

## CASES IN GLOBAL HEALTH DELIVERY

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# Tuberculosis in Dhaka: BRAC's Urban TB Program

*This case is a sequel to "BRAC's Tuberculosis Program: Pioneering DOTS Treatment for TB in Rural Bangladesh."*

At a meeting between the Bangladesh National Tuberculosis Programme (NTP) and its partner non-governmental organizations (NGOs) in December 2007, Dr. Akramul (Akram) Islam and Dr. Mahfuza Rifat presented their most recent data on BRAC's urban tuberculosis (TB) control programs in Bangladesh. While BRAC's rural TB programs covered over 80 million people overall, its TB program in Dhaka was facing significant challenges. There BRAC was experimenting with new partnerships and treatment models to improve its service penetration. The partner NGOs felt strained by the lack of recent surveillance data and availability of drug sensitivity testing. Akram wondered how BRAC could be most effective in combating TB in the crowded, urban service environment.

## Overview of Dhaka

In the mid-1950s Dhaka was a relatively small city with a population of 400,000. It, along with other Bangladeshi cities, boomed following Bangladesh's independence, rapidly reaching a population of 6 million in 1974. Many of Dhaka's poor had migrated from districts in Bangladesh that had been affected by river bank erosion or where agricultural production had not kept pace with the growing population. Most migrants came to Dhaka seeking employment. About a third of workers arrived to Dhaka with information, usually from family or friends in Dhaka, about a job, and 60% found work within a week of arrival.<sup>1</sup> The unemployment rate among the poor in Dhaka was estimated at 20%.<sup>2</sup>

Dhaka's continued rapid expansion of industries and investments led to unplanned population growth and settlement. In 1998 Dhaka's growth rate was 4.2%.<sup>3</sup> Utility services were unable to match the needs of *Maria May, Richard Cash, and Joseph Rhatigan prepared this case for the purposes of classroom discussion rather than to illustrate either effective or ineffective health care delivery practice.*

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the growing population, and power shortages were common. In 2001, 75% of households did not have piped sewage, and 33% had no running water.<sup>3</sup> The city's low-lying position and proximity to water also made it vulnerable to flooding, contributing to the city's waste management and sanitation challenges.

"Old Dhaka," the original port city, was situated on the northern border of the Buriganga River, with a slum settlement expanding rapidly to the south of the river where a large market also sat (see **Exhibit 1** for map). More affluent communities were located in the northern parts of Dhaka, but pockets of slum settlements interspersed the communities.

In 2007 Dhaka City Corporation was surrounded by five adjacent municipal areas (Savar, Narayaganj, Gazipur, Kadamrasul, and Tongi) that were usually included in the city's statistics. Dhaka and these areas had a total population of close to 20 million, covering 1,353 square kilometers, an average population density of 9,600 per square kilometer.<sup>2</sup> The city corporation itself was divided into 100 wards, each of which elected one commissioner. Those commissioners and the mayor elected an additional 18 women to serve as commissioners.<sup>4</sup> All elected officials, including the mayor, served a five-year term.

### ***Economy and Infrastructure***

In 2007 a third of the population lived on less than USD 2 per day,<sup>2</sup> and approximately a third of the city's inhabitants lived in slum settlements across the city.<sup>5</sup> The 10 largest slums were home to over 1.2 million in total, but most of the remaining slums were comprised of just 10-50 households.<sup>5</sup> A study that examined the living conditions of Dhaka's rickshaw drivers, who often lived in the slums, found that about 60% of drivers lived with their families, usually four people per room.<sup>6</sup> Among drivers living collectively, the average number of occupants sharing a room was 17.<sup>6</sup>

One study found that 93% of slum respondents had experienced or witnessed crime or violence in the past year.<sup>2</sup> Rates of violence against women in the slums, including intimate partner violence, were considered very high and, like most other types of crimes, seldom reported. There was little police presence. One often had to bribe officers to have their case investigated, and many slums had powerful *mastaans* (informal local leaders) who assumed responsibility for maintaining public order by terrorizing residents through the use of violence and extortion.

The government did not have a consistent policy about slums; in 1999 and 2001 several *bustess* (slums built on private land) were destroyed, citing unhygienic conditions and high levels of crime as the justifications. Residents in slums on public land also faced occasional evictions but usually could move back into the area without problem soon after.

Transportation in Dhaka was almost entirely road-based. There was limited waterway travel, with no rail or air service. Non-motorized vehicles, in particular bicycle rickshaws, played an important role in everyday transportation (about 24% of all trips made). Dhaka City Corporation issued 70,000 rickshaw licenses in 1998, but experts estimated that there were three times as many in operation.<sup>7</sup> Public and private buses were available for commuting into Dhaka and provided basic service around the city. Public buses were the less expensive option but were overwhelmed with demand, often carrying overflow passengers on top of the bus and hanging onto the sides.

### **Urban Economic Growth**

Bangladesh gradually adopted a liberal economic policy through the 1980s, and in the 1990s industrial growth accelerated as tariffs and subsidies were largely phased out. Bangladesh was one of many countries to implement export processing zones (EPZ) to improve foreign trade.<sup>8</sup> Export processing zones were exempt from the host country's tariffs on exports and what was often considered a stifling bureaucratic

processes. Bangladesh created its first EPZ in 1981 in Chittagong, with the hopes of promoting foreign investment, as a means of job creation, technological transfer, and skills creation among its workforce.<sup>8</sup>

### **The Garment Industry**

Large-scale manufacturing grew at a rate of 7% annually throughout the 1990s. Most of this growth was due to the fast pace of the ready-made garment industry, which grew at a rate of 15% during this period; in the early 2000s the industry employed over 2 million people and accounted for 76% of Bangladesh's foreign earnings.<sup>2</sup>

While overall only 26% of Bangladeshi women had entered the formal labor market (compared to 87% of men), the growth rate of female participation in the urban areas had outpaced the rate in rural areas 13% to 9%. The garment industry employed primarily women (66%),<sup>9</sup> including roughly 30% of all women working in urban areas. The urban garment industry's growth created over 1 million jobs for women and created some of the first employment opportunities for women with low educational attainment.<sup>10</sup> Compared to other female workers in Dhaka, garment workers were less likely to be born in Dhaka, more likely to have migrated without a husband, and much more likely to come with siblings or other relatives and with the main motivation of gaining employment. They were more likely than other female wage workers to be single; those who were married tended to have fewer children and on average completed more years of education.<sup>10</sup>

It was not uncommon for factory workers to work 14-hour days, seven days a week.<sup>11</sup> During peak production the hours often increased. The average wage for workers in the ready-made garment industry was USD 0.15 an hour in 2002.<sup>12</sup>

### **Tuberculosis in Dhaka**

Tuberculosis estimates in Dhaka were based on findings from a 1980s community-based survey. No large-scale surveillance efforts had been conducted in the urban areas, and most experts agreed that they had little idea of the actual epidemiology of the disease in Dhaka. A surveillance study was planned for the end of 2008.

Little data existed on the co-infection rate of HIV and TB. A study in Dhaka in 1999 found that 0.1% of smear-positive patients were also infected with HIV.<sup>13</sup> There were approximately 13,000 cases of HIV in Bangladesh in 2007.<sup>14</sup>

Women and men in the workforce afflicted with TB often felt additional pressures to conceal their condition and not seek treatment. At the conclusion of a BRAC study on garment factory workers and stigma, Akram and others wrote, "In the workplace, fear of losing one's job prevents people from seeking TB health care. For women, this stigma and discrimination are often more acute and make them more vulnerable."<sup>15</sup> Women also faced additional social stigma since TB often affected their marital prospects. Many thought TB to be a hereditary condition, so women with TB were seen as carriers of an undesirable disease.

### **TB Services in Dhaka**

In 2004 the NTP and BRAC were co-recipients of a USD 42 million grant from the Global Fund to Fight AIDS, TB and Malaria (Global Fund) for their rural partnership, which had expanded to include 11 NGOs in total. In 2005 the partnership received another USD 9.6 million from the Global Fund to include the 13

additional NGOs working in urban areas. The main TB service providers in Dhaka were the Urban Primary Health Care Project (UPHCP) and the NGO Service Delivery Program.

In Dhaka the NTP controlled where each NGO provided TB services. The NTP assigned each NGO a certain set of the city wards, with no overlap between service areas.<sup>16</sup> The NTP also strove to increase the number of microscopes available for diagnostics and in 2003 achieved the World Health Organization (WHO) recommended standard for urban areas of 1 microscopic center per 100,000 population.<sup>16</sup>

The NTP required partner NGOs to submit reports quarterly. All patients on treatment were given an ID number. Information on laboratory activities, diagnoses, type of case (new, defaulted, relapse, or failure), and treatment outcome were some of the required indicators. All information was recorded in a paper record and manually calculated at the end of the period.

The NTP had a central medicine store where all NGOs working in Dhaka could pick up their drugs on a quarterly basis free of cost. Medications were distributed primarily based on how many were used in the past month. BRAC gave *shebikas* a month's supply at a time for their patients. There were virtually no stockouts. In 2006 the NTP and its partner NGOs diagnosed and treated 9,800 cases of TB.

### ***The Urban Primary Health Care Program***

The UPHCP was a consortium of non-profit organizations founded in 1998 with the aim of providing comprehensive health care to the urban poor. Its services included reproductive health, vaccinations, management of HIV and dengue fever, services for respiratory diseases, and health education. In all coverage areas it conducted neighborhood surveys to determine relative levels of wealth, and it provided families in the bottom 30% with vouchers for free care and medications. For all other patients UPHCP used a fee-for-service model. The UPHCP had six main branch offices with a doctor on staff and a laboratory and, in addition, offered technical support to many other organizations, co-operating in over 60 other sites around Dhaka

The UPHCP signed a memorandum of understanding with the NTP in 2001 to provide TB control services. As stipulated by the NTP, TB services, including testing, were provided free of charge. UPHCP provided support to satellite directly observed therapy, short-course (DOTS) clinics by confirming diagnosis and reading sputum smears. By 2007 UPHCP had set up 24 microscopy centers with NTP microscopes. In total, UPHCP partnered with over 60 sites covering almost 2 million people.

While TB treatment and services were provided at no cost, all other services, medications, and lab tests carried a charge. UPHCP identified the poorest 30% of households in its area and provided them with red identification cards that qualified them for completely free care.

Outreach workers in satellite clinics would collect sputum samples from patients to send to central laboratories for diagnosis. Results were returned to the satellite clinic where treatment would take place. The UPHCP also focused on contact tracing—using one case of TB to recruit others, often the individual's family and friends with whom they had the most contact, for testing. Outreach workers would perform house visits on patients who failed to come to the DOTS provider for treatment. For 2006 the UPHCP reported a case detection rate of 81% and a treatment success rate of 84.5%. In September 2007 the UPHCP had identified 4,213 cases of TB. Over 80% of the 2,000 staff had been trained in TB control by fall 2007, and through targeted outreach orientations, the UPHCP had reached 1,200 religious leaders and teachers, 1,200 community leaders, 1,000 pharmacists and private practitioners, and 1,600 factory workers. At the urban DOTS meeting in December 2007, the UPHCP staff identified weak linkages between the microscopy centers and the clinics as a key operational challenge.

## BRAC's Urban Programs

In the 1990s, with ongoing migration to Dhaka, senior staff at BRAC began to discuss the feasibility and necessity of developing programs targeting urban populations. Faruque Ahmed, director of BRAC's health program, said, "There were many, many poor people living in cities. BRAC's mission was to serve the poor, not just the poor in the rural areas."

Based on the results of a survey that BRAC conducted in 1991 revealing that children living in urban slums had virtually no access to educational institutions, BRAC launched an urban school program in Dhaka in 1997. Simultaneously, it launched an urban credit program using the same village organization structure and micro-finance focus that it had developed in the rural villages. BRAC also launched its health program in 1998, training local women to be program organizers (PO), *shasthya shebikas*, and *shasthya kormi*. BRAC worked with Dhaka City Corporation to improve the water supply and access to sanitation in slum settlements.

Working with slum populations proved difficult for BRAC. The mobility of residents—motivated by employment opportunities, flooding, violence, and other reasons—made forming strong groups difficult. While the education program grew quickly, the microfinance program expanded relatively slowly compared to BRAC's other endeavors. The health programs soon contained most of the same components as the rural program, though BRAC created more centers than it had in the rural areas. Centers, which provided some health services, also served as meeting places for the microfinance groups and other community events.

In 2008 BRAC had nine health centers in Dhaka. Its facility in Badda, which was established in 2000 when BRAC built a six-story building in a slum area in the western part of Dhaka, had a catchment area of about 272,000. In 2008 it had 140 active *shebikas* working in the community.

### ***Launching an Urban TB Program***

In 2000 it became clear to Akram and others at BRAC that the existing TB programs in Dhaka and other cities were insufficient. For those living in the slums and living in poverty, accessing existing services was difficult and costly. Sixteen NGOs were already working on TB services in Dhaka, and several were alarmed when BRAC made its decision to enter the field. Akram explained, "We saw that the services were inadequate and knew that we had to work in the cities. But we approached the other NGOs first to talk to them about our intentions and emphasize that we wanted to work only in areas where no services were already available."

In 2002 BRAC began to implement programs in the urban and peri-urban areas of five city corporations, including Dhaka. In the peri-urban areas, which greatly resembled the rural areas except for differences in employment (many residents commuted into Dhaka during the day), it replicated the *shebika*-based model for basic health services and TB control. Because there were no clinics in the peri-urban areas, BRAC also opened health facilities that could provide basic curative services to these populations.

In several of Dhaka's slums where BRAC had already implemented its *shebika* community health program, BRAC trained the existing *shasthya shebikas* in the identification of TB and its treatment. The organization brought satellite sputum-smear centers to different settlements throughout the month. The patients paid the same bond as their rural counterparts.

The *shasthya shebikas* in the slums faced many challenges in providing TB services that the village *shebikas* had not. There was much greater stigma associated with TB in the slums. Many preferred to conceal the illness from their neighbors and did not want to be seen with the *shebika* every day, fearing that others

would be able to make the connection to TB treatment. Because the women who became *shebikas* were usually from the slums, they had difficulty gaining access to poor households in non-slum neighborhoods. Patient mobility also interfered with treatment; *shebikas* usually lost communication with a patient if he moved. In addition, those with jobs often left the slums all day and only returned in the evening, so it was difficult for *shebikas* to connect with them.

Akram described urban TB as “a more complex problem. TB affects not just the poor, and there are many more stressors in urban areas. One must pay attention to things like poor nutrition, poor housing, and the other urban stresses.” Akram also commented, “We use the same bond, but [it] is not as much to people living in the city. It is less money to lose.”

Other BRAC health programs, including BRAC's growing maternal, neonatal and child health (MNCH) program, found that turnover among the *shebikas* proved highly challenging. The director of the MNCH program, commented, “It is a constant problem for us. Our turnover must be close to 40%, and it's always the best ones that find other opportunities.” Some staff speculated that BRAC would have to begin to pay its *shebikas* a salary if it was to retain them consistently.

BRAC began to find others who could help deliver care to those who were beyond the reach of the *shasthya shebikas*. It conducted trainings about TB and DOTS treatment, with its audiences including home-based volunteers, local leaders, pharmacists, and physicians. In areas such as Badda, some trainings specially targeted village doctors.

### ***Urban Expansion: the DOTS Corner***

In 2004 BRAC and the NTP received USD 42 million from the Global Fund to scale up and strengthen their TB programs. BRAC hired Dr. Mahfuza Rifat, a physician with a background in health economics, to work with Akram to expand its program in the rural and urban areas. In Dhaka and other urban areas, Rifat would have to develop new programs to adapt to the context.

The 22 hospitals associated with medical colleges were one of the few places for the poor to seek complex treatment, as few had insurance and private hospitals were unaffordable. Patients were charged USD 0.08 to see a doctor. The NTP and BRAC realized that these hospitals could serve as TB referral centers. The hospitals had the microscopy capacity for TB testing and could refer patients to one of the various TB treatment sites throughout the city. Because there was no governing body that oversaw all of the medical college hospitals, some of which were privately owned, they had to approach each college independently. In 2004 BRAC wrote letters to the directors and had written support from the NTP.

Rifat, Akram, and others at BRAC developed the concept of the “DOTS corner.” Three program officers (POs) overseen by a physician at the hospital managed each DOTS corner. BRAC chose POs who had worked in BRAC TB and health programs for some time; one of the POs working at Dhaka Medical College in 2008 had been with BRAC since 1980; another, since 2003. The hospital's physicians referred patients with TB symptoms to the DOTS corner. The POs collected sputum samples from patients and tested them for TB in the lab facilities that BRAC furnished in the hospital space. All three POs were salaried employees of BRAC and shared the same job responsibilities, though frequently one person performed the diagnostics. The supervising physician had to confirm the diagnosis as the NTP guidelines stipulated.

When patients returned for their diagnosis, the POs asked them for their place of residence and found the closest TB treatment center to their home. Patients were then given a referral form with their TB test results to take with them to that center. When patients sought care at that referral center, they were entered into the TB registry. The center would send part of the paperwork back to the referring DOTS corner and would then match it with the patient information that they took down initially. In 2007 the POs at Dhaka

Medical Center Hospital said that they received confirmation for virtually all of their patients, usually in a matter of weeks.

The DOTS corner POs also managed the care for TB patients receiving in-patient care for other conditions. They ensured that the nurse or a family member had the TB medications for the patient and administered them at the correct times. Most of their patients had cell phones, so when patients neglected to come in for treatment, they would call to remind them.

In 2005, 81% (592) of the 723 cases registered for treatment at the DOTS corners were treated successfully. In 2006, 1,294 cases were registered for treatment in DOTS corners. By 2007 BRAC had opened DOTS corners in all medical colleges in Dhaka, and Rifat and Akram approached the two post-graduate medical colleges and a private hospital about opening DOTS corners in 2008.

### ***Factory Outreach Efforts***

Despite its efforts to train *shasthya shebikas* and establish DOTS corners, BRAC felt that more outreach activities were necessary. Akram and Rifat decided to increase employer participation and education around TB in hopes that it would motivate employers to encourage their workers to seek testing and treatment. In particular, the TB team identified the garment industry as a target. In the EPZ there were several factories that employed thousands of workers and had on-site medical services. Rifat approached these factory owners and presented them with information on TB and its treatment, asking them to allow BRAC to provide TB education and information about where one could go for TB treatment and on-site opportunities for testing to workers.

In 2006 BRAC worked with 35 factories, testing a total of 529 workers and enrolling 146 in TB treatment. In 2007 BRAC expanded its work to an additional 26 factories, testing 2,010 workers and enrolling 468 workers in TB treatment. Many workers, particularly women, were extremely concerned about whether a TB diagnosis would put their job in jeopardy or result in social isolation. When they did not want anyone in their workplace to know their status, BRAC arranged for a volunteer or health worker to administer the drugs in the patients' home. Rifat found that some of the patients, however, trusted another worker or supervisor who they could utilize as a DOTS partner. Patients could also receive referrals to DOTS clinics near their work or home where they could receive a week's worth of medication at a time. BRAC continued using its bond system with these patients. All participating in the DOTS treatment received basic training from BRAC on TB and the importance of adherence.

### ***Training Private Practitioners***

Though partnerships between NGOs and the NTP had become well-established over the previous decade, little effort had been made to engage private practitioners in the efforts to fight TB. Private facilities were not compelled to submit any sort of data to the NTP. Though the NTP had made an effort to improve quality of care within public facilities, the stigma and perception of low quality services persisted. Many patients preferred to seek care from private practitioners or pharmacists who could prescribe medication on the spot. Patients and many practitioners were unaware that the government would provide free medications for TB. Often, even when practitioners were aware of the free medications, they did not inform their patients.

BRAC and the NTP attempted to locate all private practitioners in Dhaka that were providing TB treatment. They identified 250, and 97 agreed to be interviewed. The interviews revealed that there was little standardization in how TB was treated in the private sector—most practitioners used a chest x-ray to diagnose TB. Few practitioners were aware of DOTS treatment or could identify nearby DOTS centers.

Many practitioners expressed concern with the quality of services provided at public facilities and admitted reluctance at referring patients to them.

Rifat and Akram felt that training private practitioners and pharmacists was an important activity to improve the quality of care that patients received. In 2006 they designed two trainings—one for traditional healers and village doctors and the other for medical professionals. In both cases, they advertised heavily, with Rifat calling offices to alert them to the opportunity and promising to compensate their time. They tried to select the most popular doctors.

Rifat often led the trainings, covering available testing facilities, national guidelines, and recommendations for treatment. Trainings lasted three to four hours and were scheduled for the morning or afternoon to allow the practitioners to have a half day to see patients.

In 2006 and 2007 BRAC reached 327 private practitioners in the Dhaka area. As a result, Akram said, “We have gotten many referrals from private practitioners in urban areas. Both the non-qualified and qualified doctors have been very cooperative.” While BRAC had developed strong relationships with a few very popular practitioners, it had yet to see a shift in the behaviors of most practitioners. It continued to hold educational meetings in hopes of increasing engagement. BRAC and the NTP were also developing a potential accreditation system for private practitioners around TB and considering ways to link them into the NTP more formally.

### ***Results and Ongoing Challenges***

By the end of 2007, BRAC covered a catchment area of 3.2 million in Dhaka, including those covered by the 18 peri-urban centers. The program had diagnosed over 3,100 cases of TB. In 2008 BRAC began to collect data on how many patient referrals it received and found that private practitioners referred about 13% of cases and village doctors 3% (see **Exhibit 2** for routes patients took to arrive to BRAC centers or DOTS corners).

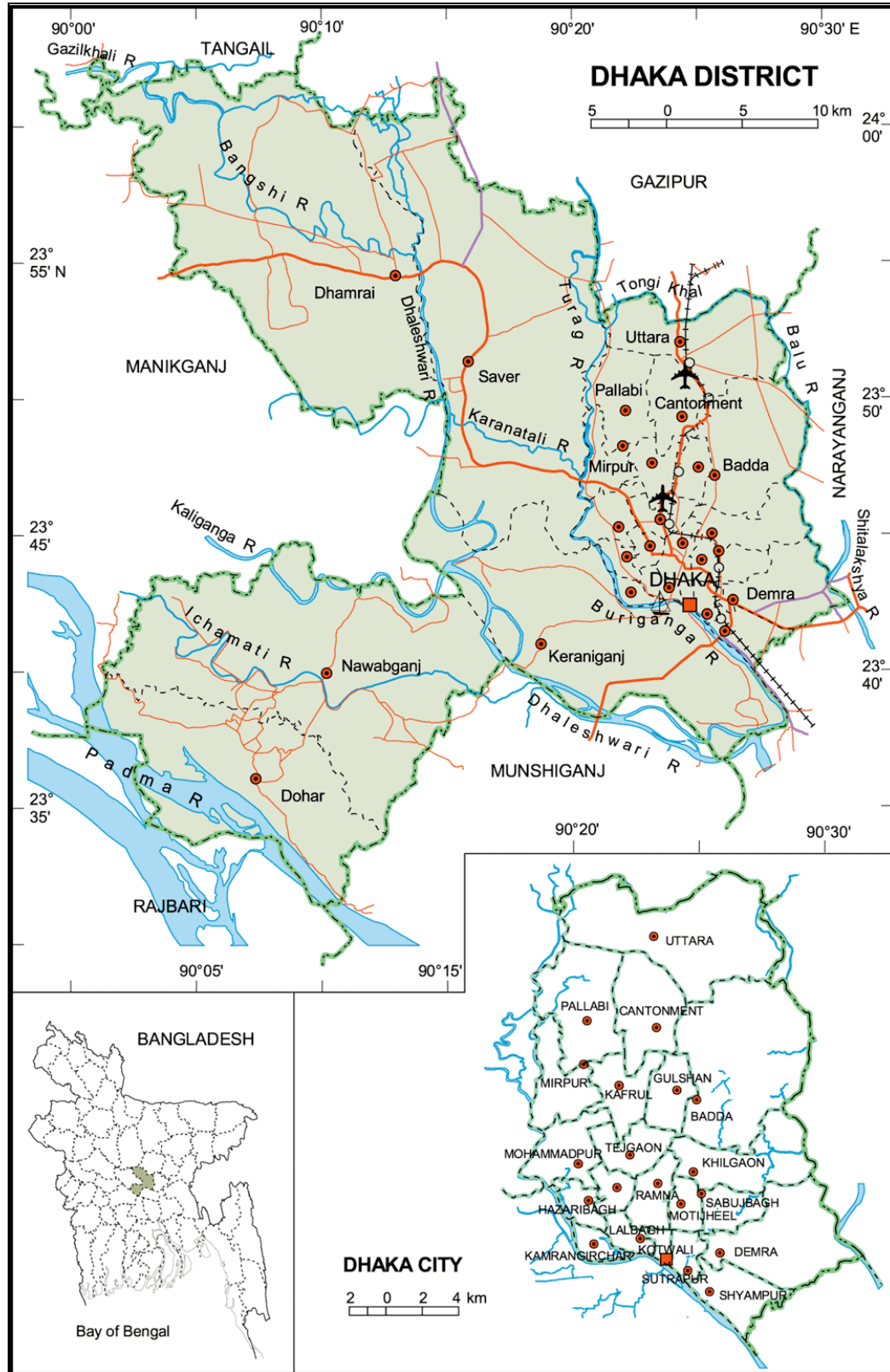
Though BRAC had become an internationally recognized organization, working in nine countries, within Bangladesh BRAC was still expanding into new areas. Based on BRAC's experiences in Afghanistan, Akram knew the power of the *shebika*-based model transcended the context of rural Bangladesh, but it was no magic bullet for urban TB. “We are still learning how to combat TB effectively in the cities. It is much more complex than TB in the villages.” Akram considered how BRAC could continue to adjust its delivery model to better fit the urban context and the challenges it posed.



**Appendix** *Abbreviations and Foreign Terms*

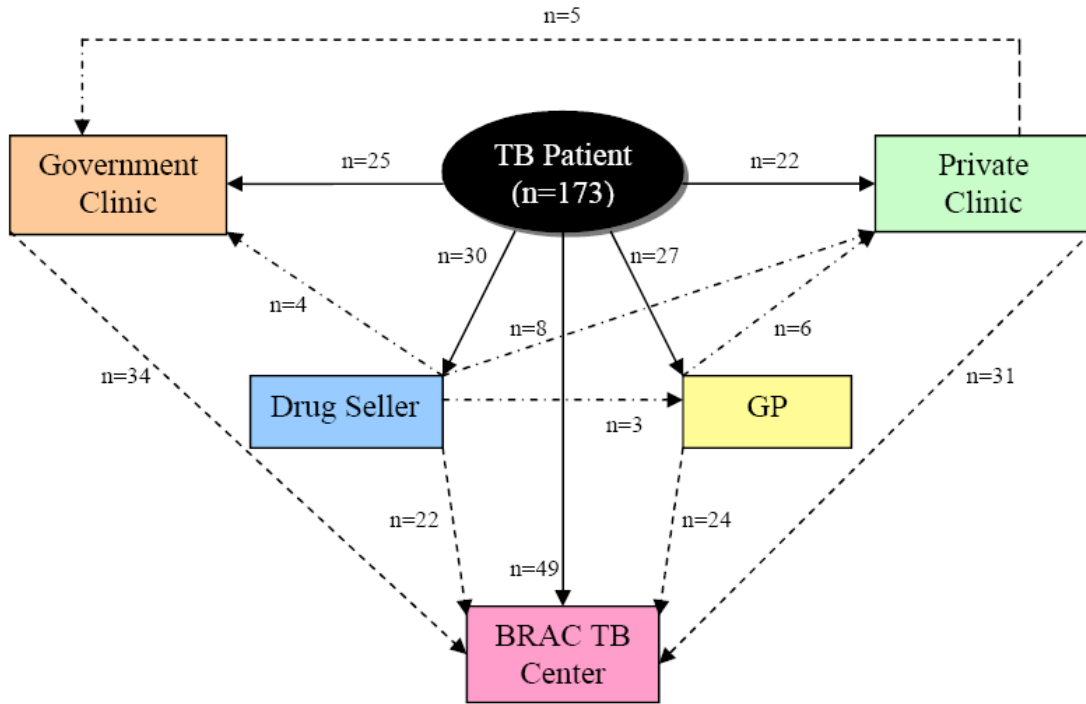
DOTS	directly observed therapy, short-course
EPZ	export processing zone
NTP	National Tuberculosis Programme
PO	program officer
<i>shasthya kormi</i>	Paid BRAC health worker with a minimum of 10 years of schooling who supervises shasthya shebikas and works under the supervision of a PO.
<i>shasthya shebika</i>	BRAC health volunteer chosen by village organizations who works under the supervision of a shasthya kormi.
<i>upazilas</i>	460 sub-districts in Bangladesh
UPCHP	Urban Primary Health Care Project
WHO	World Health Organization

**Exhibit 1** Map of Dhaka



Source: Available at <http://www.urpnissues.com/webpage/maps/Districts/13.GIF>

**Exhibit 2** Patient Routes to BRAC Center or DOTS corner



Note: GP represents General Practitioner

Source: Sherzad AB. *Health-seeking behavior of smear-positive tuberculosis patients receiving treatment from BRAC TB centers in urban Dhaka*. A thesis presented to the James P. Grant School of Public Health, BRAC University on December 4, 2008.

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