

Turning liabilities into resources: informal village doctors and tuberculosis control in Bangladesh

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Abstract In 1998, the Damien Foundation Bangladesh invited semi-qualified, private “gram dakter” (Bangla for “village doctors”) to participate in tuberculosis (TB) programmes in a population of 26 million people in rural Bangladesh. The organization trained 12 525 village doctors to not only refer suspected TB cases for free diagnosis but also to provide directly observed treatment (DOT) free of charge. Source of referral and place of DOT was recorded as part of the standardized TB recording and reporting system, which enabled us to quantify the contribution of village doctors to case detection rates and also allowed disaggregated cohort analysis of treatment outcome. During 2002 and 2003, 11% of all TB cases with positive sputum smears in the study area had been referred by village doctors; the rate of positive tests in patients referred by village doctors was 14.4%. 18 792 patients received DOT from village doctors, accounting for between 20% and 45% of patients on treatment during the 1998–2003 period. The treatment success rate was about 90% throughout the period. Urine samples taken during random checks of treatment compliance were positive for isoniazid in 98% of patients treated by village doctors. Within the framework of Public–Private Mix DOTS, services provided by semi-qualified private health care providers are a feasible and effective way to improve access to affordable high quality TB treatment in poor rural populations. The large informal health workforce that exists in resource poor countries can be used to achieve public health goals. Involvement of village doctors in TB control has now become national policy in Bangladesh.

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Introduction

Bangladesh ranks fifth among the 22 highest tuberculosis-burden countries in the world with an estimated tuberculosis (TB) incidence rate of 246 cases per 100 000 population.¹ The country adopted the DOTS strategy for TB control in 1993. Since then, the National TB Programme has expanded to cover almost the entire country, mainly through two large nongovernmental organizations (NGOs): the Damien Foundation Bangladesh, a Belgian NGO covers 26 million people and the Bangladesh Rural Advancement Committee (BRAC) covers 82 million. Global targets set by the World Health Assembly for 2005 include detection of at least 70% of infectious TB cases and successfully treat over 85% of these. Despite improvements in the TB services offered by the National TB Programme and collaborating NGOs, the smear-positive case detection rate

in Bangladesh was only 33% in 2003 and the treatment success rate was also slightly lower than expected — 84% in 2002.¹

Like most countries in south Asia, Bangladesh has a large private health sector that exists in both rural and urban areas. This sector comprises formal and informal individual private practitioners as well as private commercial and voluntary institutions. Estimates show that in Bangladesh, 50% of doctors, 42% of nurses, 65% of paramedics and 100% of informal (non-qualified and unregistered) “gram dakter” (Bangla for “village doctor”) are in the private sector.² Gram dakter are by far the largest group of health-care providers. This group is made up of semi-qualified or unqualified allopathic practitioners, drug vendors and practitioners of non-allopathic or mixed systems of medicine. Because village doctors are usually close by and

provide inexpensive services, they are the most commonly used care providers in rural areas, especially among the poor.^{3,4} And with more than 75% of the population of Bangladesh living in rural areas, village doctors provide most of the outpatient health care in the country as a whole. However, the poor quality of their services, delays in TB diagnosis and irrational use of drugs have all impeded TB control.

The Damien Foundation recognized the potential of these “non-doctors”, who are well accepted by people in rural areas, to improve access to quality TB care in villages. Thus, the Damien Foundation launched a special initiative to make use of village doctors in TB control. Here, we report how this initiative turned village doctors, a previous liability for TB control, into a resource that contributed substantially to DOTS implementation.

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A programme for TB diagnosis and treatment

Setting

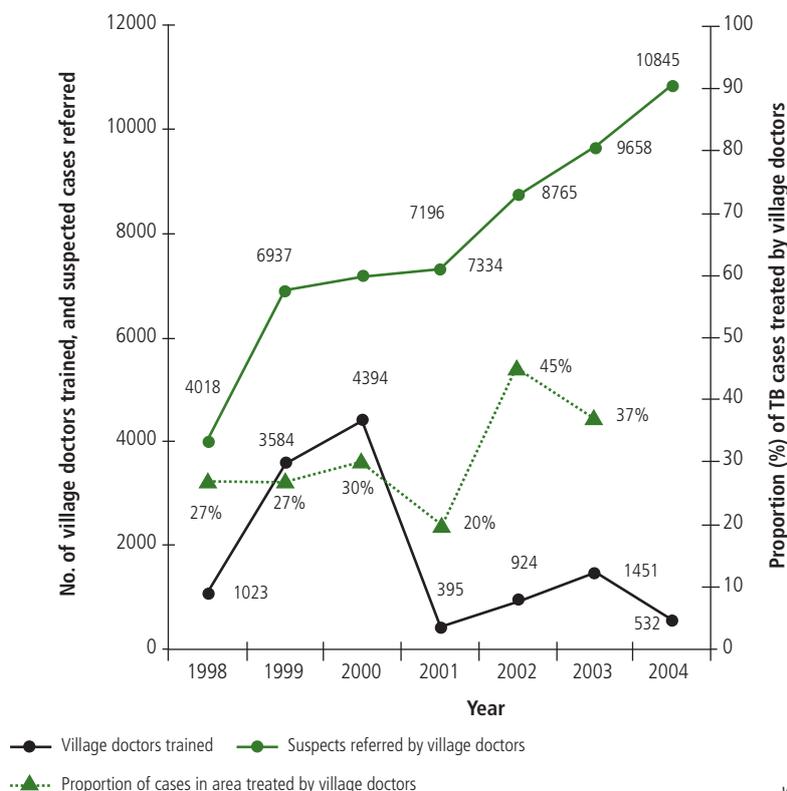
The Damien Foundation has collaborated with the National TB Programme of Bangladesh since 1994 in implementing DOTS in a population of about 26 million people. The allocated area is divided into four project areas: each has a director assisted by two medical doctors, one field coordinator and several TB supervisors. Every supervisor looks after a population of 750 000–1 000 000 with the help of about nine TB health workers. TB drugs and laboratory supplies are provided by the National TB programme.

Enlisting village doctors

There is at least one village doctor for every 2000 people and they are often first contact for patients with symptoms of TB. That they live within and have a rapport with communities makes these health workers suitable for providing directly observed treatment (DOT) close to patients' places of residence.

To engage village doctors, we compiled a list of all these workers using information obtained from the village doctors' association and from drug companies. We sent invitations to batches of 30–40 village doctors, requesting their participation at a one-day orientation and training course on TB. The training took place in the government health centres and was facilitated jointly by the centres' health and family planning officer and the NGO staff. The intention was to drive home the importance of the project and the government's support for it. All important aspects of the TB programme were covered during the training course: the problem of TB in their communities and the organization of TB control services; symptoms of TB and ways to identify potential TB cases among outpatients; the importance of detecting all cases and detecting them early; the significance of appropriate, adequate and regular treatment of all patients under direct supervision; and the value of maintaining proper records. At the end of the training, we enlisted those village doctors who were willing to refer TB suspects to the microscopy centres in their respective areas, carry out DOT of patients living in the neighbourhood, maintain drug stores and records, and have regular supervision (including surprise checks). The village doctors

Fig. 1. Number of village doctors trained, number of suspected tuberculosis (TB) cases referred by village doctors and proportion of patients in the area who received treatment by a village doctor: 1998–2004



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were guaranteed the necessary supply of sputum cups, drugs and treatment cards. They were not offered any direct financial incentives for their contribution. However, all trainee village doctors had their travel costs to the training day paid, were provided with lunch on the training day and were paid a small per diem, all amounting to a total of US\$ 5 per trainee. Village doctors who agreed to participate in the TB programme were also offered a one-day refresher training course once every year.

Task mix for DOTS

When they suspect TB, the village doctors provide two cups to the patient, one for an immediate "spot" sputum sample and one for a sample to be taken the next morning. The patients are then referred to the closest microscopy centre where a third spot sample is produced and all three samples are given for microscopy. Results are available on the same day. When a patient is diagnosed as having TB, a treatment card is prepared and the TB health worker carries a copy of the treatment card and the drugs to the village doctor. Each participating village doctor is supplied with a plastic box for

preserving the drugs properly and a pot to store drinking water to enable patients swallow their medicines in the clinic. Patients visit their village doctor daily to take the drugs at a time of their own convenience. If a patient fails to show up, the village doctor tries to make a home visit, enquires about the reason for their absence and gives drugs to the patient. Defaulters are reported to the relevant TB health worker. If a patient has any adverse drug reaction, the village doctor refers the patient back to the health centre for advice.

Supervision and monitoring

Participating village doctors are closely supervised by TB health workers (NGO staff), who make at least three visits during the course of treatment to each village doctor. The health worker interviews patients in their homes or the clinic and asks the village doctor about their TB-related work. Patient cards and TB drug stocks are checked and any discrepancies are identified and addressed. The TB health workers also encourage the village doctor and try to motivate them to keep up their good work. For the first three years of the project, TB health workers

made unannounced and random visits for collection of urine to be tested for the presence of isoniazid in the project laboratory. These checks were undertaken to ensure that TB drugs were being administered and taken regularly.

Data collection and analysis

Data were collected through routine recording and reporting practices, in accordance with National TB Programme and WHO guidelines.⁵ The patients' source of referral and place of treatment were recorded in the TB laboratory register and the TB patient register, respectively, to allow the number of suspected TB cases and detected cases referred by each village doctor to be measured, as well as to allow performance of disaggregated cohort analysis of treatment outcomes.⁵

Findings

Since 1998, 12 525 village doctors have been trained. Their contribution to referral of suspected TB cases and DOT of TB patients in the community is presented in Fig. 1. In 2003, 9658 suspected TB cases (10% of all suspected cases in the project area) were referred for sputum microscopy by village doctors.

The percentage of suspected TB patients referred by village doctors who were sputum smear-positive was 14.4% in 2002–03, which was significantly higher than the rate in suspected TB cases referred by other trained health staff (10.8%; $P < 0.0001$) (Table 1). Of the 24 201 sputum smear-positive cases detected in the area in 2002 and 2003, 2648 (11%) had been referred by village doctors (Table 1).

DOT was provided by village doctors for between 20% and 45% of patients on treatment in the area between 1998 and 2003. A total of 18 792 patients received DOT from village doctors

Table 1. Rates of positive sputum smears among suspected TB cases: referrals from village doctors versus other trained health staff

	Suspected cases referred (n)	Sputum smear-positive (n)	P-value ^a
Village doctors	18 423	2 648 (14.4) ^b	
Other trained staff	199 171	21 553 (10.8)	<0.0001

^a χ^2 test for difference between percentage of suspected TB cases with positive smear.

^b Figures in parentheses are percentage of sputum smear-positive suspected cases.

in 1998–2003. Treatment success rate was about 90% (range 89–93%) throughout this period. Urine samples for isoniazid were positive in 98% of the tested patients treated by village doctors (Table 2).

Discussion

Private sector involvement in TB control has received considerable attention in recent years.⁶ WHO has been promoting and assisting countries to initiate and scale up public–private mix for DOTS expansion (PPM DO TS). Their aim is to effectively link the National TB Programme and all public and private health care providers presently out of the realm of national TB control efforts.⁷ However, much of the information on approaches to involve private care providers and their evaluations is focused on urban areas and reports on projects of modest size and short duration.^{8–13} While formal private health care providers are indeed concentrated in cities, rural areas also have a significant and distinct private sector. Traditional healers in Africa or non-qualified or semi-qualified practitioners in Asia, like the village doctors we describe here, are often the preferred first-level health-care providers of people living in rural areas.^{3,4,14–16} Their effective involvement in DOTS implementation has not yet been documented. Our report of this large, rural PPM DOTS programme

in Bangladesh highlights the need, the feasibility and the use of extending PPM DOTS to rural areas.

Over three-quarters of the population in Bangladesh lives in rural areas.² Despite the availability of services offered by the public sector and NGOs, many people do seek help from village doctors for their common health problems.^{3,4} Village doctors are popular because they live in and are a part of the community, and are available almost always in the time of need. Village doctors offer advice that is in line with the cultural beliefs of their patients and, at the same time, provide drugs used in modern medicine. More importantly, their services are affordable even to the poor. A recent World Bank report² on Bangladesh has drawn attention to the widespread use of village doctors, quoting data from various studies that show that between 49% and 90% of all outpatient visits are to village doctors.

However, there have been serious concerns about the quality of services provided by village doctors. For example, Ashraff et al.¹⁷ have noted inappropriate use of many modern medicines by village doctors in Bangladesh. Bhuiya¹⁸ reports similar findings. Against this background, the success achieved by this TB programme in building on the strengths and addressing weaknesses of village doctors is noteworthy.

The contribution of the village doctors to this large, well performing TB project was substantial: referral of 10% of all suspected cases, DOT of almost half of over 12 000 patients put on treatment each year, and a remarkably high cure rate of about 90%; and all this at a very modest cost. Significantly, no financial incentives were used. What, then, motivated the village doctors to do all that they did, do so with sincerity and continue to do it for years? The NGO staff, who work closely with the village doctors, often reflect on this issue. They offer several factors that might motivate

Table 2. Result of random checking by DOT provider for presence of isoniazid in urine of patients receiving DOT

DOT provider	Samples tested (n)	Isoniazid-positive samples (n)	95% confidence interval (%)
NGO ^a health centre staff	624	618 (99.0) ^b	98.0–99.6
Government sub-centre	392	382 (97.4)	95.4–98.7
Government field staff	425	414 (97.3)	95.4–98.6
NGO hospital staff	557	554 (99.5)	98.5–99.7
Village doctors	1390	1359 (97.7)	96.8–98.4

^a NGO = nongovernmental organization.

^b Figures in parentheses are percentages.

the village doctors to participate effectively in the TB programme: recognition of the village doctor by a reputable organization, free access to training and knowledge updates, the confidence shown in them by giving them TB drugs, the subsequent social respect and credibility they gain in the community because of this and the increase in their clientele and business as a result. Perhaps village doctors consider these gains more important than some small financial compensation. The experience of PPM DOTS projects elsewhere is not too different from that in Bangladesh, especially in the projects that engaged first-level general health care providers. The providers' direct loss of income is negligible since TB cases form a tiny proportion of their overall practice.¹¹⁻¹³ However, a deeper understanding of factors that motivate private care providers to collaborate with public health programmes is important and should be studied in a range of settings and among different types of providers.

If village doctors are often the first option for health care for most rural people in Bangladesh, why is their contribution to the referral of suspected cases only around 10%? This finding may be due to some of the parallel activities of the NGO. The NGO has been working in the project areas for a very long time and is accepted and respected by the community for its work. As a part of its DOTS programme, the NGO also undertakes targeted health education to encourage people to report when they develop symptoms of TB. Another relevant activity undertaken is to use cured TB patients to educate people and identify suspected cases of TB for sputum examination. An analysis of referral sources showed that the contribution of cured patients was greater

than that of village doctors, varying from 25% to 31% between project areas. Irrespective of their relatively small contribution to case detection, the use of village doctors in community-based treatment supervision on such a large scale is noteworthy.

What lessons does this programme of community-based non-doctors offer for TB control globally? Although successful, even in scaled-up proportions, questions may be raised about wider replication of this innovative programme. Does the use of unqualified doctors amount to promotion of quackery? Would the task of supervising hundreds of treatment observers become unmanageable?

In this project, when the number of participating village doctors increased substantially, they were all encouraged to refer suspected cases of TB. However, the number of doctors supervising drug treatment was restricted. Transparent application of a few criteria such as location of the clinic, facilities available in the clinic, and willingness of the village doctor to supervise all eligible TB patients in the neighbourhood allowed a limited number of centres to be selected for delivery of DOT. The use of non-qualified practitioners for non-medical tasks that could be undertaken by any informed lay person should not be equated with quackery. Nevertheless, such arrangements may vary from context to context and local managers should be best placed to identify local solutions and implement them. BRAC successfully uses voluntary community health workers in its programmes,¹⁹ which shows that there are several viable approaches for expanding DOTS in rural areas.

Our study did not compare the effectiveness of private village doctors with that of other community health

providers; instead, we assessed the feasibility and quality of village doctors' involvement, as one of several possible modes of DOTS implementation. Just as they were used for DOTS implementation, the private village doctors could well be involved in other health-care programmes. Importantly, therefore, this study also provides insights into addressing the issue of human resources for health in poor countries through a combination of local, national and international ingredients in proper proportions. The final proof of the real success of this programme, however, was that the National TB Programme of Bangladesh has recently incorporated the involvement of village doctors into national policy to improve TB case detection and treatment success. ■

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Résumé

Médecine informelle et lutte contre la tuberculose au Bangladesh ou comment transformer en ressources des éléments considérés comme des handicaps

En 1998, la Fondation Damien au Bangladesh a invité des «gram dakter» (terme local désignant les «médecins de village») partiellement qualifiés et privés à participer aux programmes de lutte contre la tuberculose (TB) dont bénéficient 26 millions d'habitants des zones rurales du Bangladesh. Cette organisation a formé 12 525 médecins de village non seulement à orienter les cas suspects de TB vers un diagnostic gratuit, mais également à délivrer un traitement sous observation directe (DOT) gratuit également. La source de la notification et le lieu d'administration du traitement DOT ont été enregistrés dans le cadre du système

standardisé d'enregistrement et de notification des cas de TB, ce qui a permis de quantifier la contribution en pourcentage des médecins de village à la détection des cas et de réaliser une analyse désagrégée des résultats du traitement au sein de la cohorte. De 2002 à 2003, les médecins de village avaient notifié 11 % de l'ensemble des cas de TB à frottis positif recensés dans la zone étudiée et dirigé 14,4 % des patients présentant un test positif vers un spécialiste. Ces médecins avaient également délivré un traitement DOT à 18 792 malades, soit une proportion de 20 à 45 % des malades sous traitement pendant la période

1998-2003. Le taux de succès du traitement était de 90 % pour cette même période. Des échantillons d'urine prélevés au hasard pour contrôler l'observance du traitement étaient positifs pour l'isoniazide chez 98 % des malades traités par des médecins de village. Dans le cadre des programmes DOTS mixtes public/privé, les services fournis par les dispensateurs de soins de santé partiellement qualifiés et privés offrent aux populations rurales

démunies un moyen efficace pour accéder plus facilement à un traitement antituberculeux de qualité. Il est donc possible de faire appel aux importants moyens humains de la médecine informelle dans les pays pauvres pour réaliser les objectifs de santé publique. La participation des médecins de village à la lutte contre la TB fait maintenant partie de la politique nationale du Bangladesh.

Resumen

Aprovechar al máximo los recursos: médicos de aldea informales y control de la tuberculosis en Bangladesh

En 1998, la Fundación Damien de Bangladesh invitó a «gram dakter» («médicos de aldea» en bangla) privados semicualificados a participar en programas de tuberculosis para una población de 26 millones de personas del Bangladesh rural. La organización capacitó a 12 525 médicos de aldea no sólo para derivar los casos sospechosos de tuberculosis a servicios de diagnóstico gratuito, sino también para proporcionar gratuitamente tratamiento bajo observación directa (DOT). La fuente de derivación y el lugar de administración del DOT se registraron como parte del sistema normalizado de registro y notificación de la tuberculosis, lo que nos permitió cuantificar la contribución de los médicos de aldea a las tasas de detección de casos y, además, efectuar análisis de cohortes desglosados de los resultados terapéuticos. Durante 2002 y 2003, el 11% de todos los casos de tuberculosis con baciloscopia de esputo positiva en el área de estudio fueron derivados por médicos de aldea; la tasa de pruebas positivas entre los pacientes derivados por esos médicos fue del 14,4%.

18 792 pacientes recibieron DOT de los médicos de aldea, lo que supone un 20% - 45% de los pacientes sometidos a tratamiento durante 1998 - 2003. La tasa de éxito terapéutico fue de alrededor del 90% durante el periodo considerado. Las muestras de orina obtenidas en los controles aleatorios del cumplimiento del tratamiento fueron positivas a la isoniazida en el 98% de los pacientes tratados por los médicos de aldea. En el marco de la DOTS publicoprivada, los servicios ofrecidos por dispensadores de atención sanitaria privados semicualificados son una opción viable y eficaz para mejorar el acceso a un tratamiento antituberculoso asequible y de calidad en las poblaciones rurales pobres. La amplia fuerza laboral sanitaria informal existente en los países con pocos recursos puede ser aprovechada para alcanzar metas de salud pública. La participación de médicos de aldea en la lucha contra la tuberculosis ha pasado a formar parte de la política nacional en Bangladesh.

ملخص

تحويل المسؤوليات إلى مصادر: أطباء القرى غير الرسميين ومكافحة السل في بنغلاديش

بينما كان معدل إيجابية الاختبارات لدى المرضى المحوّلين من أطباء القرى 14.4%. وقد قدّم أطباء القرى المعالجة القصيرة الأمد تحت الإشراف المباشر ل 18 792 مريضاً، وهذا ما يعادل 20 45% من مجمل المرضى المعالجين خلال الفترة 1999 - 2003. وكان معدل نجاح المعالجة 90% خلال كامل فترة المعالجة. وكانت عينات البول التي تؤخذ للتحقق من الامتثال للمعالجة إيجابية للإيريزونيازيد في 98% من المرضى الذين عالجهم أطباء القرى. إن الخدمات التي يقدّمها القائمون على الرعاية الصحية من غير المستكملين للتأهيل مُجدية وفعّالة لتحسين إتاحة المعالجة الميسورة التكلفة والعالية الجودة للسل للسكان الفقراء الريفيين. ويمكن الاستفادة من القوى العاملة الهائلة في البلدان المحدودة الموارد والفقيرة لبلوغ الأهداف الصحية. إن إشراك أطباء القرى في مكافحة السل أصبح اليوم من السياسات الوطنية في بنغلاديش.

في عام ثمانية وتسعين وتسعمائة وألف دعت مؤسسة داميان في بنغلاديش الأطباء غير الرسميين الذين يُطلق عليهم باللغة المحلية ((غراما دكتور))، وهو ما يقابل عبارة أطباء القرى، للمساهمة في برامج مكافحة السل في منطقة ريفية يبلغ عدد سكانها 26 مليون نسمة في بنغلاديش. ودربت المنظمة 12 522 من هؤلاء الأطباء حتى لا يكتفوا بإحالة الحالات المشتبهة بالسل إلى مرافق التشخيص المجانية، بل يقدموا لها المعالجة القصيرة الأمد تحت الإشراف المباشر مجاناً. وقد تم تسجيل مصادر الإحالة ومواقع المعالجة القصيرة الأمد تحت الإشراف المباشر ضمن نظام معياري للإبلاغ وتسجيل حالات السل، وهو ما مكّننا من معرفة التقدير الكمي لمساهمة أطباء القرى في معدل كشف الحالات، وسمح لنا بتحليل تفصيلي للأثر ونتائج معالجتهم. ففي عامي 2002 و2003، أُحيل 11% من مجمل حالات السل الإيجابي للطلاخة في المنطقة التي أُجريت فيها الدراسة إلى أطباء القرى،

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