



## NOTES FROM THE FIELD

## Experience of active tuberculosis case finding in nearly 5 million households in India

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In India, to increase tuberculosis (TB) case detection under the National Tuberculosis Programme, active case finding (ACF) was implemented by the Global Fund-supported Project Axshya, among high-risk groups in 300 districts. Between April 2013 and December 2014, 4.9 million households covering ~20 million people were visited. Of 350 047 presumptive pulmonary TB cases (cough of  $\geq 2$  weeks) identified, 187 586 (54%) underwent sputum smear examination and 14 447 (8%) were found to be smear-positive. ACF resulted in the detection of a large number of persons with presumptive pulmonary TB and smear-positive TB. Ensuring sputum examination of all those with presumptive TB was a major challenge.

Globally, India accounts for one third of the 'missing' 3 million tuberculosis (TB) cases that are not notified under national tuberculosis control programmes.<sup>1</sup> This is primarily due to underdiagnosis, misdiagnosis, and diagnosis and treatment of TB patients in the vast private sector.<sup>2-5</sup> To address these challenges, the government of India's Revised National Tuberculosis Control Programme (RNTCP) has formulated several strategies, including active case finding (ACF), among clinically vulnerable and socially marginalised populations.<sup>6,7</sup> Some of these strategies are implemented through the Project Axshya (<http://www.axshya-theunion.org>), supported by the Global Fund. Implemented in mid-2010 in 300 of 650 districts in 21 of the 36 states in India, the primary aim of Project Axshya is to enhance the visibility and reach of the RNTCP services among vulnerable and marginalised populations.

## ASPECT OF INTEREST

TB case finding in India is predominantly passive, and consists of detection of cases among those visiting health facilities. During 2013–2014, the Project Axshya initiated ACF in households located in urban slums and tribal and rural areas that are relatively far from the public health facilities in these 300 districts. This intervention was in addition to ongoing passive case finding by the RNTCP. The populations living in these areas within a district were operationally defined as 'marginalised and vulnerable', and were identified by a population mapping exercise that involved multiple stakeholders such as programme managers, com-

munity representatives and non-government organisations (NGOs). Thereafter, the NGOs identified community volunteers (CVs) in these selected areas and trained them to disseminate messages on TB using interpersonal communication tools and to conduct ACF.

The CVs visited approximately 1000 new households in each district every month. Each household was visited only once, similar to a cross-sectional study design. During the visit, the volunteers informed household members about specific aspects of TB: transmission, symptoms and the availability of free diagnostic and treatment services under the RNTCP. In addition, the CVs screened the household members and identified persons with presumptive pulmonary TB (PPPTB), i.e., those with a cough of  $\geq 2$  weeks. The PPPTBs were line-listed and referred to the nearest RNTCP-designated microscopy centre (DMC) for sputum smear examination. For those unable to visit the DMC for any reason, the CVs undertook sputum collection and transportation (SCT) of their sputum samples (one spot and one early morning). An additional visit was made to collect the early morning sputum specimen. Sputum smear-positive (SSP) patients were initiated on anti-tuberculosis treatment under the RNTCP. Smear-negative patients were not followed up by the CVs, but were advised to visit public health facilities for further evaluation. To ensure continuity, the CVs provided their contact details to all the households visited as well as to the village headman for future assistance. The activity (including recording and reporting) was supervised by the staff of the local NGO, the sub-recipient partners and the International Union Against Tuberculosis and Lung Disease (The Union) South-East Asia Regional Office, New Delhi, India, all recipients of the Global Fund grant. The compiled data were routinely shared with the RNTCP programme managers at district, state and national levels.

In this study, we report the results of the ACF from April 2013 to December 2014 in terms of the number of households visited, the number of PPPTB identified and the number of SSP cases detected and initiated on treatment.

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## KEY WORDS

tuberculosis; active case finding; India; project Axshya

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**FIGURE** Map of India depicting the districts and states (shaded in grey) where active tuberculosis case finding was implemented under Project Axsya.

## RESULTS

Of the 300 districts, we obtained data from 281 (Figure). ACf was conducted in 4.9 million households, covering a population of approximately 20 million (Table). In these households, 350 047 PPPTB were identified, among whom SCT was undertaken for 142 606 (41%). The remaining 207 441 persons were

referred to the nearest DMC. Of these, only 44 980 (22%) underwent sputum smear examination. In total, 187 586 (54%) PPPTB underwent sputum smear examination as a result of referral or SCT. Of these, 14 447 (8%) were found to be SSP (10 973 [76%] from SCT and 3 474 [24%] from referrals reaching DMC independently), and 13 971 (97%) were initiated on treatment.

**TABLE** Results of active case finding in India through Project Axshya, April 2013–December 2014

State	Districts reached through project <i>n</i>	Households covered <i>n</i>	Approximate population <i>n</i>	Presumptive pulmonary TB cases identified (cough of $\geq 2$ weeks)		PPPTB who underwent sputum smear examination at DMC <i>n</i> (%)	Of those who underwent sputum smear examination, those diagnosed as SSP <i>n</i> (%)	Of those diagnosed, patients initiated on treatment through the RNTCP <i>n</i> (%)
				<i>n</i>	/100000			
Bihar	25	518 192	2 383 683	45 241	1898	22 875 (51)	1 715 (7)	1 636 (95)
Chhattisgarh	10	211 157	717 934	11 035	1 537	4 341 (39)	284 (7)	273 (96)
Delhi	4	38 443	76 886	1 188	1 545	312 (26)	38 (12)	37 (97)
Goa	1	15 327	56 710	364	642	211 (58)	5 (2)	5 (100)
Haryana	12	284 659	1 280 966	21 233	1 658	12 377 (58)	1 074 (9)	993 (92)
Jharkhand	15	260 549	990 086	17 804	1 798	11 437 (64)	1 131 (10)	1 103 (98)
Karnataka	16	326 857	1 176 685	22 588	1 920	12 467 (55)	831 (7)	808 (97)
Kerala	13	206 454	433 553	8 729	2 013	5 444 (62)	143 (3)	136 (95)
Madhya Pradesh	24	395 187	1 541 229	30 500	1 979	16 169 (53)	1 144 (7)	1 110 (97)
Maharashtra	28	597 377	2 210 295	34 528	1 562	17 901 (52)	1 388 (8)	1 322 (95)
Manipur	9	44 596	200 682	1 517	756	664 (44)	38 (6)	25 (66)
Nagaland	6	53 188	212 752	3 497	1 644	1 861 (53)	95 (5)	92 (97)
Punjab	15	319 723	1 502 698	12 004	799	7 830 (65)	546 (7)	537 (98)
Rajasthan	20	337 179	1 652 177	27 952	1 692	12 910 (46)	931 (7)	901 (97)
Tamil Nadu	24	403 917	1 332 926	24 741	1 856	15 280 (62)	797 (5)	786 (99)
Uttar Pradesh	42	716 092	3 222 414	73 971	2 296	39 654 (54)	3 731 (9)	3 664 (98)
Uttarakhand	13	183 066	659 038	10 445	1 585	4 060 (39%)	462 (11)	451 (98)
West Bengal	4	62 851	295 400	2 710	917	1 793 (66%)	94 (5)	92 (98)
Total	281	4 974 814	19 946 114	350 047	1 755	187 586 (54%)	14 447 (8)	13 971 (97)

TB = tuberculosis; PPPTB = persons with presumptive pulmonary TB; DMC = designated microscopy centre; SSP = sputum smear-positive; RNTCP = Revised National Tuberculosis Control Programme.

The number of PPPTB identified per 100 000 population varied from 642 in the state of Goa to 2296 in Uttar Pradesh. Similarly, the proportion that underwent sputum examination ranged from 26% in Delhi to 66% in West Bengal. Sputum positivity among those who underwent sputum examination ranged from 2% in Goa to 12% in Delhi.

## DISCUSSION

This is one of the first reports on the large-scale implementation of ACF in India, and it has several important observations. First, the number of TB patients detected is within the ranges reported in similar epidemiological settings.<sup>8</sup> Second, the study confirms that ACF can be implemented efficiently by CVs with adequate training and a supportive supervisory structure in place, as per the World Health Organization systematic screening guidelines.<sup>9</sup> Third, ACF can identify a large number of PPPTB, especially in communities that face difficulties in accessing RNTCP services, in addition to passive case finding. Determining whether the yield was 'additional' would require further research comparing the number of cases who reached RNTCP services through ACF with those who reached the RNTCP without this activity. Fourth, as identification and referral only of PPPTB is unlikely to be helpful (only 22% reached microscopy centres in our study), ACF should be combined with SCT for it to be effective in this setting. The reasons for referrals not reaching a DMC need to be evaluated further, and appropriate measures need to be taken based on the findings. Fifth, pulmonary TB patients were diagnosed by Ziehl-Neelsen; additional cases could have been detected if more sensitive technologies, such as light-emitting diode (LED) fluorescence microscopy or Xpert® MTB/RIF (Cepheid,

Sunnyvale, CA, USA), were used.<sup>10</sup> The number of SSP TB cases detected by ACF in this study is thus likely to be an underestimation. Finally, whether ACF results in a reduction in diagnostic delay due to early identification and/or reducing the number of health care providers visited prior to diagnosis, or a reduction in costs incurred by PPPTB and TB patients, needs further evaluation. These aspects of ACF present a rich area for operational research.

## CONCLUSION

In India, ACF resulted in the detection of a large number of persons with presumptive pulmonary TB and TB patients with variations across different states. ACF can be conducted efficiently by CVs with adequate training and supervision. Ensuring that all identified persons undergo sputum smear examination was a major challenge; this could be partially overcome by sputum collection and transportation.

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En Inde, le projet Axshya (soutenu par le Fonds Mondial) a mis en œuvre une recherche active des cas (ACF) afin d'en augmenter la détection sous l'égide du Programme Révisé National Contre la Tuberculose auprès des groupes à risque dans 300 districts. Entre avril 2013 et décembre 2014, 4,9 millions de foyers, soit environ 20 millions de personnes, ont été visités. De 350047 cas présumés de

tuberculose (TB) pulmonaire (toux  $\geq 2$  semaines) identifiés, 187586 (54%) ont bénéficié d'un examen de frottis de crachats et 14447 (8%) ont eu un frottis positif. L'ACF a abouti à la détection d'un grand nombre de personnes présumées atteintes de TB pulmonaire et de TB à frottis positif. Assurer l'examen des crachats de tous les cas avec suspicion de TB a été un défi majeur.

Con el propósito de aumentar la detección de casos en la India, el Proyecto Axshya (financiado por el Fondo Mundial) introdujo un mecanismo de búsqueda activa de casos (ACF), dirigido a los grupos de alto riesgo en 300 distritos, en el marco del Programa Nacional Revisado Contra la Tuberculosis. De abril del 2013 a diciembre del 2014 se visitaron 4,9 millones de hogares, que cubrían una población cercana a 20 millones de personas. Se detectaron 350047 casos con

presunción de tuberculosis (TB) pulmonar (tos con una duración de  $\geq 2$  semanas), se practicó la baciloscopia del esputo a 187586 personas (54%), de las cuales 14447 obtuvieron un resultado positivo (8%). La ACF dio lugar a la detección de un gran número de personas con presunción de TB pulmonar y baciloscopia positiva del esputo. La realización del examen microscópico del esputo en todas estas personas representó un gran desafío.