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Performance Based Financing for Tuberculosis Care: Are Provider Incentives the Answer?

EVIDENCE SUMMARY

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Purpose of the document

The document presents a brief summary of evidences of TB specific Performance Based Financing (PBF) programs. The review is suitable for a wide audience including policy makers, healthcare researchers and health managers interested in learning more about PBF schemes in Tuberculosis Care. Full resources could be accessed at: <https://goo.gl/VzTyos>

To access the shared library, please go to [Zotero](#) platform and register [on the link](#). After that you will be able to access the full set of the [resources](#) used in the document.

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Background

Georgia has achieved remarkable gains in the management of tuberculosis (TB) in recent years, however continues to face several challenges:

1. **Limited referral of presumptive cases at primary care level and late patient presentation:** currently primary care physicians only refer 18% of presumptive TB cases for diagnosis; patients with TB symptoms directly self-refer to TB units rather than presenting at primary care, though this generally implies late presentation;
2. **High rate of both drug-resistant TB (DR-TB) and loss-to-follow up:** data from 2016 estimates high rates of DR-TB in the Georgian population (incidence is 9.8% in new cases and over 40% in those previously treated). Every third drug resistant TB patient interrupts treatment prematurely and that increases risk of infection transmission;
3. **Problematic management of TB:** operational expenses needed for treatment delivery or defaulter tracing (e.g. mobile phone bills, fuel) are currently covered by TB care professionals themselves: given these circumstances, nurses and epidemiologists have limited possibilities for tracing the patients who have adherence problems and defaulters;
4. **Low financial motivation of TB professionals:** TB doctors and nurses receive lower salaries compared to their peers in General Primary Care, no incentives mechanisms are in place;
5. **Substantial future human resource gap for TB care professionals:** the majority of TB nurses and doctors are reaching retirement age, however due to low remuneration and substantial professional risk, the profession is not appealing to younger generations.

To address the above challenges, the Georgian Ministry of Health is considering several policy options.

- Financial incentives to patients have been provided since June 2014 in order to prompt timely patient presentation at clinics. Evidence from Curatio International Foundation suggests this monetary support has been particularly helpful for poor patients for whom limited alternative income sources were available.

- Alternative treatment strategies are considered specifically for DR-TB: several clinical trials are currently conducted in Georgia to evaluate the efficacy of shorter courses of treatment for DR-TB.
- An adherence department has been established in the National Centre for Tuberculosis and Lung Diseases; staff employed here include psychologists and social workers as well as adherence consultants who are to provide education, counselling, psycho-social support as well as treatment follow-up and monitoring services for the population.
- To attract younger staff into the TB profession, fee waivers and subsidies are considered for TB and Lung Diseases specific residency programmes.

Additionally, under consideration are provider-specific performance based financing (PBF) programmes intended to assist in achieving Georgia's TB management targets.

TB MANAGEMENT TARGETS

1. Reduce the TB mortality rate by at least 25%;
2. Reduce the TB incidence rate by at least 15%;
3. Maintain the proportion of MDR-TB among new cases under 15% and among previously treated cases under 40%;
4. Ensure universal access to diagnosis and treatment of all forms of TB, including M/XDR-TB, so that at least 90% of estimated MDR-TB cases are diagnosed; and at least 75% of all notified MDR-TB cases are successfully treated.

Performance based financing incentives for TB providers in Georgia: review of available evidence

We reviewed the available evidence on TB-specific PBF programmes across high-, middle- and low-income countries to identify and synthesize evidence suited to informing the roll-out of such programmes in Georgia. We proceed to:

- a. Appraise the impact of PBF schemes reviewed;
- b. Synthesize key findings of interest on scheme design.

Methods for evidence review

Searches

We searched titles and abstracts of documents indexed in bibliographic databases (Medline and the Cochrane Library) using search terms around performance based financing (adapted from Witter et al 2012) and tuberculosis. To retain the most recent and relevant literature, documents pre-1980 were excluded; no language, setting or study design restrictions were applied.

Selection

Documents were retained for full-text review if they focused on supply- or a mix of demand- and supply-side performance based financing interventions. Documents were excluded if they focused only on demand-side interventions or did not include a comparison group against which impact of the PBF intervention was assessed.

Data extraction and synthesis

Data was extracted into a standardized extraction template adapted from Witter et al 2012. Data was then grouped according to study type, setting and/or type of performance based-financing scheme described and narratively synthesised accordingly.

Documents reviewed

Literature searches identified 628 studies of potential relevance; after removing duplicates and screening all titles and abstracts, 14 studies of relevance remained: reviews of primary PBF studies (n=5), primary studies focused on two specific high-burden TB settings: China (n=3) and Taiwan (n=4), and primary studies conducted in other settings (n=2).

A. IMPACT OF TB-PBF INTERVENTIONS

Key findings relating to TB-PBF scheme impact are summarised below:

1. **PBF schemes may increase case detection:** Evidence from Taiwan and further studies across India, Bangladesh, the Philippines and Czech Republic suggest that incentivizing health care providers (e.g. via case finding fees) may increase TB case detection rates by 10-30%. (Li 2009, Beith 2007) Contrasting evidence is available from China (Wei 2009, Yao 2008): both patients and doctors were meant to receive incentives within this scheme, however as doctors had limited to no guidance available on how to pass incentives on to patients or manage increasing patient numbers, the scheme failed to produce any significant impact. While case detection increased in the intervention group, this was substantially lower than the control group.
2. **PBF schemes positively influence overall utilization of TB services:** Evidence from Taiwan suggests that facilities and employees taking part in a PBF programme aimed at promoting improved case management (i.e. via collaborative management of DS-TB cases) significantly reduced patient default rates. (Tsai 2010) Volmink and Garner (1997) similarly note that incentivizing 'peer health advisers' among the community (similar to community DOTS) is effective in promoting treatment adherence and TB service utilization.
3. **PBF schemes positively influence cure and TB-treatment success rates:** Beith et al. summarize evidence on provider PBF schemes across India, Bangladesh, the Philippines, Czech Republic and Romania and note that schemes largely contribute to increases in cure rates (in cases up to 28%). A study into community based DOTS provision by Kangovi et al. similarly suggests that programmes offering financial incentives to CB-DOT providers had higher success rates than comparator programmes; however, differences were not statistically significant. (Kangovi 2009) Evaluations from Taiwan (Li 2010, Lee 2015) also support these findings, noting that the national PBF programme increased cure rates from 46.9% to 68.1%

($p < 0.01$) (Li 2010) and that patients enrolled in such schemes were at increased odds of treatment success (OR1.56, $p < 0.001$) (Lee 2015).

4. PBF schemes may prove cost-saving to the health system, however there are concerns over sustainability

A programme evaluation by Lee (2015) relating to a PBF scheme promoting collaborative case management (among others) in Taiwan, suggests that PBF enrolees spent on average \$215 less on TB related expenses than counterparts not treated at PBF hospitals (costs are reflective of insurance claims logged). Such evidence should be interpreted with caution: findings do not hold across different TB patient sub-groups. In contrast, the FIDELIS project in China exemplifies the importance of judicious PBF scheme design: regional level TB coordinators did not actively promote the FIDELIS scheme due to financial sustainability concerns. (Wei, 2009)

We caution that the evidence base supporting the above conclusions is limited and heterogeneous. We appraised mixed method, quantitative and qualitative evaluation studies as well as reviews and note that the majority provided only minimal information relating to PBF programme design and intervention calibration. Studies largely draw on evidence from before and after studies. Only Volmink (1997) reviewed clinical trial evidence specifically, and only one reviewed trial used provider-specific financial incentives.

B. PBF SCHEME DESIGN: WHAT WORKS?

In addition to information on PBF programme impact, we extracted information on PBF scheme design and draw attention to the following:

1. Non-financial incentives can be as important as financial incentives in achieving desired impacts

Intrinsic motivations for care delivery (e.g. dedication towards improving community health care, adherence to 'medical professionalism') as well as reputational benefits (e.g. being associated with an 'accredited' TB management programme) may motivate health care staff to improve case detection and referral practices. (Tao 2015, Lonnroth 2006) For example, a recent evaluation of financial incentives to community physicians in China showed little to no impact in improving case detection despite the lowest paid physicians acknowledging additional funds as an important part of their monthly income. Most rural doctors perceived incentives as particularly low and noted financial bonuses as demeaning and compromising professional values and dignity. (Tao 2015) Professionalism, prestige and reputation have also been shown to be of relevance in an evaluation of drug-for-performance contracts with private providers (See Lonnroth – Table 1): being employed in programmes receiving a government incentive or accreditation proved motivating for health care staff.

2. If financial incentives are to be put in place, decision-makers and funders should consider:

a. The complete network of agents engaged in TB detection and treatment so as to identify whose performance is to be targeted

In Taiwan, TB-PBF programmes were evaluated as successful in achieving higher cure rates than non-PBF comparators, as well as improved coordination processes across actors engaged in TB management. By incentivizing hospitals, patient and staff coordinators and individual clinicians to improve TB diagnosis, DOT delivery and defaulter tracing, the Taiwan National Health Insurance Bureau managed to increase detection rates by 30% and cure rates by 20%. (Li, 2010) Notably however, the long-standing programme only managed to prompt specific behavioural changes: despite coordinators having the ability to conduct further educational and sensitization campaigns in communities, such activities

were not rewarded directly and coordinators therefore did not take these forward.

b. The types and relative amounts of income health care providers have recourse to in order to effectively calibrate the performance incentive

Understanding the 'complex remuneration' of providers is critical to understanding the decision-problems providers face and how they may respond to incentives. (Bertone & Witter 2015) For example, the FIDELIS project in China aimed to incentivize more than one potential care provider, however showed little to no benefit over comparator groups across the country. Within this scheme, individual doctors and village leaders were provided funds for referring new smear-positive patients (US\$3) or for supervising DOTS delivery (US\$8) in communities, however benefits failed to materialize. (Yao 2008) When interviewed about why benefits failed to change provider behaviours, individuals noted that incentives were insufficient given current remuneration structures: i.e. by continuing to treat patients at rural primary care level and delaying referral to TB diagnostic services, rural physicians were bound to make higher profits than the financial incentives would have provided.

Conclusion

Our findings should be interpreted with due caution: the majority of reviewed studies did not include explicit accounts of why PBF interventions were implemented in contrast to other policy options, how such schemes were designed (i.e. it is unclear why specific providers' behaviours were targeted, how benefit payments and performance thresholds were set), or how sustainable such programmes were over time (e.g. what costs did PBF imply for the system and how long were programmes implemented?). Scheme evaluations additionally only include minimal details on relevant baseline performance of comparator groups: as Kangovi et al. note, for example, PBF schemes may at times be targeted at the most 'capable' providers giving the false impression of high scheme success.

The evidence-base on the impact and design of provider-specific TB-PBF programmes is modest, however suggests such interventions can achieve positive impacts in improving both case detection and overall cure/treatment success rates, as well as decreasing treatment default rates. Judicious and context-appropriate scheme design is imperative: reviewed studies suggest decision-makers require detailed knowledge of both the complex TB care system and various agents engaged within it and the motivational factors which may impact on behavioural change.

Table 1: Evidence summary across key references

PBF scheme type	Targeted providers	Examples of incentives provided	Evaluations and outcomes	Notes on scheme design and impact evaluations of schemes	References
Financial and non-financial incentives targeted at one health system level	Patients and nurses and doctors engaged in primary care TB case detection and DOTS delivery	Financial incentives were available to community based DOT providers (community supervisors overseeing DOT) enrolled in performance based financing schemes across Asia and Africa. For providers, financial incentives were complemented by routine arrangements for check-in with more experienced staff, mechanisms for monitoring of service delivery (both routine and spot-check)	Kangovi (2009): Across 24 programmes involving community based DOT providers, 19 offered financial incentives: evidence suggests schemes have positive impact on treatment success rates and lowered treatment default rates. Differences are not statistically significant	Kangovi (2009) Schemes and programmes implementing financial incentives (n=19) were noticeably different from comparators: incentivized programmes had higher case-loads and services provided were more complex at outset of implementation period.	Kangovi et al, 2009: A classification and meta-analysis of community based directly observed therapy programmes for TB treatment in developing countries
Financial incentives targeted at multiple system levels: mix of micro, meso and macro	Patients and nurses/doctors engaged in primary care referral, follow-up or DOTS supervision; regional or national coordinators and case managers	E.g. Wei (2009) notes how the FIDELIS project was implemented in China: TB patients screened as 'poor' were to be offered US\$1 upon first visit to dispensary for TB diagnosis. Doctors and village leaders were additionally incentivized: US\$3 for doctors who referred a new smear positive patient to TB dispensaries, US\$8 for village doctors to observe six month treatment of TB positive patient and US\$1 to village leaders for	Three studies conducted in China noted no to limited impact of both the FIDELIS incentive programme (Yao 2008, Wei 2009) and a national performance based financing scheme (Tao 2013). Case detection and service utilization increased in time in intervention groups, however this was not significant compared to control arms. Schemes were judged as unsuccessful.	Several issues relating to the 'failure' of the Chinese performance based financing schemes were noted: 1) financial incentives were judged as inadequate by health care providers (physicians noted that a 4-times larger incentive would be expected in order to effect behaviour change, specifically as in the case of private providers they were bound to make increasing profits from continuing delivery of services as before) 2) schemes provided no guidance on how they were to be managed: e.g. in one case, physicians were asked to assess patients' socio-economic	Yao et al (2008) Evaluating the effects of providing financial incentives to tuberculosis patients and health providers in China. Tao et al (2013) Motivating health workers for the provision of directly observed treatment to TB patients in rural China: does cash incentive work? A qualitative study Wei et al (2009) Why financial incentives did

broadcasting knowledge in local villages.		status and vulnerability in order to give out patient incentives, however no guidance on this was given - physicians' own incentives structures (i.e. what specifically they were/were not to be incentivized for) were also not clear; 3) the motivations of physicians were misunderstood by incentive managers: i.e. financial incentives were perceived as compromising professional integrity and thus mistrusted by physicians	not reach the poor tuberculosis patients? A qualitative study of a Fidelis funded project in Shanxi, China
E.g. Li (2010) summarizes a scheme implemented in Taiwan which varies payments according to points allotted for the various stages of TB treatment achieved: For overseeing the first months of treatment (1-3 months), hospitals get 4900 points, physicians 500 (250 per identified case) and case managers 1500 (each hospital with more than 100 TB cases must have a case manager to coordinate patient follow-up and service delivery). During a second stage (4-6 months) hospitals receive 2900 points, physicians 1000 (if the case is cured) and 1500 are allocated to case managers. During a third stage (7-9 months),	Several studies conducted in Taiwan (Li 2010, Tsai 2010 , Lo 2015 and Lee 2015) suggest the performance based financing programme increased case detection rates, decreased default rates and increased cure rates. Findings are statistically significant at 0.05 level and the evaluation studies conducted are moderate to high quality (retrospective studies using comparing two or more groups, including matching and clustering as relevant). Across studies, tertiary facilities had lower cure rates (hypothesised as 'to be expected' as these facilities handle most complex cases); private facilities were outperformed by public institutions (cure rates	Studies across Taiwan emphasize that PBF success is owed to judicious scheme design: by incentivizing several agents across the TB detection and treatment pathway, care providers perceive the benefit of coordinating their behaviour and ensuring improved patient outcomes. While case managers fulfil part of this coordination role, Tsai et al. (2010), note that case managers neglect potential other avenues for improving treatment outcomes (e.g. delivering further patient education) as such strategies are not linked to further financial rewards.	Tsai et al. (2010) Effects of pay for performance system on tuberculosis default cases control and treatment Li et al. (2010) Effects of pay for performance on TB treatment in Taiwan Lee et al. (2015) Using financial incentives to improve the care of TB patients Lo et al. (2015) Does enhanced diabetes management reduce the risk and improve the outcome of tuberculosis?

	hospitals receive 5250 points and an additional 1950 if the case is cured; physicians will receive 1000 points provided the case is cured and case managers receive a flat point value of 500 per month; in a fourth stage (9-12 months), physicians will receive 1000 points if the case is cured and case managers 500 per month as a flat value.	specifically) though this is likely due to historic investment and strengthening of TB management in public facilities. Regarding resource use, Lee et al. (2015) note that patients enrolled in performance based financing programmes incur relatively fewer expenses for the health system than those not enrolled in schemes (the latter are likelier to need hospitalization services due to increased treatment interruption).
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Financial and non-financial incentives targeted at multiple system levels: mix of micro, meso and macro

E.g. payments conditional on: number of diagnostic tests performed (Czech Republic), area specific targets (e.g. % cured patients per rural area, # of education session and home visits provided in Bolivia).

Rigorous studies suggest that financial incentives increase detection and cure rates over time and against no-incentive comparators.

It is difficult to assign increases in detection and treatment outcomes solely to financial incentives: in many settings, financial incentives are implemented alongside strengthening of DOTS provision or other interventions - findings are therefore highly dependent upon scheme design. In most cases, financial incentives are complemented by non-financial incentives: e.g. material packages (food parcels), training or supervision, and accreditation by national bodies may be offered. In such cases perverse incentives may be introduced: e.g. in Cambodia where treatment cards were used by providers to obtain food packages.

Evidence as summarized by Beith, Eichler and Weil (2007): Performance-Based Incentives for Health: A Way to Improve Tuberculosis Detection and Treatment Completion?

<p>Non-financial incentives targeted at multiple system levels</p>		<p>Medicines are provided for successful management of TB and for private providers adherence to national TB treatment guidelines</p>	<p>Lönnroth et al (2006) explored the use of 'drug for performance' contracts in relation to TB treatment success and quality of care. Using this model, private providers are given medicines either for free or at a subsidized rate by the government or NGOs provided physicians follow national treatment, referral and reporting guidelines and dispense medicines to patients on a no-cost basis.</p>	<p>Across the 15 studied programmes in Asia by Lönnroth et al (2006), detection and treatment success rates increased. The authors caution that for such programmes to be successful several 'soft' aspects of incentivization and contracting must be considered: 1) all parties must commit to monitoring the performance of TB programmes 2) the reputational incentives of adhering to national treatment guidelines or accreditation schemes must be explicit 3) other non-financial incentives may need to be offered by the government or NGOs (e.g. training) and 4) the monitoring and evaluation agencies must have the management capacity needed to oversee and audit national programmes.</p>	<p>Lönnroth K., M. Uplekar, L. Blanc. "Hard gains through soft contracts: productive engagement of private providers in TB control." Bulletin of the World Health Organization (2006): 84: 876-883.</p>
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