Private practitioners' contributions to the Revised National Tuberculosis Control Programme in a South Indian district

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_ S U M M A R Y

SETTING: Tumkur District, South India.

OBJECTIVE: To assess the participation of for-profit, formal private practitioners (PPs) under the Revised National Tuberculosis Control Programme's (RNTCP's) public-private mix (PPM) schemes and document their contribution to RNTCP pulmonary tuberculosis (TB) case finding.

DESIGN: RNTCP reports at district TB centre were reviewed. PPs were mapped and their referrals of presumptive TB cases to the RNTCP during 2011 were assessed using laboratory registers at designated microscopy centres (DMCs).

RESULTS: None of the 424 PPs had signed up for any PPM scheme. However, 22% made at least one referral to a DMC in 2011. PP referrals constituted

TUBERCULOSIS (TB) remains a major public health problem in India, with an estimated annual incidence of 171 cases per 100 000 population in 2013, accounting for 24% of all TB cases worldwide.¹ The Indian Revised National TB Control Programme (RNTCP), based on the World Health Organization (WHO) recommended DOTS strategy, was launched in 1996. The country's health system is complex, with diverse providers ranging from unqualified practitioners to highly trained specialists. The private health sector is dominant and largely unregulated.

There is a large body of evidence to demonstrate that private sector providers (PSPs) are often the first choice for seeking TB care in India,^{2–5} with 50% of cases being managed in the private sector,⁶ where TB is often inaccurately diagnosed and ineffectively treated.^{7–11} Recognising the critical need to engage PSPs in RNTCP, the Government of India published guidelines for non-government organisations' (NGOs') and allopathic private practitioners' (PPs') involvement in TB control in 2000 and 2001 respectively, which were revised in 2008. There are currently 10 public-private mix (PPM) schemes, 15% of the presumptive TB cases examined at the DMCs, and PPs contributed to 23% of the sputum smear-positive TB cases detected. Among PP referrals, the proportion of confirmed smear-positive cases was high (24%).

CONCLUSION: Fifteen years after the start of PPM, formal engagement of PPs with RNTCP was nonexistent. However, PPs do refer cases to the RNTCP and contribute to a fraction of TB case detection. The high proportion of confirmed sputum smear-positive cases suggests that PPs tend to make selective referrals. More efforts are needed to promote the engagement of PPs in the RNTCP.

KEY WORDS: private practitioners; public-private mix schemes; pulmonary tuberculosis; referrals; RNTCP

principally based on results-based financing (Table 1). Each scheme has specific objectives that the partnership is expected to fulfil by signing a memorandum of understanding with the District TB Officer (DTO).¹² The Government of India declared TB a notifiable disease in May 2012, making it mandatory for all public and private providers to notify TB cases to the designated public health authorities. Nevertheless, notification from PPs remains abysmal.¹³

Studies of PPM initiatives in India have demonstrated their positive impact on case detection and treatment success rate and their feasibility and costeffectiveness,^{14–17} but these are confined to a specific setting or context. Lessons from these successful experiences have not been pursued or scaled up across the country. Formal engagement of PPs in the RNTCP through any available PPM scheme is low: in 2010 only 10 000 PPs in the entire country were officially engaged.^{18,19} Moreover, no studies have documented the participation and contribution of individual PPs to the RNTCP under programme conditions.

We conducted a study to assess whether for-profit,

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Table 1	PPM schemes	and related	financial	incentives	in the
RNTCP					

- Advocacy, communication and social mobilisation: for NGOs to mobilise local political commitment and resources for TB, empower communities affected by TB
- grant-in-aid: USD2293 per one million population per year 2 Sputum collection centre: for sputum sample collection in 'underserved' areas
- grant-in-aid: USD917 per year, per centre
- 3 Sputum pick up and transport service: for NGOs to transport sputum samples to the nearest DMCs grant-in-aid: USD367 per year
- 4 DMC scheme: for NGO/private laboratories to provide sputum smear microscopy and anti-tuberculosis treatment services free of charge

grant-in-aid: USD2292 per year; only microscopy, USD0.4 per slide

- 5 Laboratory technician scheme: to recruit laboratory technicians to strengthen RNTCP diagnostic services in hospitals outside ministry of health grant-in-aid: Laboratory technician's salary and 5% overhead
- cost
- 6 Culture and DST: for well-functioning mycobacterial culture and DST laboratory in the private/NGO sector grant-in-aid: USD31 per specimen
- 7 Adherence scheme: for NGOs and PPs to ensure patient adherence to anti-tuberculosis treatment grant-in-aid for NGOs: USD612 for 100 000 population per year; for PPs: USD6 per patient successfully treated
- 8 Slum scheme: for NGOs/self-help groups/PPs working in slums to ensure timely diagnosis and treatment adherence grant-in-aid: USD765 per 20 000 population per year
- 9 Tuberculosis Unit model: for NGOs who can carry out all the services typically executed by RNTCP TB Units grant-in-aid: USD8103 per year
- 10 TB-HIV scheme: for NGOs already working with HIV patients to help treat TB in conjunction with HIV treatment grant-in-aid: USD1834 per NGO per 1000 target population

PPM = public-private mix; RNTCP = Revised National Tuberculosis ControlProgramme; NGO = non-governmental organisation; TB = tuberculosis; USD =US dollar; DMC = designated microscopy centre; DST = drug susceptibilitytesting; PP = private practitioner; HIV = human immunodeficiency virus.

formally trained PPs working in solo clinics, nursing homes and hospitals in a district in South India are engaged in RNTCP PPM schemes and to document whether and to what extent, either formally or informally, they contribute to the RNTCP in terms of new/retreatment smear-positive pulmonary TB case finding.

MATERIALS AND METHODS

Setting

Tumkur District (total population 2716997) is located in Karnataka, South India. As elsewhere in India, the district has a public sector network of primary health centres (PHCs) and hospitals that provide free health care. As of 2012, there were 146 PHCs and 10 hospitals providing a mix of primary and secondary care. There is also a large private health sector, with a wide array of health care providers ranging from unqualified practitioners to highly trained specialists.

Under the umbrella of the RNTCP, the district is divided into six TB Units (TUs), each catering for a population of around 500 000 and responsible for programme implementation. Under each TU, designated microscopy centres (DMCs) cover a population of 100 000 and perform sputum smear microscopy (n = 28). Patients can either access these centres directly or be referred by a public facility or a PP. DMC laboratory technicians are expected to record various details, including the source of referral, for each presumptive TB case examined. Quarterly reports are generated at the District TB Centre (DTC), based on the reports from TUs.

By 2011, the DTO had carried out four workshops at the district's headquarters on sensitisation about the RNTCP for allopathic PPs, as reported in the records at the DTO office.

Definitions

For our study, PPs were defined as 'formal' if they were formally trained in allopathic medicine or in the Indian system of medicine—Ayurveda, Yoga and Naturopathy, Unani, Sidda and Homeopathy (AYUSH), and as 'informal' otherwise. Allopathic PPs with no specialist training were classified as general practitioners (GPs). Specialists potentially consulted by patients with chest symptoms in their routine practice, such as physicians, surgeons, paediatricians and gynaecologists, were categorised as 'Core'; other specialists less likely to be consulted, such as anaesthetists, psychiatrists and orthopaedicians, etc., were categorised as 'Others'.

Data collection and analysis

Data were collected in 2012 to assess PP participation in the RNTCP in 2011. Data on referrals were collected retrospectively from the DMC laboratory registers. Individual names of referring PPs, number of referrals, total number of patients undergoing sputum examination (referred and non-referred by PPs) and numbers with a positive smear result were extracted and entered into an Excel database (Micro-Soft, Redmond, WA, USA). Data were cross-verified with routine quarterly reports and records at the DTC. Information on whether and how many PPs had engaged in PPM schemes in the district was searched for in routine DTC reports and registers.

To ascertain the total number of PPs practising in the study area, regardless of their engagement with the RNTCP, PPs were mapped using five data sources: the Indian Medical Association (New Delhi, India), the Karnataka Private Medical Establishment Act, the district TB office, private nursing homes and the Medical College, complemented by field visits. Of the 28 DMCs, only five (one urban, four rural), all located in the headquarters of the respective TUs, systematically recorded the source of referrals in their laboratory registers: Sira Town DMC, Koratagere Town DMC, Kunigal Town DMC, Swami Vivekananda Integrated Rural Health Centre DMC in Pavagada Town and DTC DMC in Tumkur City.

	Mapped PPs		PP	s found in each d	ata source, n (%)*	
TB Unit	n	KPMEA	IMA	DTC	Nursing home list	Medical college
Koratagere	20	6 (30)	4 (20)	15 (75)	0	0
Kunigal	27	19 (70)	11 (41)	8 (30)	1 (4)	0
Pavagada	23	12 (52)	13 (57)	15 (65)	9 (39)	0
Sira	45	23 (51)	16 (36)	18 (40)	1 (2)	0
Tumkur	309	157 (51)	160 (52)	115 (37)	58 (19)	73 (24)
All	424	217 (51)	204 (48)	171 (40)	69 (16)	73 (17)

 Table 2
 Number of PPs practising in the five selected TB Units found in each of five different data sources, Tumkur District, Karnataka, India, 2011

* Some PPs were found in more than one data source.

PP = private practitioners; TB = tuberculosis; KPMEA = Karnataka Private Medical Establishment Act; IMA = Indian Medical Association; DTC = District TB Centre.

The analysis was thus narrowed down to these five DMCs, and the mapping of PPs was restricted to the five TUs where they were located. Of the remaining 23 DMCs, 2 were urban and 21 rural.

Data were analysed using MS Excel[®] v. 2010 (Microsoft) and Epi InfoTM v. 3.5.3 (Centers for Disease Control and Prevention, Atlanta, GA, USA). The median number of referrals per PP and the interquartile ranges (IQR) were calculated considering only PPs who had referred at least one case during the study period. Two parallel analyses were performed, including and excluding 44 PPs not found during the field visit. If not expressly stated, the reported results include the 44 PPs.

As the study involved the collection of secondary data from routine RNTCP registers and reports, and personally identifiable information of patients was not collected, ethical approval was not required.

RESULTS

A total of 424 formal PPs (363 allopaths and 61 AYUSH) were identified (Table 2). None of the five mapping sources was complete, and there were some overlaps. Of the 424 PPs mentioned in one or more data sources, 44 were not found during the field visit, possibly because they had relocated or retired; six of these had made at least one referral in 2011. Among 375 PPs with complete information on the site of practice, the majority of the GPs (n = 117, 84%) practised in solo clinics; among specialists, 134 (57%) practised in a nursing home or hospital. No PP in the entire district of Tumkur had formally signed up for any of the PPM schemes during 2011.

Among the 424 PPs mapped in the study area, 94 (22%) had made at least one referral to a DMC during the year (Table 3): 87 allopaths (32 [38%] GPs and 55 [20%] specialists—25% core and 7% other specialists) and 7 (11%) AYUSH. Results did not significantly change on excluding the 44 PPs not found during the field visit. A total of 675 presumptive TB cases were referred by PPs (Table 4) to the five DMCs, 320 (47%) by GPs, 336 (50%) by specialists (97% of whom were core specialists) and 19 (3%) by

AYUSH. Among the referring PPs, the median number of referrals per PP was 3 (IQR 1–6) (Table 4).

Among the total 4446 presumptive TB cases examined at the five DMCs, 675 (15%) had been referred by PPs (Table 5). There were respectively 157 (23%) and 521 (14%) confirmed smear-positive cases among those referred and not referred by PPs, and respectively 81 (24%) and 74 (23%) among referrals by core specialists. In the 23 DMCs not included in the study, 1246 (7%) of the 17 540 presumptive TB cases examined were confirmed as smear-positive cases. PPs thus contributed to 23% of all detected sputum smear-positive TB cases in the study area, with variations across the different DMCs (Table 5).

DISCUSSION

Even 15 years after the introduction of PPM schemes, we found a complete absence of formal engagement by PPs with the RNTCP throughout Tumkur District. However, in the study area, 22% of PPs had made at least one referral to the RNTCP, contributing nearly a quarter of the sputum smear-positive TB cases detected. Compared to core specialists and GPs, a lower number of other specialists and AYUSH referred cases to the RNTCP. The proportion of confirmed sputum smear-positive cases among presumptive TB cases referred by PPs was much higher than the normally expected value of 10%.²⁰

This is the first study in India to assess the participation and contribution of for-profit, formally trained PPs in the RNTCP under a programme setting. An important limitation of the study is that it included only five DMCs that systematically documented sources of referral. Some patients referred by PPs might have presented to other DMCs, possibly leading to an underestimation of the contribution of PPs to referrals. On the other hand, this is likely to be low, as the selected DMCs are located at the headquarters of their respective TUs, where the majority of the district's PPs have their practice. Another limitation is that as data were extracted from DMC laboratory registers, referred cases who did not reach the DMCs were not captured, hence potentially leading to an underesti-

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		A	II PPs		All		GPs			Spe	ecialists			Ą	/USH
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DMC	Population 2011	Total <i>n</i>	Referring n (%)												
Koratagere Town	17 021	20	5 (25)	12	3 (25)	7	2 (29)	ъ	1 (20)	4	1 (25)	-	0	ø	2 (25)
Kunigal Town	39721	27	6 (22)	23	6 (26)	10	3 (30)	13	3 (23)	10	3 (30)	m	0	4	0
Pavagada SVIRHC	67 235	23	4 (17)	22	4 (18)	6	3 (33)	13	1 (8)	00	1 (13)	ŋ	0	-	0
Sira Town	66520	45	20 (44)	34	20 (59)	15	11 (73)	19	9 (47)	16	8 (50)	m	1 (33)	11	0
Tumkur DTC	305821	309	59 (19)	272	54 (20)	43	13 (30)	229	41 (18)	155	36 (23)	74	5 (7)	37	5 (14)
Total	496318	424	94 (22)	363	87 (24)	84	32 (38)	279	55 (20)	193	49 (25)	86	6 (7)	61	7 (11)

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							Refert	rals by allopaths						
										Specialists				
		PP referrals		All		GPs		All		Core		Others	Refe	rals by AYUSH
DMC	Total <i>n</i>	Number per PP median [IQR]												
Koratagere Town	33	2.0 [1.0–14.0]	30	14.0 [1.0–15.0]	15	7.5 [1.0–14.0]	15	15	15	15	0	0	m	1.5 [1.0–2.0]
Kunigaľ Town	104	7.0 [2.0–14.0]	104	7.0 [2.0–14.0]	76	2.0 [1.0-73.0]	28	11.0 [3.0–14.0]	28	11.0 [3.0–14.0]	0	0	0	0
Pavagada SVIRHC	21	5.5 [2.5-8.0]	21	5.5 [2.5-8.0]	14	4.0 [1.0–9.0]	7	2	7	L _	0	0	0	0
Sira Town	202	5.0 [1.5–12.0]	202	5.0 [1.5–12]	162	9.0 [5.0-30.0]	40	1.0 [1.0-5.0]	35	1.0 [1.0-6.5]	Ъ	5 [-]	0	0
Tumkur DTC	315	3.0 [1.0–5.0]	299	3.0 [1.0-5.0]	53	2.0 [1.0–4.0]	246	3.0 [1.0-5.0]	240	3.0 [2.0–6.0]	9	1.0 [1.0–1.0]	16	3.0 [2.0–6.0]
Total	675	3.0 [1.0–6.0]	656	3.0 [1.0-7.0]	320	4 [2-10.5]	336	3.0 [1.0–6.0]	325	3.0 [2.0–6.0]	11	1.0 [1.0–2.0]	19	2.0 [1.0-4.0]
PP = private practition	JMC ;JMC	= designated microsco	opy centr	e; GP = general practit	tioner; A'	YUSH= Ayurveda, Yoç	ga and Na	aturopathy, Unani, Sido	da and H	lomeopathy; IQR = int	erquartile	e range; SVIRHC= Swa	ami Vivel	kananda Integrated

	Presumptive	TB cases examined	Conf	irmed sputum smear-positive 1	B cases
DMC	Total n	PP referrals n (%)	Total smear-positive n (%)	Confirmed smear-positive PP referrals n (%)	% of total confirmed smear-positive cases referred by PPs
Koratagere Town Kunigal Town	511 379	33 (6) 104 (27)	55 (11) 50 (13)	5 (15) 16 (15)	9 32
Pavagada SVIRHC	1244	21 (2)	215 (17)	12 (57)	6
Sira Town	1174	202 (17)	184 (16)	56 (28)	30
Tumkur DTC	1138	315 (28)	174 (15)	68 (22)	39
Total	4446	675 (15)	678 (15)	157 (23)	23

 Table 5
 Number of presumptive TB cases examined by sputum smear microscopy, source of referral and number found smear-positive in five selected DMCs in Tumkur District, Karnataka, India, 2011

TB = tuberculosis; DMC = designated microscopy centre; PP = private practitioner; SVIRHC= Swami Vivekananda Integrated Rural Health Centre; DTC = District TB Centre.

mation of the volume of PP referrals. Laboratory technicians at the selected DMC might also have missed documenting the source of referral in some cases, also leading to an underestimation of PP referrals. Underreporting of the source of referral at the DMC level could have been estimated by interviewing a sample cohort of PPs on their referral patterns; however, this was not done. Another limitation was that we focused on PP referral for sputum smear microscopy for the diagnosis of presumptive pulmonary TB without exploring referral patterns for the diagnosis of presumptive extrapulmonary TB. A recent study in the same area showed that nearly half of TB cases diagnosed and/or treated in private clinics/hospitals are extra-pulmonary.²¹ It should be noted, however, that at the time of the study histopathology was available only in the private sector in the district, making referral to the RNTCP for the diagnosis of extra-pulmonary TB not meaningful to explore.

The WHO recommends that the source of referral and place of treatment be routinely recorded and reported to assess PSP participation in national TB programmes.²² This helps to estimate the contribution of PPs to the RNTCP and prioritise efforts to engage PPs who are most likely to contribute to RNTCP. Although mandated to do so by the programme, laboratory technicians at peripheral DMCs did not routinely comply with this recommendation; only those at the DMCs included in the study complied. Furthermore, the format of the laboratory register is not adapted to this guideline, suggesting that this practice needs to be strengthened by the RNTCP.

A fully comprehensive registry of PPs for the district was not available. The list of PPs available in the DTO contained only 40% of the PPs that we ultimately mapped. The majority of GPs practised in solo clinics, which were more challenging to identify and locate. Systematic mapping of all health care providers is a prerequisite for an effective PPM strategy,²³ particularly in India's pluralistic private health sector. Clear guidelines should be developed by

the Government to aid programme managers in carrying out and maintaining the mapping of PSPs, as the utility of this exercise goes well beyond just the TB programmes.²⁴

Despite the absence of formal engagement with the RNTCP, PPs referred presumptive TB cases to the RNTCP on an ad hoc basis. The current PPM schemes (Table 1) are not conducive for individual PPs to refer patients for diagnosis and treatment to the RNTCP, as limited options are offered through only two available PPM schemes (adherence and slum scheme). The introduction of a scheme aimed at referrals of presumptive TB cases to the RNTCP by individual PPs.

GPs and core specialists referred more cases than other specialists and AYUSH. Among GPs, 38% referred to the RNTCP, contributing to 47% of PP referrals. This suggests that, as shown in other settings,^{25–27} both GPs as well as core specialists should be targeted in PPM collaborative efforts. AYUSH referred a small number of cases to the RNTCP. Other studies have shown that these are the first contact points for seeking care, especially in rural India,²⁸ and authors have stressed the need to engage them in PPM efforts.⁹

The high proportion of presumptive PP-referred TB cases later confirmed as smear-positive cases suggests that PPs tend to make selective referrals to the RNTCP. The reasons for this selective referral, i.e., whether PPs refer only cases with a high index of suspicion of TB instead of referring all presumptive TB cases to the RNTCP, should be further explored.

PSP contribution to the RNTCP is not routinely measured and reported in India. The PPM section of the RNTCP's quarterly reports provides only the absolute number of PSPs involved in any PPM scheme; it does not provide any disaggregated data according to different types of providers. In the absence of clear performance-related indicators for the PPM component, RNTCP staff may circumvent PPM-related activities, as it neither offers any incentives nor contributes to their measurable performance.²⁹ Efforts to strengthen the PPM reporting system by incorporating tools and indicators to measure the PSP contribution should be made.

In conclusion, PPM TB has been implemented for several years in India, with limited success. Nonetheless, there is scope for greater engagement of PPs, who refer a substantial number of cases even without having formal agreements with the RNTCP. The vision of the Government of India is for a 'TB-free India'. To achieve this, the programme has adopted a new strategy in RNTCP Phase III (2012-2017) of universal access to quality diagnosis and treatment for all TB patients by engaging all health care providers.³⁰ To achieve this objective, and bearing in mind that a strong public health system is a prerequisite for successful TB control,³¹ it is critically important that PPs are fully involved in the programme. Previous studies in India have highlighted the challenges in involving individual PPs in RNTCP.³² It is important to understand the reasons for the absence of formal engagement, if and why PPs prefer informal collaboration, and what strategies would work to build long-term collaboration. Qualitative research into what motivates PPs to collaborate with the RNTCP could contribute to the build-up of this knowledge and to the development of sustainable health system-related interventions to improve referrals of presumptive TB cases from PPs to the RNTCP.

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Conflicts of interest: none declared.

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_ R E S U M E

CONTEXTE : District de Tumkur, Inde du Sud.

OBJECTIF : Evaluer la participation de médecins privés libéraux (PP) dans le projet d'association public-privé (PPM) dans le cadre du Programme National de lutte contre la Tuberculose révisé (RNTCP) et documenter leur contribution à la recherche de cas de tuberculose (TB) pulmonaire du RNTCP.

SCHÉMA : Les rapports du RNTCP au centre TB du district ont été revus. Les PP ont été cartographiés et leurs références de cas présumés de TB au RNTCP pendant l'année 2011 ont été évaluées grâce aux registres des laboratoires dans des centres de microscopie désignés (DMC).

RÉSULTATS : Aucun des 424 PP ne s'est inscrit à un projet de PPM. Cependant, 22% ont fait au moins une

référence vers un DMC en 2011. Les références des PP ont constitué 15% des cas présumés de TB examinés dans les DMC. Les PP ont contribué à 23% des cas de TB à frottis positif détectés. Parmi les références des PP, la proportion des cas à frottis positif confirmés a été élevée (24%).

CONCLUSION : Même 15 années après le début du PPM, il y a une absence totale d'engagement formel des PP auprès du RNTCP. Cependant, les PP réfèrent au RNTCP et contribuent à une fraction de la détection des cas de TB. La proportion élevée de cas à frottis positif confirmés suggère que les PP tendent à faire des références sélectives. Davantage d'efforts sont requis pour promouvoir l'engagement des PP auprès du RNTCP.

MARCO DE REFERENCIA: El distrito de Tumkur en el sur de la India.

OBJETIVO: Evaluar la participación de los médicos del sector privado (PP) de salud con fines de lucro en los esquemas de la colaboración publicoprivada (PPM) del Programa Nacional contra la Tuberculosis Revisado (RNTCP) y documentar su contribución a la búsqueda de casos de tuberculosis (TB) pulmonar en el marco del programa.

MÉTODO: Se examinaron las notificaciones al RNTCP en el centro distrital de TB. Se localizaron los PP y se evaluaron sus remisiones de casos con presunción clínica de TB al RNTCP durante el 2011, a partir de los registros de laboratorio de los centros de microscopia designados (DMC).

RESULTADOS: Ninguno de los 424 PP estaba registrado en alguno de los esquemas de la PPM. Sin embargo, el 22% remitió como mínimo un paciente a un DMC en el 2011. Las remisiones de los PP representaron el 15% de los casos con presunción de TB examinados en estos centros. Los PP contribuyeron al 23% de los casos detectados de TB con baciloscopia positiva. En los casos remitidos por los PP, fue alta la proporción de casos confirmados por baciloscopia (24%).

CONCLUSIÓN: Después de 15 años de vigencia de la PPM en la India, se observó una ausencia total de compromiso formal de los PP con el RNTCP. Sin embargo, los PP remiten casos al programa y contribuyen con una proporción de los casos de TB diagnosticados. La alta proporción de casos confirmados por la baciloscopia del esputo indica que los PP tienden a practicar remisiones selectivas. Es necesario reforzar las iniciativas que promueven la adhesión de los PP al RNTCP.