended by WHO four symptom screening rule is used to rule out TB. This screening rule has a negative predictive value of 97.7% (95% CI 97.4–98.0) at 5% TB prevalence among people living with HIV. Tuberculin skin test (TST) is not a requirement for initiating IPT in people living with HIV. Providing IPT to people living with HIV does not increase the risk of developing isoniazid-resistant TB.<sup>8</sup>

Training of the NACP and RNTCP staff was conducted to improve the knowledge about IPT, operational manual for program staff was developed and disseminated.<sup>13</sup> However there were several challenges identified in implementation of IPT.

### **Supervision, monitoring of integrated TBHIV services:**

Joint supportive supervision was conducted by RNTCP and NACP to improve the quality of services and address the bottlenecks in implementation of activities. Recording and reporting formats were revised and tailored as per the model of care, which included involvement of ART staff in documenting TB treatment and other details for those who were on daily anti-TB treatment at ART centre. Monitoring indicators were revised as per the WHO recommendations. NACP and RNTCP developed supervision, monitoring and evaluation (SME) guide for uniformity in the SME strategy thought country. <sup>14</sup> Joint review meetings were held to strengthen the monitoring mechanism.

### **Discussion:**

A coordinated, comprehensive approach to diagnosis and treatment was required to reduce the morbidity, mortality due to dual burden of HIV and TB. The model of integration of TB and HIV services helped in pooling of resources, skills with TB and HIV programs for delivering patient centred services.

After the integration of services the uptake of diagnostic, treatment services has improved. Use of CBNAAT at the facilities improved the yield in addition to early diagnosis of Rif/R. Daily anti-TB treatment was first introduced in the country at these sites, which improved the timely uptake and access to treatment services for PLHIV. Treatment adherence strategies including counselling by ART counsellor, Pharmacist and treatment supervisors supported by mobile based treatment adherence system helped in improving the compliance to anti TB and ART, thereby improving outcomes. Studies conducted earlier to assess the impact of integration of services found out that successful treatment outcomes seem to have increased

significantly, lost to follow up rates fell significantly after integration.<sup>15,16</sup> Similarly integration of TB and HIV services enhanced uptake and reduced treatment delays in health.<sup>17</sup>

Patient's found integrated care services more convenient. Studies show that integration of services reduces the number visits to the health facility as compared to stand alone facilities for TB and HIV.<sup>18</sup> It helps in improving access across the HIV-TB cluster of services.<sup>19</sup>

As integration involved training of both the program staff in HIV and TB services, improvement in the quality of services was also evident. Knowledge regarding airborne infection control was improved and several of the AIC measures were practiced. With the availability of existing resources, standardized trainings, and relatively simple modifications in the functions and design of the services –systematic changes were evident in the administrative, environmental & personal protection measures for TB infection control at the settings. However challenges were encountered in the major environmental measures modifications and health care worker surveillance.

In conclusion, the integrated model of HIV/TB care and prevention has been feasible for implementation and it is patient friendly. More studies are required to understand cost effectiveness and impact of the intervention on treatment outcomes. This model has potential to successfully scale up and it is a case study to learn for several resources limited settings.

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