Adults with Chronic Cough in Urban Bangladesh: Healthcare Utilization and Management of Cases by Private Practitioners

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Abstract

Tuberculosis (TB) case detection under the Directly Observed Treatment – Short-course (DOTS) strategy largely relies upon care seeking of chronic coughers and the actions taken by their healthcare providers. This study aimed to describe the healthcare utilization of people ≥15 years of age with a chronic cough in urban areas of Bangladesh and to understand their management by private practitioners. A community-based, household survey included 60,382 persons ≥15 years of age from two administrative areas of Dhaka City. A total of 1138 (2%) were identified to have had a cough for 3 weeks or more. This survey was linked to interviews of licensed and unlicensed practitioners in Dhaka and the Chittagong City Corporation of Bangladesh. Among identified coughers, 1046 (92%) were interviewed, of whom 648 (62%) reported having sought care from any provider. Among care seekers, 16% directly attended a DOTS facility. The remaining 84% sought care from the private sector, where less than 1% reported referral to a DOTS facility. Bivariate and multivariate assessments showed that care seeking from a licensed private practitioner or a DOTS centre was significantly associated with severity of the disease and previous diagnosis of TB.

Introduction

Introduced first in 1991, the WHO-recommended Directly Observed Treatment – Short-Course (DOTS) strategy is currently considered the most cost-effective strategy for tuberculosis (TB) control (Borgdorff et al. 2002; Dye et al. 1998). The DOTS strategy includes passive-case detection through sputum smear microscopy, administration of directly observed short-course therapy, a regular supply of all antitubercular drugs, a standardized recording and reporting system and a government commitment to ensure all these components (Raviglione et al. 1997; World Health Organization [WHO] 1999). The National Tuberculosis Control Program (NTP), Bangladesh, adopted DOTS in 1993 (Directorate General of Health Services [DGHS] 2004), and in 2007 the estimated case detection rate under the program was 66% (WHO 2009). The country currently ranks sixth among the 22 high-TB-burden countries (WHO 2009). The objectives of the NTP, Bangladesh, are to sustain the global targets of achieving at least 70% case detection and 85% treatment success among smear-positive TB cases under DOTS, thereby reaching the targets of millennium development goals by 2015 (DGHS 2004). Therefore, most NTP activities are directed toward increased case detection and successful completion of treatment.

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TB cases, are usually detected either by active care seeking of symptomatic individuals or case finding activities of healthcare providers in health centres (Rieder 1993). Early symptoms in adults ≥15 years of age are usually mild in nature, often starting with a persistent cough (Tuberculosis Coalition for Technical Assistance 2006; WHO 2001). A chronic cough of more than 2 to 3 weeks' duration is therefore considered an important criterion for suspecting pulmonary TB in adults ≥15 years of age (DGHS 2004, Tuberculosis Coalition for Technical Assistance 2006). However, the effectiveness of chronic cough as a case finding tool depends heavily on the awareness of symptomatic individuals and the case management practices of healthcare providers. Studies from other countries indicate that there are significant delays in care seeking among chronic coughers as well as frequent provider mismanagement (Singla et al. 1998; Lonnroth et al. 2001; Uplekar et al. 1998; WHO 2001).

Statistics about the care-seeking behaviour of adults with a chronic cough who might have TB are not known in Bangladesh. This study documents the healthcare utilization of people ≥15 years of age

with chronic cough in urban areas of Bangladesh to explore the management pattern of such cases by both licensed and unlicensed private practitioners in the two cities of Dhaka and Chittagong.

Methods

Setting

In 2004–2005, two descriptive surveys were conducted in selected areas of Dhaka and Chittagong, the two most densely populated cities in Bangladesh. The survey related to adult chronic coughers was limited to Dhaka, while the survey of healthcare providers in the private sector was carried out in both Dhaka and Chittagong, taking into account the different length time in which DOTS has been implemented in these cities – since 1997 in Chittagong and since 2003 in Dhaka (DGHS 2004).

Two administrative areas (zones) within the Dhaka City Corporation, Kamalapur and Lalbagh, were purposely selected. Kamalapur is an impoverished area with predominantly slum and squatter settlement populations. The area has over 80,000 people per square km, and on average 25% of the population live below the poverty line, with a monthly income of less than 13 US dollars per capita (International Centre for Diarrhoeal Disease Research, Bangladesh [ICDDR,B] 2008). Lalbagh is also densely populated, but has a mixed population from different socio-economic strata. Several local nongovernmental organizations (NGOs) provide DOTS services in both areas. Chittagong is divided into 44 wards, or small administrative areas, with an average population of 20,000 to 30,000 people. Eighteen of the most populated wards with the greatest number of private practitioners were selected for the private practitioner survey.

Study Participants

People ≥15 years of age who reported of having a persistent cough for the previous 3 weeks or more were considered adult chronic coughers. Any provider practising allopathic medicine in a private clinic, receiving clients with a chronic cough and charging a fee was eligible. We defined a licensed private practitioner as having graduated from a medical college or having post-graduate medical education. All other qualifications, or individuals without qualifications, were considered unlicensed.

Data Collection

Persons with a chronic cough were identified in two stages. Initially, a census survey of all households in Kamalapur and three wards of Lalbagh was carried out by trained field assistants to identify and list all persons ≥15 years of age with a history of a persistent cough for 3 weeks or more. Subsequently, trained interviewers visited all those identified at their household to verify the presence of a persistent cough, obtain verbal consent and conduct an interview. A second visit was made if the identified person was not home. All interviews took place between March and August 2005.

Both licensed and unlicensed private medical practitioners who met the selection criteria were interviewed at their clinics in Kamalapur and Lalbagh and in the 18 wards of Chittagong. In Dhaka, a list of private practitioners was prepared based on whom the chronic coughers had sought care from, and these practitioners were interviewed. The survey in Chittagong took place between September and December 2004 and in Dhaka between May and November 2005. For all interviews, a time and a fee were agreed on. A fee comparable to a patient consultation fee of Taka 300 (4.60 US dollars) for licensed practitioners and Taka 150 for unlicensed practitioners was provided following the interview. Trained research assistants interviewed unlicensed practitioners, while a medical doctor interviewed licensed practitioners. The study had the approval of ICDDR,B's Research Review Committee and Ethical Review Committee.

Sample Size

To identify a 10% difference in healthcare utilization pattern among adults with a chronic cough by wealth–asset quartile, and 20% prevalence in care seeking, a sample of 250 symptomatic adults

in each quartile was estimated as required. To estimate the specific chronic cough management practices, with a conservative prevalence of 0.5 and a precision of 0.075, 170 each of licensed and unlicensed private practitioners from Dhaka and Chittagong were surveyed.

Measurement

The chronic cougher interview obtained information about healthcare utilization histories, services received, treatment and referral patterns. Socio-economic status was estimated by determining a household asset score based on ownership of consumer items including home equipment (e.g., a television, a sewing machine), utilities in the home (electricity, telephone) and dwelling characteristics (e.g., source of drinking water, sanitation facilities, building materials) related to wealth status. Private practitioner interviews included information on their medical qualifications, TB management training, type of practice and knowledge about DOTS program.

Data Analysis

Data was entered and analyzed using Epi Info 2000 and Stata statistical software (Release 8.0, Stata Corporation, College Station, TX). Bivariate analysis was carried out to reveal factors associated with care seeking. Chi square was used to compare binary and categorical variables and also to assess the homogeneity among multi-response proportions. The analysis was done separately, initially to identify factors related to care seeking from any providers and then care seeking either from a DOTS facility or a licensed private practitioner together.

Multiple logistic regression analyses were carried out to predict factors associated with care seeking from these two sources. The final model included all results from bivariate analyses except the factor "recall 3 or more TB symptoms." This factor was found to be strongly correlated with reported TB symptoms or additional TB symptoms by the study subject. Multivariate adjusted odds ratios (OR), their 95% confidence intervals (CI) and p-values were calculated for both groups. Statistical significance was defined as a *p*-value of less than .05.

Household economic status was assessed by creating a wealth index based on assets (National Institute of Population Research and Training et al. 2001). To calculate the wealth index, each asset item was assigned a weight generated through principal component analysis. Subsequently, each household was then assigned a score based on its assets, and the scores were summed for each household. Individuals were ranked according to the total score for the household in which they belonged. The sample was then divided into population quartiles of four groups.

Results

Chronic Coughers Survey

Census Result

The initial census listed 89,455 adults (≥15 years) from the two areas of Dhaka city. About two thirds (60,382/67%) were available during the survey. Among the surveyed population, 1138 (1.9%) individuals reported having had a cough for 3 weeks or more. More females (64%) than males (36%) were screened; however, the prevalence of chronic cough was significantly higher in males (2.3% vs. 1.7%, $p < .05$).

Of the 1138 chronic coughers, 1046 (91.9%) were successfully interviewed. The mean age of respondents was 37 years, 75.1% were married, and their median family expenditure was Taka 4500 (69 US dollars) per month (Table 1). Nearly one third (29%) reported only cough, 38.2% had fever as well, 52.5% had chest pain and 12.4% reported loss of appetite. It was found that 50% were aware of the location of the nearest DOTS centre and 54% knew that treatment is free under DOTS. Nearly 19% reported a positive family history for TB, 17% reported having been previously diagnosed with TB and 19.9% could correctly recall three or more symptoms of TB, such as cough, fever, chest pain, night sweating and weight loss (data not shown).

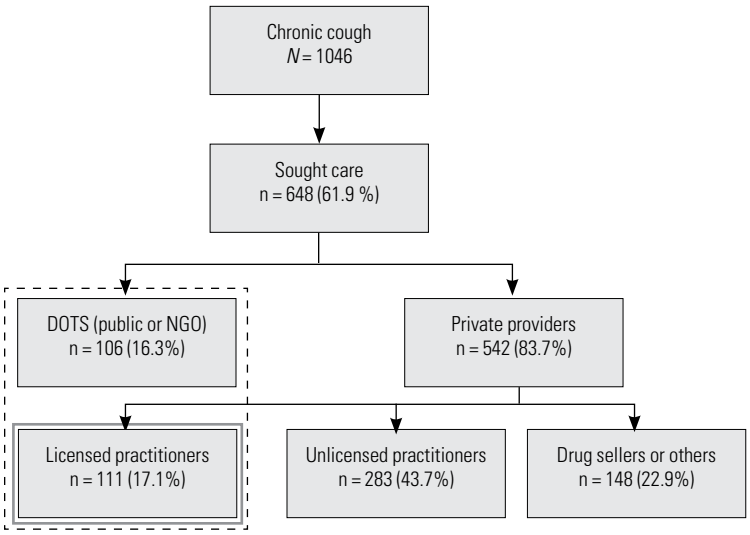
Table 1. Selected socio-demographic characteristics of the chronic coughers interviewed (N = 1046)

Characteristic	
Age in years	
15–44	68.2%
>45	31.8%
Mean age	37 years
Married	75.1%
Education	
None	51.0%
1–5 years	26.4%
6 years[a]	22.6%
Monthly household expenditures (Taka[a])	
<4000	46.6%
4000–6000	31.1%
>6000	22.3%
Median	Taka 4500

[a] 1 US dollar = Taka 69.

Among respondents, 648 (61.9%) reported seeking care from any provider as an initial consultation. About 16% (n = 106) reported having attended an NGO and/or government DOTS centres. The remaining 84% (n = 542) of initial care seekers had relied on the private sector. The proportion seeking care from a licensed private practitioner was 17.1% (n = 111) (Figure 1). Among all chronic coughers seeking care, 171 (26.4%) had subsequently sought help from more than one provider (data not shown).

Figure 1. Reported care seeking among persons ≥15 years with a chronic cough



Bivariate Results

Table 2 summarizes care seekers' characteristics or factors associated with care seeking from any practitioners and from DOTS or licensed private practitioners. Female sex (p = .002), higher family expenditure (p = .015), cough with additional TB symptoms (p = .001) and those recalling three or more TB symptoms (p = .002) were found significantly associated with care seeking from any type of practitioner. With the exception of female sex, all these factors were also significantly associated with care seeking from DOTS or licensed private practitioners. In addition, higher asset quartiles (p = .014), previous diagnosis of TB (p = .000), knowledge about the nearest DOTS centre (p = .001) and knowledge that TB treatment is free at DOTS centres (p = .006) were also found significantly associated with care seeking from DOTS or licensed private practitioners.

Table 2. Percentages of factors associated with care seeking for a chronic cough from any provider and from DOTS/licensed private practitioners

Factors	Care sought from any provider			Care sought from DOTS/ licensed PPs		
	n = 1046	Yes (%)	*p*-value	*n* = 648	Yes (%)	*p*-value
Age						
<45 years	714	62.0	.926	443	34.3	.514
45+ years	332	61.7		205	31.7	
Sex						
Male	445	56.6	.002*	252	35.3	.431
Female	601	65.9		396	32.3	
Education						
No schooling	533	60.8	.634	324	30.6	.238
Some schooling	277	62.0		172	34.9	
Secondary or more	236	64.4		152	38.1	
Household expenditure						
<Taka 4500	565	58.6	.015*	331	29.0	.013*
Taka 4500+	481	65.9		317	38.2	
Asset quartiles						
1st (lowest)	261	62.8	.823	164	27.4	.014*
2nd	262	60.7		159	28.3	
3rd	263	60.4		159	35.8	
4th (highest)	260	63.8		166	42.2	

Table 2. Continued

Factors	Care sought from any provider			Care sought from DOTS/ licensed PPs		
	n = 1046	Yes (%)	*p*-value	*n* = 648	Yes (%)	*p*-value
Additional TB symptoms+						
Only cough	300	54.0	.001*	162	27.2	.001*
Cough + 1 symptom	313	61.3		192	32.3	
Cough + 2 symptoms	225	64.9		146	28.8	
Cough ≥3 symptoms	208	71.1		148	46.6	
Previously diagnosed as TB						
Yes	173	60.1	.586	104	57.7	.000
No	873	62.3		544	28.9	
Recall 3 or more TB symptoms						
Yes	208	71.2	.002*	148	46.6	.001*
No	838	59.7		500	29.6	
Know about nearest DOTS centre						
Yes	527	60.5	.341	319	39.8	.001*
No	519	63.4		329	27.4	
Know TB treatment is free at DOTS centre						
Yes	565	60.5	.306	342	38.3	.006*
No	481	63.6		306	28.1	

DOTS = Directly Observed Treatment – Short-course; PP = private practitioner; TB = tuberculosis.
* $p < .05$ Pearson chi-square.

Multivariate Analysis

After adjustment for all these factors, the likelihood of seeking care from any private practitioner increased with females (OR=1.51, CI=1.16–1.98), those with a family expenditure of more than Taka 4500 per month (OR=1.65 CI=1.20–2.28) and those having a cough with additional TB symptoms (OR=1.42, CI=1.02–1.98; OR=1.67, CI=1.16–2.43; and OR=2.42, CI=1.62–3.61 for one, two and three additional symptoms, respectively) (Table 3). Similarly, after adjustment, presence of cough with ≥3 additional TB symptoms (OR=1.87, CI=1.12–3.12) and previous diagnosis of TB (OR=2.97, CI=1.83–4.84) remained significantly associated with care seeking from DOTS centres or licensed private practitioners in combination.

Table 3. Multivariate adjusted odds ratio for factors associated with care seeking for a chronic cough from any provider or from DOTS/licensed private practitioners

	Any provider			DOTS + licensed PPs		
	OR	95 % CI	*p*-value	OR	95% CI	*P*-value
Age						
<45 years vs. 45+ years	1.22	0.91–1.64	.193	0.92	0.61–1.39	.712
Sex						
Male vs. female	1.51	1.16–1.98	.002*	0.94	0.65–1.35	.746
Education						
No schooling vs. some schooling	1.07	0.78–1.47	.644	1.26	0.82–1.94	.238
No Schooling vs. Secondary or mor	1.21	0.84–1.74	.299	1.26	0.78–2.04	.327
Household expenditure						
<Taka 4500 vs. Taka 4500+	1.65	1.20–2.28	.002*	1.18	0.77–1.80	.430
Assets quartiles						
1st (lowest) vs. 2nd	0.88	0.61–1.26	.484	0.92	0.55–1.54	.758
1st (lowest) vs. 3rd	0.77	0.53–1.13	.187	1.27	0.75–2.14	.365
1st (lowest) vs. 4th (highest)	0.70	0.45–1.11	.130	1.66	0.92–2.99	.088
Additional TB symptoms						
Only cough vs. cough + 1 symptom	1.42	1.02–1.98	.035*	1.25	0.77–2.03	.345
Only cough vs. cough + 2 symptom	1.67	1.16–2.43	.006*	1.04	0.61–1.76	.868
Only cough vs. cough ≥3 symptoms	2.42	1.62–3.61	.000*	1.87	1.12–3.12	.017*
Previously diagnosed as TB						
No vs. yes	0.85	0.59–1.24	.396	2.97	1.83–4.84	.000*
Know about nearest DOTS centre						
No vs. yes	0.87	0.60–1.28	.491	1.22	0.73–2.03	.433
Know TB treatment is free at DOTS centre						
No vs. yes	0.99	0.67–1.46	.966	1.04	0.62–1.73	.869

CI = confidence interval; DOTS = Directly Observed Treatment – Short-course; OR = odds ratio; PP = private practitioner; TB = tuberculosis.
* $p < .05$.

Chronic coughers reported that in about 95% to 98% of cases, the practitioners they sought care from prescribed one or more drugs. Less than 1% reported they had been referred to a DOTS facility when they sought care (Table 4).

Table 4. Measures taken by providers as reported by persons with a chronic cough who sought care

Measures taken	Licensed PP *n* = 111 %	Unlicensed PP *n* = 283 %	Drug sellers and others *n* = 148 %
Advice given	6.3	1.4	1.4
Investigations ordered	37.8	1.8	5.4
Prescribed a drug	94.6	98.2	95.3
Referred to a DOTS centre	0	0.4	0
Referred to other providers	0.9	0.4	0

DOTS = Directly Observed Treatment – Short-course; PP = private practitioner.

Private Practitioner Survey

We interviewed a total of 557 private practitioners – 340 in Chittagong and 217 in Dhaka. Among them, 258 (46.3%) were licensed and 299 (53.7%) were unlicensed.

Table 5 summarizes the reported practice of the private practitioners. Similar proportions of licensed (45.7%) and unlicensed private practitioners (40.8%) reported that they suspected TB in adults presenting with a cough for 3 weeks or more. In general, a higher proportion of licensed private practitioners (>98%) preferred to order investigations as an initial step. On the other hand, significantly higher proportion of unlicensed private practitioners reported that they had referred adult chronic coughers as initial practice than licensed practitioners (32.4% vs. 1.2%). After investigations, licensed private practitioners were more likely to prescribe drugs (63.6% vs. 4.0% ; $p < .05$) and less likely to refer (34.9% vs. 47.5%; $p < 0.05$) compared to unlicensed private practitioners. Among those who ordered investigations, licensed private practitioners ordered more chest X-rays (96.4 % vs. 81.2 %; $p < .05$) than unlicensed private practitioners. The TB clinic was the most preferred referral point by both types of private practitioners. Nearly 90% of licensed and 80% of unlicensed private practitioners who reported referral practice referred to a TB clinic (usually older, well-known clinics). However, they differed in overall referral practice ($p < .000$) and specifically when referring to TB specialists (6.4% and 13.8%, respectively) or to hospitals (5.4% and 24.1%, respectively).

Table 5. Practices reported by private practitioners for the management of persons with a chronic cough

Measures taken	Licensed PP *n* = 258 % (95% CI)	Unlicensed PP *n* = 299 % (95% CI)	*p*-value
Cough >3 weeks			
Suspect TB	45.7 (39.6–51.8)	40.8 (35.2–46.4)	.244
Treatment			.000[b]
Prescribed drug	0.4 (0.4-1.2)	1.7 (0.2–3.2)	
Prescribed drug after investigations	63.6 (57.7–69.5)*	4.0 (1.8–6.2)	
Refer initially	1.2 (1.0–2.5)	32.4 (27.1–37.7)*	
Refer after investigations	34.9 (29.1–40.7)	47.5 (41.8–53.2)*	

Table 5. Continued

Treatment and refer	0.0 (0)	14.3 (10.3–18.3)*	
Investigations[a]			.545[b]
X-ray	96.4 (94.1–98.7)*	81.2 (75.0–87.4)	
Sputum for AFB	80.7 (75.8–85.6)	77.3 (70.7–83.9)	
Mantoux test	64.9 (57.7–72.1)	62.3 (54.6–70.0)	
Referral practices[a]			.000[b]
TB clinic	88.2 (81.6–94.8)	79.0 (74.2–83.8)	
TB specialist	6.4 (1.4–11.4)	13.8 (9.8–17.8)*	
Other hospitals	5.4 (0.8–10.0)	24.1 (19.1–29.1)*	

AFB = acid fast bacilli; CI = confidence interval; DOTS = Directly Observed Treatment – Short-course; PP = private practitioner; TB = tuberculosis.
[a] Multiple responses. [b] Overall test of homogeneity with Pearson's chi statistics.
*$p < .05$ licensed vs. unlicensed private practitioner.

Discussion

This study provides evidence that the majority of persons above 15 years of age who are symptomatic of TB are not presenting to DOTS centres. In spite of relatively high practitioner and client knowledge of DOTS centres, referral of chronic coughers to these facilities was found to be nearly nonexistent. Both licensed and unlicensed private practitioners were found to be the chronic coughers' major source of primary care. The initial care seeking from any provider was associated with female sex, having high household expenditures and additional TB symptoms. Seeking care from a DOTS centre or from a licensed private practitioner was associated with the severity of the condition, either as presence of additional TB symptoms or as previous diagnosis of TB.

Our results showed that less than two thirds of persons with chronic cough had sought care for their symptoms; this is consistent with results from other settings

The 2% prevalence of chronic cough found in this study is somewhat lower than that from other reports from this region (Grover et al. 2003; Sudha et al. 2003; Thorson et al. 2000; WHO 2004). Bangladesh national TB prevalence surveys reported prevalence of TB suspects as 7.7% (Government of Bangladesh 1973) and 5.9% (DGHS 1989), and a rural survey reported the prevalence as 7.1% (Zaman et al. 2006). However, all these surveys differed in case definition, location and sampling procedures. Our results showed that less than two thirds of persons with chronic cough had sought care for their symptoms; this is consistent with results from other settings (Grover et al. 2003, Thorson et al. 2000). Our observation that more than 80% of initial care seeking was from private providers is also comparable with findings from regional countries. Utilization of private sector providers dominates in Asia (Ahmed et al. 2005), with less qualified, unregulated practitioners providing a large proportion of services to rural and lower income populations (Ahmed et al. 2005; Sudha et al. 2003; Thorson et al. 2000). In Bangladesh, it was noted that the private sector is the preferred source of curative care, including both licensed and unlicensed providers (BHW 2006; Cockcroft et al. 2007; Perry 2000). The reasons for choosing less qualified practitioners have not been adequately studied but are likely related to relatively easy access, low cost, familiarity and user-friendly services (Desmet et al. 1998). It is more likely that for populations with lower socio-

economic, unlicensed private practitioners remained the primary choice not only for chronic cough but also for all other illnesses (Lonnroth et al. 2001; Ahmed et al. 2005).

Age was not found to influence care seeking from any of the providers in this study. On the other hand, we found a significantly higher proportion of females than males sought care from any sources. Gender disparities have been reported in care seeking in cases of childhood diarrhea and other childhood illnesses (Pandey et al. 2002); however, such bias varied by residence and socio-economic conditions in the Bangladeshi context (Larson et al. 2006; Ahmed et al. 2005). Moreover, females were more likely to seek care from nonregulated or less qualified sources (Thorson et al. 2000; Lonnroth et al. 2001).

In this study, chronic coughers with more symptoms were found more likely to seek care from DOTS or licensed private practitioners. It is intuitively correct that people with one or more severe symptoms would seek care from a licensed practitioner if they had the economic means to do so. In the early stages of TB, studies have found that the symptom of a chronic cough was not taken seriously enough by affected individuals to be assessed by a practitioner (Tuberculosis Coalition for Technical Assistance 2006; WHO 2001, 2004). Similarly, persons previously diagnosed with TB were probably more knowledgeable about where to seek appropriate care for TB (Lonnroth et al. 2001), as we also found in this study.

We found an inconsistent association between care seeking and wealth quartiles, but a significant association with household expenditure and seeking care from any provider. The median expenditure of the study population was 69 US dollars, and the highest expenditure was 177 dollars. How well the wealth differences correlated with expenditure differences remains unexplored. In a study on healthcare seeking from rural Bangladesh, the authors found a direct relation with poverty and levels of education with care seeking (Ahmed et al. 2005). However, it is difficult to measure whether these factors produce such care-seeking behaviour individually or care seeking is a product of their combined effect.

Discrepancies between doctors' reported practices and TB patients' reports have been described in India (Uplekar et al. 1998). In our study, practitioners' reports also differed from what clients of practitioners reported, and we also found that the two groups of private practitioners managed chronic cough differently. Less than 1% of chronic coughers claimed they had been referred to a DOTS facility. The discrepancy in the reported referral practices to DOTS centres among private practitioners relative to their clients is a comparatively newer finding in Bangladesh and critical for control programs.

Prescribing medicines on first consultation was common with all types of private practitioners. Similar practices are also reported in Africa and Asia, where 50% to 95% of respiratory patients attending facilities are given a prescription (Auer et al. 2000; WHO 2004). Among investigations advised, ordering chest X-rays in high proportions persists in our study among licensed and unlicensed private practitioners, as observed from studies in the region (Neeta et al. 1998; Prasad et al. 2003; Uplekar et al. 1998; WHO 2001). Multiple tests at the first visit were also reported, including sputum for acid fast bacilli (AFB), Mantoux tests and a chest X-ray. This practice is not always preferred at the initial stage from the control point of view (DGHS 2004).

The results of our study might be somehow influenced by an enrolment restricted to a relatively poor urban population. In addition, nearly 50% of adult males listed in the survey could not be interviewed to confirm a history of chronic cough. A proxy response from household members recorded the prevalence of chronic cough among the absentees to be just over 1.5%. These males are likely to include healthy workers such as day labourers, factory workers and rickshaw pullers. Given the similar background and household characteristics, their inclusion would probably not influence the obtained findings much. Another limitation was that we did not collect information on the prevalence of smoking in the study population. The current estimate from a national survey reported prevalence of tobacco smoking as 23% among adults, and greater in males than in females (Global Adult Tobacco Survey 2009).

Conclusions

Adult chronic coughers in this study utilized a wide range of both licensed and unlicensed private practitioners, suggesting a need to partner with these practitioners in different activities and steps of the National TB Control Program in Bangladesh. It is also important to identify barriers to referrals to DOTS centres by these private practitioners. This can be achieved by further strengthening the ongoing public–private mixed approach of the National TB Control Program and by widening its scope to include all potential providers.

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