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Involving the Private Medical Sector in TB Control in Bangladesh: a mixed method study

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Involving the Private Medical Sector in TB Control in Bangladesh: a mixed method study

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Abstract

Objectives: In Bangladesh, private health care is common and popular, regardless of income or area of residence, making the private sector an important player in health service provision. Although the private sector offers a good range of health services, TB care in the private sector is poor. We conducted research in Dhaka between 2004 and 2008 to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) within the NTP's TB control activities. Since 2008, this PPP model has been scaled up in two other big cities – Chittagong and Sylhet. This paper reports the results of this development, evaluation and scale up.

Design: Mixed method, observational study design. We used NTP service statistics to compare the TB control outcomes between intervention and control areas. To capture detailed insights of PMPs and TB managers about the process and outcomes of the study, we conducted in-depth interviews, focus group discussions, and workshops.

Setting: Urban setting – piloted in four areas in Dhaka city; later scaled up in other areas of Dhaka and in two major cities.

Findings: The partnership with PMPs yielded significantly increased case finding of sputum smear positive TB cases. Between 2004 and 2010, 703 participating PMPs referred 3,959 sputum smear positive TB cases to the designated DOTS centres – contributing about 36% of all TB cases in the project areas. There was a steady increase in case notification rates in the project areas following implementation of the partnership.

Conclusions: The PPP model was highly effective in improving access and quality of TB care in urban settings.

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Introduction

Despite the availability of effective treatment, our ability to control tuberculosis (TB) remains uncertain. Current estimates suggest that globally every year there are over 9 million new TB cases, and nearly 2 million people die from TB: 98% of these cases and deaths occur in developing countries.[1] The World Health Organisation (WHO) predicts that 36 million people will die of TB between 2002 and 2020 if control measures do not improve.[2–4] Bangladesh is among the top ten high TB burden countries, with estimated prevalence and incidence of all forms of TB of 426 and 225 per 100,000 population respectively.[1] To reduce this burden, the Bangladesh National TB Control Programme (NTP) has adopted the DOTS strategy, delivered primarily through government-run health facilities.[5] However, major obstacles to implementation remains primarily due to insufficient infrastructure and appropriately trained health personnel.[6,7] These limitations mean many people with the (rather non-specific) signs and symptoms of TB must travel considerable distances to obtain TB care, have lengthy waits to be seen when they arrive, and may not be dealt with appropriately. Health facility opening times that are inconvenient for working people also limit accessibility and acceptability of Direct Observation of Treatment (DOT), a central component of DOTS. Furthermore, there is considerable stigma associated with TB, both in its own right and because of its association with HIV/AIDS. These factors combine to limit patients' desire and ability to seek early diagnosis and treatment from public services. Consequently, large numbers of people with chest symptoms initially seek care from private health care providers.

Private healthcare is common in Bangladesh and popular amongst all, regardless of income or location. Private health care providers are found in abundance, primarily in urban areas.[8–10] Although the private sector offers a range of good quality health services, as in many other countries, the care they provide for TB is poor with over-reliance on radiology for diagnosis, use of inappropriate treatment regimens, and poor case holding, leading to incomplete treatment and potentially to MDR-TB.[11–14] Moreover, non-existent linkages with the public sector mean TB cases managed by private sector providers are neither recorded nor reported, so that routine cohort reporting is impossible, and outcomes are not consolidated into national data.

In this context, we conducted research between 2004 and 2008 to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) in the NTP's TB control activities. Since 2008, this PPP model has been scaled up in two other big cities, Chittagong and Sylhet, in addition to continued implementation in Dhaka City. This paper reports the outcomes from this development, evaluation and scale up.

Methods

This operational research study was set within an existing NTP-NGO collaboration framework, enabling participation of SEED and three selected NGOs – BRAC, Progoti Samaj Kallyan Protisthan (PSKP) and Population Services Training Centre (PSTC). The NTP supported the organisation and management of the research activities. A local Project Coordinator coordinated the project activities.

We developed the PPP model in three phases:

- *Preparation phase*
  - Formation of a Technical Working Group Committee (TWGC)
  - Collection of pre-intervention baseline data
  - Identification of tasks/service components within the partnership, based on partners' diverse strengths.
- *Intervention phase*
  - Strengthening DOTS centres to provide the PPP service components
  - Orientation and training of PMPs on NTP guidelines/protocols
  - Adaptation of TB forms and registers to incorporate PPP components
  - Development of diagnostic, referral and treatment protocols and linkages
  - Development and organisation of ACSM initiatives involving all stakeholders
  - Monitoring and supervision of the partnership activities
  - Evaluation of pilot phase.
- *Scale up phase*
  - Identification and orientation of new partners
  - Scale up.

Four areas of Dhaka City, with population nearly one million, were selected purposively for the study, where the NTP and NGOs were undertaking joint TB control activities; the selected partner NGOs provided TB service delivery (diagnosis and treatment); and where PMPs were major providers of health services.

To evaluate the PPP, we compared TB outcomes in the intervention and control areas using service statistics from the NTP and the five NGO DOTS centres involved. We also collected additional baseline data from the selected PMPs (see Zafar Ullah *et al* 2010 for details), and used in-depth interviews, focus group discussions (FGDs) and workshops to capture PMPs' and TB managers' insights into the process and outcomes of the study (Table 1).

Table 1: evaluation methods, participants, tools and focus

Phase	Method *(n)*	Participants *(n)*	Tools	Focus
Preparation	• Survey (1)	• PMPs (60)	• Semi-structured questionnaire	• Process
	• In-depth interviews (42)	• NTP managers (12) • NGO managers (6) • PMPs (24)	• Semi-structured questionnaire	• Process • Outcomes
	• FGDs (4)	• PMPs (24)	• FGD guidelines	• Process
Evaluation	• Workshops (2)	• PMPs (60: 30 per workshop)	• Agenda • Workshop guidelines	• Process • Outcomes
	• Follow-up interviews	• PMPs (12)	• Semi-structured questionnaire	• Process • Outcomes

Analysis of quantitative data was primarily by tabulations and graphs, and of qualitative data by thematic analysis.

Ethics approval was obtained from the University of Leeds and the Directorate General of Health Services, Ministry of Health and Family Affairs, Bangladesh.

Findings

Pilot Implementation (2004-2008)

At inception in 2004 the PPP included 97 PMPs but by the end of 2009 this had risen to 703. There was continuous enrolment of PMPs: although numbers fluctuated due to retirements and relocation, no PMPs chose to leave the PPP for other reasons. The male:female ratio was 6:1, reflecting the ratio amongst urban private health service providers.

All 703 PMPs were trained to provide quality TB care. As PMPs made it clear they were unwilling to set aside more than two days for training, we tailor-made a two-day training module (based on a training needs assessment) that included technical aspects of TB care, operational aspects of the PPP, and TB record-keeping.

We used a participatory approach involving all stakeholders including PMPs to develop many tools and forms. These were field-tested and reviewed before use. We also used a participatory approach to develop Advocacy, Communication and Social Mobilisation (ACSM) materials, which were made context-specific using baseline survey data. These advocacy activities had a major role in influencing policy makers to endorse the PPP model for country-wide scale-up.

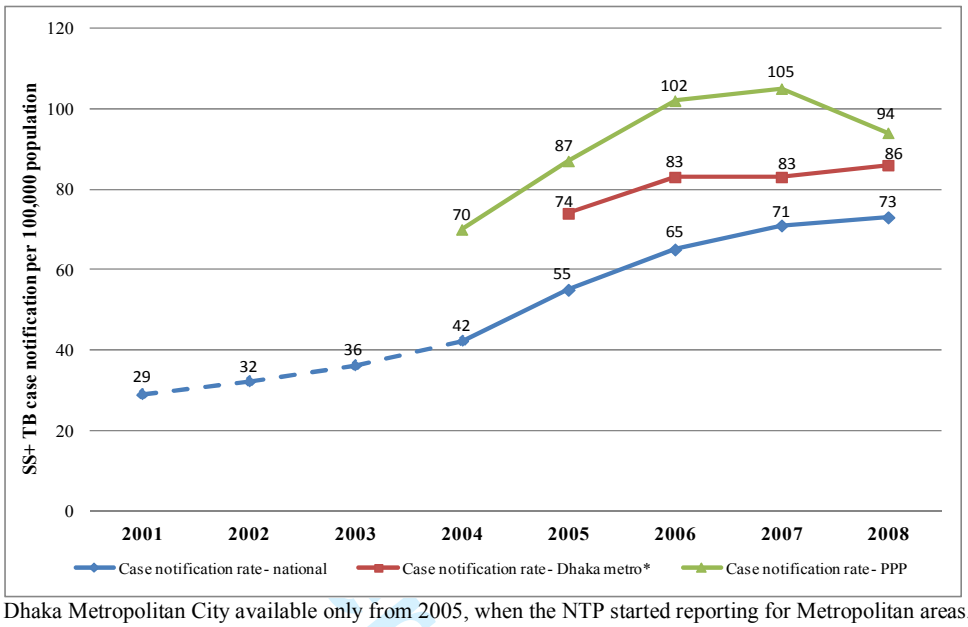
Within the project period (2004-2008), a total of 3,585 sputum smear positive (SS+) TB patients were registered in the five DOTS centres in the project areas; of these 647 were referred by PMPs. Numbers referred rose progressively over the period (Table 2).

Table 2: SS+ TB cases registered in the PPP areas

	2004	2005	2006	2007	2008	Total
Total SS+ TB cases	533	673	800	830	749	**3585**
Total SS+ TB cases referred by PMPs	11	54	143	164	275	**647**
PMPs' contribution (%)	2	8	18	20	37	**18**

The case notification rate for new SS+ TB cases in the study areas increased steadily over the project period, and was consistently higher than the national average. By 2008 the rate in the study areas was 94/100,000 while the national rate was 73/100,000 (Figure 1). The study rate was also consistently higher than that in Dhaka Metropolitan City, which encloses the study sites (Figure 1).

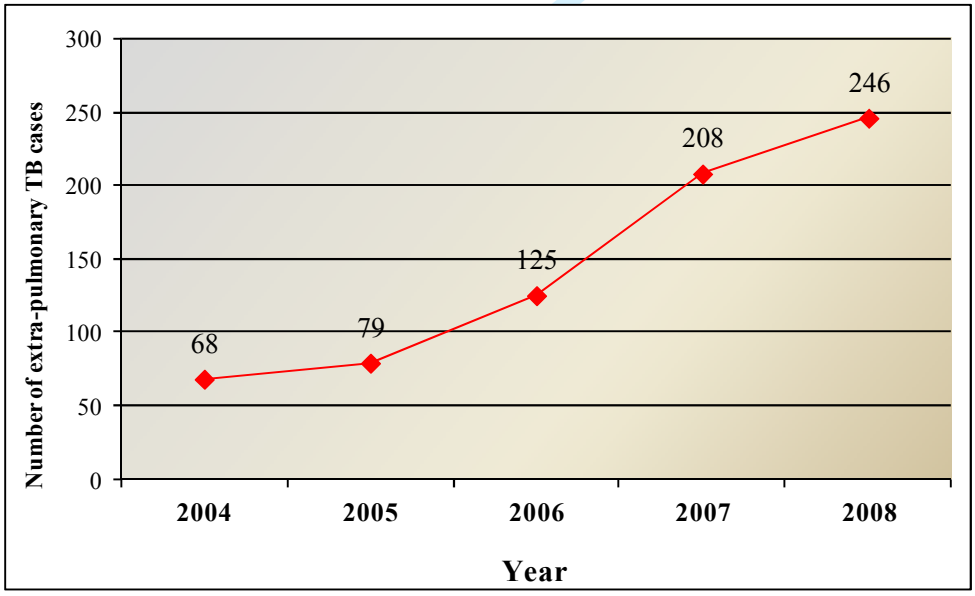
Figure 1: Case notification rates of new SS+ TB cases in Dhaka Metropolitan City and the PPP project areas*



*Data for Dhaka Metropolitan City available only from 2005, when the NTP started reporting for Metropolitan areas.

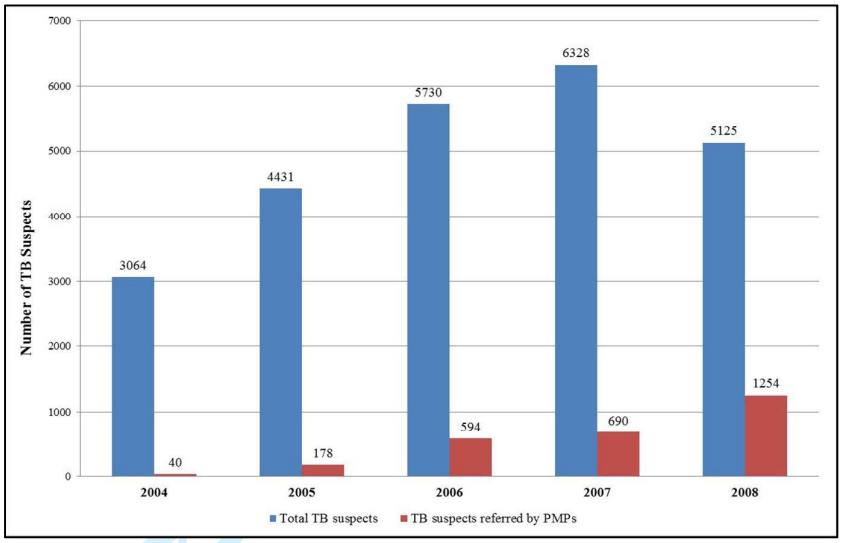
Another noticeable impact of the PPP was a large increase in numbers of cases of extra-pulmonary TB registered over time (Figure 2).

Figure 2: Numbers of extra-pulmonary TB cases registered in the PPP DOTS Centres



PMPs made a significant contribution to the numbers of TB suspects examined in the designated labs in the four PPP areas: in total 2,756 of the 24,678 TB suspects examined were referred by PMPs, with a steady rise over the study period (Figure 3).

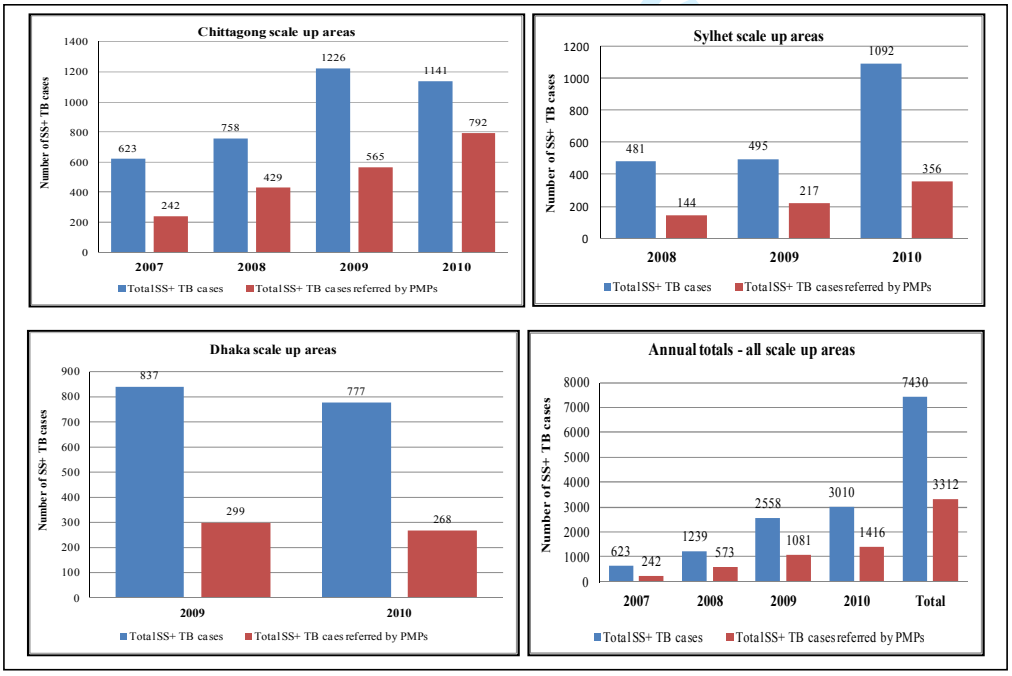
Figure 3: Numbers of TB suspects receiving sputum microscopy in PPP areas



Scaling up and GRIPP

Based on the PPP pilot results, the NTP started implementing the PPP model in other cities – Chittagong (from 2007), Sylhet (2008), and other areas of Dhaka (2009) – covering more than 15 million people. In Chittagong, five NGO partners collaborated with the NTP to support the PPP; in Sylhet, BRAC was the only NGO service provider, but two medical college hospitals were also involved. In the scale-up areas, PMPs have made a substantial contribution to the NTP's effort to control TB in Bangladesh (Figure 4 and Table 3).

Figure 4: SS+TB patients registered in PPP scale up areas and PMP's contribution, 2007-2010



Overall impact of the PPP on TB Control

The involvement of PMPs substantially increased case finding of SS+ TB cases, a key TB control indicator. The partnership yielded significant contribution in identifying SS+ TB cases – from the inception of the PPP in 2004 until 2010, 703 participating PMPs referred almost 19,000 TB suspects and 3,959 SS+ TB cases to the designated DOTS centres (Figure 5). Overall, almost 36% of all SS+ TB cases were attributable to involvement of the private sector providers (Table 3).

Figure 5: Overall PMP contribution to identifying TB suspects in all PPP areas, 2004-2010 (including scale up)

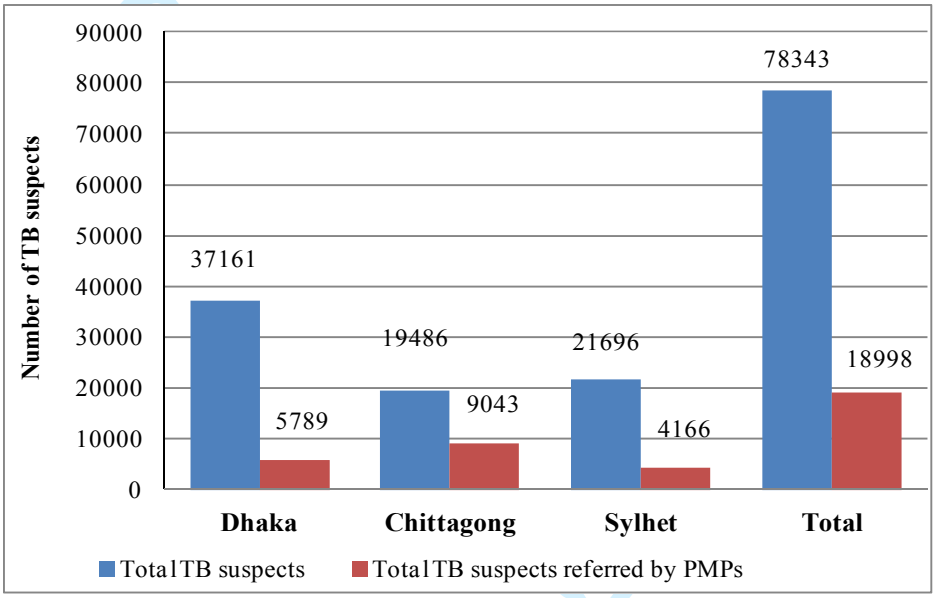


Table 3: Total SS+TB patients in all PPP areas and PMP's contribution, 2004-2010

	Dhaka	Chittagong	Sylhet	Total
Total SS+ TB cases in the PPP areas	5199	3748	2068	**11015**
Total SS+ TB cases referred by PMPs	1214	2028	717	**3959**
PMPs' contribution %	23	54	35	**36**

The qualitative evaluation revealed that the participatory approach of planning and designing the PPP including involvement of all stakeholders in the process of selecting service components, selecting partners, and monitoring of the PPP played a crucial part in securing commitment and ownership from all parties involved. Virtually all PMPs interviewed (96%) mentioned having a positive experience in regard to the monitoring and support mechanism of the project, which was key to the success of the project implementation, and paved the way for scale-up. Specifically, they valued the monthly field visit by the project field staff. In reply to the question: *"Do you own this project?"* a popular PMP spontaneously replied *"Oh, yes. No doubt about it"*. He went on to say *"I have been consulted throughout the planning process of the project, and later we have jointly implemented it. So, this is our project. I am part of it"*.

The quarterly review meetings were organised in rotation by the NTP and the partner NGOs either in the NTP's conference room or in one of the NGO's working locations. When asked about these arrangements, both the NTP and NGOs expressed their satisfaction and expressed their commitment to maintaining this practice in future collaborations.

All PMPs interviewed (n=24) said they had no problems using the referral and other forms. *"The [TB related] registers and referral forms are quite simple and user-friendly, and easy to maintain"* said a busy practitioner. The NTP managers said they were amazed by the fact that most PMPs were keeping records. The PMPs also liked the system of referral back to the referring practitioners, which preserved their commercial interests. However, a few PMPs were unhappy that they felt they did not get sufficient feedback about the patients they had referred, even though feedback was regularly given to PMPs through monthly field visits and during quarterly review meetings.

Another important finding was that the public, NGO and private sector providers showed strong commitment and willingness to work together to achieve the common goal of TB control, although PMPs were initially sceptical about the motive of the public sector regarding this partnership, and the public sector and NGOs were initially doubtful whether PMPs would sacrifice their time to participate in such partnerships.

The evaluation revealed major challenges in managing the PPP. It was difficult to bring such a heterogeneous group under one umbrella, especially in the early stages of the partnership process. In the absence of a regulatory mechanism, the PPP was primarily based on good relationships and dialogue. Both NTP and NGO respondents stated that they were sometimes overburdened with the extra work needed to implement the partnership activities. The NTP was hit harder than the partner NGOs, because there was a shortage of staff within the NTP management. Other key challenges encountered during implementation were to maintain the progress of the partnership, as it evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. One senior PMP said *"Initially I thought this partnership would fail because I had serious reservations about negative attitudes of government officials. They [government officials] don't know how to give respect to anybody other than their bosses. But after getting the chance to work with the NTP, I have now changed my mind. I have found the government officials now behave much better than they used to do in the past"*.

Discussion

The PPP model was highly effective in improving access to and quality of TB care in urban settings, as evidenced by a steady increase in case notification since implementation of the partnership. In PPP areas the case notification rate increased from 36% of estimated cases (pre-implementation) in 2003 to 94% in 2008, exceeding internationally agreed targets, and consistently maintained much higher rates than the national average.

Systematic implementation of the PPP led to greater and effective involvement of PMPs, resulting not only in increased access to quality TB care but also reduced harmful care by PMPs with the potential for development of chronic or MDR-TB.

The lessons learned from this partnership formed the basis of the National PPM (Public-Private Mix) guidelines. National recording and reporting forms and registers were revised to

incorporate PPP elements, considerably improving the quality of TB reporting as well as strengthening the health information system. The referral mechanism allowed referral back to the PMPs for case holding if they wished, giving PMPs confidence that they would not lose their patients, which greatly increased their motivation to remain in the partnership.

The public, NGO and private sector providers showed strong commitment and willingness to work together to achieve the common goal of TB control, although PMPs were initially sceptical about the motive of the public sector regarding this partnership. Moreover, the public sector and NGOs were doubtful whether PMPs would sacrifice their time to participate in such partnerships. As observed elsewhere,[15] PMPs expressed a lack of confidence in the quality of public sector TB services, especially of diagnosis using sputum microscopy and the NTP-recommended treatment regimen. This study addressed these issues through joint development and monitoring of partnership activities and strong advocacy and communication campaigns. In addition to disseminating information for raising awareness, technical training on DOTS and the NTP guidelines was conducted to improve PMPs' knowledge, attitudes and practices in TB care provision. These activities helped the PMPs to gain confidence and trust in the public sector services, which in turn facilitated the development of a close relationship with the NTP and NGO partners. These findings are consistent with the outcomes of other much smaller operational research projects implemented elsewhere.[14–20]

PMPs initially expected financial support from the NTP as a partnership component. This expectation was discussed with all stakeholders and it was agreed that any financial incentive would jeopardise the partnership and could prove unsustainable in the long run. Public sector managers had thought these decisions would deter PMPs from becoming involved, but events proved otherwise.

The key challenges encountered during implementation were to maintain progress as the partnership evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. The NTP's and other partners' continuing, visible and joint commitment and nurturing of an atmosphere where all stakeholders could feel involved in the partnership were critical to overcoming these challenges.

The study demonstrated that TB control outcomes could be achieved by combining the diverse strengths and advantages of the public and private sectors, NGOs and a group of selected PMPs. High rates of case detection and treatment success were attained without involving all private practitioners in the area, thus making the PPP technically attractive to national programmes in terms of feasibility of implementation and wider scale up.

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Conflicts of interest: none declared.

Authors contributions: ZU conceived and designed the study, led the data collection and analysis, and preparation of the manuscript; RH participated in the data analysis and in the preparation of the manuscript; AH participated in data collection and analysis; SA coordinated the study implementation and data collection; AI participated in data collection; JNN participated in the design of the study, advised on data collection and analysis and participated in the preparation of the manuscript.

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Abstract

Objectives: In Bangladesh, private health care is common and popular, regardless of income or area of residence, making the private sector an important player in health service provision. Although the private sector offers a good range of health services, tuberculosis (TB) care in the private sector is poor. We conducted research in Dhaka between 2004 and 2008 to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) within the National TB Control Programme (NTP)'s activities. Since 2008, this PPP model has been scaled up in two other big cities – Chittagong and Sylhet. This paper reports the results of this development, evaluation and scale up.

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Introduction

Despite the availability of effective treatment, the ability to control tuberculosis (TB) remains uncertain. Current estimates suggest that globally there are over 8.8 million new TB cases, and nearly 1.5 million people die from TB yearly: 98% of these cases and deaths occur in developing countries.[1] The World Health Organisation (WHO) predicts that 36 million people will die of TB between 2002 and 2020 if control measures do not improve.[2–4] Bangladesh is among the top ten high TB burden countries; the prevalence and incidence rates of all forms of TB are estimated to be 411 and 225 per 100,000 population respectively.[1] To reduce this burden, the National TB Control Programme (NTP) has adopted the DOTS strategy, delivered primarily through government-run health facilities.[5] However, major obstacles to implementation remains primarily due to insufficient infrastructure and shortage of appropriately trained health personnel.[6,7] These limitations mean many people with the signs and symptoms of TB must travel considerable distances to obtain TB care, have lengthy waits to be seen when they arrive, and may not be dealt with appropriately. Health facility opening times that are inconvenient for working people also limit accessibility to and acceptability of Direct Observation of Treatment (DOT), a central component of DOTS. Furthermore, there is considerable stigma associated with TB, both in its own right and because of its association with HIV/AIDS. These factors combine to limit patients' desire and ability to seek early diagnosis and treatment from public services. Consequently, large numbers of people with chest symptoms initially seek care from private health care providers.

Private healthcare is common in Bangladesh and popular amongst all, regardless of income or location. Apart from the NGOs, all other private or non-government sector health providers are generally considered to be as medically trained providers working for-profit and located outside of the government health system. The private sector also incorporates a large number of privately-managed auxiliary health services such as diagnostic laboratories, ambulance services and pharmacies/drugstores.[8] These private health care providers are available in abundance in urban areas.[9–11] However, there are countless untrained or non-qualified providers in Bangladesh who offer a combination of traditional (e.g. Unani, ayurbedic etc.) and western (allopathic) types of medicine but they are primarily found in rural areas.[8] Although the private sector offers a range of good quality health services, as in many other countries, the care they provide for TB is poor with over-reliance on radiology (e.g. X-ray) for diagnosis, use of inappropriate treatment regimens, and poor case holding, leading to incomplete treatment and potentially to multi-drug resistant TB (MDR-TB).[12–15] Moreover, non-existent linkages with the public sector mean TB cases managed by private sector providers are neither recorded nor reported, so that routine cohort reporting is impossible, and outcomes are not consolidated in to the national data. Given the above context, the task of increasing access to and quality of TB care as well as increasing the case detection rate is enormous. To achieve this task, the NTP has recognised the need for an increased collaborative effort between the public and private health sector providers.

In this context, we conducted research to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) in the NTP's urban TB control activities, and to measure to what extent the outcomes of this partnership affect access to and quality of TB care. The development and piloting of the PPP model took place in four selected research sites in Dhaka city which spanned between 2004 and 2008. Since 2008, this PPP model has been scaled up in two other cities - Chittagong and Sylhet, in addition to

scaling up in other areas of Dhaka City. This paper reports the outcomes from this development, evaluation and scale up.

Methods

Considering the research objectives and intended outcome of a change in policy and practice, an operational research methodology[16,17] was thought to be appropriate. A set of criteria underpinning the broader scope of operations research was employed to make the implementation process more participative and resource-effective, and to facilitate the scale up. Specific techniques and approaches drawn from both quantitative and qualitative research methods were used to collect multiple kinds of data for the study.[18,19]

The study was set within the policy environment of a government-NGO collaboration, enabling participation of Society for Empowerment, Education and Development (SEED) and three other NGOs – Bangladesh Rural Advancement Committee (BRAC), Progoti Samaj Kallyan Protisthan (PSKP) and Population Services Training Centre (PSTC), who were undertaking TB control activities jointly with the NTP.

Four areas of Dhaka City namely Mirpur, Rampura, Dokkhinkhan, and Kamrangirchar were selected purposively as the study sites, where the selected partner NGOs were located and had a DOTS centre; and where PMPs were major providers of health services. These study sites generally represent the geographic catchment areas of the selected NGOs covering a population of nearly one million.

Within this partnership, SEED was the lead research partner; BRAC, PSKP and PSTC provided TB services (diagnosis, treatment and follow-up) through designated health centres whereas the NTP provided the overall policy guidelines and supported the organisation and management of the research activities. In Mirpur, PSKP provided TB services through two DOTS centres and PSTC had one DOTS centre in Rampura; whereas BRAC covered both Dokkhinkhan, and Kamrangirchar through one DOTS centre in each area. PMPs were agreed to refer the TB suspects and patients to these designated DOTS centres following the NTP guidelines. A technical committee was formed with representation from the NTP, partner NGOs and PMPs to advise on the operational issues and to support the smooth running of the partnership. A local Project Coordinator coordinated the project activities.

We developed and implemented the PPP model in three phases:

- *Preparation phase*
  - Formation of a Technical Working Group Committee (TWGC)
  - Collection of pre-intervention baseline data
  - Identification of tasks/service components within the partnership, based on partners' diverse strengths.
- *Intervention phase*
  - Strengthening DOTS centres to provide the PPP service components
  - Orientation and training of PMPs on NTP guidelines/protocols
  - Adaptation of TB forms and registers to incorporate PPP components
  - Development of diagnostic, referral and treatment protocols and linkages
  - Development and organisation of Advocacy, Communication and Social Mobilisation (ACSM) initiatives involving all stakeholders
  - Monitoring and supervision of the partnership activities
  - Evaluation of pilot phase.

- *Scale up phase*
  - Identification and orientation of new partners
  - Scale up.

To evaluate the PPP, we compared TB outcomes in the intervention and control (non-PPP) areas using service statistics from the NTP and the five NGO DOTS centres involved in this project. We also collected additional baseline data from the selected PMPs (see Zafar Ullah *et al* 2010 for details), and used in-depth interviews, focus group discussions (FGDs) and workshops to capture PMPs' and TB managers' insights of the process and outcomes of the study (Table 1).

Table 1: evaluation methods, participants, tools and focus

Phase	Method *(n)*	Participants *(n)*	Tools	Focus
Preparation	• Survey (1)	• PMPs (60)	• Semi-structured questionnaire	• Process
	• In-depth interviews (42)	• NTP managers (12) • NGO managers (6) • PMPs (24)	• Semi-structured questionnaire	• Process • Outcomes
	• FGDs (4)	• PMPs (24)	• FGD guidelines	• Process
Evaluation	• Workshops (2)	• PMPs (60: 30 per workshop)	• Agenda • Workshop guidelines	• Process • Outcomes
	• Follow-up interviews	• PMPs (12)	• Semi-structured questionnaire	• Process • Outcomes

Analysis of quantitative data was done primarily by tabulations and graphs using SPSS and Microsoft Excel programmes, and of qualitative data by thematic analysis.

Ethical approvals were obtained from University of Leeds, United Kingdom and also from relevant in-country institutions including the Directorate General of Health Services, and Bangladesh National TB Control Programme. We have ensured all respondents their rights to anonymity and confidentiality. A written informed consent was obtained from each participant of the in-depth interviews and FGDs.

Findings

Pilot Implementation (2004-2008)

At inception in 2004, the PPP included 97 PMPs but by the end of 2009 this had risen to 703. There was continuous enrolment of PMPs: although numbers fluctuated due to retirements and relocation, no PMPs chose to leave the PPP for any other reasons. The male:female ratio was 6:1, reflecting the ratio amongst urban private health service providers.

All 703 PMPs were trained to provide quality TB care. As PMPs made it clear they were unwilling to set aside more than two days for training, we tailor-made a two-day training module (based on a training needs assessment) that included technical aspects of TB care, operational aspects of the PPP, and TB record-keeping.

We used a participatory approach involving all stakeholders including PMPs to develop and revise the tools and forms. National recording and reporting forms and registers were revised

to incorporate PPP elements, and to maintain records of the referrals from PMPs. These were field-tested and reviewed before use. We revised the NTP's TB treatment algorithm to incorporate a flexible referral mechanism, which allowed the DOTS centres to refer TB suspects/patients back to their respective PMPs, if they wished. We also used a participatory approach to develop ACSM materials, which were made context-specific using baseline survey data. These advocacy activities had a major role in influencing policy makers to endorse the PPP model for country-wide scale-up.

PMPs initially expected financial support from the NTP as a partnership component. This expectation was discussed with all stakeholders and it was agreed that any financial incentive would jeopardise the partnership and could prove unsustainable in the long run. At the beginning of the partnership, PMPs also expressed a lack of confidence about the quality of public sector TB services, especially of diagnosis using sputum microscopy and the NTP-recommended treatment regimen. This study addressed these issues through joint development and monitoring of partnership activities and strong advocacy and communication campaigns.

Quantitative findings

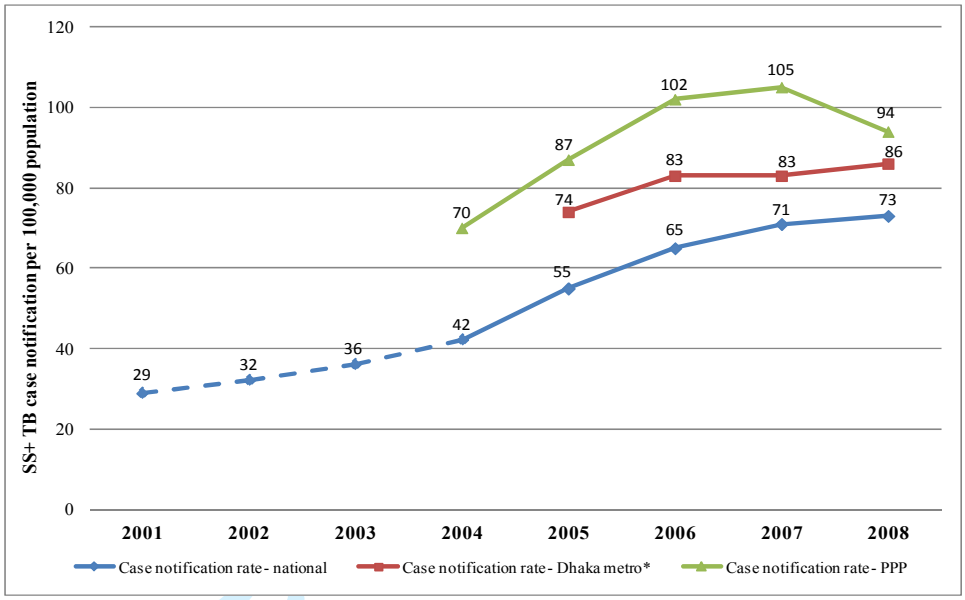
Within the project period (2004-2008), a total of 3,585 sputum smear positive (SS+) TB patients were registered in the five DOTS centres in the project areas; of these 647 were referred by PMPs. Numbers referred rose progressively over the period (Table 2).

Table 2: SS+ TB cases registered in the PPP areas

	2004	2005	2006	2007	2008	Total
Total SS+ TB cases in the PPP areas	533	673	800	830	749	**3585**
Total SS+ TB cases referred by PMPs	11	54	143	164	275	**647**
PMPs' contribution (%)	2	8	18	20	37	**18**

The case notification rate for new SS+ TB cases in the study areas increased steadily over the project period, and was consistently higher than the national average. By 2008 the rate in the study areas was 94/100,000 while the national rate was 73/100,000 (Figure 1). The study rate was also consistently higher than that in Dhaka Metropolitan City, which encloses the study sites (Figure 1).

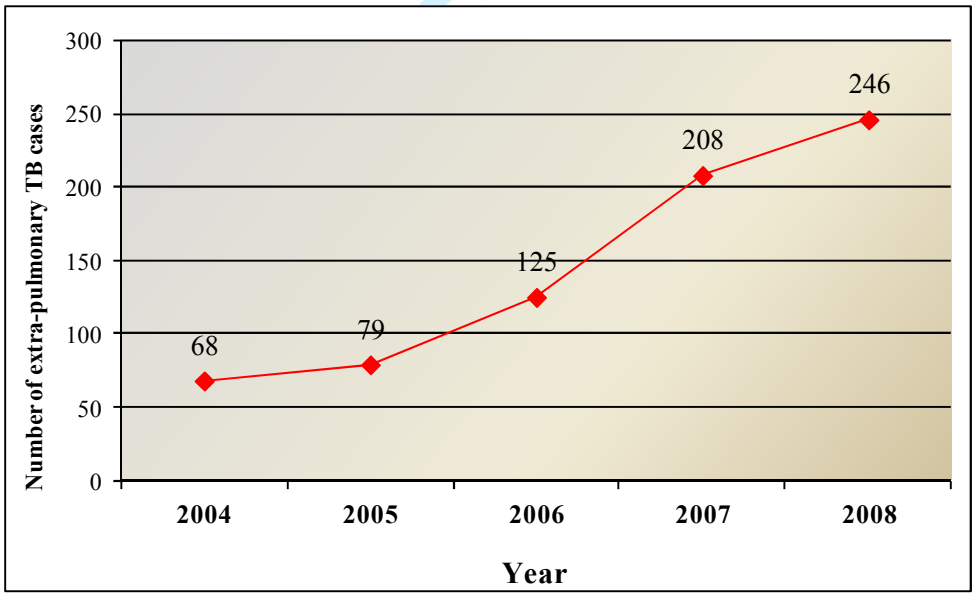
Figure 1: Case notification rates of new SS+ TB cases in Dhaka Metropolitan City and the PPP project areas*



*Data for Dhaka Metropolitan City available only from 2005, when the NTP started reporting for Metropolitan areas.

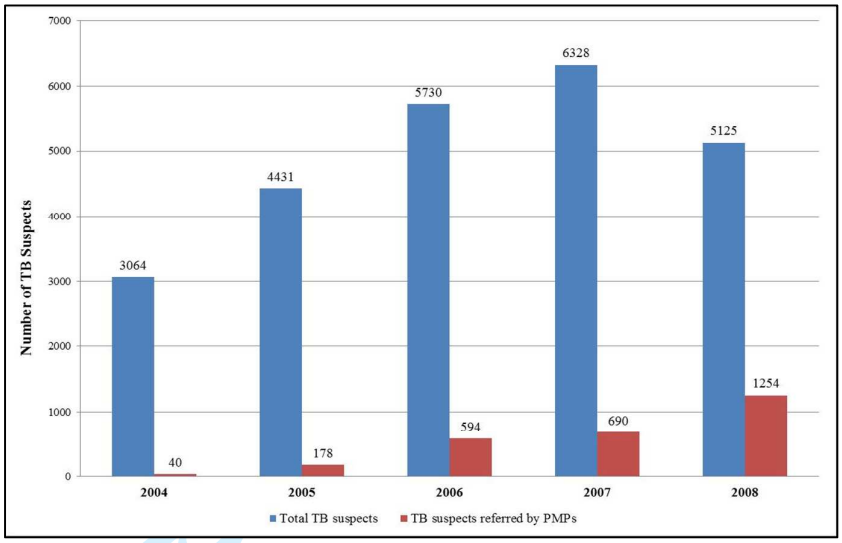
Another noticeable impact of the PPP was a large increase in numbers of cases of extra-pulmonary TB registered over time (Figure 2).

Figure 2: Numbers of extra-pulmonary TB cases registered in the PPP DOTS Centres



PMPs made a significant contribution to the numbers of TB suspects examined in the designated labs in the four PPP areas: in total 2,756 of the 24,678 TB suspects examined were referred by PMPs, with a steady rise over the study period (Figure 3).

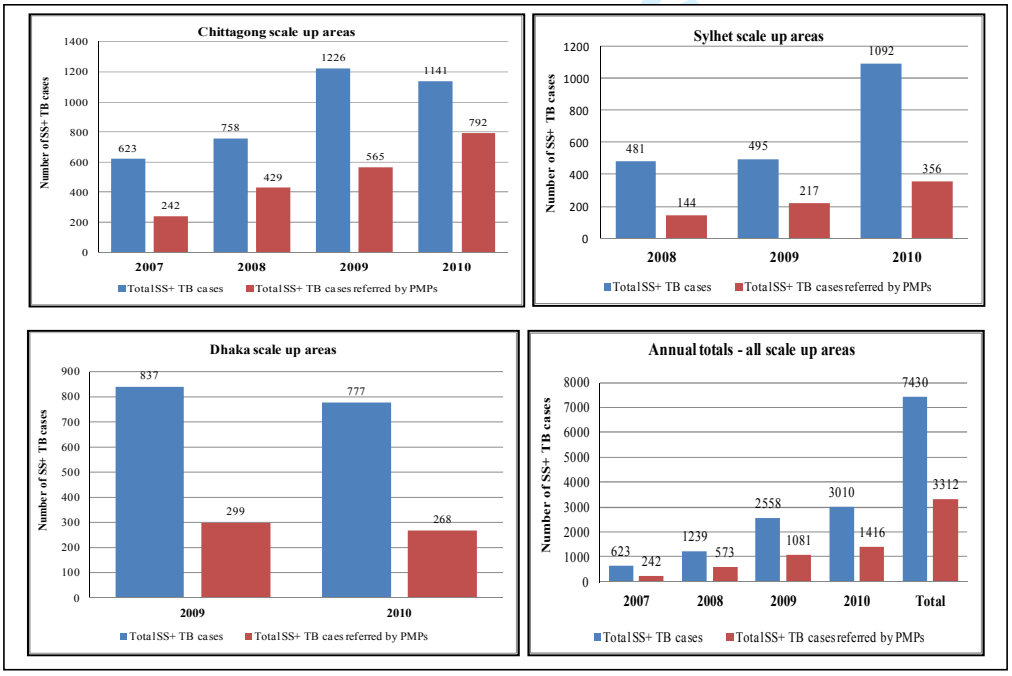
Figure 3: Numbers of TB suspects receiving sputum microscopy in the PPP project areas



Scaling up and getting research into policy and practice (GRIPP)

Based on the PPP pilot results, the NTP started implementing the PPP model in other cities – Chittagong (from 2007), Sylhet (2008), and other areas of Dhaka (2009) – covering more than 15 million people. In Chittagong, five NGO partners collaborated with the NTP to support the PPP; in Sylhet, BRAC was the only NGO service provider, but two medical college hospitals were also involved. In the scale-up areas, PMPs have made a substantial contribution to the NTP's effort to control TB in Bangladesh (Figure 4 and Table 3).

Figure 4: SS+TB patients registered in PPP scale up areas and PMP's contribution, 2007-2010



Overall impact of the PPP on TB Control

The involvement of PMPs substantially increased case finding of SS+ TB cases, a key TB control indicator. The partnership yielded significant contribution in identifying SS+ TB cases – from the inception of the PPP in 2004 until 2010, 703 participating PMPs referred almost 19,000 TB suspects and 3,959 SS+ TB cases to the designated DOTS centres (Figure 5). Overall, almost 36% of all SS+ TB cases were attributable to involvement of the private sector providers (Table 3).

Figure 5: Overall PMP contribution to identifying TB suspects in all PPP areas, 2004-2010 (including scale up)

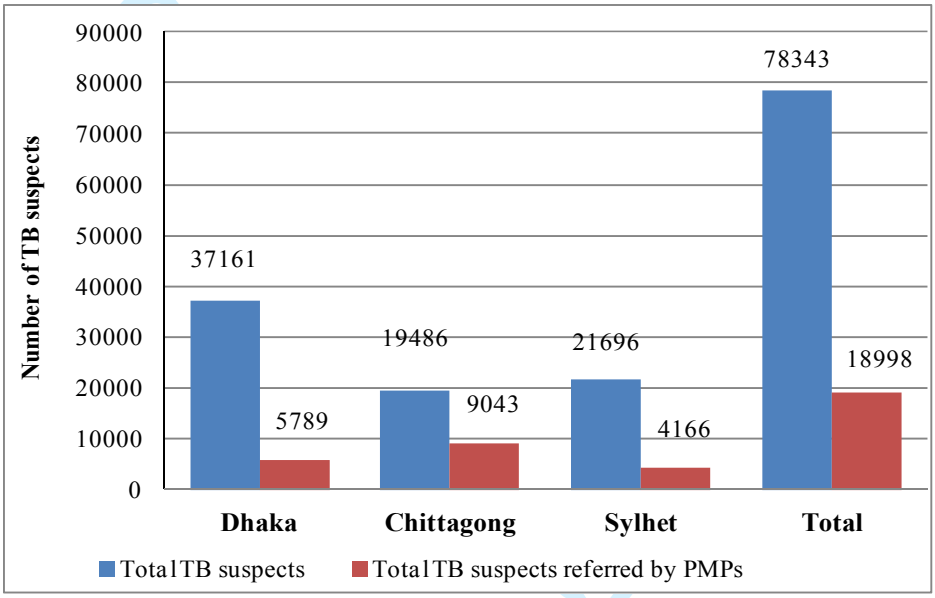


Table 3: Total SS+TB patients in all PPP areas and PMP's contribution, 2004-2010

	Dhaka	Chittagong	Sylhet	Total
Total SS+ TB cases in the PPP areas	5199	3748	2068	**11015**
Total SS+ TB cases referred by PMPs	1214	2028	717	**3959**
PMPs' contribution %	23	54	35	**36**

Qualitative findings

The qualitative evaluation revealed that the participatory approach of planning and designing the PPP including involvement of all stakeholders in the process of selecting service components, selecting partners, and monitoring of the PPP played a crucial part in securing commitment and ownership from all parties involved. Virtually all PMPs interviewed (96%) mentioned having a positive experience in regard to the monitoring and support mechanism of the project, which was key to the success of the project implementation, and paved the way for scale-up. Specifically, they valued the monthly field visit by the project field staff. In reply to the question: *"Do you own this project?"* a popular PMP spontaneously replied *"Oh, yes. No doubt about it"*. He went on to say *"I have been consulted throughout the planning*

process of the project, and later we have jointly implemented it. So, this is our project. I am part of it".

The quarterly review meetings were organised in rotation by the NTP and the partner NGOs either in the NTP's conference room or in one of the NGO's working locations. When asked about these arrangements, both the NTP and NGOs expressed their satisfaction and expressed their commitment to maintaining this practice in future collaborations.

All PMPs interviewed (n=24) said they had no problems using the referral and other forms. *"The [TB related] registers and referral forms are quite simple and user-friendly, and easy to maintain"* said a busy practitioner. The NTP managers said they were amazed by the fact that most PMPs were keeping records. The PMPs also liked the system of referral back to the referring practitioners, which preserved their professional and commercial interests. However, a few PMPs were unhappy as they felt they did not get sufficient feedback about the patients they had referred, even though feedback was regularly given to PMPs through monthly field visits and during quarterly review meetings.

The evaluation revealed major challenges in managing the PPP. It was difficult to bring such a heterogeneous group under one umbrella, especially in the early stages of the partnership process.

Another important finding was that the public, NGO and private sector providers showed strong commitment and willingness to work together to achieve the common goal of TB control, although PMPs were initially sceptical about the motive of the public sector regarding this partnership, and the public sector and NGOs were initially doubtful whether PMPs would sacrifice their time to participate in such partnerships.

In the absence of a regulatory mechanism, the PPP was primarily based on good relationships and dialogue. Both NTP and NGO respondents stated that they were sometimes overburdened with the extra work needed to implement the partnership activities. The NTP was hit harder than the partner NGOs, because there was a shortage of staff within the NTP management. Other key challenges encountered during implementation were to maintain the progress of the partnership, as it evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. One senior PMP said *"Initially I thought this partnership would fail because I had serious reservations about negative attitudes of government officials. They [government officials] don't know how to give respect to anybody other than their bosses. But after getting the chance to work with the NTP, I have now changed my mind. I have found the government officials now behave much better than they used to do in the past".*

Discussion and conclusion

The PPP model was highly effective in improving access to and quality of TB care in urban settings, as evidenced by a steady increase in case notification since implementation of the partnership, exceeding internationally agreed targets, and consistently maintained much higher rates than the national average.

Systematic implementation of the PPP led to greater and effective involvement of PMPs, resulting in increased access to quality TB care. However, needs-based training is necessary

for PMPs to enhance their knowledge on the NTP guidelines in regard to appropriate diagnosis, treatment, and follow-up to guarantee the continuity of quality of TB care.

The tools and protocols, and ACSM materials proved vital to facilitating the partnership. The lessons learned from this partnership formed the basis of the National PPM (Public-Private Mix) guidelines. The revised tools and guidelines considerably improved the quality of TB reporting, thus strengthened the health information available. The revised protocol for referrals gave PMPs confidence that they would not lose their patients, which greatly increased their motivation to remain in the partnership.

The key challenges encountered during implementation were to maintain the momentum as the partnership evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. The NTP's and other partners' commitment and nurturing of an atmosphere where all stakeholders could feel involved in the partnership were critical to overcoming these challenges.

It was possible to bring the public, NGOs and private sector providers together to work towards achieving a common public health goal despite perceived barriers between public and private sector providers, initial scepticism about forming the partnership, and challenges during implementation of the PPP. The participatory development of the partnership and maintaining close linkages with the PMPs helped them to gain confidence and trust over the public sector services, which in turn facilitated the development of a close relationship with the NTP and NGO partners. However, in order to develop and sustain such a partnership, roles and responsibilities of participating agencies and individuals must be defined. These findings are consistent with the outcomes of other much smaller operational research projects implemented elsewhere.[15,20–25]

Finally, this study demonstrated that TB control outcomes could be achieved by combining the diverse strengths and advantages of the public and private sectors, NGOs and a group of selected PMPs. High rates of case detection were attained without involving all private practitioners in the area, thus making the PPP technically attractive to national programmes in other countries in terms of feasibility of implementation and wider scale up.

Acknowledgements

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Conflicts of interest: none declared.

Authors contributions: ZU conceived and designed the study, led the data collection and analysis, and preparation of the manuscript; RH participated in the data analysis and in the preparation of the manuscript; AH participated in data collection and analysis; SA coordinated the study implementation and data collection; AI participated in data collection; JNN participated in the design of the study, advised on data collection and analysis and participated in the preparation of the manuscript.

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Title

Involving the Private Medical Sector in TB Control in Bangladesh: a mixed method study

Article Focus

- To assess the effectiveness of a Public-Private Partnership (PPP) model to involve private medical sector in TB control
- To ascertain whether scaling up of the PPP model approach to engage PMPs is feasible and has an effect on case notification rate.

Key messages

- This study demonstrated the feasibility and effectiveness of providing TB care through involving private sector health care providers
- The PPP substantially improved access to and quality of TB care in urban settings, as evidenced by increased TB case notification rate and increased treatment success rate.
- Our results show that it is feasible to scale up a public-private partnership within the national TB control programme.

Strengths and Limitations

- As TB continues to be a major threat to public health in low- and middle-income countries, and is re-emerging as an issue for concern in high-income countries, the findings of this study provide evidence for national and international scale-up of such partnerships
- By using both quantitative and qualitative methods, this study has permitted more in-depth analysis of the effectiveness of this PPP model
- From the beginning, the study was guided by a vision of nation-wide scale up.

Involving the Private Medical Sector in TB Control in Bangladesh: a mixed method study

Authors: Zafar Ullah A N[1]; Huque R[2]; Husain A[3]; Akter S[4]; Islam A[5]; Newell J N[1]

Abstract

Objectives: In Bangladesh, private health care is common and popular, regardless of income or area of residence, making the private sector an important player in health service provision. Although the private sector offers a good range of health services, tuberculosis (TB) care in the private sector is poor. We conducted research in Dhaka between 2004 and 2008 to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) within the National TB Control Programme (NTP)'s activities. Since 2008, this PPP model has been scaled up in two other big cities – Chittagong and Sylhet. This paper reports the results of this development, evaluation and scale up.

Design: Mixed method, observational study design. We used NTP service statistics to compare the TB control outcomes between intervention and control areas. To capture detailed insights of PMPs and TB managers about the process and outcomes of the study, we conducted in-depth interviews, focus group discussions, and workshops.

Setting: Urban setting – piloted in four areas in Dhaka city; later scaled up in other areas of Dhaka and in two major cities.

Findings: The partnership with PMPs yielded significantly increased case finding of sputum smear positive TB cases. Between 2004 and 2010, 703 participating PMPs referred 3,959 sputum smear positive TB cases to the designated DOTS centres – contributing about 36% of all TB cases in the project areas. There was a steady increase in case notification rates in the project areas following implementation of the partnership.

Conclusions: The PPP model was highly effective in improving access and quality of TB care in urban settings.

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[3] National Tuberculosis Control Programme, Bangladesh
[4] Society for Empowerment, Education and Development (SEED), Bangladesh
[5] Associate Director, BRAC Health Programme, Bangladesh

Introduction

Despite the availability of effective treatment, the ability to control tuberculosis (TB) remains uncertain. Current estimates suggest that globally there are over 8.8 million new TB cases, and nearly 1.5 million people die from TB yearly: 98% of these cases and deaths occur in developing countries.[1] The World Health Organisation (WHO) predicts that 36 million people will die of TB between 2002 and 2020 if control measures do not improve.[2–4] Bangladesh is among the top ten high TB burden countries; the prevalence and incidence rates of all forms of TB are estimated to be 411 and 225 per 100,000 population respectively.[1] To reduce this burden, the National TB Control Programme (NTP) has adopted the DOTS strategy, delivered primarily through government-run health facilities.[5] However, major obstacles to implementation remains primarily due to insufficient infrastructure and shortage of appropriately trained health personnel.[6,7] These limitations mean many people with the signs and symptoms of TB must travel considerable distances to obtain TB care, have lengthy waits to be seen when they arrive, and may not be dealt with appropriately. Health facility opening times that are inconvenient for working people also limit accessibility to and acceptability of Direct Observation of Treatment (DOT), a central component of DOTS. Furthermore, there is considerable stigma associated with TB, both in its own right and because of its association with HIV/AIDS. These factors combine to limit patients' desire and ability to seek early diagnosis and treatment from public services. Consequently, large numbers of people with chest symptoms initially seek care from private health care providers.

Private healthcare is common in Bangladesh and popular amongst all, regardless of income or location. Apart from the NGOs, all other private or non-government sector health providers are generally considered to be as medically trained providers working for-profit and located outside of the government health system. The private sector also incorporates a large number of privately-managed auxiliary health services such as diagnostic laboratories, ambulance services and pharmacies/drugstores.[8] These private health care providers are available in abundance in urban areas.[9–11] However, there are countless untrained or non-qualified providers in Bangladesh who offer a combination of traditional (e.g. Unani, ayurbedic etc.) and western (allopathic) types of medicine but they are primarily found in rural areas.[8] Although the private sector offers a range of good quality health services, as in many other countries, the care they provide for TB is poor with over-reliance on radiology (e.g. X-ray) for diagnosis, use of inappropriate treatment regimens, and poor case holding, leading to incomplete treatment and potentially to multi-drug resistant TB (MDR-TB).[12–15] Moreover, non-existent linkages with the public sector mean TB cases managed by private sector providers are neither recorded nor reported, so that routine cohort reporting is impossible, and outcomes are not consolidated in to the national data. Given the above context, the task of increasing access to and quality of TB care as well as increasing the case detection rate is enormous. To achieve this task, the NTP has recognised the need for an increased collaborative effort between the public and private health sector providers.

In this context, we conducted research to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) in the NTP's urban TB control activities, and to measure to what extent the outcomes of this partnership affect access to and quality of TB care. The development and piloting of the PPP model took place in four selected research sites in Dhaka city which spanned between 2004 and 2008. Since 2008, this PPP model has been scaled up in two other cities - Chittagong and Sylhet, in addition to

scaling up in other areas of Dhaka City. This paper reports the outcomes from this development, evaluation and scale up.

Methods

Considering the research objectives and intended outcome of a change in policy and practice, an operational research methodology[16,17] was thought to be appropriate. A set of criteria underpinning the broader scope of operations research was employed to make the implementation process more participative and resource-effective, and to facilitate the scale up. Specific techniques and approaches drawn from both quantitative and qualitative research methods were used to collect multiple kinds of data for the study.[18,19]

The study was set within the policy environment of a government-NGO collaboration, enabling participation of Society for Empowerment, Education and Development (SEED) and three other NGOs – Bangladesh Rural Advancement Committee (BRAC), Progoti Samaj Kallyan Protisthan (PSKP) and Population Services Training Centre (PSTC), who were undertaking TB control activities jointly with the NTP.

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	• Follow-up interviews	• PMPs (12)	• Semi-structured questionnaire	• Process • Outcomes

Analysis of quantitative data was done primarily by tabulations and graphs using SPSS and Microsoft Excel programmes, and of qualitative data by thematic analysis.

Ethical approvals were obtained from University of Leeds, United Kingdom and also from relevant in-country institutions including the Directorate General of Health Services, and Bangladesh National TB Control Programme. We have ensured all respondents their rights to anonymity and confidentiality. A written informed consent was obtained from each participant of the in-depth interviews and FGDs.

Findings

Pilot Implementation (2004-2008)

At inception in 2004, the PPP included 97 PMPs but by the end of 2009 this had risen to 703. There was continuous enrolment of PMPs: although numbers fluctuated due to retirements and relocation, no PMPs chose to leave the PPP for any other reasons. The male:female ratio was 6:1, reflecting the ratio amongst urban private health service providers.

All 703 PMPs were trained to provide quality TB care. As PMPs made it clear they were unwilling to set aside more than two days for training, we tailor-made a two-day training module (based on a training needs assessment) that included technical aspects of TB care, operational aspects of the PPP, and TB record-keeping.

We used a participatory approach involving all stakeholders including PMPs to develop and revise the tools and forms. National recording and reporting forms and registers were revised

to incorporate PPP elements, and to maintain records of the referrals from PMPs. These were field-tested and reviewed before use. We revised the NTP's TB treatment algorithm to incorporate a flexible referral mechanism, which allowed the DOTS centres to refer TB suspects/patients back to their respective PMPs, if they wished. We also used a participatory approach to develop ACSM materials, which were made context-specific using baseline survey data. These advocacy activities had a major role in influencing policy makers to endorse the PPP model for country-wide scale-up.

PMPs initially expected financial support from the NTP as a partnership component. This expectation was discussed with all stakeholders and it was agreed that any financial incentive would jeopardise the partnership and could prove unsustainable in the long run. At the beginning of the partnership, PMPs also expressed a lack of confidence about the quality of public sector TB services, especially of diagnosis using sputum microscopy and the NTP-recommended treatment regimen. This study addressed these issues through joint development and monitoring of partnership activities and strong advocacy and communication campaigns.

Quantitative findings

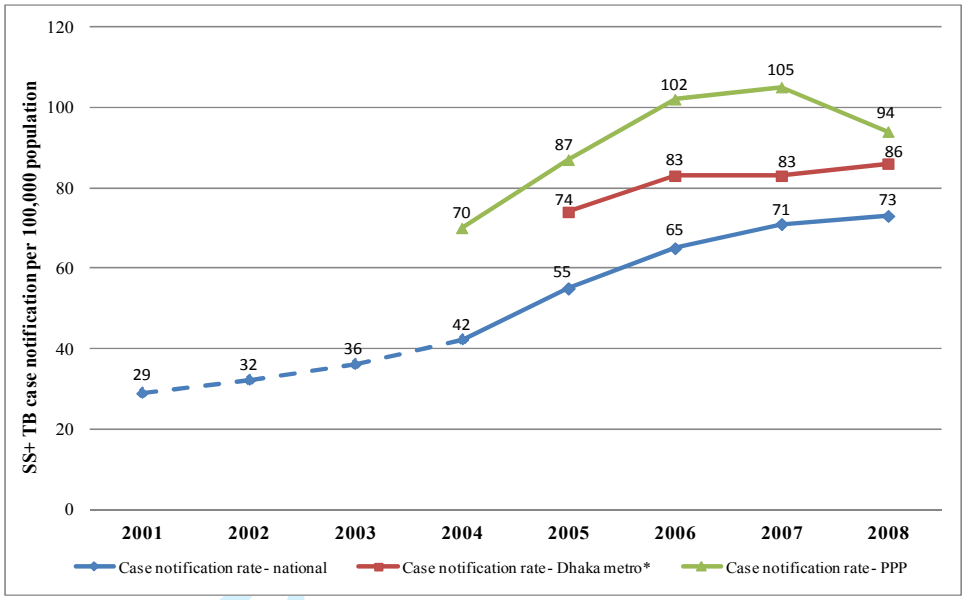
Within the project period (2004-2008), a total of 3,585 sputum smear positive (SS+) TB patients were registered in the five DOTS centres in the project areas; of these 647 were referred by PMPs. Numbers referred rose progressively over the period (Table 2).

Table 2: SS+ TB cases registered in the PPP areas

	2004	2005	2006	2007	2008	Total
Total SS+ TB cases in the PPP areas	533	673	800	830	749	**3585**
Total SS+ TB cases referred by PMPs	11	54	143	164	275	**647**
PMPs' contribution (%)	2	8	18	20	37	**18**

The case notification rate for new SS+ TB cases in the study areas increased steadily over the project period, and was consistently higher than the national average. By 2008 the rate in the study areas was 94/100,000 while the national rate was 73/100,000 (Figure 1). The study rate was also consistently higher than that in Dhaka Metropolitan City, which encloses the study sites (Figure 1).

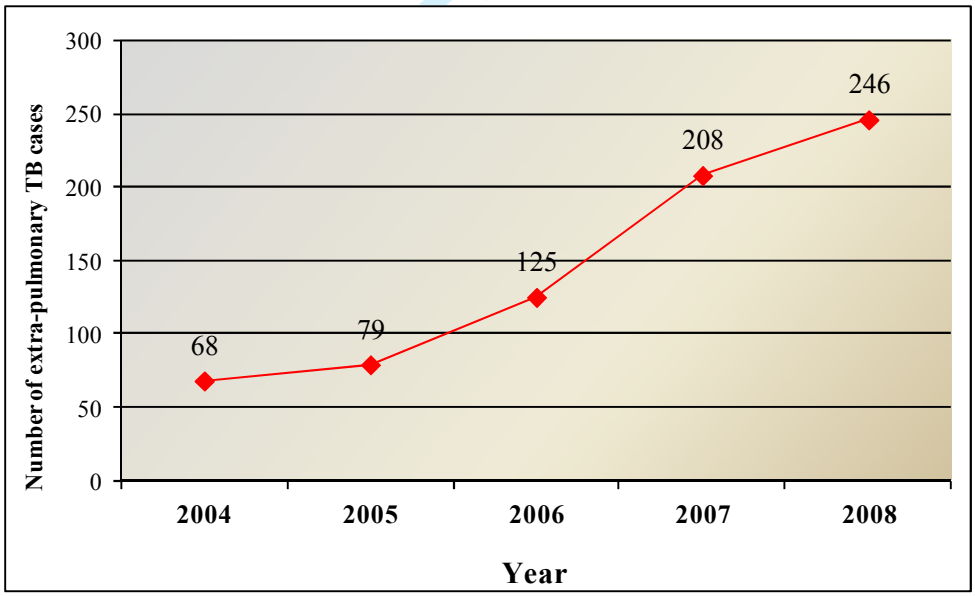
Figure 1: Case notification rates of new SS+ TB cases in Dhaka Metropolitan City and the PPP project areas*



*Data for Dhaka Metropolitan City available only from 2005, when the NTP started reporting for Metropolitan areas.

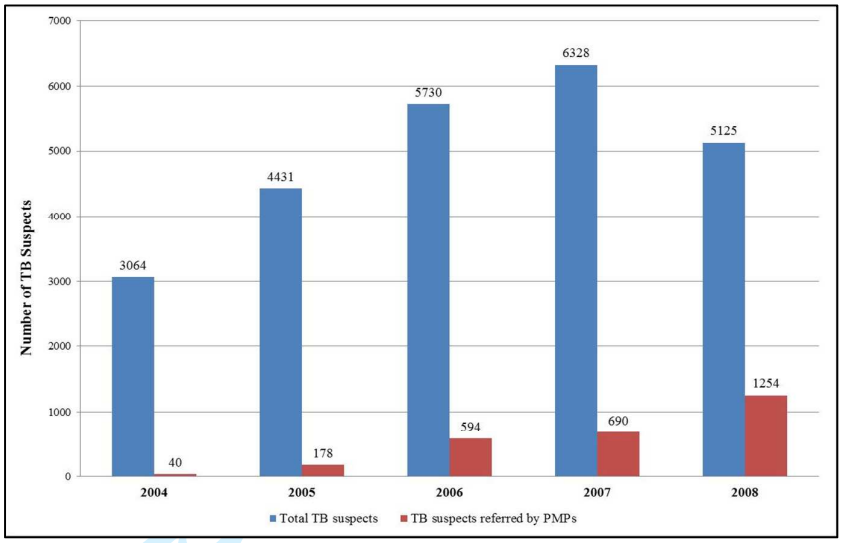
Another noticeable impact of the PPP was a large increase in numbers of cases of extra-pulmonary TB registered over time (Figure 2).

Figure 2: Numbers of extra-pulmonary TB cases registered in the PPP DOTS Centres



PMPs made a significant contribution to the numbers of TB suspects examined in the designated labs in the four PPP areas: in total 2,756 of the 24,678 TB suspects examined were referred by PMPs, with a steady rise over the study period (Figure 3).

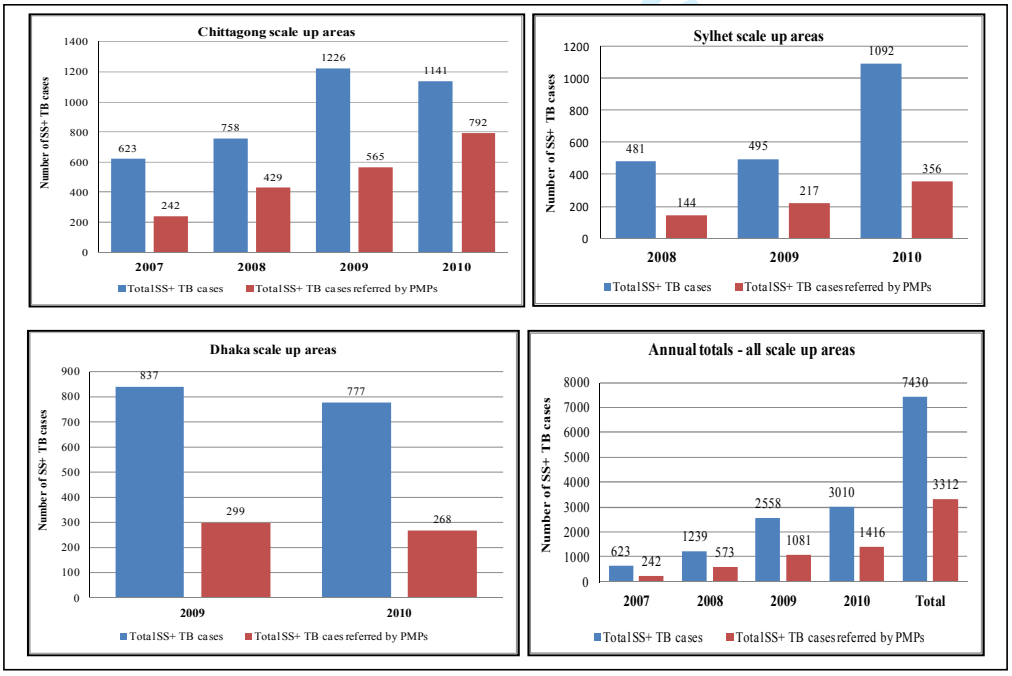
Figure 3: Numbers of TB suspects receiving sputum microscopy in the PPP project areas



Scaling up and getting research into policy and practice (GRIPP)

Based on the PPP pilot results, the NTP started implementing the PPP model in other cities – Chittagong (from 2007), Sylhet (2008), and other areas of Dhaka (2009) – covering more than 15 million people. In Chittagong, five NGO partners collaborated with the NTP to support the PPP; in Sylhet, BRAC was the only NGO service provider, but two medical college hospitals were also involved. In the scale-up areas, PMPs have made a substantial contribution to the NTP's effort to control TB in Bangladesh (Figure 4 and Table 3).

Figure 4: SS+TB patients registered in PPP scale up areas and PMP's contribution, 2007-2010



Overall impact of the PPP on TB Control

The involvement of PMPs substantially increased case finding of SS+ TB cases, a key TB control indicator. The partnership yielded significant contribution in identifying SS+ TB cases – from the inception of the PPP in 2004 until 2010, 703 participating PMPs referred almost 19,000 TB suspects and 3,959 SS+ TB cases to the designated DOTS centres (Figure 5). Overall, almost 36% of all SS+ TB cases were attributable to involvement of the private sector providers (Table 3).

Figure 5: Overall PMP contribution to identifying TB suspects in all PPP areas, 2004-2010 (including scale up)

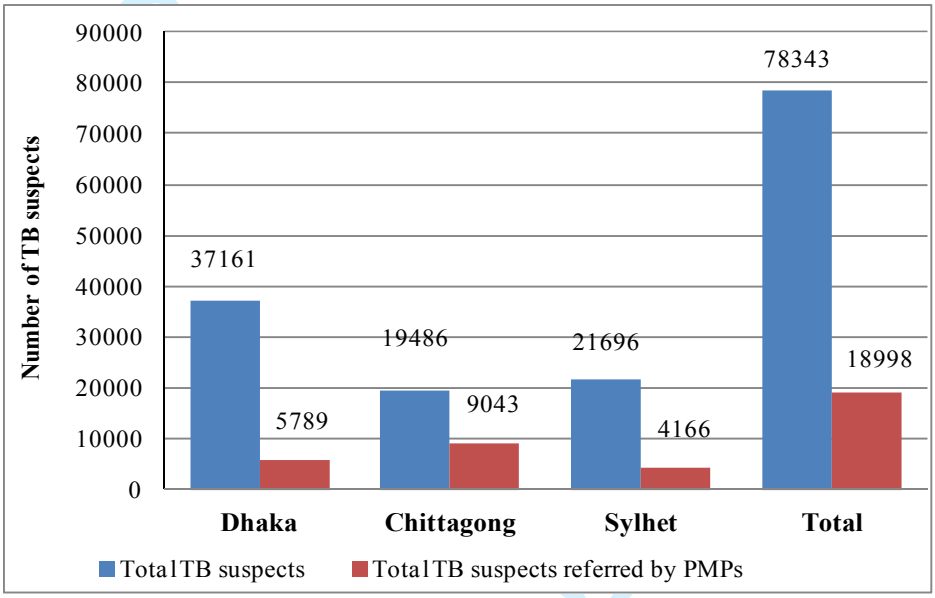


Table 3: Total SS+TB patients in all PPP areas and PMP's contribution, 2004-2010

	Dhaka	Chittagong	Sylhet	Total
Total SS+ TB cases in the PPP areas	5199	3748	2068	**11015**
Total SS+ TB cases referred by PMPs	1214	2028	717	**3959**
PMPs' contribution %	23	54	35	**36**

Qualitative findings

The qualitative evaluation revealed that the participatory approach of planning and designing the PPP including involvement of all stakeholders in the process of selecting service components, selecting partners, and monitoring of the PPP played a crucial part in securing commitment and ownership from all parties involved. Virtually all PMPs interviewed (96%) mentioned having a positive experience in regard to the monitoring and support mechanism of the project, which was key to the success of the project implementation, and paved the way for scale-up. Specifically, they valued the monthly field visit by the project field staff. In reply to the question: *"Do you own this project?"* a popular PMP spontaneously replied *"Oh, yes. No doubt about it"*. He went on to say *"I have been consulted throughout the planning*

process of the project, and later we have jointly implemented it. So, this is our project. I am part of it".

The quarterly review meetings were organised in rotation by the NTP and the partner NGOs either in the NTP's conference room or in one of the NGO's working locations. When asked about these arrangements, both the NTP and NGOs expressed their satisfaction and expressed their commitment to maintaining this practice in future collaborations.

All PMPs interviewed (n=24) said they had no problems using the referral and other forms. *"The [TB related] registers and referral forms are quite simple and user-friendly, and easy to maintain"* said a busy practitioner. The NTP managers said they were amazed by the fact that most PMPs were keeping records. The PMPs also liked the system of referral back to the referring practitioners, which preserved their professional and commercial interests. However, a few PMPs were unhappy as they felt they did not get sufficient feedback about the patients they had referred, even though feedback was regularly given to PMPs through monthly field visits and during quarterly review meetings.

The evaluation revealed major challenges in managing the PPP. It was difficult to bring such a heterogeneous group under one umbrella, especially in the early stages of the partnership process.

Another important finding was that the public, NGO and private sector providers showed strong commitment and willingness to work together to achieve the common goal of TB control, although PMPs were initially sceptical about the motive of the public sector regarding this partnership, and the public sector and NGOs were initially doubtful whether PMPs would sacrifice their time to participate in such partnerships.

In the absence of a regulatory mechanism, the PPP was primarily based on good relationships and dialogue. Both NTP and NGO respondents stated that they were sometimes overburdened with the extra work needed to implement the partnership activities. The NTP was hit harder than the partner NGOs, because there was a shortage of staff within the NTP management. Other key challenges encountered during implementation were to maintain the progress of the partnership, as it evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. One senior PMP said *"Initially I thought this partnership would fail because I had serious reservations about negative attitudes of government officials. They [government officials] don't know how to give respect to anybody other than their bosses. But after getting the chance to work with the NTP, I have now changed my mind. I have found the government officials now behave much better than they used to do in the past".*

Discussion and conclusion

The PPP model was highly effective in improving access to and quality of TB care in urban settings, as evidenced by a steady increase in case notification since implementation of the partnership, exceeding internationally agreed targets, and consistently maintained much higher rates than the national average.

Systematic implementation of the PPP led to greater and effective involvement of PMPs, resulting in increased access to quality TB care. However, needs-based training is necessary

for PMPs to enhance their knowledge on the NTP guidelines in regard to appropriate diagnosis, treatment, and follow-up to guarantee the continuity of quality of TB care.

The tools and protocols, and ACSM materials proved vital to facilitating the partnership. The lessons learned from this partnership formed the basis of the National PPM (Public-Private Mix) guidelines. The revised tools and guidelines considerably improved the quality of TB reporting, thus strengthened the health information available. The revised protocol for referrals gave PMPs confidence that they would not lose their patients, which greatly increased their motivation to remain in the partnership.

The key challenges encountered during implementation were to maintain the momentum as the partnership evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. The NTP's and other partners' commitment and nurturing of an atmosphere where all stakeholders could feel involved in the partnership were critical to overcoming these challenges.

It was possible to bring the public, NGOs and private sector providers together to work towards achieving a common public health goal despite perceived barriers between public and private sector providers, initial scepticism about forming the partnership, and challenges during implementation of the PPP. The participatory development of the partnership and maintaining close linkages with the PMPs helped them to gain confidence and trust over the public sector services, which in turn facilitated the development of a close relationship with the NTP and NGO partners. However, in order to develop and sustain such a partnership, roles and responsibilities of participating agencies and individuals must be defined. These findings are consistent with the outcomes of other much smaller operational research projects implemented elsewhere.[15,20–25]

Finally, this study demonstrated that TB control outcomes could be achieved by combining the diverse strengths and advantages of the public and private sectors, NGOs and a group of selected PMPs. High rates of case detection were attained without involving all private practitioners in the area, thus making the PPP technically attractive to national programmes in other countries in terms of feasibility of implementation and wider scale up.

Acknowledgements
We thank the patients, PMPs, and NGOs involved in this study, and the Bangladesh NTP for permission to carry out the study. We also thank an anonymous professional colleague who reviewed the revised manuscript.

Funding: This study was funded by the Department for International Development (DFID) of the United Kingdom through the COMDIS research programme consortium; however, DFID does not take any responsibility for any information provided or views expressed.

Conflicts of interest: none declared.

Authors contributions: ZU conceived and designed the study, led the data collection and analysis, and preparation of the manuscript; RH participated in the data analysis and in the preparation of the manuscript; AH participated in data collection and analysis; SA coordinated the study implementation and data collection; AI participated in data collection; JNN participated in the design of the study, advised on data collection and analysis and participated in the preparation of the manuscript.

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Title

Involving the Private Medical Sector in TB Control in Bangladesh: a mixed method study

Article Focus

- To assess the effectiveness of a Public-Private Partnership (PPP) model to involve private medical sector in TB control
- To ascertain whether scaling up of the PPP model approach to engage PMPs is feasible and has an effect on case notification rate.

Key messages

- This study demonstrated the feasibility and effectiveness of providing TB care through involving private sector health care providers
- The PPP substantially improved access to and quality of TB care in urban settings, as evidenced by increased TB case notification rate and increased treatment success rate.
- Our results show that it is feasible to scale up a public-private partnership within the national TB control programme.

Strengths and Limitations

- As TB continues to be a major threat to public health in low- and middle-income countries, and is re-emerging as an issue for concern in high-income countries, the findings of this study provide evidence for national and international scale-up of such partnerships
- By using both quantitative and qualitative methods, this study has permitted more in-depth analysis of the effectiveness of this PPP model
- From the beginning, the study was guided by a vision of nation-wide scale up.

Date: 21 September 2012

Dear Editors,
The BMJ Open

Dear Madam/sir,

Thank you for considering our paper entitled “Involving the Private Medical Sector in TB Control in Bangladesh: a mixed method study”. Also, thanks to the reviewers for their comments and advice. We have revised the manuscript based on these comments and suggestions. The revised sections/texts are highlighted in the manuscript.

TB continues to be a major threat to public health in low- and middle-income countries, and is re-emerging as an issue for concern in high-income countries. Our paper demonstrates the feasibility and effectiveness of providing TB care through involving private sector health care providers in Bangladesh. Therefore, we believe your readership would be interested in our work on public-private partnership in TB care because of its novelty, its demonstrated effectiveness and its scope for national and international scale-up.

Thank you once again for considering our work for publication in the BMJ Open.

Yours sincerely,

AN Zafar Ullah and colleagues

Reviewer(s)' Comments to Author:

Reviewer: Dr. MMH Khan
Assistant Professor
Department of Public Health Medicine
School of Medicine
Bielefeld University
Germany

Comments: TB is an important public health problem in Bangladesh and hence the topic addressed by the authors is relevant from public health point of view. In this paper, the authors mainly attempted to report the impact of Public-Private Partnership (PPP) in reporting TB suspects and cases in four areas of Dhaka city. Frankly speaking, this study has valuable information for health policymakers; however, I found several limitations of the study. Although the journal structured the review process focusing on several questions in relation to the results and conclusion, it is difficult to answer 'yes' or 'no'. Therefore I have written my comments as a text.

Response: Thank you.

Comments: The research questions or outcomes are not clearly reflected by the title of the study. It should be revised according to the main findings of the study in the abstract and introduction.

Response: The study was aimed at developing a partnership between the NTP and different elements of the private sector in Bangladesh such as Private Medical Practitioners (PMPs) and NGOs. We used both quantitative and qualitative methods (mixed methods) for the data collection of the study. We think the title reflects the study aim and methodology.

Comments: The overall study design is not clearly written. Authors mentioned many methods (as a triangulation) combining quantitative and qualitative methods. However, these methods are not adequately described. Some of the crucial things are missing. For example, authors mentioned that four areas are selected. What does the 'area' mean? Moreover, they did not mention which areas from the Dhaka city were selected for this study. Dhaka is a megacity with about 15.4 million population (not about 10 million) (see the United Nations publication (2012) "World Urbanization Prospects The 2011 Revision: Highlights") and intra-urban differences are huge in terms of socio-economic conditions, economical and commercial activities, and settlement types (i.e. slums versus non-slums). Authors should clearly report the characteristics of four areas and five DOT centre in Dhaka. Discussion regarding the representativeness of the study is also missing. Statistical methods are not discussed too.

Responses: We have revised the methods section accordingly (highlighted texts) - see page 3 and lines.6-34; and page 4 lines 15-16 and lines 18-22. We have added the following texts:
Considering the research objectives and intended outcome of a change in policy and practice, an operational research methodology[16,17] was thought to be appropriate. A set of criteria underpinning the broader scope of operations research was employed to make the implementation process more participative and resource-effective, and to facilitate the scale up. Specific techniques and approaches drawn from both quantitative and qualitative research methods were used to collect multiple kinds of data for the study.[18,19]

The study was set within the policy environment of government-NGO collaboration, enabling participation of Society for Empowerment, Education and Development (SEED) and three other NGOs – Bangladesh Rural Advancement Committee (BRAC), Progoti Samaj Kallyan Protisthan (PSKP) and Population Services Training Centre (PSTC), who were undertaking TB control activities jointly with the NTP.

Four areas of Dhaka City namely Mirpur, Rampura, Dokkhinkhan, and Kamrangirchar were selected purposively as the study sites, where the selected partner NGOs were located and had a DOTS centre; and where PMPs were major providers of health services. These study sites generally represent the geographic catchment areas of the selected NGOs covering a population of nearly one million.

Within this partnership, SEED was the lead research partner, BRAC, PSKP and PSTC provided TB services (diagnosis, treatment and follow-up) through designated health centres whereas the NTP provided the overall policy guidelines and supported the organisation and management of the research activities. In Mirpur, PSKP provided TB services through two DOTS centres and PSTC had one DOTS centre in Rampura; whereas BRAC covered both Dokkhinkhan, and Kamrangirchar through one DOTS centre in each area. PMPs were agreed to refer the TB suspects and patients to these designated DOTS centres following the NTP guidelines. A technical committee was formed with representation from the NTP, partner NGOs and PMPs to advise on the operational issues and to support the smooth running of the partnership. A local Project Coordinator coordinated the project activities.
Analysis of quantitative data was done primarily by tabulations and graphs using SPSS and Microsoft Excel programmes, and of qualitative data by thematic analysis.

Ethical approvals were obtained from University of Leeds, United Kingdom and also from relevant in-country institutions including the Directorate General of Health Services, and Bangladesh National TB Control Programme. We have ensured all respondents their rights to anonymity and confidentiality. A written informed consent was obtained from each participant of the in-depth interviews and FGDs.

Comments: Results are highly summarized, although some of the results are credible. Study subjects are not adequately described. For a better understanding, results of the TB suspects and cases should be presented by sex (male versus female), age group and by area. Otherwise intra-urban differences, inequities by sex and age group will be ignored.

Response: We were mindful to remain within the recommended word-length of the journal. In fact, the PPP project in Bangladesh yielded big dataset/findings since its inception in 2004. We recognised that this manuscript would have higher impact if we remain focused within the stated objective of the paper. We also planned to publish a series of papers based on the results/data of the PPP project. As part of this plan, we have already published two papers (Zafar Ullah *et al,* 2004 and Zafar Ullah *et al,* 2010); current manuscript is the third in the serial. The fourth one is in the drafting stage; the analyses on gender, inter-area differences will be part of that forthcoming publication. However, we are willing to incorporate the age and gender related analyses, if that is strongly felt by the editor/reviewer.

Comments: Results should be logically presented according to methods. In the present form, results of some methods are missing.

Response: In this paper, we have presented the results according to the project phases (e.g. pilot implementation and scale up), and outcomes of the partnership (e.g. TB control indicators). We have analysed/used data from both quantitative (service statistics from the NTP and five DOTS centres) and qualitative (in-depth interviews, FGDs and workshops) while organising and presenting the article content. Data from baseline has already been published elsewhere (see Zafar Ullah *et al*. Public-private partnership for TB control in Bangladesh: role of private medical practitioners in the management of TB patients. *World Medical & Health Policy,* 2010; **2 (1)**, Article 13, for details). As we mentioned above, some results and analysis have been kept aside for forthcoming publication(s). However, we have added two sub-headings, as suggested (see pages 5 line 18 and page 8. Line 19).

Other comments:

Comment: Some abbreviations such as NTP (in abstract), SEED, and BRAC are not given in the first appearance.

Response: We have revised as below (see page 3. Lines 14-16)
Society for Empowerment, Education and Development (SEED) and three other NGOs – Bangladesh Rural Advancement Committee (BRAC), Progoti Samaj Kallyan Protisthan (PSKP) and Population Services Training Centre (PSTC).

Comments: In the introduction, the authors have written about private healthcare. To my opinion, it is too short because private sectors include not only private medical practitioners but many other medically untrained or semi-trained providers such as people working in pharmacies/drugstores, traditional healers, homeopathic and Unnai/Ayurvedic providers. The quality of services by the private healthcare sectors is often questionable. Referring some suitable articles, authors should provide more information about private healthcare sector in Bangladesh.

Response: We have revised the introduction section and added the following texts. We have also updated the references (see page 2 lines 24-32).
Private healthcare is common in Bangladesh and popular amongst all, regardless of income or location. Apart from the NGOs, all other private or non-government sector health providers are generally considered to be as medically trained providers working for-profit and located outside of the government health system. The private sector also incorporates a large number of privately-managed auxiliary health services such as diagnostic laboratories, ambulance services and pharmacies/drugstores.[8] These private health care providers are available in abundance in urban areas.[9–11] However, there are countless untrained or non-qualified providers in Bangladesh who offer a combination of traditional (e.g. Unani, ayurbedic etc.) and western (allopathic) types of medicine but they are primarily found in rural areas.[8]

Comments: Authors mentioned in the method section that in the study areas three NGOs are working for TB case reporting and management. Two of them are not well-known like BRAC. So some descriptions are also needed for these NGOs.

Response: We have revised accordingly (see page 3 lines 13-34). Also see the following additional information:

BRAC, PSKP and PSTC are registered non-governmental organisations primarily work in the areas of health services delivery, and are among the existing collaborating partners of the NTP in implementing TB control activities.

Comments: Statements regarding ethical permission should be elaborated. Particularly what is name of the Ethical board under the Directorate General of Health Services?

Response: We have revised as follows (see page 4 lines 15-18).
Ethical approvals were obtained from University of Leeds, United Kingdom and also from relevant in-country institutions including the Directorate General of Health Services, and Bangladesh National TB Control Programme. We have ensured all respondents their rights to anonymity and confidentiality. A written informed consent was obtained from each participant of the in-depth interviews and FGDs.

Reviewer: Dr Lal Sadasivan
Senior Specialist
Strategy, Investment and Impact Division The Global Fund to Fight AIDS, Tuberculosis and Malaria Switzerland

Comment: Research question: There is no research question stated.

Response: We have now explained the rationale and aim of the paper (see page 2 lines 39-49 and page 3 lines 1-2)
Given the above context, the task of increasing access to and quality of TB care as well as increasing the case detection rate is enormous. To achieve this task, the NTP has recognised the need for an increased collaborative effort between the public and private health sector providers.

In this context, we conducted research to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) in the NTP's urban TB control activities, and to measure to what extent the outcomes of this partnership affect access to and quality of TB care. The development and piloting of the PPP model took place in four selected research sites in Dhaka city which spanned between 2004 and 2008. Since 2008, this PPP model has been scaled up in two other cities - Chittagong and Sylhet, in addition to scaling up in other areas of Dhaka City. This paper reports the outcomes from this development, evaluation and scale up.

Comments: PPM scale up: It is not clear where the scale up was done. In the abstract, under objectives, it is said that the scale up happened in two other bigger cities. Under objectives, it is stated that scale up happened in other areas of Dhaka and in two major cities. In the main text of the article, under introduction, it is said that PPM model was scaled up in two other big cities in addition to continued implementation in Dhaka.

Response: The PPP has been scaled up in two other cities – Chittagong and Sylhet. It was also scaled in other areas of Dhaka city after the completion of the pilot phase. We have now revised the relevant sections to make it more consistent. We added the following texts (see page 2 lines 48-49 and page 3 lines 1-2)
Since 2008, this PPP model has been scaled up in two other cities - Chittagong and Sylhet, in addition to scaling up in other areas of Dhaka City. This paper reports the outcomes from this development, evaluation and scale up.

Comments: Reference 1 has 2011 version. Reference 2 and 3 are old. Check for a better reference for 5.

Response: We have updated reference 1. Reference 2 and 3 are to justify the WHO's prediction about TB deaths by 2020 which was declared in 2002.

We have replaced the reference 5 with Guda DR, Khandaker IU, Parveen SD, and Whitson T. *Bangladesh: NGO and Public Sector Tuberculosis Service Delivery—Rapid Assessment Results*; Published for the United States Agency for International Development by the Quality Assurance Project; December 2004.

Comment: Page 2: line 18: it can not be 'appropriately trained' which is a positive thing.

Response: We have now revised the sentence, as below (see page 2 lines 12-14)
However, major obstacles to implementation remains primarily due to insufficient infrastructure and shortage of appropriately trained health personnel.[6,7]

Comment: Line 51: What is SEED?

Response: We have provided the full name of SEED as below (see page 3 line 14)
Society for Empowerment, Education and Development (SEED)

Comment: Table 2: From 2007 to 2008, there is a decline in SS+ cases in the non-PPM sector while the PPM cases go up steadily. This is not explained. Did the PPM start getting the cases that would have later gone to the public sector? This may actually avoid diagnostic delays. Same question about figure 3.

Response: We tend to agree with the reviewer's explanation but we did not have enough evidence to claim that. We can confirm that there were no changes in the project implementation in 2007 and 2008. There are several hypotheses (epidemiological and programmatic) for this decrease in the case notification rate. The strongest epidemiological argument is that there might be reduction of number of TB cases in the PPP areas due to successful implementation of the PPP. However, we think it is too early to confirm this hypothesis - we have to observe the trend for much longer period to claim that.

Comment: Table 2 and 4: There is higher positivity rate among the suspects referred by the PPM (23%) compared to non-PPM (16%). Is it because of a different criteria for referral or due to stricter selection?

Response: Our PMPs have used the NTP guidelines (WHO recommended) for indentifying TB suspects. They used a referral form developed by the PPP project. Sputum microscopy was done by the NGO-run DOTS centres involved in this project. There was no Table 4 in our manuscript.

Comment: Figure 1: decline in case notification from 2007 to 2008 in PPP is not explained.

Response: We can confirm that there were no changes in the project implementation in 2007 and 2008. There are several hypotheses (epidemiological and programmatic) for this decrease in the case notification rate. The strongest epidemiological argument is that there might be reduction of number of TB cases in the PPP areas due to successful implementation of the PPP. However, we think it is too early to confirm this hypothesis - we have to observe the trend for much longer period to claim that.

Comment: Page 8: line 45: Discussion: What is the evidence to say that the access and quality of care has improved?

Response: We have included the following text (see page 9 lines 43-46)
The PPP model was highly effective in improving access to and quality of TB care in urban settings, as evidenced by a steady increase in case notification since implementation of the partnership, exceeding internationally agreed targets, and consistently maintained much higher rates than the national average.

Comment: Discussion is weak and is mostly repetition of some findings. It brings in new findings also. Needs to be rewritten to clearly convey the message.

Response: We have substantially revised the discussion section (see highlighted texts in page 9 lines 43-49; and page 10 lines 1-26)

Comment: This article has a good scope becasue it comes from a well quoted PPM site. However, it needs a careful rewriting.

Response: Thank you. We have now updated the information and substantially revised the manuscript, as suggested.

Comment: Please also note some points below.

- It is not clearly stated what is meant by referral by PPM.
- Please say why there is no information in figure 3 for the years beyond 2008?
- Why treatment outcomes are not reported?
- Page 8: lines 14 and 53: Using terms like 'commercial interests' and 'harmful care' can be objectionable

Response:

- Referral within PPP means sending TB suspects and/or TB patients by the selected PMPs to the designated DOTS centre for diagnosis and/or treatment. The PPP project has developed a systematic approach (and a referral form) for the referral system. We have explained this in the methods section (see page 3 lines 25-34).
- Figure 3 represents data from the pilot phase only which spanned from 2004 to 2008. Data beyond 2008 are presented under “scale up section”.
- The rationale for this PPP project was to increase case detection rate which was low at the start of the project, and therefore we considered the case notification and referral as the key outcome indicators to demonstrate PPP success. The treatment outcomes within the national TB control programme in Bangladesh are mostly near or above the WHO targets throughout the PPP period. Nevertheless, the treatment outcomes in the PPP areas have been consistently higher than the national average.
- We have removed the term 'harmful care', and added ‘professional and’ before the term 'commercial interests', as suggested (see page 9 line 13).

Title

Involving the Private Medical Sector in TB Control in Bangladesh: a mixed method study

Article Focus

- To assess the effectiveness of a Public-Private Partnership (PPP) model to involve private medical sector in TB control
- To ascertain whether scaling up of the PPP model approach to engage PMPs is feasible and has an effect on case notification rate.

Key messages

- This study demonstrated the feasibility and effectiveness of providing TB care through involving private sector health care providers
- The PPP substantially improved access to and quality of TB care in urban settings, as evidenced by increased TB case notification rate and increased treatment success rate.
- Our results show that it is feasible to scale up a public-private partnership within the national TB control programme.

Strengths and Limitations

- As TB continues to be a major threat to public health in low- and middle-income countries, and is re-emerging as an issue for concern in high-income countries, the findings of this study provide evidence for national and international scale-up of such partnerships
- By using both quantitative and qualitative methods, this study has permitted more in-depth analysis of the effectiveness of this PPP model
- From the beginning, the study was guided by a vision of nation-wide scale up.

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Effectiveness of involving private medical sectors in the National TB Control Programme in Bangladesh: evidence from mixed methods

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Effectiveness of involving private medical sectors in the National TB Control Programme in Bangladesh: evidence from mixed methods

Authors: Zafar Ullah A N[1]; Huque R[2]; Husain A[3]; Akter S[4]; Islam A[5]; Newell J N[1]

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Abstract

Objectives: In Bangladesh, private health care is common and popular, regardless of income or area of residence, making the private sector an important player in health service provision. Although the private sector offers a good range of health services, tuberculosis (TB) care in the private sector is poor. We conducted research in Dhaka between 2004 and 2008 to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) within the National TB Control Programme (NTP)'s activities. Since 2008, this PPP model has been scaled up in two other big cities – Chittagong and Sylhet. This paper reports the results of this development, evaluation and scale up.

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Design: Mixed method, observational study design. We used NTP service statistics to compare the TB control outcomes between intervention and control areas. To capture detailed insights of PMPs and TB managers about the process and outcomes of the study, we conducted in-depth interviews, focus group discussions, and workshops.

Setting: Urban setting – piloted in four areas in Dhaka city; later scaled up in other areas of Dhaka and in two major cities.

Findings: The partnership with PMPs yielded significantly increased case finding of sputum smear positive TB cases. Between 2004 and 2010, 703 participating PMPs referred 3,959 sputum smear positive TB cases to the designated DOTS centres – contributing about 36% of all TB cases in the project areas. There was a steady increase in case notification rates in the project areas following implementation of the partnership.

Conclusions: The PPP model was highly effective in improving access and quality of TB care in urban settings.

Introduction

Despite the availability of effective treatment, the ability to control tuberculosis (TB) remains uncertain. Current estimates suggest that globally there are over 8.8 million new TB cases, and nearly 1.5 million people die from TB, yearly: 98% of these cases and deaths occur in developing countries.[1] The World Health Organisation (WHO) predicts that 36 million people will die of TB between 2002 and 2020 if control measures do not improve.[2–4] Bangladesh is among the top ten high TB burden countries; for all forms of TB, the prevalence is 411 per 100,000 and the incidence is 225 per 100,000 populations per year.[1] To reduce this burden, the National TB Control Programme (NTP) has adopted the DOTS strategy, delivered primarily through government-run health facilities.[5] However, major obstacles to implementation remain, primarily due to insufficient infrastructure and shortage of appropriately trained health personnel.[6,7] These limitations mean many people with the signs and symptoms of TB must travel considerable distances to obtain TB care, have lengthy waits to be seen when they arrive, and may not be dealt with appropriately. Health facility opening times that are inconvenient for working people also limit access to and acceptability of Direct Observation of Treatment (DOT), a central component of DOTS. Furthermore, there is considerable stigma associated with TB, both in its own right and because of its association with HIV/AIDS. These factors combine to limit patients' desire and ability to seek early diagnosis and treatment from public services. Consequently, large numbers of people with chest symptoms initially seek care from private health care providers.

Private healthcare is common in Bangladesh and popular amongst all, regardless of income or location. Private sector health providers are generally medically trained providers working for-profit and located outside of the government health system. The private sector also incorporates a large number of privately-managed auxiliary health services such as diagnostic laboratories, ambulance services and pharmacies/drugstores.[8] These private health care providers are available in abundance in urban areas.[9–11] There are countless untrained or non-qualified providers in Bangladesh who offer a combination of traditional (e.g. Unani, ayurbedic etc.) and western (allopathic) types of medicine but they are primarily found in rural areas.[8] Although the private sector offers a range of good quality health services, as in many other countries, the care they provide for TB is poor with over-reliance on radiology (e.g. X-ray) for diagnosis, use of inappropriate treatment regimens, and poor case holding, leading to incomplete treatment and potentially to multi-drug resistant TB (MDR-TB).[12–15] Moreover, non-existent linkages with the public sector means TB cases managed by private sector providers are neither recorded nor reported, so that routine cohort reporting is impossible, and outcomes are not consolidated into national data. Given this context, the task of increasing access to and quality of TB care as well as increasing the case detection rate is enormous. To achieve this task, the NTP has identified the need for collaboration between the public and private health sector providers.

In this context, we conducted research to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) in the NTP's urban TB control activities, and to measure to what extent the outcomes of this partnership affect access to and quality of TB care. The development and piloting of the PPP model took place in four selected research sites in Dhaka city during the period 2004 and 2008. Since 2008, this PPP model has been scaled up in two other cities - Chittagong and Sylhet, in addition to scaling up in other areas of Dhaka City. This paper reports the outcomes from this development, evaluation and scale up.

Methods

Considering the research objectives and intended outcome of a change in policy and practice, an operational research methodology was thought to be appropriate based on a set of criteria underpinning the broader scope of operations research.[16,17] This approach was employed to make the implementation process more participative and resource-effective, and to facilitate scale up. Specific techniques and approaches drawn from both quantitative and qualitative research methods were used to collect multiple kinds of data for the study.[18,19]

The study was set within the policy environment of a government-NGO collaboration, enabling participation of the Society for Empowerment, Education and Development (SEED) and three other NGOs – Bangladesh Rural Advancement Committee (BRAC), Progoti Samaj Kallyan Protisthan (PSKP) and Population Services Training Centre (PSTC), which were undertaking TB control activities jointly with the NTP.

Four areas of Dhaka City - Mirpur, Rampura, Dokkhinkhan, and Kamrangirchar - were selected as study sites. Selection was purposeful, based on where the selected partner NGOs were located and had a DOTS centre; and where PMPs were major providers of health services. These study sites generally represent the geographic catchment areas of the selected NGOs covering a population of nearly one million.

Within this partnership, SEED was the lead research partner; BRAC, PSKP and PSTC provided TB services (diagnosis, treatment and follow-up) through designated health centres, and the NTP provided overall policy guidelines and supported the organisation and management of the research activities. In Mirpur, PSKP provided TB services through two DOTS centres and PSTC had one DOTS centre in Rampura; whereas BRAC covered both Dokkhinkhan, and Kamrangirchar through one DOTS centre in each area. PMPs agreed to refer the TB suspects and patients to these designated DOTS centres following the NTP guidelines. A technical committee was formed with representation from the NTP, partner NGOs and PMPs to advise on the operational issues and to support the smooth running of the partnership. A local Project Coordinator coordinated the project activities.

We developed and implemented the PPP model in three phases:

- *Preparation phase*
  - Formation of a Technical Working Group Committee (TWGC)
  - Collection of pre-intervention baseline data
  - Identification of tasks/service components within the partnership, based on partners' diverse strengths.
- *Intervention phase*
  - Strengthening DOTS centres to provide the PPP service components
  - Orientation and training of PMPs on NTP guidelines/protocols
  - Adaptation of TB forms and registers to incorporate PPP components
  - Development of diagnostic, referral and treatment protocols and linkages
  - Development and organisation of Advocacy, Communication and Social Mobilisation (ACSM) initiatives involving all stakeholders
  - Monitoring and supervision of the partnership activities
  - Evaluation of pilot phase.
- *Scale up phase*
  - Identification and orientation of new partners

- Scale up.

To evaluate the PPP, we compared TB outcomes in the intervention and control (non-PPP) areas using service statistics from the NTP and the five NGO DOTS centres involved in this project. We also collected additional baseline data from the selected PMPs (see Zafar Ullah *et al* 2010 for details), and used in-depth interviews, focus group discussions (FGDs) and workshops to capture PMPs' and TB managers' insights of the process and outcomes of the study (Table 1).

Table 1: evaluation methods, participants, tools and focus

Phase	Method *(n)*	Participants *(n)*	Tools	Focus
Preparation	• Survey (1)	• PMPs (60)	• Semi-structured questionnaire	• Process
	• In-depth interviews (42)	• NTP managers (12) • NGO managers (6) • PMPs (24)	• Semi-structured questionnaire	• Process • Outcomes
	• FGDs (4)	• PMPs (24)	• FGD guidelines	• Process
Evaluation	• Workshops (2)	• PMPs (60: 30 per workshop)	• Agenda • Workshop guidelines	• Process • Outcomes
	• Follow-up interviews	• PMPs (12)	• Semi-structured questionnaire	• Process • Outcomes

Analysis of quantitative data was primarily by tabulation and graphs, and of qualitative data by thematic analysis.

Ethical approval wasobtained from University of Leeds, United Kingdom and also from relevant in-country institutions including the Directorate General of Health Services, and Bangladesh National TB Control Programme. All personal data has been anonymised and has remained confidential. A written informed consent was obtained from each participant of the in-depth interviews and FGDs.

Findings

Pilot Implementation (2004-2008)

At inception in 2004, the PPP included 97 PMPs but by the end of 2009 this had risen to 703. There was continuous enrolment of PMPs: although numbers fluctuated due to retirement and relocation, no PMPs chose to leave the PPP for any other reasons. The male:female ratio was 6:1, reflecting the ratio amongst urban private health service providers.

All 703 PMPs were trained to provide quality TB care. As PMPs made it clear they were unwilling to set aside more than two days for training, we tailor-made a two-day training module (based on a training needs assessment) that included technical aspects of TB care, operational aspects of the PPP, and TB record-keeping.

We used a participatory approach involving all stakeholders including PMPs to develop and revise the tools and forms. National recording and reporting forms and registers were revised to incorporate PPP elements, and to maintain records of the referrals from PMPs. These were field-tested and reviewed before use. We revised the NTP's TB treatment algorithm to

incorporate a flexible referral mechanism, which allowed the DOTS centres to refer TB suspects/patients back to their respective PMPs, if the PMPs wished. We also used a participatory approach to develop ACSM materials, which were made context-specific using baseline survey data. These advocacy activities had a major role in influencing policy makers to endorse the PPP model for country-wide scale-up.

PMPs initially expected financial support from the NTP as a partnership component. This expectation was discussed with all stakeholders and it was agreed that any financial incentive would jeopardise the partnership and could prove unsustainable in the long run. At the beginning of the partnership, PMPs also expressed a lack of confidence about the quality of public sector TB services, especially of diagnosis using sputum microscopy and the NTP-recommended treatment regimen. This study addressed these issues through joint development and monitoring of partnership activities and strong advocacy and communication campaigns.

Quantitative findings

Within the project period (2004-2008), a total of 3,585 sputum smear positive (SS+) TB patients were registered in the five DOTS centres in the project areas; of these 647 were referred by PMPs. Numbers referred rose progressively over the period (Table 2).

Table 2: SS+ TB cases registered in the PPP areas

	2004	2005	2006	2007	2008	Total
Total SS+ TB cases in the PPP areas	533	673	800	830	749	**3585**
Total SS+ TB cases referred by PMPs	11	54	143	164	275	**647**
PMPs' contribution (%)	2	8	18	20	37	**18**

The case notification rate for new SS+ TB cases in the study areas increased steadily over the project period, and was consistently higher than the national average. By 2008 the rate in the study areas was 94/100,000 while the national rate was 73/100,000 (Figure 1). The study rate was also consistently higher than that in Dhaka Metropolitan City, which encloses the study sites (Figure 1).

*Data for Dhaka Metropolitan City available only from 2005, when the NTP started reporting for Metropolitan areas.

The presence of BRAC's extensive community network influenced the total number of new SS+ cases identified in the PPP areas (Figure 2). In Dokkhinkhan and Kamrangirchar areas, the number of new SS+ TB cases was higher than Mirpur and Rampura areas where BRAC's community health workers (known as *Shasthya Sebika)* work closely with the community to identify persons with chest complaints and advise them to go for a sputum test from a designated DOTS centre.

Another noticeable impact of the PPP was a large increase in numbers of cases of extra-pulmonary TB registered over time (Figure 3).

Almost three-quarters of the reported TB cases were between 15 and 54 years of age: most male cases were detected in the 35-44 age-group, while the peak in females was observed in the 15-24 year age-group. The number of male cases was always higher than females except in children of 0-14 age group. Only one-third of new SS+ TB cases were female. This analysis reflects the national distribution and trend observed by the NTP and other collaborating NGOs (Figure 4).

PMPs made a significant contribution to the numbers of TB suspects examined in the designated labs in the four PPP areas: in total 2,756 of the 24,678 TB suspects examined were referred by PMPs, with a steady rise over the study period (Figure 5).

Scaling up and getting research into policy and practice (GRIPP)

Based on the PPP pilot results, the NTP started implementing the PPP model in other cities – Chittagong (from 2007), Sylhet (2008), and other areas of Dhaka (2009) – covering more than 15 million people. In Chittagong, five NGO partners collaborated with the NTP to support the PPP; in Sylhet, BRAC was the only NGO service provider, but two medical college hospitals were also involved. In the scale-up areas, PMPs have made a substantial contribution to the NTP's effort to control TB in Bangladesh (Figure 6 and Table 3).

Overall impact of the PPP on TB Control

The involvement of PMPs substantially increased case finding of SS+ TB cases, a key TB control indicator. The partnership made a significant contribution in identifying SS+ TB cases: from the inception of the PPP in 2004 until 2010, 703 participating PMPs referred almost 19,000 TB suspects and 3,959 SS+ TB cases to the designated DOTS centres (Figure 7). Overall, almost 36% of all SS+ TB cases were attributable to involvement of the private sector providers (Table 3).

Table 3: Total SS+TB patients in all PPP areas and PMP's contribution, 2004-2010

	Dhaka	Chittagong	Sylhet	Total
Total SS+ TB cases in the PPP areas	5199	3748	2068	**11015**
Total SS+ TB cases referred by PMPs	1214	2028	717	**3959**
PMPs' contribution %	23	54	35	**36**

Qualitative findings

The qualitative evaluation revealed that the participatory approach of planning and designing the PPP including involvement of all stakeholders in the process of selecting service components, selecting partners, and monitoring of the PPP played a crucial part in securing commitment and ownership from all parties involved. Virtually all PMPs interviewed (96%) mentioned having a positive experience in regard to the monitoring and support mechanism of the project, which was key to the success of the project implementation, and paved the way for scale-up. Specifically, they valued the monthly field visit by the project field staff. In reply to the question: *"Do you own this project?"* a popular PMP spontaneously replied *"Oh, yes. No doubt about it"*. He went on to say *"I have been consulted throughout the planning process of the project, and later we have jointly implemented it. So, this is our project. I am part of it"*.

The quarterly review meetings were organised in rotation by the NTP and the partner NGOs either in the NTP's conference room or in one of the NGO's working locations. When asked about these arrangements, both the NTP and NGOs expressed their satisfaction and expressed their commitment to maintaining this practice in future collaborations.

All PMPs interviewed (n=24) said they had no problems using the referral and other forms. *"The [TB related] registers and referral forms are quite simple and user-friendly, and easy to maintain"* said a busy practitioner. The NTP managers said they were amazed by the fact that most PMPs were keeping records. The PMPs also liked the system of referral back to the referring practitioners, which preserved their professional and commercial interests. However, a few PMPs were unhappy as they felt they did not get sufficient feedback about the patients they had referred, even though feedback was regularly given to PMPs through monthly field visits and during quarterly review meetings.

The evaluation revealed major challenges in managing the PPP. It was difficult to bring such a heterogeneous group under one umbrella, especially in the early stages of the partnership process.

Another important finding was that the public, NGO and private sector providers showed strong commitment and willingness to work together to achieve the common goal of TB control, although PMPs were initially sceptical about the motive of the public sector regarding this partnership, and the public sector and NGOs were initially doubtful whether PMPs would sacrifice their time to participate in such partnerships.

In the absence of a regulatory mechanism, the PPP was primarily based on good relationships and dialogue. Both NTP and NGO respondents stated that they were sometimes overburdened with the extra work needed to implement the partnership activities. The NTP

was hit harder than the partner NGOs, because there was a shortage of staff within the NTP management. Other key challenges encountered during implementation were to maintain the progress of the partnership, as it evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. One senior PMP said *"Initially I thought this partnership would fail because I had serious reservations about negative attitudes of government officials. They [government officials] don't know how to give respect to anybody other than their bosses. But after getting the chance to work with the NTP, I have now changed my mind. I have found the government officials now behave much better than they used to do in the past".*

Discussion and conclusion

The PPP model was highly effective in improving access to and quality of TB care in urban settings, as evidenced by a steady increase in case notification since implementation of the partnership, exceeding internationally agreed targets, and consistently maintaining much higher rates than the national average.

Systematic implementation of the PPP led to greater and effective involvement of PMPs, resulting in increased access to quality TB care. However, needs-based training is necessary for PMPs to enhance their knowledge on the NTP guidelines in regard to appropriate diagnosis, treatment, and follow-up to guarantee the continuity and quality of TB care.

The tools, protocols and ACSM materials proved vital to facilitating the partnership. The lessons learned from this partnership formed the basis of the National PPM (Public-Private Mix) guidelines. The revised tools and guidelines considerably improved the quality of TB reporting, thus strengthening the health information available. The revised protocol for referrals gave PMPs confidence that they would not lose their patients, which greatly increased their motivation to remain in the partnership.

The key challenges encountered during implementation were to maintain the momentum as the partnership evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. The NTP's and other partners' commitment and nurturing of an atmosphere where all stakeholders could feel involved in the partnership were critical to overcoming these challenges.

It was possible to bring the public, NGOs and private sector providers together to work towards achieving a common public health goal despite perceived barriers between public and private sector providers, initial scepticism about forming the partnership, and challenges during implementation of the PPP. The participatory development of the partnership and maintaining close linkages with the PMPs helped them to gain confidence and trust over the public sector services, which in turn facilitated the development of a close relationship with the NTP and NGO partners. However, in order to develop and sustain such a partnership, roles and responsibilities of participating agencies and individuals must be defined. These findings are consistent with the outcomes of other much smaller operational research projects implemented elsewhere.[15,20–25]

The selected study sites were drawn from urban DOTS areas in Bangladesh and the research was deliberately embedded within the NTP programme activities. The PPP service components were aligned with the NTP guidelines and were implemented through the NTP/NGO's designated DOTS centres. The health system elements, particularly the type of

health facilities, composition of health staff, and organisation of the TB control activities through government-NGO collaboration were similar in the study areas and in other urban areas of Bangladesh. Moreover, the type and characteristics of urban health care provided by private sector providers follow a similar pattern in all urban areas of the country. Therefore, the PPP can be scaled up in other urban DOTS areas providing that human and financial resources are provided for the partnership activities.

In summary, this study demonstrated that TB control outcomes could be achieved by combining the diverse strengths and advantages of the public and private sectors, NGOs and a group of selected PMPs. High rates of case detection were attained without involving all private practitioners in the area, thus making the PPP technically attractive to national programmes in other countries in terms of feasibility of implementation and wider scale up.

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Conflicts of interest: none declared.

Authors contributions: ZU conceived and designed the study, led the data collection and analysis, and preparation of the manuscript; RH participated in the data analysis and in the preparation of the manuscript; AH participated in data collection and analysis; SA coordinated the study implementation and data collection; AI participated in data collection; JNN participated in the design of the study, advised on data collection and analysis and participated in the preparation of the manuscript.

Data Sharing

No additional data available.

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Figure Legends

Figure 1: Case notification rates of new SS+ TB cases in Dhaka Metropolitan City and the PPP project areas*

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Effectiveness of involving private medical sectors in the National TB Control Programme in Bangladesh: evidence from mixed methods

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Abstract

Objectives: In Bangladesh, private health care is common and popular, regardless of income or area of residence, making the private sector an important player in health service provision. Although the private sector offers a good range of health services, tuberculosis (TB) care in the private sector is poor. We conducted research in Dhaka between 2004 and 2008 to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) within the National TB Control Programme (NTP)'s activities. Since 2008, this PPP model has been scaled up in two other big cities – Chittagong and Sylhet. This paper reports the results of this development, evaluation and scale up.

Design: Mixed method, observational study design. We used NTP service statistics to compare the TB control outcomes between intervention and control areas. To capture detailed insights of PMPs and TB managers about the process and outcomes of the study, we conducted in-depth interviews, focus group discussions, and workshops.

Setting: Urban setting – piloted in four areas in Dhaka city; later scaled up in other areas of Dhaka and in two major cities.

Findings: The partnership with PMPs yielded significantly increased case finding of sputum smear positive TB cases. Between 2004 and 2010, 703 participating PMPs referred 3,959 sputum smear positive TB cases to the designated DOTS centres – contributing about 36% of all TB cases in the project areas. There was a steady increase in case notification rates in the project areas following implementation of the partnership.

Conclusions: The PPP model was highly effective in improving access and quality of TB care in urban settings.

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Introduction

Despite the availability of effective treatment, the ability to control tuberculosis (TB) remains uncertain. Current estimates suggest that globally there are over 8.8 million new TB cases, and nearly 1.5 million people die from TB, yearly: 98% of these cases and deaths occur in developing countries.[1] The World Health Organisation (WHO) predicts that 36 million people will die of TB between 2002 and 2020 if control measures do not improve.[2–4] Bangladesh is among the top ten high TB burden countries; for all forms of TB, the prevalence is 411 per 100,000 and the incidence is 225 per 100,000 populations per year.[1] To reduce this burden, the National TB Control Programme (NTP) has adopted the DOTS strategy, delivered primarily through government-run health facilities.[5] However, major obstacles to implementation remain, primarily due to insufficient infrastructure and shortage of appropriately trained health personnel.[6,7] These limitations mean many people with the signs and symptoms of TB must travel considerable distances to obtain TB care, have lengthy waits to be seen when they arrive, and may not be dealt with appropriately. Health facility opening times that are inconvenient for working people also limit access to and acceptability of Direct Observation of Treatment (DOT), a central component of DOTS. Furthermore, there is considerable stigma associated with TB, both in its own right and because of its association with HIV/AIDS. These factors combine to limit patients' desire and ability to seek early diagnosis and treatment from public services. Consequently, large numbers of people with chest symptoms initially seek care from private health care providers.

Private healthcare is common in Bangladesh and popular amongst all, regardless of income or location. Private sector health providers are generally medically trained providers working for-profit and located outside of the government health system. The private sector also incorporates a large number of privately-managed auxiliary health services such as diagnostic laboratories, ambulance services and pharmacies/drugstores.[8] These private health care providers are available in abundance in urban areas.[9–11] There are countless untrained or non-qualified providers in Bangladesh who offer a combination of traditional (e.g. Unani, ayurbedic etc.) and western (allopathic) types of medicine but they are primarily found in rural areas.[8] Although the private sector offers a range of good quality health services, as in many other countries, the care they provide for TB is poor with over-reliance on radiology (e.g. X-ray) for diagnosis, use of inappropriate treatment regimens, and poor case holding, leading to incomplete treatment and potentially to multi-drug resistant TB (MDR-TB).[12–15] Moreover, non-existent linkages with the public sector means TB cases managed by private sector providers are neither recorded nor reported, so that routine cohort reporting is impossible, and outcomes are not consolidated into national data. Given this context, the task of increasing access to and quality of TB care as well as increasing the case detection rate is enormous. To achieve this task, the NTP has identified the need for collaboration between the public and private health sector providers.

In this context, we conducted research to develop and evaluate a Public-Private Partnership (PPP) model to involve Private Medical Practitioners (PMPs) in the NTP's urban TB control activities, and to measure to what extent the outcomes of this partnership affect access to and quality of TB care. The development and piloting of the PPP model took place in four selected research sites in Dhaka city during the period 2004 and 2008. Since 2008, this PPP model has been scaled up in two other cities - Chittagong and Sylhet, in addition to scaling up in other areas of Dhaka City. This paper reports the outcomes from this development, evaluation and scale up.

Methods

Considering the research objectives and intended outcome of a change in policy and practice, an operational research methodology was thought to be appropriate based on a set of criteria underpinning the broader scope of operations research.[16,17] This approach was employed to make the implementation process more participative and resource-effective, and to facilitate scale up. Specific techniques and approaches drawn from both quantitative and qualitative research methods were used to collect multiple kinds of data for the study.[18,19]

The study was set within the policy environment of a government-NGO collaboration, enabling participation of the Society for Empowerment, Education and Development (SEED) and three other NGOs – Bangladesh Rural Advancement Committee (BRAC), Progoti Samaj Kallyan Protisthan (PSKP) and Population Services Training Centre (PSTC), which were undertaking TB control activities jointly with the NTP.

Four areas of Dhaka City - Mirpur, Rampura, Dokkhinkhan, and Kamrangirchar - were selected as study sites. Selection was purposeful, based on where the selected partner NGOs were located and had a DOTS centre; and where PMPs were major providers of health services. These study sites generally represent the geographic catchment areas of the selected NGOs covering a population of nearly one million.

Within this partnership, SEED was the lead research partner; BRAC, PSKP and PSTC provided TB services (diagnosis, treatment and follow-up) through designated health centres, and the NTP provided overall policy guidelines and supported the organisation and management of the research activities. In Mirpur, PSKP provided TB services through two DOTS centres and PSTC had one DOTS centre in Rampura; whereas BRAC covered both Dokkhinkhan, and Kamrangirchar through one DOTS centre in each area. PMPs agreed to refer the TB suspects and patients to these designated DOTS centres following the NTP guidelines. A technical committee was formed with representation from the NTP, partner NGOs and PMPs to advise on the operational issues and to support the smooth running of the partnership. A local Project Coordinator coordinated the project activities.

We developed and implemented the PPP model in three phases:

- *Preparation phase*
  - Formation of a Technical Working Group Committee (TWGC)
  - Collection of pre-intervention baseline data
  - Identification of tasks/service components within the partnership, based on partners' diverse strengths.
- *Intervention phase*
  - Strengthening DOTS centres to provide the PPP service components
  - Orientation and training of PMPs on NTP guidelines/protocols
  - Adaptation of TB forms and registers to incorporate PPP components
  - Development of diagnostic, referral and treatment protocols and linkages
  - Development and organisation of Advocacy, Communication and Social Mobilisation (ACSM) initiatives involving all stakeholders
  - Monitoring and supervision of the partnership activities
  - Evaluation of pilot phase.
- *Scale up phase*
  - Identification and orientation of new partners

- Scale up.

To evaluate the PPP, we compared TB outcomes in the intervention and control (non-PPP) areas using service statistics from the NTP and the five NGO DOTS centres involved in this project. We also collected additional baseline data from the selected PMPs (see Zafar Ullah *et al* 2010 for details), and used in-depth interviews, focus group discussions (FGDs) and workshops to capture PMPs' and TB managers' insights of the process and outcomes of the study (Table 1).

Table 1: evaluation methods, participants, tools and focus

Phase	Method *(n)*	Participants *(n)*	Tools	Focus
Preparation	• Survey (1)	• PMPs (60)	• Semi-structured questionnaire	• Process
	• In-depth interviews (42)	• NTP managers (12) • NGO managers (6) • PMPs (24)	• Semi-structured questionnaire	• Process • Outcomes
	• FGDs (4)	• PMPs (24)	• FGD guidelines	• Process
Evaluation	• Workshops (2)	• PMPs (60: 30 per workshop)	• Agenda • Workshop guidelines	• Process • Outcomes
	• Follow-up interviews	• PMPs (12)	• Semi-structured questionnaire	• Process • Outcomes

Analysis of quantitative data was primarily by tabulation and graphs, and of qualitative data by thematic analysis.

Ethical approval wasobtained from University of Leeds, United Kingdom and also from relevant in-country institutions including the Directorate General of Health Services, and Bangladesh National TB Control Programme. All personal data has been anonymised and has remained confidential. A written informed consent was obtained from each participant of the in-depth interviews and FGDs.

Findings

Pilot Implementation (2004-2008)

At inception in 2004, the PPP included 97 PMPs but by the end of 2009 this had risen to 703. There was continuous enrolment of PMPs: although numbers fluctuated due to retirement and relocation, no PMPs chose to leave the PPP for any other reasons. The male:female ratio was 6:1, reflecting the ratio amongst urban private health service providers.

All 703 PMPs were trained to provide quality TB care. As PMPs made it clear they were unwilling to set aside more than two days for training, we tailor-made a two-day training module (based on a training needs assessment) that included technical aspects of TB care, operational aspects of the PPP, and TB record-keeping.

We used a participatory approach involving all stakeholders including PMPs to develop and revise the tools and forms. National recording and reporting forms and registers were revised to incorporate PPP elements, and to maintain records of the referrals from PMPs. These were field-tested and reviewed before use. We revised the NTP's TB treatment algorithm to

incorporate a flexible referral mechanism, which allowed the DOTS centres to refer TB suspects/patients back to their respective PMPs, if the PMPs wished. We also used a participatory approach to develop ACSM materials, which were made context-specific using baseline survey data. These advocacy activities had a major role in influencing policy makers to endorse the PPP model for country-wide scale-up.

PMPs initially expected financial support from the NTP as a partnership component. This expectation was discussed with all stakeholders and it was agreed that any financial incentive would jeopardise the partnership and could prove unsustainable in the long run. At the beginning of the partnership, PMPs also expressed a lack of confidence about the quality of public sector TB services, especially of diagnosis using sputum microscopy and the NTP-recommended treatment regimen. This study addressed these issues through joint development and monitoring of partnership activities and strong advocacy and communication campaigns.

Quantitative findings

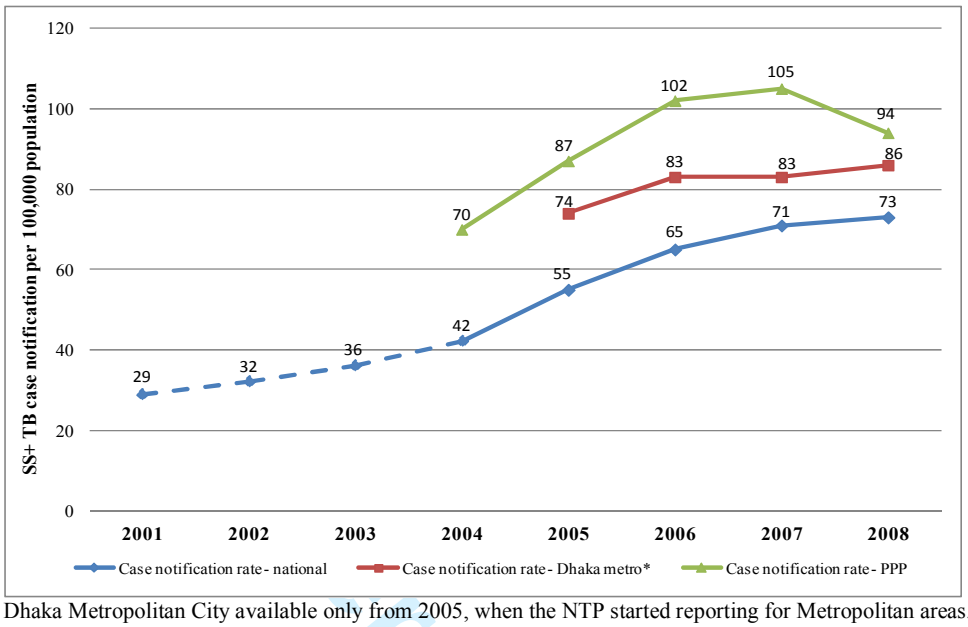
Within the project period (2004-2008), a total of 3,585 sputum smear positive (SS+) TB patients were registered in the five DOTS centres in the project areas; of these 647 were referred by PMPs. Numbers referred rose progressively over the period (Table 2).

Table 2: SS+ TB cases registered in the PPP areas

	2004	2005	2006	2007	2008	Total
Total SS+ TB cases in the PPP areas	533	673	800	830	749	**3585**
Total SS+ TB cases referred by PMPs	11	54	143	164	275	**647**
PMPs' contribution (%)	2	8	18	20	37	**18**

The case notification rate for new SS+ TB cases in the study areas increased steadily over the project period, and was consistently higher than the national average. By 2008 the rate in the study areas was 94/100,000 while the national rate was 73/100,000 (Figure 1). The study rate was also consistently higher than that in Dhaka Metropolitan City, which encloses the study sites (Figure 1).

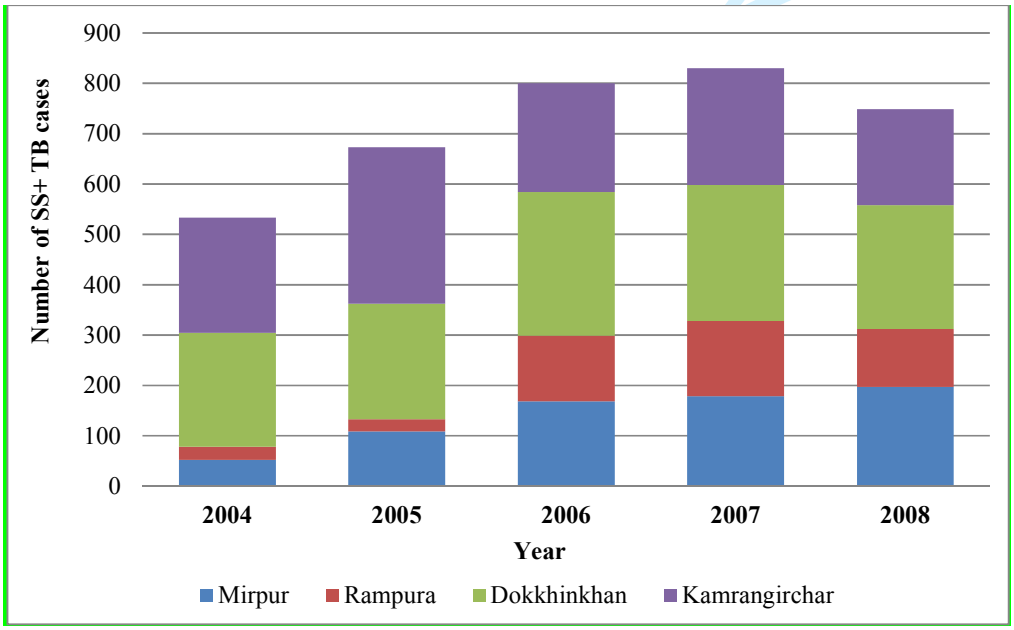
Figure 1: Case notification rates of new SS+ TB cases in Dhaka Metropolitan City and the PPP project areas*



*Data for Dhaka Metropolitan City available only from 2005, when the NTP started reporting for Metropolitan areas.

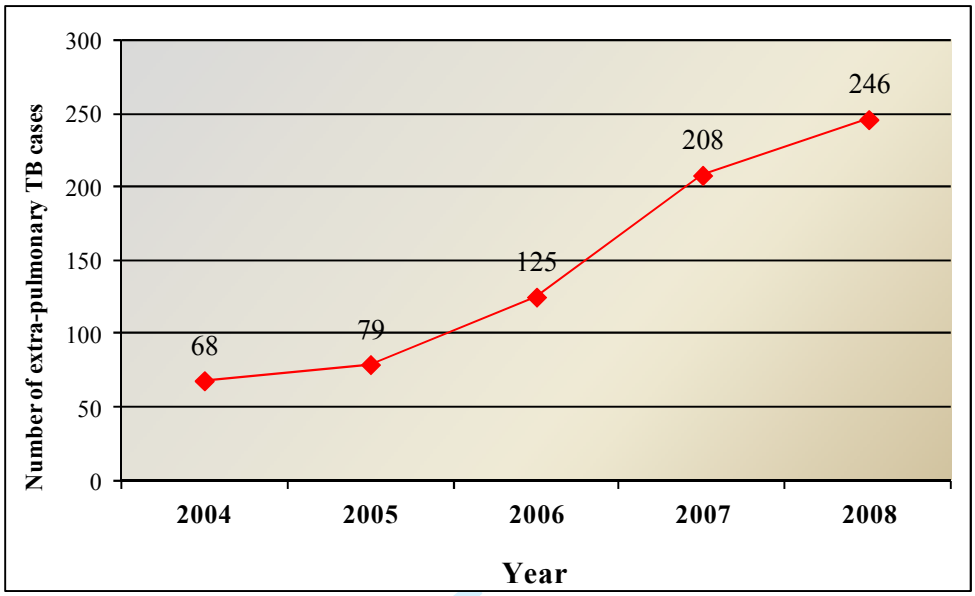
The presence of BRAC's extensive community network influenced the total number of new SS+ cases identified in the PPP areas (Figure 2). In Dokkhinkhan and Kamrangirchar areas, the number of new SS+ TB cases was higher than Mirpur and Rampura areas where BRAC's community health workers (known as *Shasthya Sebika)* work closely with the community to identify persons with chest complaints and advise them to go for a sputum test from a designated DOTS centre.

Figure 2: Area-wise case notification of SS+ TB in the PPP project areas: 2004 – 2008



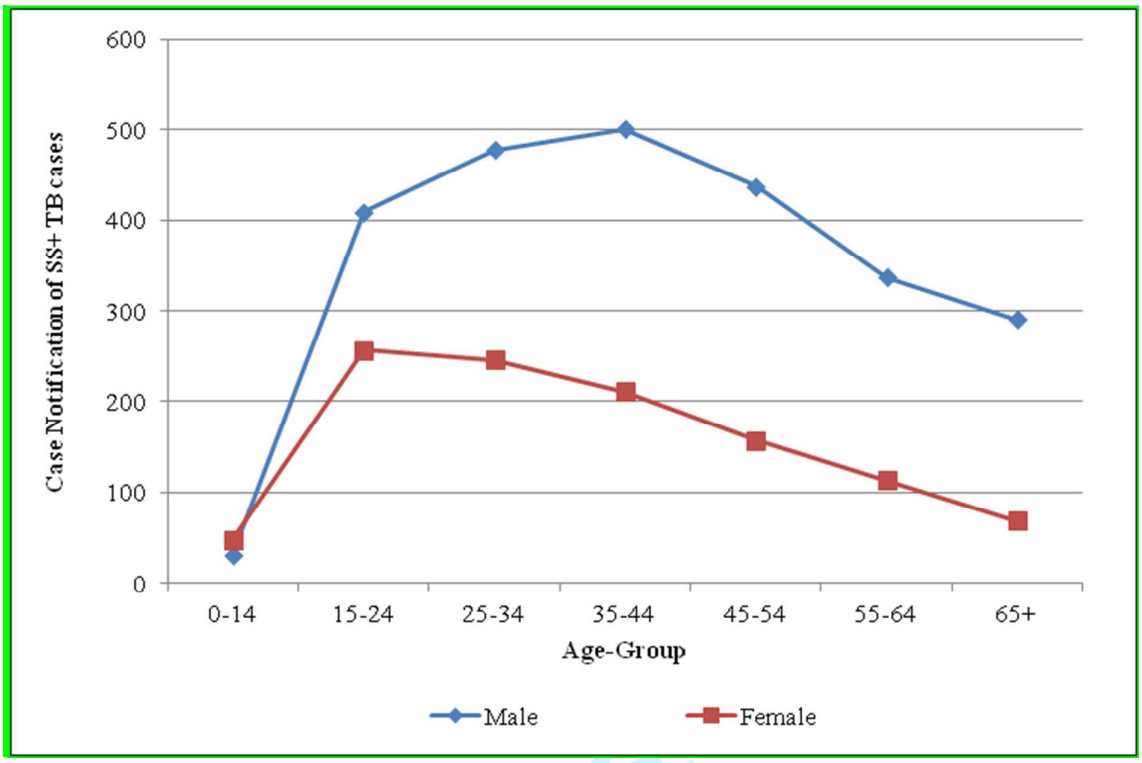
Another noticeable impact of the PPP was a large increase in numbers of cases of extra-pulmonary TB registered over time (Figure 3).

Figure 3: Numbers of extra-pulmonary TB cases registered in the PPP DOTS Centres



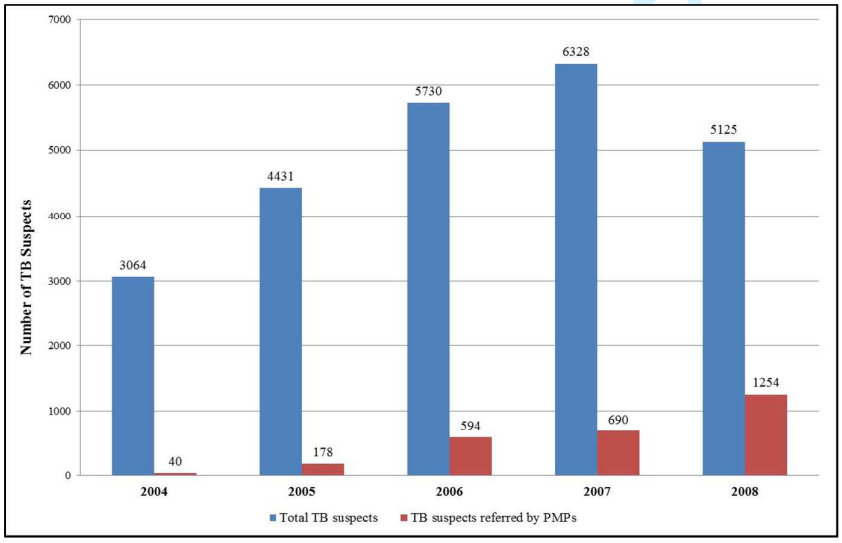
Almost three-quarters of the reported TB cases were between 15 and 54 years of age: most male cases were detected in the 35-44 age-group, while the peak in females was observed in the 15-24 year age-group. The number of male cases was always higher than females except in children of 0-14 age group. Only one-third of new SS+ TB cases were female. This analysis reflects the national distribution and trend observed by the NTP and other collaborating NGOs (Figure 4).

Figure 4: Distribution of new SS+ TB cases per age group and gender in the PPP project areas



PMPs made a significant contribution to the numbers of TB suspects examined in the designated labs in the four PPP areas: in total 2,756 of the 24,678 TB suspects examined were referred by PMPs, with a steady rise over the study period (Figure 5).

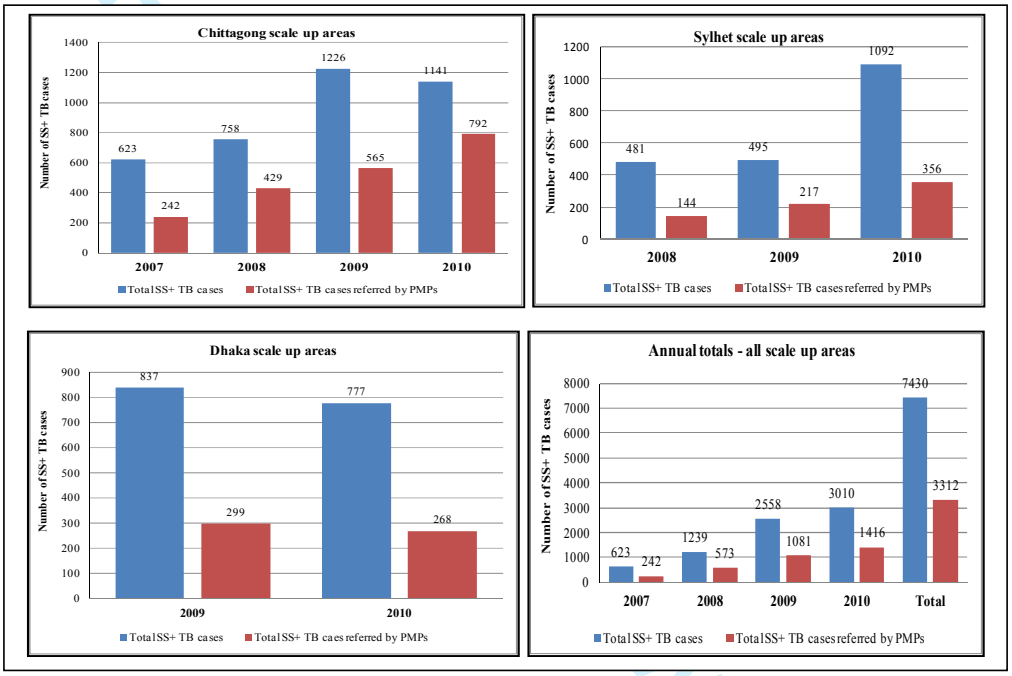
Figure 5: Numbers of TB suspects receiving sputum microscopy in the PPP project areas



Scaling up and getting research into policy and practice (GRIPP)

Based on the PPP pilot results, the NTP started implementing the PPP model in other cities – Chittagong (from 2007), Sylhet (2008), and other areas of Dhaka (2009) – covering more than 15 million people. In Chittagong, five NGO partners collaborated with the NTP to support the PPP; in Sylhet, BRAC was the only NGO service provider, but two medical college hospitals were also involved. In the scale-up areas, PMPs have made a substantial contribution to the NTP's effort to control TB in Bangladesh (Figure 6 and Table 3).

Figure 6: SS+TB patients registered in PPP scale up areas and PMP's contribution, 2007-2010



Overall impact of the PPP on TB Control

The involvement of PMPs substantially increased case finding of SS+ TB cases, a key TB control indicator. The partnership made a significant contribution in identifying SS+ TB cases: from the inception of the PPP in 2004 until 2010, 703 participating PMPs referred almost 19,000 TB suspects and 3,959 SS+ TB cases to the designated DOTS centres (Figure 7). Overall, almost 36% of all SS+ TB cases were attributable to involvement of the private sector providers (Table 3).

Figure 7: Overall PMP contribution to identifying TB suspects in all PPP areas, 2004-2010 (including scale up)

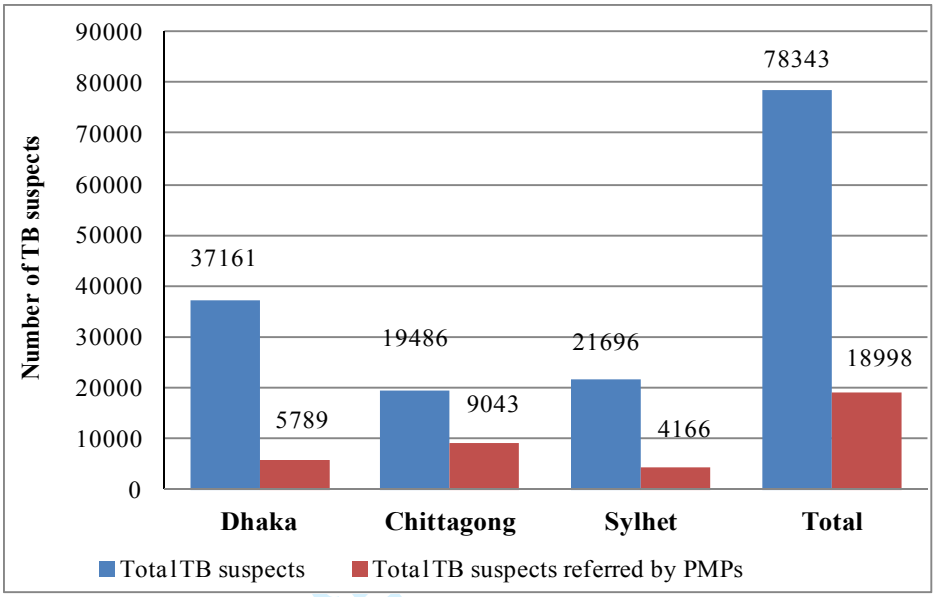


Table 3: Total SS+TB patients in all PPP areas and PMP's contribution, 2004-2010

	Dhaka	Chittagong	Sylhet	Total
Total SS+ TB cases in the PPP areas	5199	3748	2068	**11015**
Total SS+ TB cases referred by PMPs	1214	2028	717	**3959**
PMPs' contribution %	23	54	35	**36**

Qualitative findings

The qualitative evaluation revealed that the participatory approach of planning and designing the PPP including involvement of all stakeholders in the process of selecting service components, selecting partners, and monitoring of the PPP played a crucial part in securing commitment and ownership from all parties involved. Virtually all PMPs interviewed (96%) mentioned having a positive experience in regard to the monitoring and support mechanism of the project, which was key to the success of the project implementation, and paved the way for scale-up. Specifically, they valued the monthly field visit by the project field staff. In reply to the question: *"Do you own this project?"* a popular PMP spontaneously replied *"Oh, yes. No doubt about it"*. He went on to say *"I have been consulted throughout the planning process of the project, and later we have jointly implemented it. So, this is our project. I am part of it"*.

The quarterly review meetings were organised in rotation by the NTP and the partner NGOs either in the NTP's conference room or in one of the NGO's working locations. When asked about these arrangements, both the NTP and NGOs expressed their satisfaction and expressed their commitment to maintaining this practice in future collaborations.

All PMPs interviewed (n=24) said they had no problems using the referral and other forms. *"The [TB related] registers and referral forms are quite simple and user-friendly, and easy to maintain"* said a busy practitioner. The NTP managers said they were amazed by the fact that most PMPs were keeping records. The PMPs also liked the system of referral back to the referring practitioners, which preserved their professional and commercial interests. However, a few PMPs were unhappy as they felt they did not get sufficient feedback about the patients they had referred, even though feedback was regularly given to PMPs through monthly field visits and during quarterly review meetings.

The evaluation revealed major challenges in managing the PPP. It was difficult to bring such a heterogeneous group under one umbrella, especially in the early stages of the partnership process.

Another important finding was that the public, NGO and private sector providers showed strong commitment and willingness to work together to achieve the common goal of TB control, although PMPs were initially sceptical about the motive of the public sector regarding this partnership, and the public sector and NGOs were initially doubtful whether PMPs would sacrifice their time to participate in such partnerships.

In the absence of a regulatory mechanism, the PPP was primarily based on good relationships and dialogue. Both NTP and NGO respondents stated that they were sometimes overburdened with the extra work needed to implement the partnership activities. The NTP was hit harder than the partner NGOs, because there was a shortage of staff within the NTP management. Other key challenges encountered during implementation were to maintain the progress of the partnership, as it evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. One senior PMP said *"Initially I thought this partnership would fail because I had serious reservations about negative attitudes of government officials. They [government officials] don't know how to give respect to anybody other than their bosses. But after getting the chance to work with the NTP, I have now changed my mind. I have found the government officials now behave much better than they used to do in the past".*

Discussion and conclusion

The PPP model was highly effective in improving access to and quality of TB care in urban settings, as evidenced by a steady increase in case notification since implementation of the partnership, exceeding internationally agreed targets, and consistently maintaining much higher rates than the national average.

Systematic implementation of the PPP led to greater and effective involvement of PMPs, resulting in increased access to quality TB care. However, needs-based training is necessary for PMPs to enhance their knowledge on the NTP guidelines in regard to appropriate diagnosis, treatment, and follow-up to guarantee the continuity and quality of TB care.

The tools, protocols and ACSM materials proved vital to facilitating the partnership. The lessons learned from this partnership formed the basis of the National PPM (Public-Private Mix) guidelines. The revised tools and guidelines considerably improved the quality of TB reporting, thus strengthening the health information available. The revised protocol for referrals gave PMPs confidence that they would not lose their patients, which greatly increased their motivation to remain in the partnership.

The key challenges encountered during implementation were to maintain the momentum as the partnership evolved, and to ensure joint ownership of decisions and collective responsibility for the direction and activities of the partnership. The NTP's and other partners' commitment and nurturing of an atmosphere where all stakeholders could feel involved in the partnership were critical to overcoming these challenges.

It was possible to bring the public, NGOs and private sector providers together to work towards achieving a common public health goal despite perceived barriers between public and private sector providers, initial scepticism about forming the partnership, and challenges during implementation of the PPP. The participatory development of the partnership and maintaining close linkages with the PMPs helped them to gain confidence and trust over the public sector services, which in turn facilitated the development of a close relationship with the NTP and NGO partners. However, in order to develop and sustain such a partnership, roles and responsibilities of participating agencies and individuals must be defined. These findings are consistent with the outcomes of other much smaller operational research projects implemented elsewhere.[15,20–25]

The selected study sites were drawn from urban DOTS areas in Bangladesh and the research was deliberately embedded within the NTP programme activities. The PPP service components were aligned with the NTP guidelines and were implemented through the NTP/NGO's designated DOTS centres. The health system elements, particularly the type of health facilities, composition of health staff, and organisation of the TB control activities through government-NGO collaboration were similar in the study areas and in other urban areas of Bangladesh. Moreover, the type and characteristics of urban health care provided by private sector providers follow a similar pattern in all urban areas of the country. Therefore, the PPP can be scaled up in other urban DOTS areas providing that human and financial resources are provided for the partnership activities.

In summary, this study demonstrated that TB control outcomes could be achieved by combining the diverse strengths and advantages of the public and private sectors, NGOs and a group of selected PMPs. High rates of case detection were attained without involving all private practitioners in the area, thus making the PPP technically attractive to national programmes in other countries in terms of feasibility of implementation and wider scale up.

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Conflicts of interest: none declared.

Authors contributions: ZU conceived and designed the study, led the data collection and analysis, and preparation of the manuscript; RH participated in the data analysis and in the preparation of the manuscript; AH participated in data collection and analysis; SA

coordinated the study implementation and data collection; AI participated in data collection; JNN participated in the design of the study, advised on data collection and analysis and participated in the preparation of the manuscript.

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Title

Involving the Private Medical Sector in TB Control in Bangladesh: a mixed method study

Article Focus

- To assess the effectiveness of a Public-Private Partnership (PPP) model to involve private medical sector in TB control
- To ascertain whether scaling up of the PPP model approach to engage PMPs is feasible and has an effect on case notification rate.

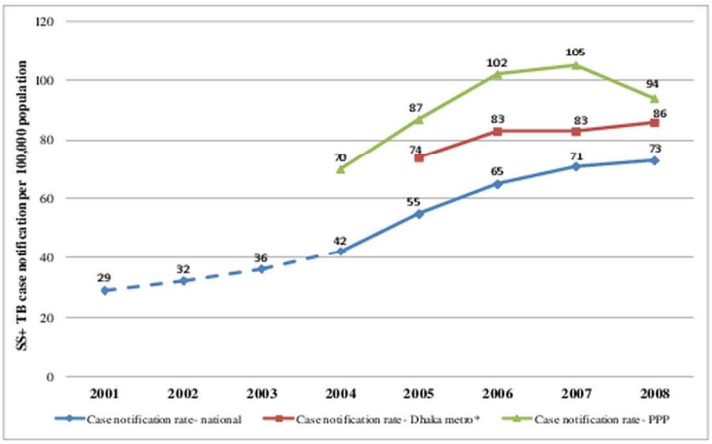
Key messages

- This study demonstrated the feasibility and effectiveness of providing TB care through involving private sector health care providers
- The PPP substantially improved access to and quality of TB care in urban settings, as evidenced by increased TB case notification rate and increased treatment success rate.
- Our results show that it is feasible to scale up a public-private partnership within the national TB control programme.

Strengths and Limitations

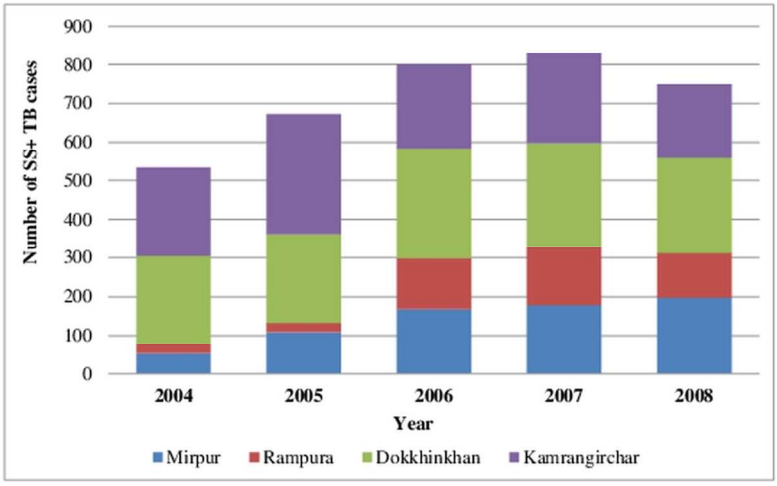
- As TB continues to be a major threat to public health in low- and middle-income countries, and is re-emerging as an issue for concern in high-income countries, the findings of this study provide evidence for national and international scale-up of such partnerships
- By using both quantitative and qualitative methods, this study has permitted more in-depth analysis of the effectiveness of this PPP model
- From the beginning, the study was guided by a vision of nation-wide scale up.

Figure 1: Case notification rates of new SS+ TB cases in Dhaka Metropolitan City* and the PPP project areas



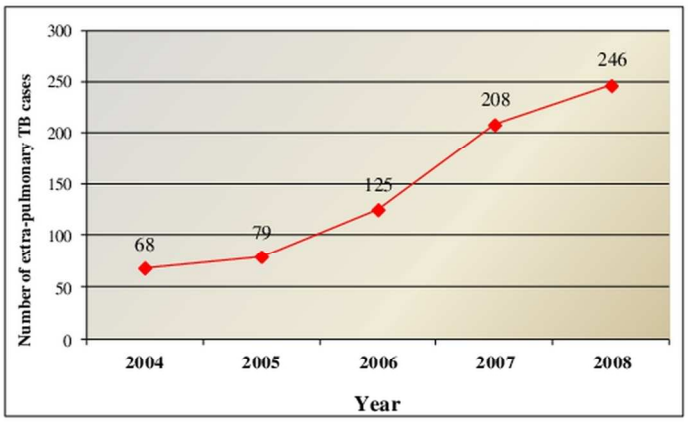
129x90mm (300 x 300 DPI)

Figure 2: Area-wise case notification of SS+ TB in the PPP project areas: 2004 – 2008



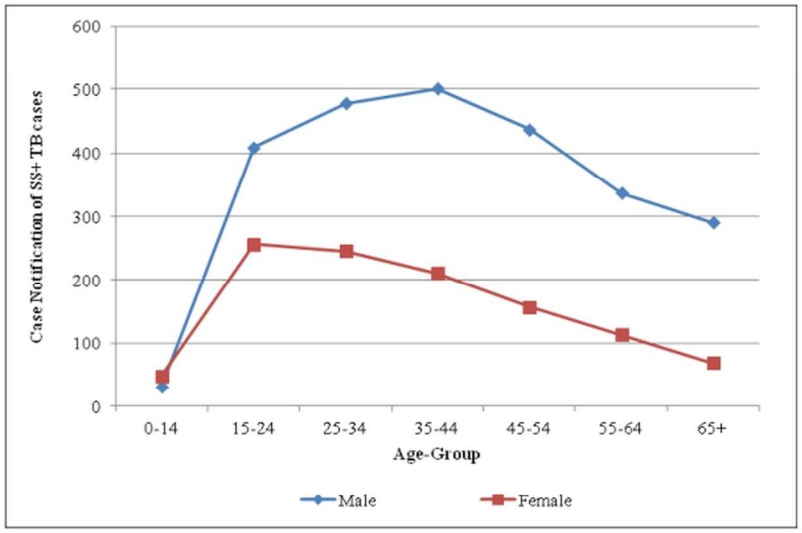
116x90mm (300 x 300 DPI)

Figure 3: Numbers of extra-pulmonary TB cases registered in the PPP DOTS Centres



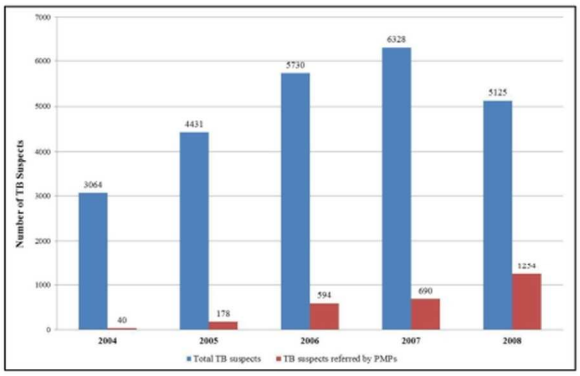
122x90mm (300 x 300 DPI)

Figure 4: Distribution of new SS+ TB cases per age group and gender in the PPP project areas



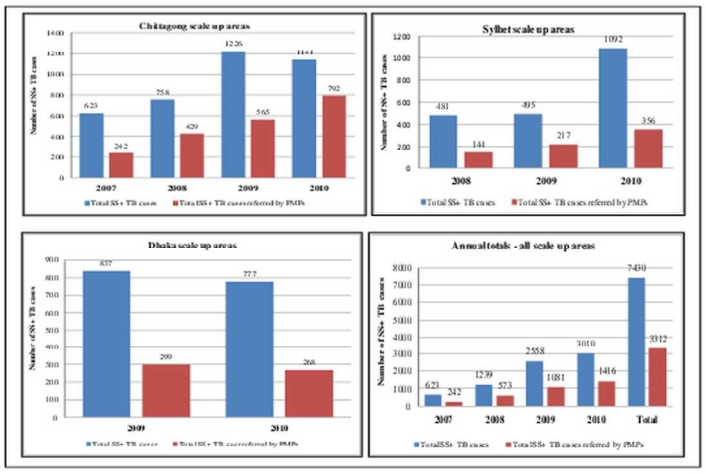
106x90mm (300 x 300 DPI)

Figure 5: Numbers of TB suspects receiving sputum microscopy in the PPP project areas



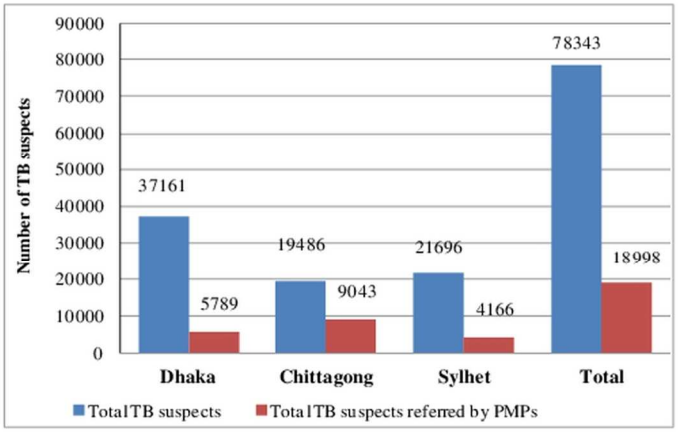
123x90mm (300 x 300 DPI)

Figure 6: SS+ TB patients *registered in PPP scale up areas and PMP's contribution, 2007-2010*



114x90mm (300 x 300 DPI)

Figure 7: Overall PMP contribution to identifying TB suspects in all PPP areas, 2004-2010 (including scale up)



122x90mm (300 x 300 DPI)