

**Performance-Based Incentives for Health:
A Way to Improve Tuberculosis Detection and Treatment Completion?**
By Alexandra Beith, Rena Eichler, and Diana Weil

Abstract

Tuberculosis is a public health emergency in Africa, Eastern Europe, and Central Asia. Of the estimated 1.7 million deaths from TB, 98 percent are in the developing world, the majority being among the poor. In order to reach the MDG and the Stop TB partnership targets for 2015, TB detection rates need to double, treatment success rates must increase to more than 70.75 percent, and strategies to address HIV-associated TB and multi-drug resistant TB must be aggressively expanded. DOTS, the internationally-recommended TB control strategy is the foundation of TB control efforts worldwide. A standard recording and monitoring system built on routine service-based data allows nearly all countries in the world to track progress in case detection and treatment completion through routine monitoring. This provides a good base for measuring the impact of different strategies for improving TB control outcomes.

Performance-based incentives in TB control programs include financial and material incentives directed to patients, individual health workers (in the public and private sectors), and entire health care facilities. Those directed toward patients encourage individuals to seek care (a diagnosis) and are conditional on completing steps in the treatment process to ensure adherence to the lengthy treatment schedule. Incentives directed at providers seek to improve the quality of diagnosis, expand access to treatment, improve teamwork, and encourage system changes to improve outcomes. Since multiple program strengthening interventions are implemented simultaneously, it is difficult to fully attribute performance changes to the incentives. However, evidence indicates that performance-based incentives for patients and providers directly contribute to increases in case detection and treatment completion rates. Experience in a number of countries points to the importance of careful design and implementation, particularly where it concerns the distribution of money and/or food. While more evidence is needed on the direct correlation between the incentives and performance, existing evidence suggests that incentives should be an integral element of a TB control strategy.

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**Performance-Based Incentives for Health:
A Way to Improve Tuberculosis Detection and Treatment Completion? ***

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Acronyms

ARC	American Red Cross
BRAC	Bangladesh Rural Advancement Committee (an NGO)
CDC	Centers for Disease Control (CDC)
CHW	community health worker
DOT	directly-observed treatment
FIDELIS	Fund for innovative DOTS expansion through local initiatives to stop TB
GFATM	Global Fund to fight Aids, Tuberculosis and Malaria
GLRA	German Leprosy Relief Association
HIV/AIDS	human immune deficiency virus/acquired immune deficiency syndrome
MDG	Millennium Development Goals
MDR-TB	multi-drug resistant tuberculosis
MSH	Management Sciences for Health
NGO	non-governmental organization
NTP	National Tuberculosis Program
PiH	Partners in Health (an NGO)
PPM	public-private mix
PPTI-J	Perkumpulan Pemeberantasan Tuberkulosis Indonesia – Jakarta
RNTCP	Revised National Tuberculosis Control Programme - India
RPM	Rational Pharmaceutical Management Plus Program
TB	tuberculosis
UPAD	Urban Poverty Alleviation Department (Cochin, India)
WFP	World Food Program
WHO	World Health Organization

Introduction

Performance-based incentives for patients and providers are incorporated into many tuberculosis (TB) control programs with the aim of increasing the number of cases detected and ultimately cured. The authors know of over forty TB control programs or projects that incorporate financial and material incentives for patients and providers, or for both. In these examples, patient incentives are usually tied to process measures that are closely linked to fully completing TB treatment and provider incentives are tied to either process or outcome measures or both. Findings from a few well-designed evaluations and TB program routine reporting data suggest that performance-based financial and material incentives for both patients and providers have a positive influence on tuberculosis detection, TB patient treatment adherence and treatment completion.

Tuberculosis remains, after millennia, a lethal public health threat. In 2005, WHO estimated 1.7 million people died from TB and nearly 9 million people developed active TB disease. Ninety-eight percent of deaths occur in the developing world and the majority of those affected are the poor and vulnerable, including those with compromised immune systems such as from HIV/AIDS and malnutrition (WHO 2006 Tuberculosis Factsheet). TB has recently been declared an emergency in Africa and Eastern Europe/Central Asia, due to still rising incidence, HIV-associated TB and/or worsening multi-drug resistant TB (MDR-TB) prevalence. In contrast, economic development and strengthened responses to TB in Asia, the Middle East, the Americas and Western Europe, have contributed to a decline in TB prevalence and mortality in these regions.

To reach the Millennium Development Goal of reversing TB incidence and the Stop TB Partnership targets for 2015 of halving mortality and prevalence rates, it will be necessary to nearly double TB case detection levels in Africa, increase treatment success rates above averages of 70-75%, and expand implementation of strategies to address HIV-associated TB and multi-drug resistant TB. A new Stop TB Strategy and Global Plan to Stop TB, 2006-2015, are providing the frameworks for further scale-up. Evidence suggests that performance based incentives have the potential to contribute.

Most evidence of the contribution of incentives to improving detection and treatment completion rates comes from routine reporting systems that have been institutionalized worldwide through WHO/Stop TB efforts. The presence of routine monitoring and reporting data offers a somewhat unique opportunity in the field of public health to track changes in performance over time. Limitations of this data, however, are that it is not possible to isolate the effects of the performance-based incentives on performance from other program strengthening interventions that may also simultaneously occur. As the last ten years have seen a dramatic increase in financing for TB control and consensus and application of new delivery strategies, there are few cases where incentives were the only addition to pre-existing TB treatment programs or projects.

This chapter provides an overview of performance-based financial and material incentives for patients and providers that are being used in a range of countries to

improve tuberculosis detection and successful completion of treatment. For the purpose of this discussion, “incentive” is being defined as: “all financial or material rewards that patients and/or providers receive, conditional on their explicitly-measured performance or behavior”¹. The chapter draws from previous work by the Stop TB Partnership, the World Health Organization (WHO), the World Bank and the Rational Pharmaceutical Management Plus (RPMplus) project, managed by Management Sciences for Health (MSH) and financed by USAID and other sources². Evidence draws substantially from information collected through four surveys of TB incentive interventions conducted by the Stop TB/WHO/World Bank/RPM Plus/MSH joint work program in 2001 and 2003 and RPM Plus/MSH in 2004 and 2005. Previous work used the broader terminology “incentives and enablers” to categorize and analyze motivators for patients and providers to overcome obstacles to TB case detection and treatment adherence³.

The chapter begins with a brief overview of current key issues in tuberculosis control. Next, the incentive environment of those involved in TB control (TB patients, health providers, other treatment supporters in the community etc.) is described. This is followed by a summary and analysis of interventions used by national TB control programs (NTPs) or others involved in TB care and service provision to modify incentives with the goal of generating improvements in case detection, treatment adherence and cure rates. This section also highlights limitations to existing evidence, which emphasizes the need for sound evaluations, and design and implementation factors that are relevant to scaling up effective and sustainable interventions. The chapter concludes by briefly touching upon lessons for management of other chronic conditions (e.g. HIV/AIDS, diabetes and hypertension).

The TB control context

TB is predominately a disease of the poor, making adherence to the extended course of treatment a considerable challenge. Without effective strategies to assure patient adherence and appropriate patient management, the danger that drug resistant forms of TB will develop increases. The newly enhanced Stop TB Strategy builds on knowledge of what is needed to deliver effective TB care in the increasingly complex environment of drug resistant TB and HIV/AIDS coinfection.

TB thrives in the context of poverty. Because TB reduces an individual’s ability to work and earn a living, the costs of seeking accurate diagnosis and treatment can be considerable for low-income households. TB patients face substantial costs prior to diagnosis, as patients may consult various private providers before being diagnosed

¹ This definition is similar to that used by Town et al., 2004; it has been slightly adapted to fit the TB control context.

² See <http://www.msh.org/projects/rpmpplus/3.5.5.htm> for an overview of this work and links to various resources on the topic

³ Where definitions are as follows: incentive: “incites someone to determination or action; introduces additional motivations to achieve existing performance objectives or to achieve higher performance standards” and enabler: “makes something possible, practical, or easy; allows action based on existing motivations or to achieve performance standards or goals within existing systems frameworks” and “motivators” could be financial, material, non-financial and non-material.

principally in public health services⁴. Even while most public services provide TB tests and drugs free of charge, other direct and opportunity costs pose barriers to accessing TB services and treatment, especially for poor rural and marginalized urban patients (such as slum dwellers, migrants, the homeless). While aggregate costs for the poor tend to be lower than for the non-poor, costs as a proportion of income are much higher for the poor⁵. In many cases, patients resort to borrowing money or selling assets as a result of their illness⁶. Many of the performance-based financial and material incentive schemes targeted at patients are designed to help compensate for these direct and opportunity costs.

Adherence to at least six months of treatment is a challenge. TB can be cured with a "cocktail" of 3-4 drugs that cost as little as US\$14-18 per patient. Adherence, though, often poses a challenge. The lengthy treatment course for patients with drug-sensitive disease is six to eight months long, and involves repeated interactions with health services. Challenges are on both the patient (demand) and provider (supply) side. Without proper health education on risks of curtailing treatment early and other motivators to encourage continued adherence, patients may cease taking drugs when they start to feel better. Unreliable drug supply, poor prescribing practices, and inadequate patient management can also result in inappropriate TB treatment.

Drug resistance is an increasing concern. In addition to failing to cure the patient, poor adherence contributes to development of strains of the bacterium that are resistant to treatment. Strains that are resistant to at least the two core anti-TB drugs (isoniazid and rifampicin), called multidrug-resistant (MDR) TB, are an increasing threat to global TB control efforts. While it is a more severe problem in some countries, MDRTB has been documented in nearly every country in the world and there are about half a million MDRTB cases each year⁷. Drug-resistant TB is usually treatable, however it requires two years of treatment that is far more expensive and potentially toxic to patients⁸.

The core elements of an effective TB control program are well established. In 2000, the WHO World Health Assembly agreed upon 2005 targets for both case detection (70% of new smear positive cases) and treatment completion (successful treatment of 85% of those detected) with the goal of decreasing the global TB burden. Where HIV is absent, reaching these targets should lead to a substantial decrease in prevalence rates and an annual decrease in incidence of about 5-10%⁹.

An internationally recognized management strategy underpins efforts to improve TB control worldwide and reach these targets, and the strategy has recently been enhanced. Since 1995, WHO has recommended the DOTS strategy for TB control, which has been scaled-up globally with over 20 million patients treated under this approach by the end of

⁴ Nhlema B et al. 2003 and quoted in Stop TB/WHO 2006b

⁵ Nhlema B et al. 2003 quoted in Stop TB/WHO 2006b

⁶ Nhlema B et al. 2003 quoted in Stop TB/WHO 2006b

⁷ Stop TB/WHO, 2006b.

⁸ <http://www.who.int/mediacentre/factsheets/fs104/en/#hiv>

⁹ Stop TB/WHO, 2006b

2004. DOTS comprises political commitment, case-detection through quality-assured bacteriology, short-course chemotherapy, ensuring patient adherence to treatment, adequate drug supply and sound reporting and recording systems¹⁰. At the end of 2003, more than three-quarters of the global population lived in countries that had adopted DOTS¹¹.

In 2006, the World Health Organization launched an expanded strategy, called the Stop TB Strategy, building on the successes of DOTS and incorporating additional policy and implementation innovations developed over the decade to address TB/HIV, MDR-TB and the challenges of reaching new populations and providers¹². The Stop TB Strategy and Global Plan, 2006-2015, include aims to reduce the suffering associated with TB and increase equitable access to care. They dovetail with universal access objectives for HIV prevention, treatment and care. In this context, performance-based incentives can have the dual objectives of helping improve public health outcomes by curing infectious patients and increasing access and reducing the suffering of individuals affected by encouraging early care-seeking and effective care.

It is important to emphasize that a range of treatment and management/support approaches exist. For example, in some countries in the former Soviet Union, patients are hospitalized during the first two months of treatment, and attend health services on an ambulatory basis for the remaining six months. In most of the world, however, TB patients receive treatment on an ambulatory basis. During the ambulatory phase, patients can attend a clinic or, increasingly, programs are developing community-based models where community workers, volunteers or family members provide the treatment support

Directly-observed therapy (DOT), whereby a health worker, community volunteer or family member supports and observes patients taking their anti-TB medicines, is a core element of TB control programs. This need emerged from experience in South Asia and the United States and elsewhere, where large default rates and the risk of emergence of drug resistant disease due to intermittent or incomplete treatment led to concern that more direct support and assurance of full-drug taking was needed. While effective DOT can ensure patient adherence and cure and reduces the risk of MDR-TB, it entails a high level of patient/provider contacts, which can impose substantial costs for the patient.

The incentive environment can discourage actions required for full TB treatment

One of the many reasons that TB programs may not achieve performance targets is that the many individuals that together form a tuberculosis control system may not act in ways that effectively contribute to necessary case detection, treatment completion and cure. What this means in practice is that providers may not always follow guidelines for appropriate detection and treatment, even when they have the knowledge, tools and appropriate enabling environment to do so. Confounding the problem is that patients

¹⁰ Stop TB/WHO, 2006b

¹¹ Stop TB/WHO, 2006b

¹² See Annex 2, which summarizes the new Stop TB Strategy and highlights the current and potential relevance of performance-based incentives

may not always seek care or adhere to the recommended treatment regimen, even when drugs are available and the importance of completing treatment has been communicated.

Patient barriers to accessing, initiating and staying on TB treatment can be considerable and present a greater challenge for the poor. Performance-based financial or material incentives such as food, transportation subsidies and/or money may be effective at reducing the direct and opportunity costs of treatment. By reducing obstacles, performance-based incentives encourage individuals to seek care and adhere to treatment.

A number of factors may motivate (and de-motivate) providers of TB care. TB service provision is very demanding, given that the extended course of TB treatment requires substantial efforts from health workers to ensure continued patient adherence. Public sector health workers are often paid a salary that does not depend on the quality of their work, the quantity of services provided, or the results achieved. Adding to this is often a lack of resources to reach out to community members or to follow up on defaulters. In settings where publicly employed providers also run private clinics, TB patients may be unappealing patients to treat because they are unlikely to be pay fees when drugs are available for free in most public settings. In contrast, private for-profit providers in developing countries often receive fees for each service they provide. Incentives for private providers may drive them to keep a fee-paying patient with TB, rather than refer them to be accurately diagnosed and treated.

At the level of the health providing institution, both clinic and hospital, funding is often based on a budget that covers the costs of inputs and contains no link to health results actually achieved. Incentives inherent in this form of payment are to justify expenditures rather than to demonstrate results.

What has been done to alter patient and provider incentives?

A range of performance-based incentives have been used to alter the incentive environment for patients, individual health workers, and health care providing institutions to improve TB results as shown in the following table:

Recipient	Form of Incentive
Patient	Direct payment
	Deposit return
	Food (hot meals, dry rations, vouchers)
	Transportation subsidies
	Vouchers for material goods
	Packages of personal hygiene products
Provider (Individual Level)	Direct Payment
	Food packages
	Vouchers
	Other material goods
	Free drugs to private providers
Provider (Team, Organization, or Local Government Level)	Direct Payment

What follows are descriptions of different types of financial and material performance-based interventions with a focus on incentive design, implementation, evaluation, and evidence of impact.

Patient performance based incentives: Financial and material patient incentives, which seek primarily to attract TB suspects for diagnosis and ensure adherence to treatment for confirmed patients, include direct payment, deposit return, food (hot meals, dry rations or food vouchers), transportation subsidies (reimbursement, tokens, passes or vouchers), vouchers for material goods other than food, and packages of personal hygiene products, such as shampoo. TB patients in the United States, where the majority are low-income, socially disadvantaged, and sometimes homeless, have long received financial and material incentives. In developing countries, some projects specifically target the poor (see box below on Tajikistan) or marginalized populations (see box below on Orel and Vladimir Oblasts in Russia), while others cover all TB patients within a given region or country (see box below on Cambodia).

Incentives are performance-based when they are given to the patient dependant on some measurable action occurring, such as the patient presents to take medicine. Performance rewards for patients are most commonly conditional on steps in the treatment process, in contrast to being conditional on treatment outcomes. Examples include providing food or money to patients that regularly attend a clinic to receive treatment under DOT and when they complete treatment.

In addition, a few performance-based patient incentive schemes have required patients to assume some financial risk. In Bangladesh, the NGO Bangladesh Rural Advancement Committee (BRAC) implemented a performance-based patient deposit incentive scheme from 1984 until 2003, where patients deposited an initial sum when beginning treatment. A proportion of the deposit was returned to the patient when treatment was completed and the remaining amount was retained by the volunteer community health worker (CHW) who provided DOT support to the patient during treatment¹³. The incentive program was changed in 2004 so that the patient receives the entire deposit when treatment is completed and the program provides a financial payment to the CHW upon treatment completion. The change was made largely due to the expansion of BRAC's role in TB control in Bangladesh and conditions associated with GFATM funding that require provision of free TB care¹⁴. Another example of financial risk imposed on patients comes from Jakarta, Indonesia, where the NGO Perkumpulan Pemeberantasan Tuberkulosis Indonesia – Jakarta (PPTI-J) provides patients with free drugs once they

¹³ This incentive program was traditionally financed entirely by the community itself. Since 2004, the Fund for innovative DOTS expansion through local initiatives to stop TB (FIDELIS) and the Global Fund for AIDS, Tuberculosis and Malaria (GFATM) have provided financial support to scale-up and it was decided that the provider incentive should be financed by the program rather than by the patient (the patient is returned the full deposit).

¹⁴ Discussion between Rena Eichler and Akramul Islam of BRAC at The Union meeting, Paris, 2005.

begin treatment. Patients must sign a contract agreeing to pay the full cost of drugs taken if s/he defaults, providing strong incentives to complete treatment.¹⁵

Provider performance-based incentives: Performance based incentives can be designed to influence provider behavior at both the individual health worker and the institution level. At the individual level, incentives are aimed at improving the quality of diagnosis, expanding access to treatment by promoting outreach, reducing default rates, and encouraging completion of treatment. Performance based incentives aimed at the team or institution level are oriented toward improving team work and stimulating system changes to improve outcomes. Payment is usually based on clearly defined process or outcome measures, such as: case detection, suspect referral, completed treatment or cured patient.

Performance-based incentives for individual public health workers. In the public sector, goals of performance-based incentives are to promote extension of DOTS services beyond public facilities to ensure greater patient access and increased adherence. Examples of performance-based incentives targeting individual public health workers include direct payment, food packages, vouchers, and other material goods¹⁶. For example, in Romania, public health workers receive gift tickets conditional on measures such as the number of new cases confirmed by microscopy and DOT rate in sputum positive patients¹⁷. In Honduras, public health workers receive material incentives (soap, hats, bags, towels etc.) when program objectives, such as ensuring that patients are regularly attending clinic-based treatment, are reached¹⁸.

Performance-based incentives for individual private health workers. Growing recognition that in many countries the first contact that a TB suspect has with the health care system is often with a private (for-profit or not-for-profit) provider has motivated the use of incentives to encourage private providers to refer suspects and/or to supervise treatment. Private providers have not traditionally been incorporated into a country's TB control strategy and have had few incentives to follow national TB guidelines. As a result, there has been considerable concern about appropriate prescription of TB drugs by private providers¹⁹, who have also been shown to rarely monitor treatment or maintain records²⁰. For example, in China, village "doctors" (community health workers who rely on fees for services for their income) receive a fee for each new sputum smear positive (ie, infectious) case enrolled in treatment, another fee when a smear exam is performed following two months of treatment and a final fee when patients complete treatment²¹. In India and the Philippines, National Tuberculosis Control Programs (NTPs) provide free anti-tuberculosis drugs to private providers on the condition that patients are not charged for the drugs. Dispensing free drugs are incentives for private providers because consultation fees can be charged, adding to providers' income. In addition, providers

¹⁵ Beith, Eichler, Sanderson and Weil (2001)

¹⁶ Such as briefcases, bags, watches, soap, T-shirts and hats.

¹⁷ S. Mookherji and A. Beith (2005 -DRAFT)

¹⁸ Honduran NTP response to RPM Plus survey in 2004 and S. Mookherji and A. Beith (2005 -DRAFT)

¹⁹ Uplekar et al. 1996 and Lonroth et al., 2003

²⁰ Lonroth, 2000 and Uplekar 2001

²¹ Beith et al. (2001), Mookherji et al. (2005), S. Mookherji and A. Beith (2005 -DRAFT)

known to cure TB patients gain a strong reputation as a healer, which can result in increased client demand for all services (see box on “soft contracts”).

"Soft" contracts with private practitioners to improve TB outcomes

WHO researchers reviewed 15 public-private mix (PPM) models in TB control involving National TB Programs (NTPs) in partnership with private care providers or with not-for-profit umbrella organizations that worked with individual providers. They examined the nature of contractual relationships, quality of care and results. In nearly all models studied, private providers received no formal financial payments although they did enter into contracts which enabled the providers to receive public-sector TB drugs for free distribution to patients, enabled them to receive continuing education, associated their work with a "reputed" national program, and lastly ensured that they followed national guidelines and reported results to the NTP. There were no competitive tenders. Treatment success rates were above 80% in 13 of the 15 initiatives, and on a par with or better than overall NTP averages, and TB case detection rose 10-36%.

Key conclusions:

1. High treatment success rate can be achieved for patients receiving treatment from private providers who are following international standards of TB care, are linked within a national DOTS-based TB program, and are providing TB drugs free of charge to patients.
2. Engagement of private providers can increase TB case detection rates, another of the measures of performance in TB control.
3. It is possible to use informal, but well-defined, "drugs-for-performance contracts" (without direct financial payments) when involving individual private practitioners in TB program implementation. These do act as incentives for participation in these programs and are associated with good performance and improved patient and public health outcomes.

Source: 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.

Performance-based incentives for teams, organizations, and levels of government.

Performance-based financial and/or material incentives are also observed to be used to motivate teams of providers or at the organization level to increase the number of cases detected and people cured. The theory is that incentives at the team or organization level inspire discovery and implementation of innovations at the system level that strengthen organizations and improve effectiveness. For example, in 2004 in Bolivia, the national program was planning to implement a performance-based payment with the goal of inspiring team based solutions to improving program results. Payment would depend on reaching service targets in rural areas, defined as: # cured patients, home visits conducted (3 per patient), community education sessions, and supervision of health promotion workers²². In pilot projects in the Czech Republic, NGOs involved in active case finding receive a monetary incentive once diagnostic tests are performed on TB

²² Bolivian NTP response to RPM Plus 2004 survey, Beith et al. (2004) and S. Mookherji and A.Beith (2005 DRAFT)

suspects²³. The FIDELIS project, financed by CIDA and managed by The Union, aims to stimulate innovative approaches to increasing case detection by awarding projects that have their second year financing conditional on achieving scores that demonstrate that patients with previous limited access were reached²⁴. In Brazil in 2000, municipalities were paid for each cured patient and provided an additional incentive to provide access to DOT. There are two possible amounts: one for patients that self-administer the TB medicines and a higher one for those that are supervised²⁵. The Indian Revised National Tuberculosis Control Programme (RNTCP) has elaborated two performance-based incentive programs targeting organizations: one for private providers (ambulatory facilities, hospitals and laboratories) and the other for NGOs²⁶.

What is the evidence of the impact of performance based incentives on TB outcomes?

The majority of known TB programs that are using performance-based financial or material incentives assess the impact of these incentives as part of the regular TB program monitoring process. Since TB programs use a standard recording and monitoring system built on routine service based data that has been institutionalized worldwide, they have access to better information to monitor results than most other public health programs. Nearly all countries in the world have estimates of the number of potential new TB cases and the actual number of new cases detected. Of patients that initiate treatment, those that complete treatment and are cured are tracked as well as those that default. These data are much better than what is available for other diseases through routine service monitoring systems at the primary care level in most developing countries. This implies that, at a minimum, TB programs can track progress in case detection and treatment completion over time using already institutionalized information from the routine monitoring system.

Evaluating impact through routine monitoring systems has a number of weaknesses, however. One weakness is that multiple program strengthening interventions may be implemented simultaneously, making it hard to fully attribute performance changes to the incentive. Evaluations that include a control group that receives all strengthening interventions except for the incentive may be a way to overcome such weaknesses, though even these evaluations can face challenges²⁷.

Additionally, even rigorous quantitative evaluations that look at performance figures for a baseline period and compare with a subsequent period only capture part of what might be useful to know in an evaluation. Since there are many variations on the design and

²³ L. Trnka/NTP Czech Republic – response to 2005 RPM Plus survey, and S. Mookherji and A. Beith (2005-DRAFT)

²⁴ Personal communication with I.D. Rusen and Rena Eichler and Alix Beith, June 2006.

²⁵ Beith et al. (2001)

²⁶ TB control website of India: <http://www.tbcindia.org/>

²⁷ In Haiti, where a patient food package scheme was implemented in some areas, there was evidence of patients pressuring providers to transfer them from control areas (without food) to intervention areas (where food was provided) (Midy et al. 2005). Also see Mookherji et al, 2005 and S. Mookherji and A. Beith (2005-DRAFT) where further examples were discussed to support this conclusion.

implementation of incentive schemes for both providers and patients, understanding more of the details of each program and aspects of each design that contribute to success or failure is also extremely useful. Few programs complement quantitative with qualitative analysis.

Evidence from few relatively rigorous studies: What follows are findings from the few known evaluations that have used more than routine monitoring data with retrospective analysis to assess the impact of performance-based incentives on TB program outcomes. These evaluations attempted to determine attribution by designing studies to distinctly identify the impact of incentives on performance. However, attribution is difficult because of design and implementation challenges as well as the problem of attributing performance changes to the incentives that is common to retrospective analyses of routine reporting data.

On the patient side, findings from three evaluation studies suggest positive incentive impact. In three oblasts in Russia (Ivanovo, Orel and Vladimir), a package of interventions (food and, in some cases, travel support, clothing and/or hygienic kits) was given to the patient if the patient did not interrupt treatment. Default rates dropped from 15-20% to 2-6% (see box below for more information). In Tajikistan, vulnerable patients were provided with food, conditional on their adherence to treatment. A treatment success rate of 89.5% was achieved (vs. 59.4% for the comparison group, see Box below for more findings). A study in Kazakhstan aimed to compare the impact of three different interventions (patient monetary payment vs. hot meals for patients vs. nurse outreach²⁸) on patient adherence. No intervention was significantly more effective, though the combined contribution of the three interventions improved treatment success 4.7%. There was less than 100% uptake; as a result the final study sample size was too small to detect differences among the three different intervention groups²⁹.

Performance-based material incentives for TB patients in Two Russian Oblasts: the examples of Orel and Vladimir³⁰
<p><i>Brief description of scheme type and overview of management/implementation process and/or challenges</i></p> <p>Description: Since 2000, TB outpatients in the Russian oblasts of Orel and Vladimir have been provided with a combination of food packages, hot meals, transport reimbursement, hygiene packages (soap etc.), and clothing based on their continued clinic attendance and observed treatment. When patients interrupt treatment for 7 days or more, they are denied the incentive package for a week or a month (depending on the territory).</p> <p>In Orel (~ 1,200 people impacted by scheme since initiation):</p> <ol style="list-style-type: none"> 1. TB patients living <u>in urban areas</u> receive a hot meal or food parcels following DOT of prescribed TB drugs. 2. TB patients <u>in rural areas</u> receive food parcels once every two weeks following two

²⁸ This latter does not fit the definition of “incentive” being used in this chapter, however.

²⁹ S. Mookherji and A. Beith (2005-DRAFT)

³⁰ Information used to develop this box comes from: Responses by Dr. Irina Danilova, TB project officer WHO/Russia TB Control Program to a 2005 survey sent out by the RPM Plus Program/MSH and personal conversations and correspondence with Dr. Wieslaw Jakubowiak, Coordinator, WHO TB Control Programme in the Russian Federation during the months of May and June 2006

- weeks of uninterrupted treatment.
3. Especially vulnerable patients (comprising 70% of TB patients and include the unemployed, ex-prisoners, migrants, homeless, TB patients having two or more minor children and students) receive additional food parcels every two weeks following two weeks of uninterrupted treatment
 4. All patients receive hygienic kits depending on their clinic attendance and adherence to treatment.
 5. Some ambulatory patients receive reimbursement for transport expenses depending on their clinic attendance and treatment adherence.

In Vladimir (~ 3,200 people impacted by scheme since initiation):

- a) All TB outpatients receive food packages (at cost of 8.9 dollars /month) following DOT of prescribed TB drugs.
- b) All new TB patients are compensated for travel expenses to places of treatment depending on their clinic attendance.
- c) All new TB patients receive bonus incentives (clothing, hygienic kits, etc.) when they complete treatment completion if there was no interruption.

Management

The incentives scheme in Orel was initially managed by the Russian Red Cross. Since 2005, management and financing was fully transferred to the local oblast administration (including managing payment, purchasing and transfer of food.). In Vladimir the incentives scheme was initially financed by WHO (food) and local administration (travel expenses) with management by the local Department for Social Affairs and TB service. Since 2005, management and financing have been fully transferred to the local oblast administration. Expanding this approach nation wide may not bring similar results given that the present model is implemented in small regions with strong TB management teams that do not exist in much of the country. In addition, most regional administrations have no budgets for food and transportation subsidies for TB patients and there are procedural and regulatory obstacles.

Key results

Impact on default rates: Evaluation of the incentive package began in 2004. Results show decreased default rates in Orel and Vladimir from 15-20% prior to the program implementation in 1999 to 2-6% in 2004. A recent retrospective study that included new pulmonary smear-positive and smear-negative TB patients from six Russian regions (including Orel and Vladimir regions) registered during the 2nd-3rd quarters of year 2003, used multivariate analysis to identify the contribution of the “social support” package of interventions (food, money, other material goods, psychological support and health education) to decreasing default rates. The analysis included other predictors of default such as employment status, alcohol abuse, and homelessness. Results were that the full package of social support decreased default outcomes but the contribution of financial and material incentive cannot be separated from other interventions in the social support package.

Perverse effects: There is little evidence of incentive misuse by program staff or patients, which may be due to strict monitoring and reporting. In rare cases, patients have tried to sell the food parcel in order to buy alcohol.

Targeting the poor: Food support in Tajikistan³¹

Description

Project HOPE, with USAID and World Food Program (WFP) support, provide food packages to patients as an incentive to complete treatment. Food packages are provided to vulnerable patients and their families on a bi-monthly basis conditional on adherence to treatment. Treatment cards maintained by providers are reviewed to determine adherence. As of June 2006, more than 3,838 TB patients and 20,205 of their family members benefited from the program.

Food packages contain wheat flour, vegetable oil, pulses and salt. The package value is approximately \$172, which, for the average-size Tajik family, is equal to about US\$ 29 per person for the six-month course of treatment.

How are the poor determined?

Through the end of 2004, the program used standard WFP criteria to determine who qualified as “vulnerable” to receive food support. Since then almost all TB/DOTS patients, regardless of “vulnerability” receive food. Criteria used until the end of 2004 to determine “vulnerability” included the amount of arable land and number of animals owned by the family as well as the family’s monthly income. Prior to patient receipt of food packages, Project HOPE conducted random home visits to confirm patient reports on number of family members and the household conditions of the patient.

In practice, very few TB patients qualified as “not vulnerable”. However, the program felt that many patients who were classified as “not vulnerable” based on WFP criteria were vulnerable, and the decision was made expand the program to cover almost all TB/DOTS patients.

Results

An evaluation of the scheme, from initiation in 2002 through second quarter 2004, compared treatment results of new patients registered in the program (N=459) with a cohort that did not receive food support (N=39). Key findings were as follows:

- Cure rates were higher for the vulnerable group that received food support: 89.5% vs. 59.4%
- Treatment failure was 3.9% in the food support group vs. 15.6% in the comparison cohort
- 2.9 percent of patients in the food support group died, vs. 12.5% in the comparison group
- Default rates were considerably lower for the food support cohort: 3.7% vs. 9.4%

Given small numbers; the program recognizes that a larger-scale study is necessary to confirm positive findings.

On the provider side, findings from the few known evaluation studies also suggest a positive impact of performance based incentives on suspect referrals, case detection and treatment completion. As known studies evaluated the impact of a package of interventions, it was not possible to distinctly identify the contribution of the financial and material incentives to improved performance. For example, a cost-effectiveness

³¹ Information used to develop this box comes from Mohr et al., 2005, S. Mookherji and A. Beith (2005-DRAFT), Project HOPE-Tajikistan response to RPM Plus 2005 survey and correspondence with Tom Mohr, Tatyana Vinichenko and Otabek Rajabov, Project HOPE/Tajikistan during June 2006.

study of the BRAC scheme in Bangladesh showed that TB case management using community health workers (of which the patient deposit-provider incentive payment was one part) increased case detection (90% vs. national average of 82%) and cure rates (from 33% to 60%), but this study did not tease out the impact of the incentive; highlighting instead that the entire community-based approach to DOTS was more effective than government facility-based DOTS³². In Pune, India, evaluation of a private provider payment scheme (for referral of suspects to microscopy centers and subsequent DOT provision) revealed that case detection increased overall and the default rate was almost zero, while cure rates were the same as for the public sector. These findings were attributed to a variety of factors that include the financial incentive³³. Additional studies in countries such as India and the Philippines addressing greater collaboration with the private sector have shown that a package of interventions, including free drugs (a financial incentive) and material incentives (such as free microscopes) may motivate private provider participation, and contribute to increases in case detection, appropriate referral and/or treatment through to patient cure³⁴.

Evidence from DOTS monitoring data and observations from TB providers:

Evidence from routine monitoring data suggests that performance based incentives for patients contribute to increased case detection and completion of treatment. For example, in the Czech Republic, a vouchers for material goods were given to homeless TB suspects who presented for testing resulted in case detection rates five times higher post-intervention³⁵. However, since NGOs also receive an incentive for active case finding it is possible that the increase in case detection might be partially or completely due to the patient incentive, the provider incentive or both. In Romania, patient travel support was piloted and adherence increased to 95%. When the pilot ended, adherence rates decreased to 80%³⁶. In Tajikistan, during periods when food support was not available, the patient default rate was 1.9 times higher than during periods when food was available³⁷. In Moldova, food and hygienic articles may have been part of the reason for an increase in treatment success from 61.9% to 68%³⁸.

On the provider side, findings from routine DOTS monitoring data also suggest that financial performance-based incentives contribute to improved performance. For example, in China, case-finding payments to village doctors may be a reason behind increasing case detection levels³⁹. As mentioned above, in the Czech Republic NGOs received a case finding fee. This alone, or together with the patient incentive may have contributed to the five-fold increase in case detection rates⁴⁰.

³² Islam et al. (2002) and S. Mookherji and A. Beith (2005-DRAFT)

³³ V. Inamdar – response to 2005 RPM Plus survey

³⁴ Lönnroth et al, 2004

³⁵ L. Trnka/NTP Czech Republic – response to 2005 RPM Plus survey

³⁶ L. Ditiu/NTP Romania – response to 2001 Stop TB, WHO, World Bank and RPM Plus survey

³⁷ Mohr et al., 2005

³⁸ D. Laticevschi - response to 2005 RPM Plus survey

³⁹ S. Mookherji and A. Beith (2005-DRAFT)

⁴⁰ L. Trnka/NTP Czech Republic – response to 2005 RPM Plus survey

It is not possible to unambiguously conclude that performance-based incentives lead to better TB program performance, though evidence from evaluations and from routine reporting data highlighted above indicate they hold promise. In addition, available evidence does not enable complete separation of the impact of financial and material incentives from the package of other program strengthening interventions that are implemented simultaneously.

Incentive effectiveness depends on quality of design, management and monitoring

Experience from existing performance based incentive initiatives suggests some lessons about the importance of appropriate scheme design, implementation, and evaluation.

Stakeholder involvement is important in the design process. Limited evidence suggests that consulting with patients to better understand the obstacles they face to be diagnosed and complete treatment, and with providers to better understand what is impeding them from performing optimally, may contribute to better design and increased buy-in among stakeholders. For example, in St. Petersburg, Russia, a needs assessment approach was essential to effective incentive design: soon to be released prisoners with TB were asked what would motivate them most to continue to adhere to treatment once they were back in the community. The most highly valued incentive for prisoners was assistance with obtaining a national identity card. Lack of such a card in Russia means that an individual loses opportunities for work, housing, access to public services and has a greater likelihood of police harassment and re-incarceration⁴¹.

Food support to patients in Cambodia: While providing food to TB patients who continue treatment may improve treatment adherence, the complexities of managing food distribution should not be underestimated⁴²

Brief description of scheme type and overview of management/implementation process and/or challenges

Description

Food has been provided to TB patients in Cambodia since 1994. Food packages from the World Food Program (WFP), composed of canned fish, vegetable oil and rice are provided to all TB patients, most commonly on a monthly basis, for 8 months total. In 2002, close to 18,000 individuals benefited from this program.

Through 2002, most TB patients were hospitalized throughout the intensive treatment phase (first two months) of treatment. Patients received food packages from the WFP if they remained in the hospital and continued to take anti-tuberculosis medicines. The program of supplementary food support from the WFP served to offset the costs of family having to provide meals for their sick relative while in the hospital. Patients in the continuation phase received the food conditional on service attendance and adherence to treatment under DOT. Patients commonly shared their food package with family members throughout the 8-month period.

Cambodia is presently moving from a hospital-based system of TB care to a fully ambulatory one. As a result, nearly all patients in the intensive phase of treatment are now treated on an ambulatory basis rather than as inpatients. In these cases, patient receipt of food packages is

⁴¹ Personal communication, Kaveh Khoshnood/Yale University, October 2004

⁴²Information used to develop this box comes from: Mookherji, S., and D. Weil. 2005, S. Mookherji, 2005 and S. Mookherji, Presentation, 2003

conditional on continued attendance at the clinic or receipt of medicines under supervised treatment in the community or home.

In 2002, a number of different food delivery modalities to patients existed in Cambodia (reflecting both the treatment phase of the patient – intensive or continuation – and the type of delivery – inpatient or ambulatory). These are summarized in the table below:

	Intensive Phase	Continuation phase
Inpatient	<ul style="list-style-type: none"> Weekly distribution of food to intensive-phase inpatients (weekly was thought to be easier in terms of patients' storing of food in the facility) 	Not applicable (no patients were hospitalized during the continuation phase)
Ambulatory patient	<ul style="list-style-type: none"> Distribution every two weeks to ambulatory intensive-phase patients (rather than monthly, as this was thought to be easier for them to transport) Once a month distribution to ambulatory intensive-phase patients 	<ul style="list-style-type: none"> Monthly distribution to continuation-phase outpatients on the same day as their medicines Monthly distribution to continuation-phase outpatients on a fixed day, but different from the patient's medicine day.

Management

Managing food distribution is complex. The WFP handles procurement and first-level distribution, while the MOH/TB program is responsible for actual distribution to patients. Prior to 1999, the WFP contracted the Cambodian Red Cross (CRC) to distribute food to TB facilities. As of 1999 a local transport company (Khmer Express Transport [KET]) assumed this responsibility. KET transports the food from the WFP's central warehouse at the port in Phnom Penh to two WFP provincial warehouses. WFP staff further deliver the food to outpatient departments, referral hospitals, and former district hospitals now downgraded to health center status. Health centers that are along the delivery routes are also directly serviced in some cases. Under this scenario, the delivery point for food is not always the same as the TB medicine delivery point, and therefore, accessing food support implies that the patient incur additional costs.

Where the WFP does not have a provincial warehouse, WFP delivers the food directly from the national warehouse to the outpatient departments and referral hospitals. TB staff at health centers and former district hospitals are responsible for collecting food from health service delivery sites. Under this scenario, the delivery point for food is the same as for TB medicines.

Mobilizing local resources to fund timely and efficient distribution of food to peripheral health centers (which are located far apart and treat only 5-15 patients at a given time) was already a challenge in some areas in 2002 and almost certainly has become more difficult in recent years given increased decentralization. In one province (Kampong Speu) where the WFP does not maintain a warehouse yet delivers food to the OD level, a mechanism has been established whereby peripheral MoH facilities have mobilized resources to transport food to peripheral DOTS delivery points through allocation of part of the operating costs budget obtained through user fees. Health facility directors in provinces where food has not yet been distributed to peripheral facilities have shown interest in further replicating the Kampong Speu experience.

Monitoring

Regular ongoing coordination between the MoH/NTP and the WFP has been critical for creative problem solving, effective monitoring, and program evolution and success. Both organizations

monitor food stocks and keep tabs on leakage. WFP conducts monthly monitoring visits to check food distribution and stock levels, verify new patient lists and review stock balance sheets. Field monitors also make random spot checks during food distribution, at which time food ration cards are checked against the TB register to ensure that false patients do not receive food supplements. In some cases, WFP field staff participate in Outpatient Department monthly meetings and interact closely with TB staff. National level coordination meetings are also held on a regular basis, addressing operational and management concerns and serving to jointly identify solutions.

Reporting systems related to food support (keeping track of number of beneficiaries and leakage for example) follow the requirements of the WFP. TB staff complete food-related forms in addition to the regular DOTS reporting requirements forms.

Monitoring and supervision within the context of decentralization remains a challenge. Given the increased number of food service deliver points (health centers), the WFP's monitoring and supervision burden has dramatically increased.

Perverse effects:

In the late 1990s, there were problems with "ghost" patients (food being given to families of non-existent or dead patients). As a result, WFP requested lists of beneficiaries from the NTP. WFP field monitors then used these lists to check food ration cards at the time of distribution. Combined with increased training and supervision enhancements, this process proved effective in reducing the number of ghost patients.

Implementation: the devil is in the details. The details of operationalizing an incentive scheme are important for programs to be able to expand to scale and to ensure impact and sustainability. Once a performance based incentive is chosen, it is critical to plan all the levels of implementation that include the following:

1. *Communication of the performance based incentive scheme to recipients.* Effectively communicating the new program to the people whose actions are intended to be affected is critical to success. If they don't understand it, they are unlikely to respond. For example, in El Salvador, providers did not fully understand the purpose of the patient food support, viewing it more for its nutritional benefit than as an intervention to influence behavior. As a result, instead of tying it to patient adherence to treatment, they provided food to all patients, regardless of adherence⁴³.
2. *Performance monitoring:* How performance will be reported, measured and monitored, and the entity (ies) responsible for each role must be determined and enabled. This may involve considerable capacity development if, for example, a government department will be taking on a new function.
3. *Management of the incentive:* Once performance is verified, the process to move the money or material goods is critical to plan. Schemes break down when the performance-based incentive is not available as promised and may imply future challenges if recipients begin to doubt the credibility of the provider of the incentive. The case of food management in Cambodia described in the text box below highlights the complications of managing food programs.
4. *Ongoing monitoring and evaluation:* Continuing to evaluate a scheme's effectiveness is important, as the impact incentive schemes may wane resulting in

⁴³ S. Mookherji et al, 2005 and S. Mookherji and A. Beith, 2005

a need for revision. It is also critical to continue to monitor whether there are perverse effects of the scheme that were not initially considered.

Unintended effects can be minimized through careful incentive design and regular ongoing monitoring. One danger of offering money or food as an incentive for patients to be tested or to remain on treatment is that the extreme poor may react by engaging in practices that enable them to continue to qualify. For example, in Cochin, India monitoring revealed that some patients attempted to prolong the treatment period by avoiding medicines in order to continue to receive a monthly payment. As a result, the scheme was revised, restricting payment for a maximum 6-month period from the date treatment began⁴⁴. In Haiti, where a patient food package scheme was implemented in several areas, there was evidence of patients pressuring providers to transfer them to food support areas resulting some failures as a few patients were referred to pilot centers located very far from their residence⁴⁵. In Cambodia there were problems with “ghost patients”; in these cases, treatment cards were used to obtain food packages for non-TB patients. This problem was overcome through effective communication and coordination among partners and tighter monitoring⁴⁶. In Russia, TB patients sold their food package in order to buy other things, such as alcohol⁴⁷. Careful consideration of these potential unintended effects and establishment of an ongoing monitoring system to identify and correct them is an important part of design and implementation of an incentive program.

In a few cases, low-income treatment observers and health workers complained that neglecting to provide incentives for health workers was unfair. In other cases, there is evidence of health worker theft of food and money intended for patients. For example, in Haiti⁴⁸, providers involved in the patient food support scheme began to demand food, so food provision for providers was ultimately formally included in the scheme to avoid pilferage. In Rio de Janeiro, Brazil, theft of food and transport vouchers was a short-term problem, until they were safely stored in a secure place within the DOTS unit⁴⁹. Careful design to consider potential unintended effects as well as systems to avoid pilferage can avoid these negative effects.

Lessons for other diseases/ interventions

Because treatment of tuberculosis takes 6-9 months, lessons about the impact of performance-based incentives to improve TB program results may inform management of other chronic conditions in the developing world. Perhaps the disease with most in common is HIV/AIDS because it is a communicable disease, treatment contains considerable challenges to support ongoing patient adherence, and poor adherence can contribute to drug resistance. Other chronic conditions such as diabetes and hypertension

⁴⁴ UPAD, Cochin, India – response to 2001 Stop TB, WHO, World Bank and RPM Plus survey

⁴⁵ Midy et al. (2005) and S. Mookherji and A. Beith (2005-DRAFT) and E. Nicolas/NTP Haiti – response to 2005 RPM Plus survey

⁴⁶ Mookherji, S. and D. Weil 2005.

⁴⁷ W. Jacobowiak and I. Danilova – response to 2005 RPM Plus survey

⁴⁸ Midy et al 2005

⁴⁹ Personal communication E. Soares, NTP Rio de Janeiro, Brazil and S. Mookherji and A. Beith (2005-DRAFT)

are not infectious, but assuring patient adherence and provider efforts to manage patients are still considerable public health challenges. Given that the service providers and the mix of incentives faced in the existing environment are common, lessons about what motivates providers to diagnose and manage the treatment of TB are likely to be relevant. Food and transportation support to patients are likely to be more effective with poor patients with profiles similar to those afflicted with TB than with higher income patients.

Conclusions

Evidence of the contribution of performance-based incentives to increasing case detection and improving treatment completion rates suggests that performance based incentives for both patients and providers should be considered one element of a strategy to achieve TB control goals. For patients, incentives can include money, food, and other material goods and may be more effective when transferred conditional on taking some action that is correlated with TB control goals. In addition, performance based incentives can be used to help overcome obstacles that poor and disadvantaged groups face. On the service provision side, performance based incentives can be used with both public and private sector providers and at the individual and institutional levels. By understanding the existing incentive environment that providers operate within, performance-based incentives can be designed to alter behavior so that TB control goals are the focus. Incentives for service providers can also orient activities to reach the poor and disadvantaged.

Experience suggests that consulting with stakeholders to understand what would best motivate them should be part of the design process. Details of implementation that must be thought through include how to communicate objectives to the providers and patients who are both recipients and implementers. How performance will be tracked and monitored and a process for assessing and refining the approach as evidence is gathered and lessons learned must be part of any program. The complications of managing the distribution of money and food cannot be underestimated as highlighted by the details of the Cambodia Food for Patients program. Management of food and other material incentives in Russia and the challenges of expanding the program nationwide also offer insights in to the challenges of designing and implementing a sustainable national program that includes incentives. These examples suggest that the devil is certainly in the details.

The majority of evidence comes from routine monitoring data that has been institutionalized in all TB control programs in the world. This routine information enables tracking of program performance on cases detected and treatment completed and allows comparison with national level performance information and targets that have been established by WHO. In addition to routine monitoring data, evidence comes from some rigorously designed studies. In both routine data and more rigorous studies, it is difficult to determine the unique contribution of performance-based incentives to improving TB program performance because other interventions are implemented simultaneously. Performance based incentives tend to be viewed as one element in a package to strengthen program performance. While more evidence is needed about the precise impact of a menu of incentives on TB control performance, existing evidence

suggests that carefully considered incentive programs will contribute to achieving program results.

Annex 1: Examples of performance-based financial and material incentives⁵⁰

Performance-based financial and material incentives for patients

Country/ Organization Implementing the Incentive	Incentive type and population covered	Financing mechanism and management responsibility	Results ⁵¹
Bangladesh/ BRAC (a national NGO)	Patient makes a deposit, which is returned in part or in whole (depending on the region) upon treatment completion. If patient dies, family receives deposit	BRAC and the community financed the scheme through 2003; FIDELIS and GFATM are funding expansion BRAC staff and CHWs are responsible for management	Cure rates higher than national average (90% vs. 82% in 2001) Case detection increased from 33% to 60% in 2002
Brazil/ Rio de Janeiro NTP	Food vouchers and bus tokens for all TB patients who attend the clinic to be treated under DOTS (N=4483 from 1999-2004)	The scheme is funded by municipal funds; central MOH funding also provided in 2003. TB control program of Rio manages the scheme	Cure rates are consistently higher in DOTS + incentives areas, as compared with non-DOTS non-incentive areas (78% vs. 69%)
Czech Republic/NTP	Vouchers for purchasing goods after TB suspect undergoes diagnostic tests. Targeted population (homeless, elderly, and families with many children. N=~10-15,000)	WHO/EURO and MoH finance the scheme; management is responsibility of TB Surveillance Unit, MoH and 10 NGOs	In 2003, case detection was five times higher among homeless receiving incentive
El Salvador/ NTP	Food baskets for TB patients who adhere to treatment in 9 out of 14 administrative departments. Design was that transfer of food would be conditional on treatment adherence.	USAID funded this scheme. The departments were responsible for scheme management, with support from CDC	Problems in implementation complicate interpretation of results. Service providers did not understand purpose of food incentive and gave to all patients regardless of adherence. Food was not supplied regularly. Result was that food baskets were not associated with higher treatment

⁵⁰ Tables primarily adapted from S. Mookherji and A. Beith (2005-DRAFT). Also used were Mookherji et al. (2005), Beith et al (2004), and Beith et al (2001). In a few cases, original responses to surveys sent out by RPM Plus in 2004 and 2005 were also consulted.

⁵¹ Most results reported here are from DOTS monitoring data as reported by survey respondents. In many cases other interventions are going on simultaneously; therefore the individual impact of the incentive has not been isolated.

Country/ Organization Implementing the Incentive	Incentive type and population covered	Financing mechanism and management responsibility	Results ⁵¹
Georgia/ Merlin and WFP	<p>Travel support, vitamins, antibiotics, and second-hand clothes to patients who continue to attend the clinic for treatment (N=~280 new patients/year, since March 2004)</p> <p>Food provided from March to September, 2004</p>	WFP funded and managed the food, while Merlin finances and manages the other material incentives.	<p>adherence.</p> <p>Default rate decreased from 30% to 0%, but started to rise slightly following termination of WFP support</p> <p>New sputum cure rates have risen from 43% to over 60%</p>
Georgia/GTZ	Food packages to TB patients who, in urban areas, must take medicines under DOT while those in rural areas must attend clinic to pick up medicines (N=285)	GTZ financed the scheme, which ran for 7 months in 2004. Management was the responsibility of the regional TB coordinator	<p>New sputum default rate fell from 25 to 17%</p> <p>Re-treatment default fell from 29 to 15%</p> <p>Treatment success rate increased from 58 to 71% (new sputum positive cases) and 29 to 35% (re-treatment cases)</p>
Haiti/ ICC-CAT (an NGO)	Food baskets to all sputum-positive patients at 27 TB units who attend the clinic for treatment (N=9573 patients over 4 year pilot study)	CIDA funded the scheme, WFP funded the food and management was the responsibility of ICC-CAT, supported by the NTP	Problems in evaluation design complicate interpretation of results. There were better outcomes in the control group; however these findings are challenged by the fact that, despite matching on background variables, the control and intervention areas were not comparable
Haiti/Partners in Health (PiH)	Package of incentives including monetary payment (\$30/month), nutritional supplements and financial assistance with travel costs for patients who adhered to treatment.	PiH funded and managed	Focus group had initial cure rate of 100%, while the best cure rate of the control was 57%

Country/ Organization Implementing the Incentive	Incentive type and population covered	Financing mechanism and management responsibility	Results ⁵¹
Honduras	Food to all TB patients who attend the clinic for treatment during intensive phase	Scheme is funded by MoH, USAID and GFATM and managed by NTP and regional and provincial authorities	Increase in case detection and cure rates Decrease in default rates
India/ Urban Poverty Alleviation Department (UPAD), Cochin municipality	Monetary support to enable travel and food purchase for urban poor TB patients in Cochin. Patients must attend clinic for treatment to receive the support	Cochin municipality finances and manages the scheme	Case detection increased from 16 during the pilot phase in 1996 to 791 during the first 3 years of the scheme
Indonesia/ PPTI-J (an NGO)	Patient signs a contract, through which s/he is “adopted” by a benefactor who funds the drugs required to complete treatment in Jakarta. Patient must complete treatment; if s/he defaults, s/he is responsible for refunding PPTI-J for all drugs taken (N=9956 from 1978 to 2000)	Adopters cover the costs of the TB medicines; while PPTI-J is responsible for financing of operational expenditure and for scheme management	The number of patients and adopters has steadily increased since 1978 Approximately 90% of adoptees have been cured Default rates are very low: around 1%
Kazakhstan/ American Red Cross (ARC)	Monetary payment, hot meal or nurse home visit ⁵² to TB patients in 20 DOTS corners in one oblast. Patient must complete treatment; if s/he defaults, s/he is responsible for refunding PPTI-J for all drugs taken (N=449)	USAID and the ARC fund the scheme while management is the responsibility of ARC, Oblast NTP and DOTS corner staff	All three groups missed fewer doses. Of three incentive groups pooled, the incremental contribution to treatment success is 4.7% - individually no incentive group is significantly better
Peru/ Partners in Health (PiH)	Food, transport costs as part of a package to patients with MDR TB in Lima who continue treatment (N=1,400 in 2001)	The scheme is funded through private donations while management is the responsibility of the NTP with assistance from PiH	80% cure of patients with MDR TB
Romania/NTP	Travel support to patients who attend clinic	The SOROS foundation funded this scheme, which ended in 2002. It was managed by the NTP and DOTS nurses.	Adherence increased to 95% (no baseline data available). When the scheme ended, adherence fell to 80%.
Romania/	Food coupons (6/month)	The scheme is GFATM-	Preliminary data

⁵² However this latter is not considered an “incentive” under the definition used in this chapter

Country/ Organization Implementing the Incentive	Incentive type and population covered	Financing mechanism and management responsibility	Results ⁵¹
DOW	which can be used to buy food and personal hygiene products. The number of coupons that a patient receives depends on the number of attended DOT appointments and patient treatment compliance	funded. DOW, the NTP and the Romanian Red Cross manage the scheme	showed strong increase in DOT attendance
Russian Federation/ St. Petersburg	Food packages are one component of a package of services provided to soon to be and newly released prisoners with TB in St. Petersburg. The patient must contact the program once released from prison, attend treatment facilities and develop treatment plan with provider (N=39)	The scheme is financed by a National Institute of Health (NIH) grant through Yale University. In kind support, mostly in form of staff time, is provided by St. Petersburg City TB Center, which is also responsible for scheme management (with some analytical support from St. Petersburg State University faculty, Biomedical Center in St. Petersburg and Yale School of Public Health faculty)	Increased number of released prisoners who contact the program, register at the TB dispensary and receive treatment
Russian Federation/ Ivanovo Oblast Government	Food package, glass of juice and compensation for travel expenses are part of a package of interventions for all TB patients in the oblast who do not interrupt treatment (500-600/year, or ~2500 since initiation)	WHO financed the scheme until 2005, at which time the local government took over funding responsibility. At scheme initiation there was some external support for management but now all management is by local government	Default rates dropped from 15-20% to 2-7%
Russian Federation/ Novgorod Oblast Government	Food package, glass of juice and bus tickets are part of a package of interventions for all TB patients in the oblast who attend the clinic for treatment and do not interrupt treatment	WHO, KNCV and the local government finance the scheme. A specially appointed TB Project manager who is responsible for writing quarterly reports to WHO manages the scheme	Patients began actively seeking their doses; patients watched nurses to ensure recording of their drug intake; formerly difficult patients (such as alcoholics) began to come regularly to obtain their drugs and to ensure that it was recorded properly
Russian Federation/ Orel Oblast Government	Food parcel, hot meal, hygienic kits and bus tickets are part of a package of interventions for all TB patients in the	WHO/Russia and USAID financed the scheme at initiation; now local government has complete funding responsibility. The	Default rates dropped from 15-20% to 2-6%

Country/ Organization Implementing the Incentive	Incentive type and population covered	Financing mechanism and management responsibility	Results ⁵¹
	oblast who adhere to treatment norms (N=~1200 since initiation)	Russian Red Cross managed the scheme at initiation but now this is also the responsibility of the local administration	
Russian Federation/ Vladimir Oblast Government	Food parcel (for outpatients only), travel expenses, clothing and hygienic articles (for all patients) are provided to patients who do not interrupt treatment (N=~3200 since initiation)	The scheme was initially financed by WHO and local administration with management by the local Department for Social Affairs and TB service; since 2005, management and financing has been fully transferred to the local oblast administration	Default rates dropped from 15-20% to 2-6%
Russian Federation/ Tomsk Oblast Government and PiH	Food support, travel support and other material goods to MDR TB patients from prison and civilian populations who adhere to treatment (N=>400)	Financing mechanism is unclear; management is the responsibility of PiH with Tomsk Oblast TB services	A cure rate of more than 82% was achieved
Tajikistan/ Project HOPE	Food support if provided to DOTS patients who adhere to treatment and their families who are determined to be vulnerable using standard WFP criteria (N=~6700 total since initiation)	Food is provided by the WFP while funding comes from USAID and Project HOPE. PH and the WFP manage the scheme	<p>Cure rates were higher for the vulnerable group that received food support: 89.5% vs. 59.4%</p> <p>Treatment failure was 3.9% in the food support group vs. 15.6% in the comparison cohort</p> <p>2.9 percent of patients in the food support group died, vs. 12.5% in the comparison group</p> <p>Default rates were considerably lower for the food support cohort: 3.7% vs. 9.4%</p>
Uruguay/NTP	Transport and monetary incentives for patients who attend a clinic that implements DOTS	NTP at central level	Increase in the percentage of patients who complete treatment and who are cured

Performance-based financial and material incentives for individual health workers and service and service delivery institutions

Country/ Organization Implementing the Incentive	Incentive type and population covered	Incentive targets individual or institution	Financing mechanism and management responsibility	Results ⁵⁷
Bangladesh/ BRAC (a national NGO)	Patient makes a deposit, part of which is given to the Community Health Workers when the patient completes treatment. CHW must ensure that patient completes treatment	Individual	BRAC and the community financed the scheme through 2003; FIDELIS and GFATM are funding expansion BRAC staff and CHWs are responsible for management	Cure rates higher than national average (90% vs. 82% in 2001) Case detection increased from 33% to 60% in 2002
China	Case-finding fee to village doctors (US \$1 each new smear positive case enrolled in treatment, US \$2 more when smear exam is performed following 2 months of treatment and US \$4 after treatment completion) As of June 2005, all provinces, cities and prefectures in China, or ~625,000 patients eligible	Individual	Local government covers the case-finding fee, while patient management fee is half paid by the World Bank and have by local government and GFATM funding (through 2008)	Case detection is increasing
Czech Republic/TB Surveillance Unit, MoH	Monetary incentive given to NGOs involved in active case finding who perform diagnostic tests on suspects	Institution	Management is responsibility of TB Surveillance Unit, MoH	In 2003, case detection was five times higher among homeless receiving incentive
Haiti/ ICC-CAT (an NGO)	Food baskets to public treatment partners who must attend clinic with patient for treatment and ensure adherence to DOT (N=80)	Individual	CIDA funded the scheme, WFP funded the food and management was the responsibility of ICC-CAT, supported by the NTP	Problems in evaluation design complicate interpretation of results. There were better outcomes in the control group; however these findings are challenged by the fact that, despite matching on background variables, the control and intervention areas were not comparable
Honduras	A variety of material incentives (soap, hats,	Individual	Scheme is funded by MoH, USAID and	Increase in case detection and cure rates

⁵⁷ Most results reported here are from DOTS monitoring data as reported by survey respondents. In many cases other interventions are going on simultaneously; therefore the individual impact of the incentive has not been isolated.

Country/ Organization Implementing the Incentive	Incentive type and population covered	Incentive targets individual or institution	Financing mechanism and management responsibility	Results ⁵⁷
	bags, towels etc.) to all public TB providers once certain program objectives are reached (such as ensuring patients punctually ingest medicines at the clinic)		GFATM and managed by NTP and regional and provincial authorities	Decrease in default rates
India/ Pune	Payment to private providers upon patient cure (if the patient was referred to a microscopy center and then subsequently provided DOTS) (N=119 in 2004)	Individual	The Indian NTP (RNCTP) funds the scheme, while NTP staff at the municipal level are responsible for management.	Default rate is close to zero among private providers Cure rate is the same as among public providers: 87%
Peru/ Partners in Health (PiH)	Food baskets and transport to visit MDR TB patient are provided to DOT providers in Lima	Individual	The scheme is funded through private donations while management is the responsibility of the NTP with assistance from PiH	80% cure of patients with MDR TB
Romania/ DOW	Gift tickets for providers involved in patient treatment are provided based on a number of factors including: new cases confirmed by microscopy, DOT rate in sputum positive patients and # of missed DOT visits	Individual	The scheme is GFATM-funded. DOW, the NTP and the Romanian Red Cross manage the scheme	Preliminary data showed strong increase in DOT attendance
Russian Federation/ Ivanovo, Novgorod and Vladimir Oblasts	Fuel for hospital cars to public providers to perform home DOT and trace defaulters	Individual	WHO financed the scheme until 2005, at which time the local governments took over funding responsibility. At scheme initiation there was some external support for management but now all management is by local government	Default rates dropped from 15-20% to 2-7%
Russian Federation/ Tomsk Oblast Government and PiH	Fuel assistance/transportation arrangements for providers to bring medications to patients' homes	Individual	Financing mechanism is unclear; management is the responsibility of PiH with Tomsk Oblast TB services	A cure rate of more than 82% was achieved

Annex 2: The new Stop TB Strategy and current and potential relevance of performance-based incentives

Component	Sub-components	Relevance of performance-based incentives
1. Expand and enhance DOTS	<ul style="list-style-type: none"> a. Political commitment with increased and sustained financing b. Case detection through quality-assured bacteriology c. Standardized treatment with supervision and patient support d. An effective drug supply and management system e. Monitoring and evaluation system, and impact measurement 	<ul style="list-style-type: none"> a. b. case detection through bacteriology - incentives being tested to support laboratory QA functions, expand smear-negative diagnosis c. treatment and patient support - incentives that encourage improved treatment provision quality by providers and patient support schemes that affect better performance d. e. Recording & reporting and impact evaluation
2. Address HIV/TB, MDR-TB and other challenges	<ul style="list-style-type: none"> a. Implement collaborative TB/HIV activities b. Prevent and control multidrug-resistant TB c. Address prisoners, refugees and other high-risk groups, and special situations 	Provide incentives that encourage collaboration, referral and safe treatment and care, and overcome specific institutional and individual bottlenecks in serving specific difficult populations (eg refugees, homeless populations, prisoners etc.)
3. Contribute to health system strengthening	<ul style="list-style-type: none"> a. Actively participate in efforts to improve system-wide policy, human resources, financing, management, service delivery, and information systems b. Share innovations that strengthen systems, including the Practical Approach to Lung Health (PAL) c. Adapt innovations from other fields 	Contribute, as feasible, to design of larger systems of contracting and performance-based incentives for the provision of basic packages of care, payment schemes for personnel, information systems and accountability strategies
4. Engage all providers	<ul style="list-style-type: none"> a. Public-Public, and Public-Private Mix (PPM) approaches b. Standards for Tuberculosis Care (ISTC) 	Provide incentives that enhance effective referral and care systems using private providers, and public and/or private hospitals not traditionally engaged in public health or accountable to public health systems, including drugs provision based on provision, training provision, recognition for affiliation with public health program etc.
5. Empower TB-affected persons, and communities	<ul style="list-style-type: none"> a. Advocacy, communication and social mobilization b. Community participation in TB care Patients' Charter for Tuberculosis Care 	Empower these groups through incentives to enable and encourage their participation in TB measurable improvements in case detection and treatment
6. Enable and promote research	<ul style="list-style-type: none"> a. Programme-based operational research b. Research to develop new diagnostics, drugs and vaccines 	Pull mechanisms that provide incentives to initiate and speed up research to resolve key TB bottlenecks and produce new tools, and/or potential exploration of new approaches to engaging local academic institutions in public health operational research

Bibliography

Ambe G, Lönnroth K, Dholakia Y, Copreaux J, Zignol M, Borremans N and M. Uplekar. Every provider counts: effect of a comprehensive public-private mix approach for TB control in a large metropolitan area in India. *International Journal of Tuberculosis and Lung Diseases* 9(5):562-568

Beith, A., P. Paredes, P.G. Suarez and M. Thumm. 2004. Workshop on the Use and Evaluation of Incentives in Tuberculosis Control in Latin America and the Caribbean: Trip Report, May 6-7, 2004. Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus Program. Arlington, VA: Management Sciences for Health

Beith A., Eichler R., Sanderson J., and D. Weil. *Can incentives and enablers improve the performance of tuberculosis control programs? Analytical framework, catalogue of experiences and literature review*. Document prepared for discussion at workshop on “Incentives and enablers to improve performance of TB control programs, Nov. 5-6, 2001”

Islam, M. A., S. Wakai, N. Ishikawa, A. M. R. Chowdhury, and J. P. Vaughan. 2002. Cost-Effectiveness of Community Health Workers in Tuberculosis Control in Bangladesh. *Bulletin of the World Health Organization* 80:445–50.

Hanson CL. Tuberculosis, poverty and inequity: a review of the literature and discussion of the issues. Geneva, Stop TB Partnership, World Health Organization, 2002.

Lönnroth K, Uplekar M, Arora VK, Juvekar S, Nguyen TN Lan, Mwaniki D, and V. Pathania. 2004. Public-private mix for DOTS implementation: what makes it work? *Bulletin of the World Health Organization*, August 2004, 82 (8)

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.

Lönnroth K. Public health in private hands. [dissertation] Gothenburg: University of Gothenburg; 2000.

Midy E., Y. Exume and G.F. Celestin. 2004. ICC: Projet de lutte contre la tuberculose avec assistance alimentaire et projet de recherches operationnelles; evaluation finale.

Mohr T, Rajobov O, Maksumova Z and R Northrup. 2005. Using Incentives to Improve Tuberculosis Treatment Results: Lessons from Tajikistan. Project HOPE.

Mookherji, S., and A. Beith. 2005. “Evaluating Tuberculosis Control Incentives and Enablers in the Context of Scale-up: Evidence and Experiences” DRAFT DOCUMENT FOR REVIEW, October 2005, RPM Plus.

Mookherji, S. 2005. "Impact and cost-effectiveness of incentives and enablers: evidence and policy implications for TB control programmes?" Powerpoint presentation, Symposium on: Scaling up the use of incentives and enablers to improve DOTS performance: what approaches work best?, 20 October 2005, 36th Annual UNION conference, Paris, France.

Mookherji, S., and D. Weil. 2005. *Food Support to Tuberculosis Patients under DOTS: A Case Study of the Collaboration between the World Food Program and the National TB Control Program of Cambodia. December 8-17, 2002.* Arlington, VA: Management Sciences for Health and Stop TB Partnership.

Mookherji, S., D. Weil, A. Beith, and C. Owunna. 2005. *Evaluating TB Enablers and Incentives Workshop Report: Paris, November 3-4, 2003.* Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus Program. Arlington, VA: Management Sciences for Health and Stop TB Partnership.

Mookherji, S., D. Weil, M. T. Eang, and H. Mory. 2003. *Enabling TB Treatment Seeking and Completion through Food Support to Patients in Cambodia: A Case Study Approach.* Powerpoint presentation, International Union Against Tuberculosis and Lung Disease 34th World Congress, October 29–November 2, Paris.

Nhlema B et al. A systematic analysis of TB and poverty. Geneva. Stop TB Partnership, World Health Organization, 2003.

Stop TB/WHO. 2006a. Engaging all health care providers in TB control: Guidance on implementing public-private mix approaches, WHO.

Stop TB/WHO. 2006b. Actions for Life: Towards a world free of tuberculosis. The Global Plan to Stop TB 2006-2015. World Health Organization

Town R, Wholey DR, Kralewski J, and B. Dowd. 2004. Assessing the influence of incentives on physicians and medical groups. *Medical Care Research and Review*, vol. 61, No. 3, (Supplement to September 2004) 80S-118S

Uplekar M, Pathania V, Raviglione M. Involving private practitioners in tuberculosis control: issues, interventions and emerging policy framework. Geneva: World Health Organization; 2001. WHO document WHO/CDS/TB/2001.285

Uplekar MW, Juvekar SD, Parande DB, Dalal DB, Khanvilkar SS, Vadair AS, et al. Tuberculosis management in private practice and its implications. *Indian Journal of Tuberculosis* 1996;43;19-22

WHO 2006 Tuberculosis factsheet: WHO 2006 WHO/HTM/STB/factsheet/2006.1