

'biotic homogenization hypothesis' (that urbanization leads to more homogenous communities compared to those in natural habitats) have not yet been widely tested³⁴. Testing this hypothesis in Indian cities can lead to an improved understanding of how urbanization affects community dynamics over long time-scales. Another example is of the landmark luxury effect mentioned earlier. Very few studies from the tropics have examined this effect, and it has not yet been tested in India^{31,35}.

Results from these academic opportunities can directly contribute in developing sustainable cities. Greater biodiversity promotes greater well-being of the citizens⁸, and academic research (e.g., on the luxury effect) can help provide an objective framework to quantify and alleviate the inequality of biodiversity based on resources³⁵. Long-term studies are also useful from an urban-planning perspective, given that the contribution of ecosystem service-based traits varies with plant functional groups³¹. Understanding temporal changes in the preference of these traits can thus aid planners in developing a framework for selecting the right species for a given region.

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Addressing poverty in India's Revised National Tuberculosis Control Programme: are we failing to harness the opportunities?

Kumaravel Ilangovan and Sharath Burugina Nagaraja

Implications of reduction of poverty in relation with TB control programme

The bi-directional relationship between poverty and tuberculosis (TB) is well established. Poverty aggravates material

disadvantage, social exclusion, discrimination in participation across a wide range of socio-economic and behavioural activities along with undernutrition, overcrowding, lack of access to health-care and other social determinants of

health; it also exacerbates TB and its spread^{1–4}. India being a high TB burden and lower-middle income country accounted for 27% of the world's 10.4 million new disease cases in 2017 (ref. 5). Nearly 27.5% of India's population is

multi-dimensionally poor and deprived in at least one third of the ten weighted indicators of health, nutrition and living standards components of Multi Dimensional Poverty Index (MPI) and 196 million people living in acute MDP in four states (Bihar, Jharkhand, Uttar Pradesh and Madhya Pradesh) alone in the country⁶.

Historically, the drastic decline in TB incidence in developed countries was due to implementation of contemporaneous public health measures, advancement of living conditions and overall socio-economic development^{7,8}. Investments on social protection programmes and poverty elimination strategies are associated with lower TB prevalence, incidence and mortality^{9–12}. Further, achievement of Sustainable Development Goal-1 which has a focus on the four main risk factors for TB (undernutrition, HIV, health behaviours and housing quality) will greatly reduce the disease epidemic¹³. According to Benetar *et al.*⁷, the global TB control policies have failed to acknowledge poverty as a core determinant of health; they lacked systematic and explicit focus on poverty-centric interventions within the context of TB control during 2000–10. The sustained advocacy of global Stop TB Partnership 2004–11 was to expand universal access to the Directly Observed Treatment Short-course (DOTS) (biomedical intervention) strategy in 22 high TB burden countries^{7,13}. In May 2014, the World Health Organization (WHO) adopted the End TB Strategy with greater emphasis to address social determinants of the disease, including policies and social protection programmes to alleviate poverty. It is ‘time for action’ for Global TB stakeholders, to translate the experiences and learnings of implementation of poverty-centric interventions in the context of TB control in their National TB Control Programmes that would drive to the goals of the End TB Strategy¹⁵.

The Revised National Tuberculosis Control Programme (RNTCP) is being implemented in India since 1997. The programme addresses factors related to social determinants of TB (like poverty, undernutrition, overcrowding, etc.) and stresses mainly on biomedical interventions. Here we summarize the various poverty-centric interventions implemented through RNTCP and other development stakeholders, and highlight the gaps in implementation.

Pro-poor interventions during 1997–2017

The RNTCP is deemed as a socially inclusive programme designed with no user fees for testing and treatment services. It has recognized the tribal populations as ‘underserved and hard-to-reach’, ascertained their barriers to access programme services and formulated the Tribal Action Plan (TAP), a pro-poor strategy being implemented since May 2005 aimed to improve the service delivery of the programme and utilization by the tribal communities through special financial provisions to the programme staff and patients. The socio-economic barriers for poor access (e.g. undernutrition, geographic difficulties, food insecurity and poor living conditions) were neglected and not addressed by the programme¹⁶.

The State TB Control Programmes of eight states (Bihar, Chandigarh, Chhattisgarh, Jharkhand, Haryana, Madhya Pradesh, Tamil Nadu and Uttarakhand) had explicitly shared their experiences on implementing various forms of poverty-reduction activities as pro-poor interventions in a regional workshop of WHO-Stop TB Partnership in India conducted in 2010. The range of pro-poor interventions included: (a) providing nutritional supplements (predominantly to drug-resistant TB patients), and (b) linkages with public health insurance schemes to compensate on expenses of transportation, and loss of daily wages¹⁷.

The large-scale Advocacy, Communication and Social Mobilization (ACSM) project Axshya (meaning TB-free) 2010–20, supported by Global Fund Round 9 TB grant is being implemented in 374 backward districts across 23 states of India towards achieving universal access to quality TB care. This project has improved the access to biomedical interventions through active case finding strategy that has led to early TB diagnosis and treatment. The principal recipient of the grant, The Union (Southeast Asia) office (also the then secretariat for TB & Poverty Sub-working Group of Stop TB-DOTS Expansion Working Group), during the inception of this project had perceived that it had provided a unique opportunity and scope to examine poverty-centric actions within TB control, research possibilities and development of tools¹⁴. Though the project has achieved programme targets substantially, it has

missed the potential opportunities to address social determinants of TB. The marginalized population (women, children, tribal/indigenous populations, prisoners, BPL families, communities living in geographically difficult areas, HIV-infected persons and vulnerable groups) with utmost difficulty in accessing TB care, have accessed TB diagnostic and treatment services¹⁸.

Pro-poor interventions in the current National Strategic Plan 2017–25

The current National Strategic Plan (NSP) has accelerated the ongoing TB elimination efforts through new interventions explicitly addressing the key social determinants of disease, especially poverty and undernutrition, and also aims to achieve ‘zero catastrophic cost for TB affected families’ by 2020.

The Government of India (GoI) has been implementing a flagship scheme since May 2016, viz. the ‘Pradhan Mantri Ujjwala Yojana (PMUY)’ that provides deposit-free subsidized cooking gas connections to BPL women households. According to the PMUY official website, GoI has provided 91,943,934 cooking gas connections till 12 April 2019 across the country¹⁹. The ACCESS 2018 survey of the Council on Energy, Environment and Water (CEEW) in 756 villages of 54 districts in six states of India has revealed that, of the 9072 rural households surveyed, 44% used traditional fuels (firewood, dung-cakes, agricultural residue), 50% used a mix of traditional fuel and liquefied petroleum gas (LPG), and merely 6% used LPG as an exclusive fuel for cooking. Among the 9072 households surveyed, 3901 (43%) have availed LPG connection under PMUY. The median annual consumption of LPG cylinders under PMUY was by Odisha (3), Jharkhand, Madhya Pradesh and Uttar Pradesh (4), West Bengal (5) and Bihar (6), whereas under non-PMUY it was by Odisha (4), Madhya Pradesh (5), Jharkhand, Uttar Pradesh, West Bengal (6) and Bihar (8). The proportion of households that had not ordered a refill since they acquired their connections (a year ago) was much higher among PMUY beneficiaries. Despite the expansion of PMUY across India, most poor households continue to use traditional biomass (alone or with LPG) due to the

high refilling cost, challenges in accessibility of LPG and the availability of free-of-cost biomass. If this continues, the potential health gains of using LPG cannot be achieved due to continued exposure to dangerous levels of indoor air pollution²⁰. While the facts are alarming, it is too early to claim that PMUY could avert an estimated 300,000 TB cases every year²¹.

The RNTCP has started implementing direct benefit transfer (DBT), an incentive scheme for nutritional support through the 'Nikshay Poshan Yojana' (NPY) from April 2018; it provides INR 500 (US\$ 8) per month to all notified TB patients whose bank accounts are linked with Aadhaar (unique personal identification number) during the treatment duration through the Nikshay portal (integrated ICT system for TB patient management). However, the scheme does not guarantee that the disbursed amount will be utilized towards improving nutritional status as the health system puts faith in the decision-making ability of the patients to use incentive towards their nutritional needs or treatment associated expenses. The implementing states have expressed the need for in-kind nutritional support through monthly food baskets/kits which will offer an opportunity for interaction between health staff and help address issues related to side-effects of medication, emotional stress during the treatment and ensure treatment adherence. Operational challenges have been reported in the implementation of this scheme. Among the 1,800,000 registered patients for treatment in 2018, only 426,000 (26%) had received cash transfers till 7 December 2018 (ref. 22). NSP has envisaged 'patient support systems' (PSS) to support the patients during their treatment period with the provision of incentives, nutrition support as well as creating linkages to public social welfare schemes with the aim to limit catastrophic out-of-pocket expenditure, strengthen treatment adherence and reduce stigma. There is lack of clarity in NSP (barring the DBT scheme) regarding which other social welfare schemes the patients would be linked and the ways to improve the uptake of such schemes. NSP has proposed the establishment of TB corpus fund called 'Bharat Kshay Niyantaran Pratishthan' (India TB Control Foundation) that aims to leverage additional financial resources for the NPY scheme and active case finding among

vulnerable population, but the progress in project implementation is sub-optimal²³.

Discussions and conclusion

The report of World Bank's Environmental and Social Systems Assessment (ESSA)²⁴ for 'The India: Programme towards Elimination of Tuberculosis', and others²⁴⁻³⁰ have highlighted poor performance of tribal districts in terms of case detection, cure rates and high incidence of drug-resistant TB cases. The report has envisaged that there are profound gaps in understanding the RNTCP service delivery synergies with poverty alleviation/social welfare schemes, lack of data and measures to understand the immediate outputs, impact of TAP and many pro-poor interventions being implemented over a decade due to poor monitoring and evaluation framework, sub-optimal political will and administrative commitment, scarcity of funds, procedural delays, complex mechanisms of disbursement of incentives and remunerations, shortfall of contractual programme staff and unavailability of funds within the RNTCP²⁴⁻³⁰. The way forward for the programme is to effectively implement poverty-centric interventions within the context of TB control. How can this be implemented? Here are our suggestions.

First, the policy makers and programme implementers at all levels have to be cognizant of the fact that TB control has to move beyond the provisions of biomedical treatment alone. They have to address socio-economic determinants of the disease as well as its devastating social and economic consequences among the economically weaker population. These will be potent steps in breaking the vicious cycle of poverty and TB. One way in which further impoverishment and descent into deeper poverty may be avoided is by having a social protection strategy with national coverage, which includes TB patients as well^{3,13,15}. It has to be built on a sound understanding of the range of risks and vulnerabilities facing indigenous, economically weaker and marginalized subgroups affected by TB at different stages of their lives.

Second, the programme needs to address the unremitting social issues such as: (i) lack of nutrition, (ii) tobacco and alcohol abuse among tribal and economically weaker populations, (iii) knowledge

and awareness about TB, (iv) poor access to quality TB services in difficult terrains and remote areas, (v) stigma reduction, and (vi) weak health system and community support systems. While the NSP 2017-25 provides overall policy guidance to address most of these issues, challenges remain in effective implementation by the sub-national health actors and stakeholders across the country. As outlined by the NSP, under cooperative federalism the sub-national governments and stakeholders should prioritize and complement the actions of RNTCP with ad hoc funding and support for effective implementation, and strengthen the ongoing TB control efforts. NSP strategies should be supported with adequate funding, robust monitoring and evaluation framework, with patient targeted approaches and tracking of budget utilization at the district level²⁹.

Third, it is important to foster multi-sectoral coordination and collaboration through sustained TB control efforts involving pro-poor approaches and prioritize access of TB-affected families access to Central and State funded housing and nutrition schemes. Decline in TB prevalence among the poor and advancing their welfare is possible only when the RNTCP coordinates, intensifies and sustains its efforts, with synergistic efforts on the part of concerned social welfare departments, elected bodies, civil society organizations and patient support groups, across diverse sectors dealing with populations that are considered to be poor.

Fourth, it is imperative to measure the equity aspects of TB control for economically weaker populations and tribal populations using the robust indicators that measure the proportion of persons (a) screened for all forms of TB, (b) utilization of TB diagnostic services, (c) access to social welfare schemes and accelerating the progress²⁷.

Fifth, encouraging the implementation and operational research to identify the pitfalls, and providing appropriate solutions shall definitely refine the pro-poor interventions in the context of TB control. To conclude, the programme has to realize the potential of poverty-centric activities in TB control and judiciously implement strategies that effectively control the disease in the country.

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