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From the Editor-in-Chief

This issue of *World Health & Population* presents papers that have been published online by *WHP* and are selected here as representative of recent outstanding contributions to the journal. It is a particularly interesting issue in that only two of the five articles, both from Bangladesh, report the empirical health services research typical for *WHP*. The other three papers, from settings as diverse as Haiti, China and Chile, are all descriptive and/or observational studies, reflecting the policy orientation of *WHP* perhaps more strongly than have recent issues of the journal. We hope readers will enjoy the slight change of focus for this issue, and we welcome feedback, suggestions and future contributions.

The first of the two empirical research articles from Bangladesh examines practice patterns associated with the diagnosis and treatment of tuberculosis (TB), based on extensive surveys in the two largest urbanized areas of Bangladesh: Dhaka and Chittagong. The surveys included a wide span of providers – public and private, licensed and unlicensed – that see adults with chronic cough who could be suspected of having TB. The study reports that over 50% of respondent providers and patients were aware of the WHO-recommended Directly Observed Treatment Short Course ("DOTS") strategy and DOTS clinics. However, fewer than 16% of patients sought care in DOTS clinics, and the number of referrals from private practitioners to DOTS facilities was essentially nonexistent. The authors recommend better communication and coordination of services between the Bangladesh National TB Control Program and providers seeing patients with chronic cough.

The second article in this issue of *WHP* is a short but extraordinary description of specific relief efforts in Haiti following the January 10, 2010 earthquake that devastated the capital, Port-au-Prince, and the surrounding area. The 16-member Toronto Rehabilitation Institute "Team Haiti" group, led by *WHP* Associate Editor Michel Landry, travelled to Haiti with three objectives: provision of direct clinical care, clinical education and support for local healthcare providers, and an assessment of broader rehabilitation needs in Haiti. Despite the potential for feeling overwhelmed by the vastness of the need they observed, the team returned, like so many providers of humanitarian care, inspired by the courage, sacrifice, hard work and optimism of the people and providers they were serving. In a cautionary and sobering note, however, Landry et al. point out that the exemplary early response to the disaster saved many lives, but the rehabilitation needs of the survivors are extensive and long term. Unfortunately, the attention span of the world community is often such that long-term follow-up is rare. We can only hope that will not be the case for Haiti after the devastation earlier this year.

The Li article, "Healthcare Reform in China," is a descriptive study of the transition in the Chinese healthcare system from an essentially free and comprehensive (at least in design and intent) healthcare system to a system that includes broader use of insurance, personal medical accounts and review of alternative treatments. Initial reforms were begun in 1994, with new strategies announced in 2009. Li discusses various specifics, including both dental care and traditional medicine, and the impact on an increasingly aging population. He concludes with some observations about the "road ahead" for healthcare in China.

Our fourth article is a very interesting observational study of healthcare for indigenous people in Chile. Although there has been interest in indigenous healthcare practices in many countries, there is relatively little documentation of efforts to integrate local, traditional practices and cultural beliefs into a "westernized" healthcare system focusing on curative, allopathic medicine. Such an approach is reported from a sociological/anthropological viewpoint by Maria Torri, however, in her article "Health and Indigenous People: Intercultural Health as a New Paradigm." The Makewe hospital,

in a non-urban area of Chile with a high indigenous Chilean population, has been controlled since 1999 by the local "Indigenous Association," with effective and extensive community participation. In 2008, Torri conducted 42 semi-structured and open-ended interviews with stakeholders at all levels at Makewe. The first issue that might come to mind when considering the integration of traditional healthcare with western healthcare is conflict in beliefs regarding healthcare practices. Torri's case study, however, also brings up other very interesting payment, religious, regulatory and economic sustainability issues that are part of "the contentious nature of intercultural health." There is a great deal of additional interesting work that can be done in this area, in particular to examine the impact on health outcomes of intercultural, integrative healthcare delivery for indigenous populations. Torri's article is an important first effort.

The final article in this issue is a study of the impact of birth spacing on infant and child mortality in Bangladesh. Using Bangladesh Demographic Health Survey (BDHS) data, Shamina Akter et al. illuminate the relationship of birth intervals on mortality from an empirical, life table approach. Probability of survival to 3 years increased steeply and dramatically from birth spacing of less than 12 months, and peaked for children spaced 54 to 60 months apart. Interestingly, it declined somewhat for birth intervals greater than 5 years. The authors acknowledge the multifactorial nature of infant and child mortality; however, the simple intervention of increased birth spacing, achievable through basic family planning, can contribute importantly and independently.

In conclusion, we hope that you find the papers in this issue interesting and worthwhile, and that you will also consult others recently released online at www.worldhealthandpopulation.com. WHP remains committed to its mission to provide a forum for researchers and policy makers worldwide to publish and disseminate health- and population-related research, and to encourage applied research and policy analysis from diverse global settings. WHP is indexed on MEDLINE and is accessible through PubMed.

We look forward to continued enthusiastic submission of manuscripts for consideration, peer review and publication. Finally, the editors and publishers of WHP are always interested in any comments or suggestions you might have on the papers or the journal. Please feel free to write or e-mail us.

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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.

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.

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).

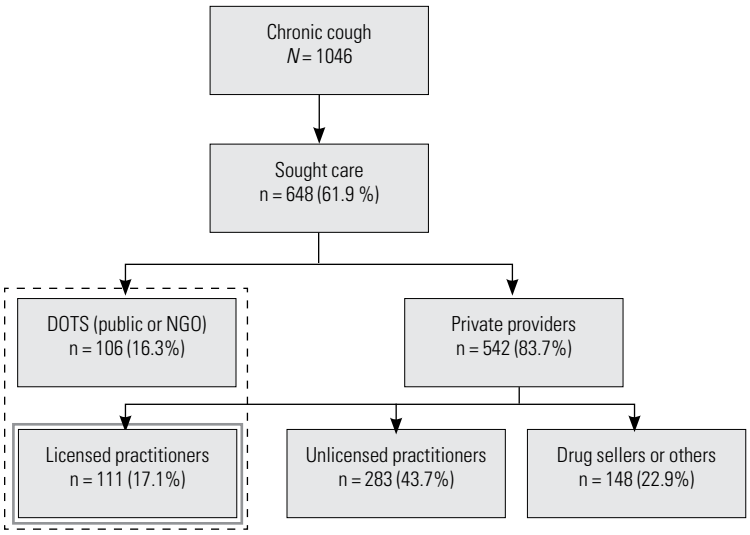
Table 1. Selected socio-demographic characteristics of the chronic coughers interviewed (N = 1046)

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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Humanitarian Response Following the Earthquake in Haiti: Reflections on Unprecedented Need for Rehabilitation

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In the late afternoon of January 12, 2010, an earthquake measuring 7.0 on the Richter scale struck the nation of Haiti. The epicentre of the earthquake was the coastal community of Léogane, approximately 25 kilometres south west of the densely populated capital city of Port-au-Prince (PAP). The devastation was enormous. An estimated 220,000 people died, over 300,000 were injured and more than 1.3 million were rendered homeless and are now living in temporary shelters in PAP (Pan American Health Organization 2010). Based on current predictions, this event led to the fifth-highest single-day loss of life due to an earthquake in modern history (United States Geological Society [USGS] 2010). Approximately 80% of schools in the PAP area were destroyed, and hundreds of thousands of structures including

dwellings, government buildings and hospitals were damaged (USGS 2010). The future infrastructure and economic needs are colossal; however, the greatest tragedy is the number of casualties and the human toll on future generations of Haitians. Haiti's ranking on the United Nations Human Development Index[1] was relatively low prior to January 2010, and the aftermath of the earthquake will further complicate long-term development in one of the poorest countries in the world (United Nations Development Program [UNDP] 2010).

Map of Haiti showing the epicentre and heavily affected zones. <http://globalvoicesonline.org/specialcoverage/haiti-earthquake-2010/>.

Despite the large number of casualties that resulted from the earthquake, many organizations hypothesize that the numbers would have been much higher without the immediate response from the global community. The pace at which humanitarian aid and emergency response workers arrived into earthquake-affected zones ultimately saved many lives that would not have otherwise been preserved. However, decreasing mortality often creates greater morbidity in the form of functional impairment and disability. The critical issue now in Haiti is to what degree those who *were* initially saved can be rehabilitated and reintegrated into their communities. Even before the earthquake, Haiti was a rather hostile environment for people with disabilities, and now discharge planning from healthcare facilities to old (and new) communities has become a convoluted scenario for those living with disabilities from burns, amputation, multiple fractures, spinal cord injuries and other injuries. Factors that complicate the transition back into the community include the destruction of infrastructure, limited access to health and social services, and the challenge of locating family members displaced by the earthquake. Moreover, while many Haitians lived discreetly with disabilities pre-earthquake, the current health system may not be equipped to meet the rehabilitation needs of people with complex injuries.

The demand for specialized rehabilitation services in post-earthquake Haiti is not driven only by the absolute number of people with disabilities, but also by the status of rehabilitation expertise within Haiti to effectively address such complex needs. Within a month of the earthquake, the Toronto Rehabilitation Institute (Toronto, Ontario, Canada) recognized that despite the staggering mortality rates, thousands of survivors would need rehabilitation to regain function and mobility. As part of a humanitarian response, Toronto Rehab sent an initial team to work at Hôpital Albert Schweitzer in Deschapelles, Haiti. Deschapelles is a rural setting located in the Artibonite Valley and was not directly affected by the event. However, in the days following the earthquake many Haitians left (or were evacuated from) PAP, the capital, for rural communities such as Deschapelles in order to seek healthcare outside of the heavily damaged earthquake zone.

Jamie Young (physical therapist) working with a patient with an incomplete spinal cord injury. (Photo: Lisa Carnie)

The goals of this initial mission were threefold: first, to provide direct clinical care to persons injured in the earthquake; second, to provide clinical education to Haitian healthcare providers regarding rehabilitation services; and third, to assess the broader rehabilitation needs in Haiti. During this first 2-week visit, well over 300 units of service were provided, and close to 25 educational sessions were conducted. In addition, one of the team members travelled the country to meet and discuss rehabilitation needs with other local and international non-governmental organization (NGOs) providing rehabilitation services in Haiti. It was during one of these encounters that we met with an NGO called Healing Hands for Haiti. Following a series of discussions on required resources and expertise, Healing Hands for Haiti requested that Toronto Rehab assist with the provision of spinal cord rehabilitation in the northern city of Cap-Haitien. In response, Toronto Rehab organized four interdisciplinary teams to rotate every 2 weeks in Cap-Haitien for an 8-week commitment.

The typical trajectory of spinal cord injury (SCI) patients in Cap-Haitien was as follows: people were injured during the earthquake either by falling from a building or having a building/wall fall

onto them; they were trapped under the rubble for a period of time ranging from a few minutes to days; then their family, neighbours or friends managed to remove them from the rubble in any way that they could (ironically, this gesture of good samaritanism may have adversely affected the patient's ultimate prognosis). After being pulled from the rubble, they were often taken to local emergency field hospitals within the immediate vicinity of where they were injured. Because of the severe nature of their injuries, many individuals with spinal cord injuries were triaged as a low priority due to likelihood of death. However, survivors of the acute phase were often triaged to another medical centre for surgical care. In the case of our patients in Cap-Haitien, they were triaged in the acute phase to one of three sites: a hospital in the Dominican Republic; a hospital in the northern town of Milot, Hôpital Sacré Coeur, operated by the CRUDEM Foundation; or to the USNS Comfort, the United States Navy's floating Medical Treatment Facility that was docked two miles off the coast of Haiti and that served as a tertiary care centre (Etienne et al. 2010).

After injured individuals received urgent medical care and became medically stable, they were discharged to a small United Kingdom–based NGO called Haiti Hospital Appeal (HHA) in Cap-Haitien. HHA was originally designed to be a maternity and pediatric facility, but due to the tremendous need to find a suitable location for the people now living with spinal cord injuries, HHA transformed their facility into a spinal cord rehabilitation unit. The importance of this offer by HHA cannot be overstated. It is truly a reflection of the compassion and dedication of the NGO community in the post-earthquake phase across Haiti.

When Toronto Rehab's first interdisciplinary team arrived at HHA, they found 19 patients, the majority of whom had active medical issues such as neurogenic bowel and bladder dysfunction with associated impaction and urinary retention, as well as severe pressure ulcers that predated admission to HHA. During the initial evaluation, each individual's story of survival in the chaos and aftermath of the earthquake was devastating. However, despite the grave implications, the narratives that were heard were also inspiring, as these patients had survived against all odds. One story that particularly resonated is that of Solange, a 21-year-old second-year nursing student from PAP. On the day of the earthquake she decided that she would not write her final-year examinations. When the earthquake struck, Solange was at her parent's house, and she sustained a complete thoracic SCI when the walls of the home fell on her. Unfortunately Solange's nursing classmates were not so lucky (although 'lucky' is used broadly in this context). They were writing their exams at the time of the event, and subsequently all perished when the university building collapsed. Solange's story is tragic but not unique.

Our initial team in HHA focused on assessing injury severity, achieving medical stability and embarking on initial patient and staff education. The teams that followed worked in unison with Haitian colleagues to progress recovery and function. During the short 8-week period, four individuals were discharged back to PAP, and at the time this article was written, an additional three patients were being prepared for their transitions back to the community. Patients discharged thus far have been those with incomplete SCI, meaning those who are able to ambulate independently with mobility aids such as walkers, canes and crutches. The discharge plan for these people included providing air and ground transportation, and offering tents for shelter. Given education on safety and compensatory strategies, we feel these people will be able to manage their self-care activities; but life will still be challenging, especially as it relates to their future ability to work and re-establish societal roles in the community.

The remaining 12 patients have complete spinal cord lesions, and the prognosis for independent walking is poor. Many people in this cohort also have significant pressure ulcers and difficulty managing the neurogenic bowel and bladder dysfunction that occurs subsequent to an SCI. Under these circumstances, discharging a patient with a tent is simply not an option. The Haitian and international communities are currently exploring housing options ranging from constructing accessible and integrated homes in the community to creating dedicated communities or facilities that would house groups of people with mobility impairments. The latter option is often met with resistance,

and it is often suggested that institutionalization of persons with disabilities is not an appropriate measure; however, given the unique challenges that exist in post-earthquake Haiti, considering and evaluating all options may ultimately prove to be a wise approach.

Rebuilding post-earthquake will be a difficult road for Haiti (Bayard 2010). Our collective experiences in Haiti have served as a reminder that decreasing mortality rates subsequent to timely and effective emergency response following a natural disaster results in higher morbidity rates. Preserving life following significant trauma often means that the person will survive with significant disabilities. We do not wish to debate the ethics of preserving life following natural disasters; we do, however, highlight that if a life is preserved through "heroic means," there is a moral imperative to also ensure that a continuum of care is initiated and implemented. This continuum of care is crucial for the injured so that they can maximize their quality of life. Rehabilitation has often been left out of mainstream humanitarian aid and emergency relief, but the outcomes of the earthquake in Haiti may signal to the global community the clinical and moral necessity for rehabilitation.

Our experiences may also serve as a reminder that despite the pessimism that is commonly expressed regarding the enormity of the problem following natural disasters, the actions and contributions of individuals, small groups and hospitals can make a difference. The involvement of Toronto Rehab made a difference in the lives of a small group of patients in Cap-Haitien and moved them along the trajectory from medical crisis to rehabilitation, and in some cases discharge back into the community within a few months of the event. We also made a measurable difference to the health providers with whom we worked and provided education. It is often said that "we" gain more from working in such settings than we give; and although it is a cliché, we believe it to be true in our case. On the one hand, the clinical teams provided direct services that saved lives, and we shared our knowledge and clinical expertise with our Haitian colleagues; but on the other, the patients whom we worked with have let us into their lives, albeit briefly, and have made an indelible mark on our hearts and souls. In Antoine de Saint-Exupéry's *The Little Prince* (1943), he writes, *"On ne voit bien qu'avec le cœur. L'essentiel est invisible pour les yeux."* The English translation would be roughly, "It is only with the heart that one can see rightly. What is essential is invisible to the eye." While we may not have known it at the time, the people we worked with in Haiti taught us about courage and confirmed our belief in the human condition, and we are better people and clinicians for having known them. To use the analogy from *The Little Prince* … they have helped us "see" rightly again.

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Notes

[1] The Human Development Index was developed by the UNDP and is a composite measure that uses three equally weighted dimensions of human development, including life expectancy at birth, adult literacy and average years of schooling, and income. The 2009 Human Development report ranked Haiti 142 out of 182 countries (just ahead of Sudan, which ranked 143) (UNDP 2010).

Healthcare Reform in Urban China

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Abstract

After the People's Republic of China was founded in 1949, urban people who worked for the government and its enterprises were offered free healthcare. This benefit continued after their retirement. Due to the characteristics of socialism, a large majority of the urban population were included in this free healthcare system. The past 16 years, however, have seen a dramatic change in this coverage, significantly influencing urban living standards. This paper will discuss the causes, consequences and current adjustments in medical care reform. The impact on the daily lives of the urban elderly will also be the focus.

Background to the Current Landscape of Urban Medical Care

In 2009 China announced new strategies for reforming the medical care system. Planned changes and adjustments build partly on the previous reforms that began in 1994. As well as addressing certain remaining problems from the 1994 reforms, the changes target new issues created during the process of economic development and focus on current healthcare concerns. One such concern is the shortage of doctors at national-level hospitals and the very large population of patients requesting treatment at these public hospitals. Allowing private facilities to operate is one way of relieving pressure on an overburdened public system. Before 1994, there were no private clinics/hospitals offering medical services in China. Subsequently, a number of private hospitals have been established, but they are expensive. Even with health insurance, patients pay more for medical services at a private hospital than at a public one.

China's public hospitals are officially categorized into three different levels: national, city and local. Capacity is limited. National-level public hospitals, located in a few large cities such as Beijing or Shanghai, have more well-known doctors and advanced medical facilities. Many patients and their families would prefer care at national-level hospitals, especially when patients suffer from serious illness. But the high demand for service has resulted in an inadequate quantity of beds and a shortage of doctors and nurses. Families who cannot help care for their hospitalized relatives have to hire others to do so. In addition, healthcare reforms and the rising cost of medication have resulted in patients paying more out of pocket.

With the recent announcement of additional strategies for reform, if all the proposed changes can be realized, it is anticipated that the cost of healthcare to the individual will decrease each year. In the near future, the proportion of medical expenses paid by the government and publicly funded healthcare plans will increase and is expected to cover a large percentage of the total medical cost for individuals by 2020. Currently, the government pays 17% of medical expenses, publicly funded healthcare plans contribute 29% and individual out-of-pocket expenditures are 54%. It is anticipated that the coverage from publicly funded healthcare plans will increase to 48%, financial support from the government will be 32% and the individual's expense will decrease to 20% (Cai 2006). It is also probable that both private and public hospitals will continue to exist (Zou 2009) and will be able to serve more people in need. This coexistence will result in growth in the number of for-profit and not-for-profit hospitals. It is believed that by 2020, problems in efficiency of hospital services will be solved and drugs will be more affordable (Zou 2009). Health insurance coverage will soon increase, too. Projections show that by 2011, more than 90% of Chinese in both urban and rural areas will have basic health insurance (China.org.cn 2009). These planned changes to the healthcare service describe a promising future. A summary of China's healthcare system and its reforms will explain why such adjustments are required.

China's Urban Healthcare System Since 1950

Under the system that began in the early 1950s, healthcare services were provided under two different vehicles: a rural cooperative medical care system and an urban medical care system. In rural areas, where the population was involved agricultural activities, medical care was not a free-of-charge system. Because it differs greatly from the urban system, the rural system will not be the focus of this paper.

Prior to 1994, urban medical care was free to anyone who worked for the government and its enterprises. Following the characteristics of socialism – ownership by the nation's people – a large majority of the urban population was included in this free system. People paid only a registration fee when hospitalized; they were not charged for seeing a doctor or receiving prescriptions. The registration fee was not co-pay but was minimal: in the late 1980s, it amounted to ¥0.15 (Chinese yuan; currently two to three US cents). At that time, people in China received very low salaries. For example, a new college graduate earned a monthly income of ¥56 (a little more than eight US dollars today). Although Chinese people did not earn a great deal, the ¥0.15 was only small percentage of their income and was quite affordable, as it was the only fee for which the patient was responsible. The registration fee today is still considered relatively low, equivalent to one to two US dollars on average, depending on the professional level of the doctor. The current issue, which has become critical, is not the registration fee but the out-of-pocket expenses for co-pay and prescription drugs. The cost of medical care has increased dramatically since the 1994 reforms.

Changing Demographics and Their Impact on the Healthcare System

China's changing population is making a significant impact on the medical system. When the system was introduced in the 1950s, the Chinese population was on average young, and the group of elderly people was relatively small. In the ensuing 40 years, however, the number of people eligible for free healthcare has grown significantly. The population has increased from around 563 million in the early 1950s to over 1.3 billion today. Urbanization has also accelerated in the last two to three decades. In addition, with the increase in life expectancy in China, healthcare for the elderly has become an even more pressing issue, and many new concerns have arisen.

First among these concerns is the growing number of people in urban areas. Originally, the free healthcare system covered a majority of urban people because they worked for the government or its enterprises. At the end of the 1980s, an estimated 150 million people, including both workers and retirees, had coverage (Chen 1994). Second, only a small proportion of the total population had access to free healthcare. At the end of the 1980s, China's population exceeded 1.1 billion people, and 26.2% of the population, around 300 million, lived in cities. None of the approximately 800

million rural residents had access to free healthcare, and only about one half of city dwellers had coverage (Chen 1994). Living in an urban area did not mean free healthcare. Third, the system was often abused. For example, some people wasted prescription drugs because they were free of charge. Fourth, the most serious issue was that a small proportion – around 13% – of China's population was enrolled in the system yet consumed a large percentage of the national revenue. According to Song (2001), the total amount spent on the free healthcare system in 1978 was ¥27 billion (about 3.9 billion US dollars). This increased to ¥774 billion in 1997 (about 112 billion US dollars). Put another way, the cost of free healthcare in 1997 was 28 times higher than in 1978, yet China's total national revenue increased by only about 6.6 times in the same period (Song 2001). The increase in healthcare expenditures for the free system had become a heavy financial burden in the process of China's economic development.

There are also many other social reasons for reforming the system. A few examples include rapid population growth, recent economic reforms, the growth of urban areas and a rapid increase in the number of people with coverage. Growth was especially rapid from the late 1980s to the early 1990s. The government realized that the burden of expenditure on free healthcare had become inconsistent with the goal to increase per capita income for the Chinese people. The free medical care system was hindering the advancement of the nation.

1994 Reforms to the Healthcare System

To address the many issues, the government began reforming the system and reducing its financial inputs by rationally allocating medical expenses to three different accounts: the government, the government-owned enterprises and individuals. Reform focused on reducing costs to the government and enterprises for medical care of their employees and retirees. These individuals were now required to pay a certain percentage of their own healthcare. This change would certainly accelerate the China's economic growth and development. However, for the first time, people who had depended on free medical coverage would bear a heavy financial burden of the cost, particularly in the case of retirees on fixed incomes.

Three major changes were involved in medical system reform in the 1990s. The first change was to broaden healthcare coverage by enrolling more people in health insurance. As a result, medical insurance is paid by both employers and employees. For example, in some of the basic plans an employee pays at least 2% of his or her income for health insurance. The business, for its part, contributes 7% of the employee's total pay for health insurance (Song 2001). According to Ministry of Labour and Social Insurance policies, laid-off individuals receive free health insurance coverage during the period in which they receive unemployment benefits. Furthermore, retirees do not need to pay for health insurance. They are covered by their former employer, using funds paid by current employees (Ministry of Labour and Social Insurance 1999).

The second change was to establish a personal medical account. With this change, individuals are responsible for part of the payment when they see doctors, use hospital facilities or buy prescriptions. Medical expenses are now partly reimbursed by employers. People without a job, such as those who have been laid off, enroll in social healthcare insurance according to their residential district. This group pays a fixed fee for medical insurance, which also includes insurance for their pension on retirement.

The third change involved coverage for expenses when seeing doctors or being hospitalized. The extent of coverage depends on different healthcare plans, drugs that are used and treatments provided. For instance, I observed and informally interviewed a Chinese patient at a national-level public hospital in 2008. This patient needed a pacemaker. After discussing options with the doctor, he chose an imported pacemaker and had to pay a large proportion of the expense personally. Imported medical devices and drugs are more expensive than those that are locally manufactured and they are not included in the coverage.

Recent Reforms to Update the Medical System

According to public opinion, reform of the Chinese medical system had been falling far behind

when compared with the rapid economic development in 1990s. To bring the medical system up to date, other reforms were required, too.

Increased Development of Private Medical Facilities

One major reform was the establishment of private hospitals and clinics. These services, though more expensive for patients than public hospitals, can provide higher quality service, such as shorter waiting times and better care. Because of China's large population, public hospitals are overcrowded every day. Patients or family members must get up early or sometimes stay overnight in the long line outside a national-level hospital, waiting to register in order to see a doctor. Because doctors can only see a limited number of patients daily, these hospitals restrict the number of patients that can be admitted. The situation is especially true in large and well-known hospitals that attract more patients and their families. People go to mid-sized or small local hospitals only for non-serious health problems. The situation is most serious in Beijing, because patients from many other areas come to the capital city expecting to find a good doctor. The availability of beds in these hospitals is especially tight, so anyone needing surgery must wait for weeks.

Establishing private hospitals has undoubtedly helped address overcrowding in public ones. Today, many private hospitals have begun to accept social health insurance coverage, although, even with coverage, these hospitals are still expensive. As a result, patients spend more from their own pockets. However, many of these private hospitals are located in communities and willing to provide extra services such as home visits. Public hospitals seldom offer such services. According to the announcement of new strategies for further healthcare reform in 2009, increased development of private hospitals will be highly encouraged. It is expected that the coexistence of public and private hospitals will solve the issue of a limited number of doctors and hospital beds in public facilities. Similarly, the cost of seeing a doctor in a private hospital will likely be partly covered by patients' health insurance.

A Growing Interest in Dental Care

Another example of healthcare reform is the recent interest in dental care. However, Chinese health insurance does not include dental insurance, and individuals pay for their own treatment. In the past, Chinese people did not go to dentists regularly. More than likely, if they saw a dentist they had a specific problem, such as a toothache, bleeding or the need for a crown. However, recently people have begun going to dentists for teeth cleaning. Many small dental offices have been established to meet people's growing needs. These clinics are located in or close to residential areas and are convenient for people to visit. I visited a private community dental clinic in Beijing in 2008. The office was clean, and the dentist was professional.

Renewed Support for Traditional Medicine

Traditional Chinese hospitals are also undergoing reform. Only a few hospitals provide traditional medicine and treatments such as Chinese herbs and acupuncture. In China, many people, especially older ones, prefer using Chinese herbs to Western methods to address their health problems. In the era of free medical care, these hospitals functioned the same way as other hospitals and were also faced with an overwhelming demand for services. Because of the large number of patients and limited number of doctors in well-known Chinese herbal hospitals, it is still difficult to register to see a traditional Chinese doctor. Now, however, many retired Chinese medical doctors are allowed to practice traditional Chinese medicine in private clinics and hospitals and in Chinese herbal pharmacies. This has helped reduce pressures on public traditional Chinese hospitals.

The Impact of Healthcare Reforms on the Elderly

The 1994 healthcare reforms had a significant financial impact on the lives of the urban elderly. This group of retirees, numbering about 30 million or 25% of the total elderly population, was previously enrolled in the free healthcare system. The reforms, however, required them to pay part of the cost

of their medical care. Elderly populations have a reduced income after retirement, yet they consume more healthcare resources in all societies. According to Tang and Wang's report (1999) on their study of the health conditions of the 130 million Chinese elderly, 35% were healthy and 40% considered themselves well, while the remaining 25%, about 30 million, were reported to be in poor health or have an illness. Tang and Wang (1999) further mentioned that in the city of Beijing alone, about 100,000 people of 60 years of age and older were suffering from illness or poor health. From the above data, there is no doubt that the elderly are in need of some type of healthcare. Due to low life expectancy when the People's Republic of China was founded in 1949, the inclusion of full medical coverage for the elderly people was not an issue. But life expectancy in China has grown considerably, from 67.8 years in 1981 to 71.8 years in 2001 (People's Daily Online 2002) to an estimated 73 years or more in 2010. In 1949, the age of a senior citizen was defined as 60 years. This definition has not changed, although many scholars suggest changing it to 65 years or even older.

Reforming the free system has undoubtedly placed a significant financial burden on the Chinese elderly. Many who retired long before the reform have a particularly difficult time due to the low pension they receive. To study the issues of the Chinese healthcare system, I visited China in 2007 and 2008. These trips helped me to further understand current medical care reform and the health and financial circumstances of the elderly. I spoke with a group of retirees in Beijing and found out that their pensions ranged from ¥1500 to ¥4000 a month. Most of the people who received about ¥1500 (220 US dollars) had retired from a manufacturing job, whereas those with about ¥4000 a month (580 US dollars) had been government officials. The amount that these retirees spend on their monthly medications also varies from person to person, depending on their health conditions. It is important to realize that the standard of living in China is much lower than in the West.

Among the people I spoke with was an elderly woman who had cancer and other health problems, including high blood pressure and heart issues. Two thirds of her monthly pension of ¥2500 (365 US dollars) was spent on drugs. She received an 80% reimbursement for Chinese-made drugs, under coverage from her previous employer. However, she had to pay for some of the imported drugs she needed to take daily and was refunded only a small percentage of the cost. I also interviewed a former government official whose monthly pension was more than ¥4000. Due to his relatively high status in his previous position, he was fully reimbursed for most of his medical costs, such as hospital expenses and drugs. The exception was imported products, such as his pacemaker, which he had to pay a large percentage of by himself.

China has become an aging society. The one-family-one-child policy was intended to reduce the country's population and enhance its economic development. The effect of this policy, however, combined with the steadily increasing life expectancy of the Chinese, has created a new social issue: the growth of the elderly population. The growth of this group in China is different from that of other aging societies. China now has the largest aging population in the world. Over 130 million people are 60 years of age or older, constituting about 10% of the total population. This segment of society is growing by 3.2% per year. By 2050, the number of elderly is projected at 400 million, or 26.5% of the total population (China.org.cn 2004).

As well as the size of the elderly population in China, there are other differences when compared other aging societies. For example, the growth rate of the elderly in Chinese urban areas is much more rapid than in rural areas. The population in more densely settled areas is aging more rapidly than in less populated areas. Also noteworthy is the increase in the oldest-old population, those of 85 years of age and older. This group is projected to reach 94.48 million in 2050 (People's Daily Online 2006), or one in five of the total elderly population, and constitutes the fastest growing group in the entire elderly population.

The growth rate of the Chinese elderly is not synchronous with economic development (Li 2005), and this is a major problem in terms of Chinese economic development. Scholars characterize this social phenomenon through a popular phrase: "Begin aging before getting rich." In most Western societies, the growth rate of the older population corresponds with urbanization and industrialization. In this situation, people "become rich before getting old." It has enabled these advanced

societies to finance services necessary to support seniors, including social security benefits and healthcare. Many Chinese scholars have already realized that the growth in the elderly population has hindered economic development and placed a heavy economic burden on current workers (China.org.cn 2006). Providing healthcare for the elderly population poses unique challenges for China.

Healthcare system reform is a complicated issue in any society. It usually requires a long time to make changes and apply them, due to the time needed for people to adapt, especially if financial planning is required. This is especially true for Chinese who previously had years of free healthcare. Furthermore, reforming the medical care system in China was not a gradual change but a rapid one. This has brought even more serious challenges. The problems encountered in Chinese society as a result of reforming the healthcare system can provide learning points for other countries.

Lessons from China's Experience in Reforming the Healthcare System

1. The reformed system costs people more than they are able to pay. This is especially true for the elderly (Lu 2003), whose pensions are much lower than a current worker's salary. Healthcare costs are unaffordable to someone on a retirement income. The financial difficulties that some aging people face make them more victims than beneficiaries of healthcare reform (Lu 2003).
2. When the Chinese government launched the reforms, they did not explain the details adequately to the public. As a result, many people do not understand the detailed policies. In the process of talking to the elderly when I was in China, I felt strongly that the majority were unsure of their benefits in the reformed system.
3. The reimbursement system was too complicated. People were required to go to local social services in order to be reimbursed for only a certain percentage of the total they had spent, which meant that patients and their families had to pay the full cost in order to see a doctor. Then the individual would go to the local healthcare services office to make a claim, and the money was deposited into his or her bank account. The issue that resulted was that many people did not know in advance what the reimbursement amount would be. This was because of the different costs of products made in China compared to imported medical devices and drugs. The complexity of the policies resulted in misunderstandings and dissatisfaction with the system. The Chinese healthcare system now practices a new policy that requires patients to pay only their share of the cost when seeing a doctor or using hospital facilities. The percentage of payment that had to be paid up front and reimbursed later no longer applies. This has not only significantly simplified the healthcare payment process, but has also greatly reduced patients' financial burden.
4. Prescription drugs in China are expensive. Although the government has made an effort to lower prices, it has been ineffective. The high cost of drugs is a problem for people, especially for the elderly, who may be able to afford to see a doctor but may not be able to afford the medication prescribed for them.

The Road Ahead

The problems described above have resulted in public complaints about the policies and practices of healthcare reform. Misunderstandings have led people to feel uncomfortable when visiting a doctor because they do not know how much their share of the cost will be. Consequently, some people do not see a doctor until they are seriously ill, which in the end is more costly. Due to the rapid growth of the elderly population, Chinese society has not yet been able to establish a fund for healthcare services for the elderly. However, after more than a decade of healthcare reform, policy makers have recognized that there have been many problems. For this reason, the Chinese government announced new policies in 2009 to address the existing issues. It is expected that with these future changes, the problems the elderly have to face will also be improved.

The reforms begun in 1994 have brought a radical change to the lives of the Chinese, especially the elderly who had once received free healthcare. After retiring from the labour force, the living standards of most people have dropped, due to the combination of lower income and annual inflation. As discussed earlier, if free healthcare had continued, most retired elders in urban China

would not need to worry about their healthcare expenditures. With the reform, however, all groups have to pay part of their healthcare cost. Medical expenses have become a heavy financial burden for the elderly due to their longer life expectancy, specific healthcare needs and limited financial resources. Therefore, understanding the ways in which the elderly are dealing with the reform and their attitudes toward it will provide essential information to all other societies and healthcare policy makers, especially for Medicare reform.

Healthcare reformation is a complex issue. This is true not only in China, but also in any other society. With an increase in the proportion of aging populations around the world, governments will be increasingly challenged to pay for the care of their people. In addition, the health conditions of the elderly, their special care needs and financial conditions should be addressed. These are important research subjects when planning for healthcare reform in the future.

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Suggested Further Reading

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Elderly Population to Double by 2040
http://english.sina.com/world/2009/0720/257073.html

Who Will Care for the Elderly in China?
http://www.bgsu.edu/downloads/cas/file35700.pdf

Gender Differences in Health among the Elderly in China
http://www.prb.org/Articles/2009/chinaelderlyhealth.aspx

Health and Indigenous People: Intercultural Health as a New Paradigm Toward the Reduction of Cultural and Social Marginalization?

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Abstract

The precarious socio-economic and health conditions of indigenous populations legitimize claims of marginalization and attest to the inherent inequality that indigenous groups suffer. In the last few years, advocates have urged the use of traditional indigenous health practices as more culturally fitting for most indigenous populations. An intercultural health program can reduce the conditions of social and cultural marginalization in an indigenous population. However, accepting and integrating indigenous medicine into a westernized health system presents a major challenge to intercultural healthcare in Latin America. The objective of this paper is to analyze the case of Makewe hospital, one of the first and few examples of intercultural health initiatives in Chile. The paper will examine the implementation of this initiative and the main challenges in creating an effective intercultural health program.

Introduction

Despite the political advances indigenous populations have made through political representation and autonomy, very few gains have been made in reducing poverty among these groups (Hall and Patrinos 2005). No systematic data on the health of these populations are available, but a few studies have reported worse indicators (infant mortality, life expectancy, maternal mortality) than

the national averages in their respective countries (Cass et al. 2002; Hall and Patrinos 2005; Pan American Health Organization [PAHO] 1999).

Chile has two health services systems. The unrecognized and unregulated traditional indigenous health system is widely distributed and utilized, whereas the formally recognized and regulated modern health system is significantly restricted in its accessibility and scope, particularly outside metropolitan areas. According to the Pan-American Health Organization (PAHO; 1998), Chile has more than 10,000 healers. Bussman et al. (2010) found that 71% of the Chilean population and 40% of the Colombian population have used traditional medicine. Modern medicine in each country has gone through a process of reforms during the last decade, most often moving toward decentralization and increased privatization.

Athough Chile has attempted to maintain a core of first-level services (primary healthcare) through insurance schemes and contract-based health centres and outposts, its social safety network has been substantially destabilized during this period. In some rural areas, a high proportion of the poor, including indigenous populations, are without adequate access to modern healthcare services. Pervasive economic and social inequality helps explain the differences in health between indigenous and non- indigenous Chilean people. A higher poverty rate hinders access to local health services for the Mapuche (Adler and Newman 2002; Johnson et al. 2004). It is important to point out that the Mapuche are not the only indigenous community in Chile. Although they represent the largest indigenous population, there were also small populations of Aymara, Atacameno, Rapa Nui and Kawaskhar in the country. In Chile, as well as in other South American countries, variations in health have been shown to be correlated with income and poverty. Lower income is associated with poorer health outcomes (Newacheck and Hung 2003; Scarpaci 1988; Shi and Stevens 2005).

Living in rural areas represents a problem in health outcomes, too. The interaction of identity with land in Chile also complicates the study of poverty among indigenous people; location and space available to a community can greatly affect the risk of poverty among indigenous and non-indigenous people alike (Adler and Newman 2002; Parse 2003). Empirical evidence has shown that those living in areas that depend on one major natural resource for economic well-being are disproportionately poor (Sapag and Kawachi 2007). Additionally, in rural areas the population is less likely to have adequate housing, health and sanitation.

Responding to problems in healthcare, advocates are attempting to promote retention of traditional indigenous practices as more culturally fitting for significant portions … of the population

Responding to problems in healthcare, advocates are attempting to promote retention of traditional indigenous practices as more culturally fitting for significant portions (and sometimes majorities) of the population (Newacheck and Hung 2003; Reyes-Ortiz and Pelaez 2007; Shi and Stevens 2005). But to what extent do such intercultural health initiatives work in practice? What are the major challenges in implementing an effective form of intercultural healthcare that can also reduce social and cultural marginalization among the indigenous population?

To answer to these questions, I shall present the case study of Makewe Hospital. Makewe is one of the first examples of an intercultural healthcare delivery system in Chile. It is located in the middle of several Mapuche communities and serves approximately 20,000 people. According to the hospital, more than 90% of its patients belong to the indigenous Mapuche communities.

Intercultural Health and Indigenous People: A Challenging Issue

The rights claimed by indigenous people, especially the Mapuche, have become part of an international effort to encourage and pressure Latin American countries to recognize and grant these groups increased sovereignty. This effort has accelerated in the last few years as indigenous groups represent themselves at international meetings and summits. Uncertain economic and health conditions of

indigenous groups are the basis for their promoting change in the health system and transformation of relations with the state. As a consequence, the consensus among international organizations has been to link improvement of health conditions to indigenous self-determination[1] struggles.

Indigenous health policy in Chile focuses on cultural differences expressed through the discourse of intercultural practices and intercultural health (Cuijema and Ochoa Davila 2003; Cunningham 2002; Orellana Salvador 2003; PAHO 1998). Intercultural practices are meant to convey acceptance, respect, horizontal relations, inclusion, equity, reciprocity and solidarity (Almaguer et al. 2002; Morgan 2001; PAHO 1998). According to PAHO's definition (1998: 36), intercultural practices "involve the equal and respectful inter-relationships of the political, economic, social, cultural, linguistic and gender differences, established in a particular space between different cultures." In many instances in Latin America, intercultural health is linked with indigenous forms of medicine (Centro Interamericano de Estudios de Seguridad Social and Reyes-Heroles 1987; Fernández Juárez 1999; Montenegro and Stephens 2006). It is important to point out that intercultural approaches to health are not only related to the indigenous medical systems. The term "intercultural practices" on one hand emphasizes the importance of cultural rights, and on the other points to the government's responsibility to provide adequate healthcare through access to institutional medicine. Cunningham et al. (2003) argue that intercultural practices emerge from a "double right: the right of indigenous peoples and ethnic communities to maintain and cultivate their traditional medical practices and the right established in international and national legislation that health is the right of all citizens."

Recognizing these different rights in the concept of "intercultural health" and the need for different policies to deal with indigenous peoples is at the core of the advocacy for decentralizing the health system for numerous indigenous populations

Recognizing these different rights in the concept of "intercultural health" and the need for different policies to deal with indigenous peoples is at the core of the advocacy for decentralizing the health system for numerous indigenous populations (Cujilema and Ochoa Davila 2003; Cunningham 2002; Murray-Garcıa et al. 2000; PAHO 1999). In Chile, the recent expansion of decentralization policies is part of a broader process of political, economic and technical reform (World Bank 1998). These policies include democratization and an effort to give voice to indigenous communities, as well as the neo-liberal modernization of the state.

Because of its long history as a centralist state, Chile is an interesting case of decentralization in health services (Angell et al. 2001; Nigenda et al. 2001). This history brings inevitable challenges for the state in reducing its own power and control over social policy. While the Chilean state is the main actor of reform in social programs and intends to maintain its centralist control over the social sector, the policy of decentralization in health sector has mainly relied on non-governmental organizations (NGOs) or civil organizations (Johnson et al. 2004; Mable and Marriott 2001; Nierkens et al. 2002). The intercultural health program emphasizes participation from indigenous communities as its key element.

These efforts at decentralization endeavour to blend intercultural practices with political action. Decentralization is explained as more than an intercultural preoccupation; it must be seen within a broader context of concerns about efficiency and local responsiveness (Birn et al. 2000; Bossert et al. 2000; Lillie-Blanton et al. 2000).

The characteristics, rationale and expected results of decentralization are aligned with the goals of the indigenous rights movement. The rationale is that local autonomy in decision-making, with input from the local population, will lead to increased responsiveness of healthcare to local needs, better quality healthcare and social empowerment. In evaluating decentralization, Bossert et al. (2000) outline the need for ways to assess improvement in equity and the democratic process. For

the indigenous movement, control over resources and autonomy in issues related to health are closely aligned with the goals of political autonomy and self-determination for indigenous groups. Cunningham (2002), for example, sees decentralization as the key to effecting an intercultural health system.

The Case Study

The Makewe hospital is situated in Makewe-Pelale, a rural Mapuche territory 25 km south of Temuco in the municipalities of Padre Las Casas and Freire. The territory includes 80 Mapuche communities with a population of approximately 10,000 persons. The vast majority of people living in these indigenous communities are small-scale farmers; the average land distribution is 1.5 hectares per capita.

As well as its intercultural health program, an unusual feature of Makewe Hospital is the strong participation of Mapuche communities in its administration. Participation is through the Indigenous Association, created in 1997 following the mobilization of the communities around the Makewe-Pelale area. The Association took control of the hospital in 1999; previously, it had been administered by the local Anglican church.

The Indigenous Association has developed mechanisms to enhance the communities' participation in the administration of the hospital. First, it has committees dedicated to gathering input from the communities. One is the Committee of the Wise (Comidad de los Sábios), which consists of lonkos, or elders, who have legal and social authority in their communities. The Committee of the Wise plays an important role in shaping the health model of the hospital and in supporting the proposals of the Indigenous Association. The director of Makewe and some of the hospital doctors interviewed emphasized this role heavily.

Methods

I contacted fieldwork for this study in Chile between February and April of 2008 at Makewe Hospital. The research is based on a sample of 42 semi-structured and open-ended interview conducted with Mapuche patients and doctors and nurses from the Makewe hospital. I interviewed four traditional Mapuche healers (machis). I selected the respondents based on their representativeness and willingness to participate. Patients were selected through parameters such as age and gender. I conducted in-depth interviews with the main actors of each intercultural health program; they included health officials from regional and municipal governments in Temuco with whom the Makewe hospital interact and negotiate, as well as Mapuche leaders in Makewe. I also conducted observations in the hospital and of participants. Interaction between the health workers and patients in the lobby, the waiting area and doctors' offices was observed, with permission from doctors. I attended seminars on intercultural health programs in Makewe, as well as various community meetings and governmental workshops in Temuco. In order to ensure the confidentiality of the data, I omitted the interviewee names.

A unique feature of this hospital is its relationships with traditional health specialists such as machis, who are religious, spiritual and medical authorities in Mapuche culture.

How Intercultural Health Is Put into Practice

The staff of the Makewe hospital is composed of 30 members, including two doctors, one dentist, three midwives, one kinesiologist, six paramedics, four custodial workers, three secretaries, three cooks, three drivers and one assistant for the dental service (PAHO 2001). A unique feature of this hospital is its relationships with traditional health specialists such as machis, who are religious, spiritual and medical authorities in Mapuche culture. These traditional healers take an active part in several events at the hospital and advise the Indigenous Association on how to formulate and

implement intercultural healthcare practices. One of the most important initiatives is collaboration between doctors and traditional healers in the diagnostic and therapeutic phases of treatment. Patients who doctors believe will benefit from traditional Mapuche healthcare are transferred to machis. In terms of intercultural health, this hospital is one of the most advanced in Chile and has the longest history with such practices.

Although the machis are linked to the work of the hospital, patients pay them directly. This aspect is particularly important, as it creates an access barrier for some. Nevertheless, from the interviews it emerged that the traditional healers' fee is generally lower than that of a medical specialist. The Indigenous Association's rational for the fees is that each type of treatment should be provided within its own cultural context. According to this vision, the machis should be validated by the community where they live, not by official entities such as the government. The Makewe hospital helps create links between the patients and the machis of the local communities. Collaboration between physicians and an intercultural worker helps determine if the patient suffers from a Mapuche (spiritual or emotional) or winka (western-based, psychological) illness. Patients diagnosed by either a western physician or a machi can use traditional or western medicine, or a combination.

The need for a culturally diverse hospital can be partially explained by the limited resources of the state to build new hospitals or clinics. Due to the paucity, and sometimes absolute lack, of hospitals and clinics in rural areas, the central question became how to make existing facilities more appropriate for indigenous people.

According to the director of SSAS (Health Service of Araucania), this can explain why the state-sponsored intercultural programs have focused on educating health workers about indigenous culture and on installing a bilingual service centre in the hospital. This initiative is also linked with reducing social discrimination, a priority for Mapuche communities. Institutionalized racism against the Mapuche in education, health and labour markets has attracted national attention to growing conflicts between Mapuche communities and the state. To foster cultural sensitivity as well as diversity of services, the Indigenous Association highlights the importance of changing health workers' attitudes to Mapuche patients and culture. As the director of Makewe emphasized in an interview, "… Intercultural health is not just about the combination of medicine. It is about respect for both cultures."

Respect for Mapuche culture is reflected in the administration of the hospital. For instance, all signs appear in both Mapudungun, the Mapuche language, and in Spanish. The hospital recognizes the religious holidays of Mapuche culture such as We Tripantü (New Year's Day for Mapuche), and religious ceremonies are celebrated within the hospital. Respect for traditional culture is also seen in the hospital grounds, which contain a ruka, a traditional Mapuche house, used by the Association as a meeting place. A rehue,[2] the most important symbol of Mapuche religion, is maintained in the front yard.

As part of the hospital's intercultural health program, the Indigenous Association encourages health workers to acquire knowledge about Mapuche culture, particularly its medicine. Programs aim to blend Western and non-Western medical knowledge. However, Chilean government documents do not present this blending as the intercultural program's main objective.

The intercultural health program promoted by the state seeks to recognize indigenous people's needs in the health sector, redefining the state as democratic, humanitarian and pro cultural rights (Laveist and Nuru-Jeter 2002; Montenegro and Stephens 2006). To improve health service for indigenous peoples, the Chilean health system introduced Bilingual Information Services to serve the Mapuche population in the IX Region, and Patient Care Services designed to greet and accompany patients and their families from hospital admission to discharge.

From the state's perspective, a bilingual office within hospitals, hiring indigenous health workers and allowing some input from indigenous communities in hospital administration was expected to improve access and reduce inequality between indigenous and non-indigenous populations. This is the key aspect of the intercultural health program and remains the key target for multicultural social policy. The state's multicultural social policy remains focused on expanding the social rights of the indigenous population rather than on promoting their cultural rights (Kim et al. 2000; Morgan 2001).

National health officials view culture in the context of values and beliefs. Intercultural practices are therefore mainly a process of communication in which those cultural values and beliefs are understood and recognized (Almaguer et al. 2002; Anderson et al. 2003; Ferguson and Candib 2002).

If the problem is culture and being able to communicate across the cultural divide, then an "add culture and stir" approach is all that is needed. Policy recommendations therefore are limited to adding elements of "cultural competence" to staff training in the health system through workshops and education.

Local health officials have a different conception of intercultural practices and health policy. The latter conforms to the model of political action previously presented by Cunningham (2002). According to this vision, intercultural practices represent an epistemological concept, one that brings together different forms of knowledge that have been placed in a hierarchy through differential access to power. As such, the goals of intercultural practices must not only be improved communication, but also political action and redressing questions of historical inequality.

There are eleven machis in the area of Makewe-Pelale, and six of them have strong collaborative ties with the Makewe hospital. If necessary, doctors may transfer a patient to a machi, while machis of the area transfer their patients to Makewe if they believe that Western medicine is needed. Once the transfer takes place, doctors and machis generally interact and discuss the patient. The hospital offers transportation for patients who wish to see a machi (PAHO 2001).

Interviews with Makewe patients revealed a high level of satisfaction with the hospital and its services. The majority of patients interviewed, 25 out of 32, answered that they chose the hospital because of the high quality of its service. Fourteen patients, mostly middle-aged women, stated that they chose to come to the Makewe hospital because of its proximity to their village. Four patients responded that they chose Makewe because of lower cost, compared to other hospitals in Temuco.

A reason that could explain patients' positive reaction to the hospital's service is that the hospital not only tackles problems related to social service delivery but also addresses cultural issues inside the service delivery system. This is illustrated by the issue of clarity in doctors' explanations of an illness. When asked how clear the doctor's explanation of their health problem was, 17 out of 32 patients answered that it was comprehensible and satisfactory. Only four patients, mostly older ones, answered that communication between doctors and patients was not completely satisfactory. Only one patient answered that the explanation lacked clarity.

Although little is known about the exact causes of the communication problems in Chilean hospitals, this is not only due to a language problem, but also to a cultural difference expressed in the way different ethnic groups think about health, disease and healthcare (Ahmad et al. 1990; Angell et al. 2001; de Haes and Koedoot 2003). The health beliefs of modern physicians are shaped by their own cultural background and biomedical and clinical training and are based on a scientific medical paradigm (Penn et al. 1995).

Many indigenous people have little education and thus have difficulty understanding information given by healthcare professionals. Kleinman (1980) argued that healthcare outcomes (compliance, satisfaction, and so forth) are directly related to the degree of cognitive disparity between the explanatory models of practitioner and patient and to the effectiveness of clinical communication.

Generally in Chilean hospitals the Mapuche patients' perception that the doctors' explanations are clear could derive from the fact that doctors have been trained to try and better understand Mapuche culture. Three out of five doctors interviewed emphasized that they have spent a long time interacting with Mapuche leaders and are familiar with Mapuche culture. For instance, one doctor from the Makewe hospital spoke Mapudungun fluently.

Outstanding Issues in This Experience of Intercultural Health

The Makewe Hospital is often cited as a successful example of the implementation of intercultural health, both by government representatives and among the Mapuche themselves. This does not mean that the project is without difficulties.

Challenges in Harmonizing Different Religious Beliefs

Study interviews highlighted how evangelical churches in the region have condemned Mapuche medical ceremonies. People who are evangelical or belong to a Protestant church tendency to not to visit machis, largely because of religious beliefs. Evangelical or Protestant nurses and workers in the hospital had nothing against the study of herbal medicine or its use in the hospital. However, they expressed uneasy feelings about the machis, whom they often associate with evil forces and witchcraft.

The Contentious Concept of Intercultural Health

Although Mapuche leaders and Indigenous Association members interviewed were active in political discussions on intercultural health or were working in this field, some expressed strong negative views about the concept itself. This was especially true in the case of elderly Mapuche, who remain sceptical of initiatives involving the Chilean government. This mistrust is based on the current and historical relationship between the Mapuche and the Chilean state and dominant culture.

The history of the indigenous population in Chile has been one of repression, discrimination and subjugation (Melissa and David 2008). Segregation and forced assimilation became the twin tools of domination by the European-origin population (Rector 2003). Indigenous people were forced to assimilate or face isolation. They were subjected to social oppression through legislation, social policies and other official and quasi-official means (Jeffery 2007). These laws created formal mechanisms such as slavery and a reservation system that legitimized discrimination against indigenous people. One example was the forcing of indigenous communities onto reservations that were smaller than their traditional ancestral lands (Ray 2007).

This resistance to state-sponsored initiatives is not generally shared by younger Mapuche leaders, who see intercultural health as a way to express the Mapuche identity and as a more balanced and egalitarian relationship with mainstream Chilean society.

Pablo, a Mapuche community leader in his early forties, explained,

> Through this experience at the Makewe hospital we have shown that Mapuche medicine can be as good as the Chilean one. We have been obliged to live in an intercultural context since our childhood. It is the time now that Chileans learn to do the same thing.

Some interviewees also argued that the concept of intercultural health does not necessarily provide equality, which can be achieved only if the fundaments of interculturality are implemented on a broader level. This involves social and political equality, legal recognition and the elevation of Mapuche medicine and culture in development programs. As long as inequality and discrimination remain unchallenged, a "relationship based on respect" will not be developed. A patient at the hospital stated,

> Traditional medicine represents an important aspect of our culture.... When people make fun of our beliefs they are not respecting the culture of the Mapuche. The fact that we have indigenous medicine included in the health system means that our culture is respected and recognized.

A machi interviewed argued that from his point of view, there were no examples of intercultural health systems in Chile. Asked about the significance of the concept of intercultural health, he explained,

> Intercultural health does not yet exist, and it will not exist as long as there are unequal conditions for the individual … the Mapuche people and other indigenous people are not recognized.

These comments are particularly meaningful as they reflect the importance of political issues in health policy. The growing grassroots demand for political recognition of culturally differentiated groups, and the apparent willingness by the government to recognize these groups, are significant

political as well as social issues. They can be understood as a problem of how to expand citizenship to realize multicultural citizenship (DiClemente et al. 2002; Kymlicka 1995) or how to modify liberal democracy to combine its universalist approach with the pluralist reality of a society (O'Neil et al. 2006; Taylor et al. 1994).

As Habermas (1994) points out, multicultural society necessarily involves the struggle of oppressed ethnic and cultural minorities. This struggle is certainly not a uniform phenomenon. Different ethnic groups have different goals, derived from different historical and political conditions. Multiculturalism draws either from the indigenous minorities who become aware of their identity and demand recognition, or from the new minorities who are a result of migrations in this globalized world (Ashton et al. 2003; Habermas 1994; Paley 2001).

These fundamental issues remain unresolved and are not currently recognized in healthcare policies. So far, governmental planning has focused on improving communication and interaction between Mapuche patients and health workers.

Inadequate Regulatory Framework

In Chile, regulations concerning how the healthcare system might best interact with traditional indigenous practitioners are minimal. The legal system hinders harmonization of the two systems because the government's Sanitary Code makes it illegal to practice medicine without holding a license. Traditional healers such as the machis do not possess a license, exposing both traditional healers and western doctors to the risk of litigation when adopting intercultural health practices. Traditional Mapuche healers practice extensively throughout rural areas in Chile, and in particular in Region IX (Araucanía), which has many Mapuche residents. The conflicts between the Mapuche and the government make implementing intercultural health difficult and hinder constitutional or legal changes that recognize traditional medicine. However, lack of recognition for the field of intercultural health does not seem to favour tendencies to identity change or cultural assimilation. Instead, the conflicting interests between the Mapuche and the dominant society accentuate ethnic difference (Almaguer et al. 2002; Cooper et al. 2003; O'Neil et al. 2006).

Economic Sustainability of the Makewe Initiative

The Makewe initiative required a new discussion on the value and role of traditional medicine, the responsibility of community health leaders, and the role of the state in intercultural health. Economic support from the government appears insufficient to ensure the sustainability of this intercultural health initiative. Currently, the Makewe Hospital is a private health institution managed and run by the Mapuche Indigenous Association. If the state's intercultural development program receives funding for intercultural healthcare, the hospital will be obliged to accept government interference in administration in exchange for economic support.

Chile's government currently provides some funding for intercultural health programs, although it is minimal (Rivadeneyra et al 2000; Sapag and Kawachi 2007; Schouten and Meeuwesen 2006). Government agencies have given no indication that the intercultural health program will be maintained once current funding is over. As the ministry's budget and resources available for indigenous health programs are limited, it is not clear how the Mapuche projects could be replicated on a broader scale.

Conclusion

The intercultural health program in Makewe presents an important case of multicultural social policy based on strong community participation with a little intervention from the state. This relatively autonomous status of the Indigenous Association has made a positive impact on intercultural health policy. The Association could enhance cultural diversity as well as health workers' cultural sensitivity. Furthermore, the Indigenous Association's intercultural health model has created a new way of combining Mapuche medicines with Western medicine; it is innovative but does not necessarily conflict with the current Chilean legal system.

The Makewe hospital has been successful in expanding cultural rights in its healthcare model. Many patients stated their satisfaction not only because the care itself is effective and speedy, but also because they do not need to worry about discrimination. The case study shows the importance of achieving multiple goals of multicultural social policy. Such policy aims at accomplishing both social rights and cultural rights. The improvement in social rights needs to accompany the expansion of cultural rights, and vice versa.

The state initiative for implementation of intercultural healthcare practices has opened new opportunities for the Mapuche in the IX Region. Using the framework of the intercultural health system, these indigenous communities have implemented local projects combining both Mapuche and western medicine in this rural area. Within these projects, the Mapuche struggle to reinstate their medicine as a recognized health system. Simultaneously, they express their culturally defined needs in a broader socio-political perspective, stressing a wider holistic view within these projects.

The concept of intercultural heath is large and vague, opening it to multiple interpretations and degrees of control from various sectors of society (Sleath and Rubin 2002; Sleath et al. 2003). Therefore, the use of these terms can provide an illusion of agreement, despite radically different interpretations and practice (Morgan 1993; Paley 2001; Triandis and Trafimow 2001).

Intercultural practices can be understood as a framework that deals with bridging cultural differences based on knowledge systems, values and practices; it can be seen as a concept that encompasses cultural differences from the perspective of unequal power relations as historically constituted in society. As is shown in this paper, from the viewpoint of the Mapuche communities, the concept of intercultural practices encompasses both.

It is very important, however, to ensure that community participation represents the wider community, not the small groups that might have a vested interest in continuing traditional practices (Morgan 1993; Paley 2001; van Wieringen et al. 2002). One can question up to which point the Mapuche Indigenous Association and the Committee of the Wise represent the views of the whole Mapuche community. The Association is elected in the community and attempts to represent its members through age and gender, but the Committee of the Wise is composed mainly of elderly people.

Community participation initiatives provide avenues for real political action, but their success depends on both the capacity of the community to ensure democratically functioning mechanisms in its organizations and the openness of governments and states to accept the political demands and consequences that these initiatives engender.

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Endnote

1. The increase interest towards indigenous people has been the result of international meetings and summits, among them the Universal Declaration of Human Rights (1948), Cumbre para la Tierra (1992), the Convenio Constitutivo del Fondo para el Desarrollo de los Pueblos Indígenas de América Latina y el Caribe (1992), Cumbre de las Américas (1994), Convenio 169 de la Organización Internacional del Trabajo sobre Pueblos Indígenas y Tribales en Países Independientes (1989), Decenio Internacional de las Poblaciones Indígenas del Mundo 1994–2004 (1993), and the Declaración de los derechos de los Pueblos Indígenas (1997). In one way or another, these international meetings have addressed the issue of health of indigenous peoples, and they have been linked to rights to self-determination, education and land.
2. A rehue is a tree trunk set in the ground and surrounded by canes of colihue, a perennial plant similar to bamboo, located in row and adorned with white, blue or yellow flags and branches of trees. The rehue has seven steps rising up from the earth to the summit. On the summit is a representation of a human face. The rehue symbolizes the connection with the cosmos. This rehue is a symbol of great importance, used in important celebrations like the Machitun, Guillatun, We Tripantu (Mapuche New Year) and others.

The Influence of Birth Spacing on Child Survival in Bangladesh: A Life Table Approach

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Abstract

In this paper we have attempted to demonstrate the relationship between birth spacing and child survival in Bangladesh using data from the 2004 Bangladesh Demographic Health Survey (BDHS). We used standard life table techniques to estimate the probability of child survival and appropriate spacing of births. Logistic regression models were used to investigate the covariates, along with the birth interval that has significant influence on child survival. Study results showed that the probability of child survival was much lower when the preceding birth interval was less than 12 months, and it may be also impeded by a higher birth interval. Child survival probability was highest for a preceding birth interval of 5 years; thereafter, the probability declined. Results of the logistic regression model clearly showed that preceding birth interval was an important and strongly significant factor in explaining infant and child mortality. While education, current age, breastfeeding status and birth order were substantial and highly significant factors both in infant and child mortality, socio-economic factors such as occupation and socio-economic status showed a significant effect only on child mortality. Postponing another child (for a birth interval of 5 years and above) and proper spacing of births would have a noticeable effect in reducing the level of mortality.

Introduction

Researcher and policy makers are interested in the effects of birth spacing on infant, child and maternal health and survival because family planning programs have the potential to affect the timing of pregnancies (Davanzo et al. 2004). The association between short birth intervals and impaired child survival are well established (Boerma and Bicego 1992; Hobcraft et al. 1985; Koening et al. 1990). It is generally accepted that if closely spaced births were delayed, particularly in countries where mortality and fertility are still high, child mortality levels would fall (World Bank 1993). The relationship between short birth intervals and high infant and child mortality has been established in a wide range of populations (e.g., Miller 1991; Miller et al. 1992; Rutstein 2000, 2003). Increasing the interval between births to improve the health of women and children has thus become one of the primary rationales for family planning programs (Locoh 1992; World Bank 1993). Infant and child mortality is a revealing indicator of the impact of government intervention policies and programs, and of socio-economic development in general.

Despite the existence of a large body of evidence on the association between birth spacing and child survival, many questions remain about the strength and nature of the association and the magnitude of mortality reductions.

Despite the existence of a large body of evidence on the association between birth spacing and child survival, many questions remain about the strength and nature of the association and the magnitude of mortality reductions. A number of studies of child survival status have been conducted (Alam 1995, 2000; Ezra and Gurum 2002; Majumder et al. 1997; Masanju et al. 2008; Syamala 2004), but very few have dealt with the relationship between birth spacing and child survival status, and none has examined the appropriate spacing of births for optimum child survival. In Bangladesh, the concept of appropriate spacing of births for child survival has rarely been studied. Hence the main objectives of this study are to examine the influence of preceding birth intervals on child survival status by investigating their optimal spacing to reduce infant and child death, and to identify the covariates of mortality.

Data and Methodology

Data used for this study are from the 2003–2004 Bangladesh Demographic and Health Survey (BDHS). BDHS (Mitra et al. 2005) used a two-stage probability sample design to select respondents.The survey recorded a large amount of data on the complete birth history of 11,440 ever married women between 10 and 49 years of age, of whom 10,145 had given birth to at least one child. Life table techniques are considered an appropriate tool to investigate the probability of child death and appropriate spacing for child survival. We used logistic regression to discover the predictors that significantly influence child survival. Regression analysis was performed for only the respondents' most recent child. Data for this study were analyzed using SPSS for Windows (Version 16.0), Statistica (Version 6.0) and Microsoft Excel.

Life Table Analysis

We constructed the life table for a total of 23,184 births of second and higher order for which the length of the preceding birth interval and age at death or survival to third birthday of the index child were known, where the index child is succeeding child. We selected children whose previous sibling had already died before the succeeding conception, yielding a sample size is 5049. Conventional life tables are used to provide an overall idea of influence of birth spacing on child survival. The tables are based on probability of dying and survival up to 3 years, that is, third birthday. In calculating the probability, the numerators are the numbers of children dying and the denominators are the number of children entering each age group. The ratios are, therefore, probabilities of death.

Age-specific probability of dying is calculated as

$$\text{Probability of dying} = \frac{S_x - S_{x+n}}{S_x} = \frac{\text{Number of deaths between ages } x \text{ and } x+n}{\text{Number alive at age } x}$$

where S_x = number of living children entering age x
S_{x+n} = number of living children entering age $x + n$

Logistic Regression Model

Cox (1958) is the pioneer of logistic regression model. Subsequently, his model was developed further by Walker and Duncan (1967) and Cox himself (1970) and, more recently, by Lee (1980) and Fox (1984). Logistic regression is part of statistical models called generalized linear models. An excellent treatment of generalized models is presented in Agresti (1996). The logistic regression model can be used not only to identify risk factors but also to predict the probability of success. The general logistic model expresses a qualitative dependent variable as a function of several independent variables, both qualitative and quantitative (Fox 1984). Binomial (or binary) logistic regression is a form of regression used when the dependent variable is a dichotomy and the independent variables are of any type. Y is a dichotomous dependent variable that takes values of 0 and 1, as follows:

For infant mortality

$$Y_i = \begin{cases} 1, & \textit{if death occur within <1 year of age} \\ 0, & \textit{otherwise} \end{cases} \quad , i = 1,2,3 \ldots\ldots\ldots,n$$

For child mortality

$$Y_i = \begin{cases} 1, & \textit{if death occur within 1-5 years of age} \\ 0, & \textit{otherwise} \end{cases} \quad , i = 1,2,3 \ldots\ldots\ldots,n$$

There is also a collection of k independent variables, denoted by the vector $X' = (x_1 x_2 x_3 \ldots\ldots x_k)'$ and β is a $(k+1)+1$ vector of unknown parameters.

For simplification, we can use the quantity $\pi(X) = P(Y = 1|X)$, the probability that the event occurs conditional on the value of X. Hence, the basic form for the logistic regression models is

$$\log \left[\frac{\pi_1}{1-\pi_1} \right] = \beta_0 + \sum_{i=1}^{k} \beta_i x_i$$

which can also be written as

$$\pi_1 = \frac{1}{1 + e^{-(\beta_0 + \sum_{i=1}^{k} \beta_i x_i)}}$$

where, π_1 in this case is the probability of death or survival of a child, and β_i is the parameter estimated for the intercept and independent variables. The results of logistic regression analysis are given as coefficients, odds ratios (if greater than unity, the probability of surviving rather than dying), and P values, to assess the relative importance of the selected variables.

Results and Discussion

Socio-Demographic Characteristics of the Study Population

Respondents' socio-demographic characteristics are given in Table 1. The majority of the 10,145 participants, 66.0%, lived in rural areas, and only 34.0% lived in urban areas. Altogether, 88.7% were Muslims and 11.3% were non-Muslims (Hindu, Christian and Buddhist).

Table 1. List of selected socio-economic and demographic variables with percentage, 2003–2004, BDHS, Bangladesh

Characteristics	Category	Frequency (N)	Percent
Respondent age (years)	1 = ≤24 2 = 25–34 3 = 35 years and more	2850 3643 3652	28.1 35.9 36.0
Age at first marriage (years)	1 = ≤14 2 = 15–19 3 = 20–24 4 = 25 and above	5670 3885 499 91	53.9 38.3 4.9 0.9
Age at birth (years)	1 = ≤24 2 = 25–34 3 = 35 years and more	5126 4156 863	50.5 41.0 8.5
Place of residence	1 = Urban 2 = Rural	3446 6699	34.0 66.0
Religion	1 = Muslim 2 = Non-Muslim	9002 1143	88.7 11.3
Respondent's education	1 = No education 2 = Primary 3 = Secondary 4 = Higher	4187 3044 2371 543	41.3 30.0 23.4 5.4
Partner's education	1 = No education 2 = Primary 3 = Secondary and higher	3816 2567 3762	37.6 25.3 37.1
Respondent's occupation	1 =Not-working 2 = Working	7813 2332	77.0 23.0
Economic status	1 = Poor 2 = Middle 3 = Rich	3702 1889 4554	36.5 18.6 44.9
No. of children ever born	1 = 1–2 2 = 2–4 3 = 5 and above	4394 3337 2414	43.3 32.9 23.8
Breastfeeding status for their child	1 = Ever 2 = Never	10,060 85	99.2 0.8
Preceding birth interval[a] (for last child)	1 = <24 months 2 = 24 and above	1546 6544	19.1 80.9

[a]The numbers do not add to 10,145 because 2055 children are first births and have no preceding sibling.

More than half of respondents were married before 15 years of age, and half gave birth at less than age 24. More than two thirds had only primary school education or none at all, and only 5.4% had been educated beyond the secondary school level. Of husbands, 37.6% had no education, while 37.1% had secondary or higher education. A total of 77.0% of respondents were not working

(meaning they were engaged only in household work), while 23.0% were gainfully employed. All respondents had given birth to one or more children, and 36.5% belonged to a poor family. About 99% of respondents breastfed their child.

Influence of Preceding Birth Interval on Child Survival

Tables 2 and 3 show the analysis of the influence of the preceding birth interval on child survival and probability of child survival up to 3 years. The tables are both constructed on the same principle: the rows represent different birth intervals of the index children and the columns represent different age groups of the same index children. Each cell represents the mortality experience of a given preceding birth interval for a specific age group. Only children observed during the full 3 years, or who died within the 3 years, in the preceding birth interval (of up to 7 years, or 84 months) and above were included in calculating the probability of dying.

Table 2 shows that birth intervals of less than 12 months and greater than 60 months were uncommon (2.5% and 2.9%, respectively). After a 60-month (5-year) interval, the number of birth decreased still further, to 2.6% at the 66- to 72-month interval and to 1.6% at the 72- to 78-month interval. Subsequent periods saw further declines. The greatest number of births occurred between 18 and 24 months (17%) and between 24 and 30 months (17.2%).

Table 2. Age-specific probability of dying and survival up to third birthday of index child by length of preceding interval in the study population as a whole, Bangladesh

Preceding birth interval (months)	Age at death of index child (months)					Probability of death up to 36 months (n=21251)	Probability of survival up to 36 months	Percent
	<1 (n=23184)	1–5 (n=22262)	6–11 (n=21864)	12–23 (n=21649)	24 –35 (n=21450)			
<12	0.119792 (576)	0.035503 (507)	0.022495 (489)	0.016736 (478)	0.019149 (470)	0.19965 (461)	0.80000	2.48
12–18	0.067806 (1873)	0.025773 (1746)	0.017049 (1701)	0.019737 (1672)	0.018304 (1639)	0.14095 (1609)	0.859	8.08
18–24	0.056853 (3940)	0.026911 (3716)	0.015763 (3616)	0.015173 (3559)	0.012839 (3505)	0.12183 (3460)	0.878	16.99
24–30	0.044328 (3993)	0.020178 (3816)	0.012303 (3739)	0.009207 (3693)	0.012845 (3659)	0.09542 (3612)	0.905	17.22
30–36	0.035042 (3453)	0.019208 (3332)	0.011628 (3268)	0.010526 (3230)	0.009074 (3196)	0.08283 (3167)	0.917	14.89
36–42	0.028125 (2560)	0.013264 (2488)	0.005295 (2455)	0.006552 (2442)	0.013603 (2426)	0.065234 (2393)	0.936	11.04
42–48	0.020219 (1830)	0.009481 (1793)	0.004505 (1776)	0.00509 (1768)	0.002843 (1759)	0.04153 (1754)	0.958	7.89
48–54	0.016393 (1281)	0.011905 (1260)	0.001606 (1245)	0.003218 (1243)	0.001614 (1239)	0.03435 (1237)	0.966	5.53
54–60	0.01466 (955)	0.004251 (941)	0.004269 (937)	0.003215 (933)	0.001075 (930)	0.02722 (929)	0.973	4.12
60–66	0.019374 (671)	0.004559 (658)	0.001527 (655)	0.006116 (654)	0.004615 (650)	0.03577 (647)	0.964	2.89
66–72	0.025295 (593)	0.013841 (578)	0.001754 (570)	0.000000 (569)	0.001761 (568)	0.04384 (567)	0.956	2.56

Table 2. Continued.

72–78	0.026737 (374)	0.010989 (364)	0.008333 (360)	0.000000 (357)	0.002801 (357)	0.04813 (356)	0.952	1.61
78–84	0.022201 (318)	0.022508 (311)	0.003289 (304)	0.000000 (303)	0.0033 (303)	0.05031 (302)	0.950	1.37
84+	0.022164 (767)	0.021333 (750)	0.00545 (734)	0.000 (730)	0.00274 (730)	0.05085 (728)	0.949	3.31
Total	0.039769 (23,184)	0.017878 (22,262)	0.009834 (21,864)	0.009192 (21,649)	0.009277 (21,450)	.08338 (21,251)	0.917	100

Note. "Index child" means the succeeding child.

Age-specific probability of dying was highest for a birth interval of less than 12 months and lowest for an interval of between 54 and 60 months. Probability of surviving to the child's third birthday ranged from a low of 0.800 for an interval of less than 12 months to a high of 0.973 when the interval was 54 to 60 months (Figure 1). After 5 years the probability of survival decreases monotonically, so a birth interval longer than 5 years substantially reduced the likelihood of child survival. Several studies have argued with this interpretation of child survival (Davanzo et al. 2004). As shown in Figure 1, the survival curve depicts an increasing trend for birth intervals of up to 54 to 60 months, where a 97.7% chance of survival is indicated; thereafter the curve shows a moderately decreasing trend. The curve illustrates the lower probability of survival when birth intervals were less than 12 months and the much higher survival probability for intervals of 54 to 60 months.

Figure 1. Probability of survival to 36 months by preceding birth interval

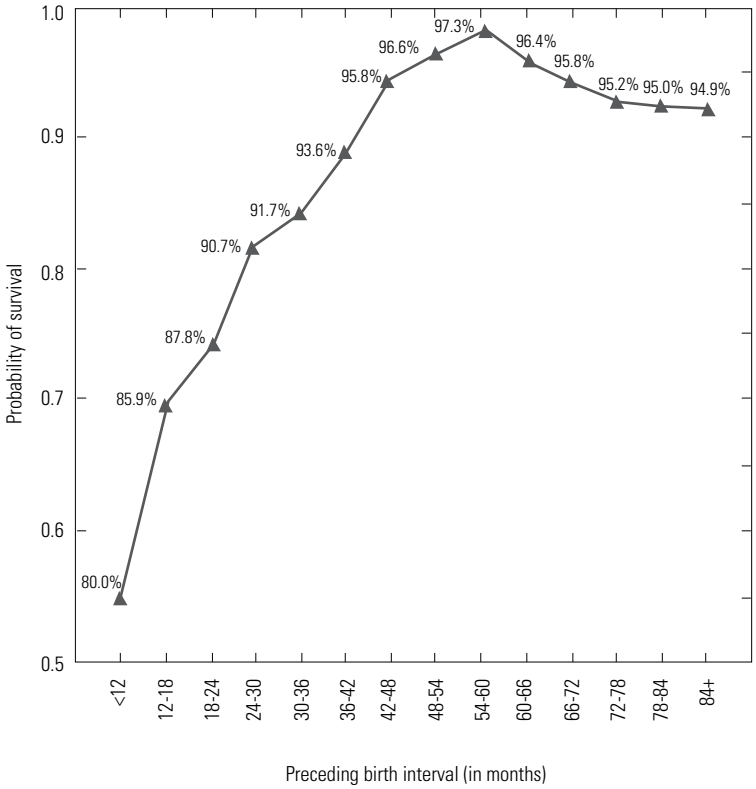


Figure 2 reveals that the probability of dying for different age groups shows a monotonically decreasing trend. Probability of death was greatest for infants less than a month old and was particularly high for those born at a preceding interval of less than 12 months. The downward trend continues to the 54- to 60-month interval.

Figure 2. Probability of death of index child by preceding birth interval

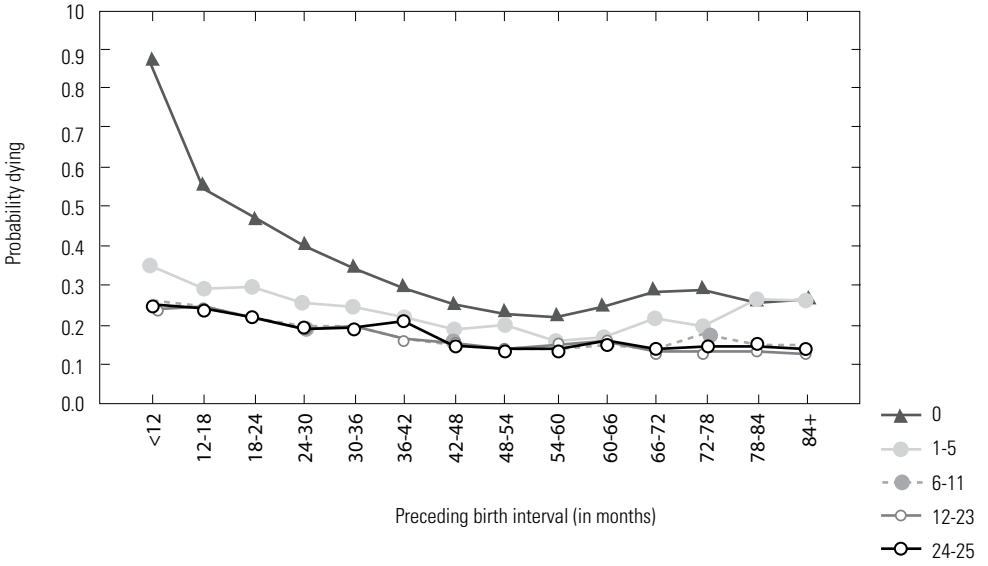


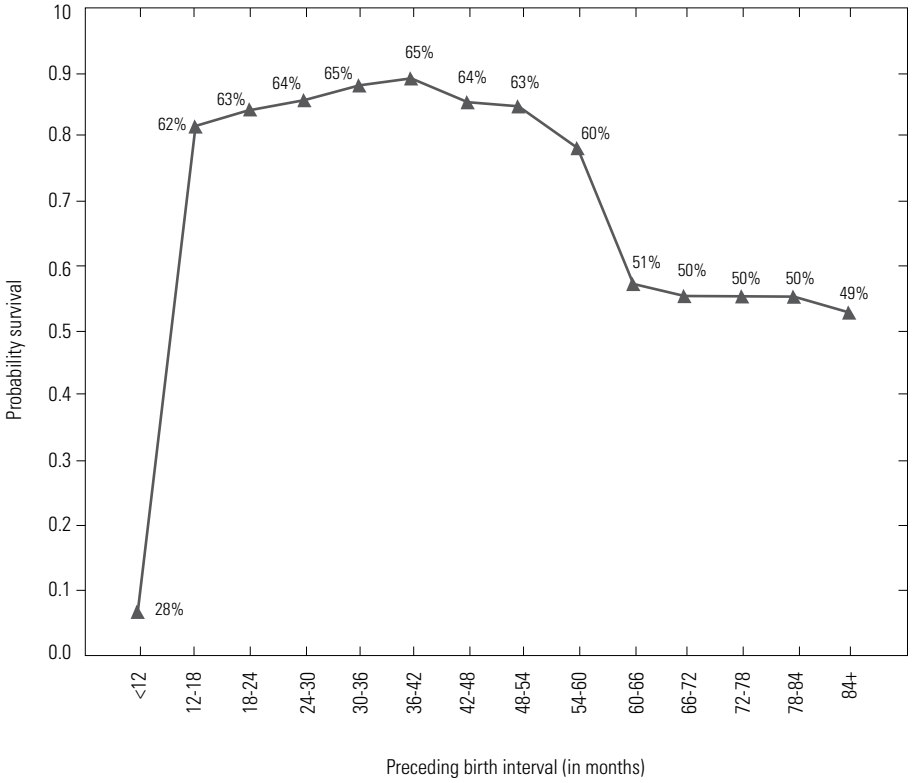
Table 3 shows the influence of the preceding birth interval on child survival when the preceding child had already died before the succeeding conception (index child) occurred. In this case, preceding intervals tended to be shorter (compare with Table 2) and probability of survival was highest at 3 or 3 1/2 years. Several countries have already begun the 3-year spacing message (Davanzo et al. 2004). Here, most births (30.8%) took place in the 12- to 18-month interval. Possible reasons for this spacing are that mothers whose children have died tend to replace them as quickly as possible, or have reduced durations of breastfeeding and amenorrhea. Figure 3 depicts the trend of probability of survival. For a preceding interval of less than 12 months, the chance of survival is low (28%), but the trend increases very rapidly for a preceding interval of 12 to 18 months (62%), gradually increasing to an interval of 36 to 42 months (65%). After 42 months the probability of survival again shows a decreasing trend. Differences in the magnitude of effects of the preceding birth interval on child survival is observed in Tables 2 and 3. One explanation is that parents are more aware of child survival, as their previous child has already dead. Risk of child death may be impeded for a short preceding birth interval because parents may place greater value on children and be more conscious of childcare practices, diet and disease. Nonetheless, further research examining differences in appropriate birth spacing as well as on biological explanations to better understand mortality differentials is needed.

Table 3. Age-specific probability of dying and survival up to third birthday of index child by length of preceding birth interval, where preceding child died before conception of the index child, Bangladesh

Preceding birth interval	Age at death of index child (months)					Probability of death up to 36 months (n=3143)	Probability of survival up to 36 months	Percent
	<1 (n=4479)	1–5 (n=4123)	6–11 (n=3720)	12–23 (n=3568)	24–35 (n=3332)			
<12	0.385604 (778)	0.200837 (478)	0.10733 (382)	0.205279 (341)	0.184502 (271)	0.7159 (221)	0.284062	17.37
12–18	0.178132 (1381)	0.096916 (1135)	0.051707 (1025)	0.063786 (972)	0.062637 (910)	0.38233 (853)	0.617668	30.83
18–24	0.183755 (751)	0.088091 (613)	0.042934 (559)	0.065421 (535)	0.054000 (500)	0.37017 (473)	0.629827	16.77
24–30	0.151079 (695)	0.110169 (590)	0.032381 (525)	0.064961 (508)	0.069474 (475)	0.36403 (442)	0.635971	15.52
30–36	0.177215 (316)	0.080769 (260)	0.029289 (239)	0.051724 (232)	0.072727 (220)	0.3544 (204)	0.645570	7.06
36–42	0.143617 (188)	0.111801 (161)	0.013986 (143)	0.085106 (141)	0.046512 (129)	0.34574 (123)	0.654255	4.20
42–48	0.212121 (99)	0.076923 (78)	0.041667 (72)	0.086957 (69)	0.000000 (63)	0.36363 (63)	0.636364	2.21
48–54	0.200000 (60)	0.083333 (48)	0.022727 (44)	0.069767 (43)	0.050000 (40)	0.3667 (38)	0.633333	1.34
54–60	0.207547 (53)	0.142857 (42)	0.000000 (36)	0.055556 (36)	0.058824 (34)	0.3962 (32)	0.603774	1.18
60–66	0.264151 (53)	0.205128 (39)	0.032258 (31)	0.033333 (30)	0.068966 (29)	0.4906 (27)	0.509434	1.18
66–72	0.250000 (32)	0.208333 (24)	0.105263 (19)	0.000000 (17)	0.058824 (17)	0.500000 (16)	0.500000	0.71
72–78	0.333333 (18)	0.250000 (12)	0.000000 (9)	0.000000 (9)	0.000000 (9)	0.50000 (9)	0.500000	0.40
78–84	0.375000 (8)	0.200000 (5)	0.000000 (4)	0.00000 (4)	0.000000 (4)	0.50000 (4)	0.500000	0.17
84+	0.319149 (47)	0.18750 (32)	0.038462 (26)	0.00000 (25)	0.080000 (25)	0.5106 (23)	0.489362	1.05
Total	0.183403 (4479)	0.097744 (4123)	0.04086 (3720)	0.066143 (3568)	0.059424 (3332)	0.30029 (3134)	0.6997	100

Note. "Index child" means the succeeding child.

Figure 3. Probability of survival to 36 months by preceding birth interval where previous child had already died before index child was conceived



… the risk of mortality was 6 times higher for infants whose mother had no education, 5 times higher when mothers had only primary education.

Determinants of Mortality

To better understand the contribution of the preceding birth interval and each of the socio-demographic factors on the dependent variable – survival status or mortality – we undertook a multivariate analysis using the logistic regression model. Logistic regression was performed considering infant (0–11months) and child mortality (1–5 years). Results for the models are summarized in Tables 4 and 5.

Infant Mortality

Table 4 shows the results of logistic regression analysis for infant mortality along with regression co-efficient (β) and standard error. The odds ratios (exponential of the regression co-efficient) and 95% confidence interval are also presented for each variable in the study. From the table, we observe that respondent education, religion, current age, preceding birth interval, breastfeeding status and birth order showed a significant effect on infant mortality for the variables studied.

Table 4. Logistic regression estimate for the effect of preceding birth interval and socio-demographic factors on infant mortality, Bangladesh

Explanatory variables	Coefficients (β)	S.E. (β)	Relative risk	95% CI
Place of residence				
Rural			1.000	
Urban	0.254	0.134	1.290	0.992–1.6775
Education*				
No education	1.773	0.645	5.890	1.663–20.870
Primary	1.506	0.646	4.507	1.271–15.989
Secondary	1.029	0.654	2.797	0.777–10.070
Secondary and higher			1.00	
Religion**				
Muslim			1.000	
Non-Muslim	0.395	0.177	1.484	1.048–2.101
Respondents occupation				
Non-working			1.000	
Working	0.230	0.136	1.258	0.964–1.642
Current age (years)*				
≤24			1.000	
25–34	-0.218	0.246	0.804	0.496–1.302
35+	0.274	0.259	1.315	0.732–2.183
Age at birth				
≤24	0.389	0.189	1.476	1.019–2.138
25–34	0.360	0.259	1.433	0.833–2.378
35+			1.000	
Preceding birth interval*				
≤24 months			1.00	0.422–0.722
>24 months	-0.594	0.137	0.552	
Breastfeeding*				
Ever			1.00	68.623–275.533
Never	4.924	0.355	137.506	
Age at marriage				
≤14			1.00	
15–19	0.018	0.134	1.018	0.734–1.322
20–24	-0.156	0.389	0.856	0.400–1.833
25+	-0.273	0.751	1.314	0.302–5.723
Socio-economic status				
Poor			1.00	
Middle	-0.110	0.171	0.896	0.641–1.253
Higher	-0.014	0.151	0.986	0.734–1.325
Birth order**				
≤2			1.00	
3–5	0.027	0.191	1.028	0.707–1.494
6+	0.473	0.240	1.605	1.003–2.568
Constant	-5.034	0.679	0.007	

CI = confidence interval; S.E. = standard error.
Model χ^2: 361.19; d.f.: 19; Cox & Snell R-square: 0.044.
*Significant at the 1% level. **Significant at the 5% level.

Mothers' education had a strong significant effect on risk of infant mortality. Table 4 shows that compared with infants of mothers with higher education, the risk of mortality was 6 times higher for infants whose mother had no education, 5 times higher when mothers had only primary education and 3 times higher when mothers had secondary education. In developing countries, mothers' educational level tends to have a strong effect on the mortality of infant children (Govindasamy and Ramesh 1997; Hobcraft et al. 1984; Mosley and Chen 1984; Omariba et al. 2007; United Nations 1985, 1991, 1998). Literate mothers usually give birth to healthier babies because they themselves tend to be healthier than mothers who are illiterate. In addition, literate mothers are more likely than illiterate mothers to provide their children with a healthier environment and nutritious food, even when other conditions are similar. Lastly, better-educated mothers are likely to have more information about healthcare facilities and more influence within the family in deciding to take sick children for treatment. These traits are likely to result in lower mortality of children at all ages under 5 years (Caldwell 1992; Cleland and Kaufman 1993; World Bank 1993).

Regarding religion, children of Muslim mothers were about 48% more likely to die in infancy than children of non-Muslim mothers. Children born to mothers under 24 or over 35 years of age were more likely to have elevated risks of mortality than mothers aged 24 to 35 years. We observed that the risk of infant mortality was 20% lower for mothers in the medium age group (25–34) and 1.315 times higher for older age (35+) mothers than for the younger age group (≤24 years). Younger mothers are not yet ready to take parental responsibilities, may not have decision-making authority in the household and lack financial resources to seek medical care for their children (Alam 2000).

An adverse effect of short preceding birth interval is observed in this model, where children born 24 months after their preceding siblings were 45% less likely to die compared to those born less than 24 months after preceding siblings. Thus when birth interval increased, the relative risk of mortality decreased.

Breastfeeding status of the mother showed a strong significant effect on mortality risk in infancy. The chance of survival at the neonatal period was much higher for babies who ever breastfed: relative risk of mortality was 137.50 times higher for babies who never breastfed than for those who ever breastfed. Considerable reduction in mortality risk is associated with breastfeeding, especially in a society where poverty is rampant and prolonged breastfeeding is a norm. Nonetheless, the role of breastfeeding in reducing mortality risk of children and in prolonging birth intervals, which in turn plays a role of fertility reduction, should be emphasized.

Risk of mortality was 1.028 times higher for birth order 3 to 5 and 1.605 times higher for birth order 6+ compared with birth order 1 to 2. Thus we see that mortality risk increased with the increase in birth order. During these stages of child development, mortality is more likely to depend on the care children receive than on biological factors. Children of high-order births face competition from older siblings for food and parental attention. They also face exposure to infectious childhood diseases from their siblings. In addition, the mother's nutritional status, which affects birth weight and lactation, may decrease with high birth orders (Rah et al. 2008).

Child Mortality

Results showing relationships between child mortality and different factors are presented in Table 5. This table considers the same variables as Table 4. From these tables, we observe that along with other covariates significantly influencing infant mortality, respondent occupation and socio-economic status showed significant effect, while the effect of religion was insignificant. Socio-economic variables had greater influence on child mortality than on infant mortality. Since we have already described results for infant mortality, in this section we provide an overview of the patterns shown in the table, comparing them with results for infant mortality where appropriate.

Table 5. Logistic regression estimate for the effect of preceding birth interval and socio-demographic factors on child mortality, Bangladesh

Explanatory variables	Coefficients (β)	S.E. (β)	Relative risk	95% CI
Place of residence				
Rural			1.00	
Urban	-0.068	0.166	0.935	0.674–1.295
Education**				
No education	1.600	1.028	4.951	0.660–37.164
Primary	1.307	1.030	3.696	0.491–27.842
Secondary	1.204	1.037	3.333	0.437–25.421
Secondary and higher			1.00	
Religion				
Muslim			1.000	
Non-Muslim	-0.022	0.234	0.978	0.618–1.548
Respondents occupation*				
Non-working			1.000	
Working	0.437	0.151	1.548	1.152–2.079
Age (years)*				
≤24			1.000	
25–34	0.052	0.295	1.054	0.591–1.879
35+	0.769	0.305	2.158	1.186–3.928
Age at birth				
≤24			1.000	
25–34	0.110	0.213	1.117	0.735–1.696
35+	0.091	0.287	1.096	0.625–1.922
Preceding birth interval*				
≤24 months			1.00	
>24 months	-0.483	0.160	0.617	0.451–0.844
Breastfeeding*				
Ever			1.00	
Never	2.544	0.338	12.726	6.565–24.668
Age at marriage				
≤14			1.00	
15–19	0.139	0.152	1.150	0.853–1.550
20–24	-1.097	0.729	0.334	0.080–1.394
25+	-0.116	1.037	0.890	0.117–6.795
Socio-economic status*				
Poor			1.00	
Middle	-0.306	0.191	0.736	0.507–1.070
Higher	-0.577	0.184	0.561	0.391–.805
Birth order**				
≤2			1.00	
3–5	0.037	0.225	1.038	0.668–1.613
6+	0.516	0.277	1.676	0.974–2.885
Constant	-5.217	1.059	0.005	

CI = confidence interval; S.E. = standard error.
Model χ^2:165.145; d.f.: 19; Cox & Snell R-square: 0.020.
*Significant at the 1% level. **Significant at the 5% level.

In infancy, the risk of death was 6 times higher when the mother had no education than when the mother had higher education; in childhood this risk fell to 5 times. The pattern was maintained for all educational groups. Mother's literacy emerged as an important factor associated with mortality during infancy and childhood. The estimated effects of maternal education on child mortality correspond closely to findings from other studies (Desai and Alva 1998; Omariba et al. 2007; Rutstein 2000).

Respondent occupation showed a strong significant effect for child mortality but an insignificant result for infant mortality. In childhood mortality, the risk was 1.548 times higher for children of working mothers than for those of non-working mothers.

Current age of the respondent demonstrated a highly significant effect on risk of death both in infancy and childhood. Compared with that of younger mothers (≤24 years), the risk of mortality was 1.054 times higher for children of mothers in the middle age group (25–34) and more than doubled for children of older-aged (35+) mothers.

Preceding birth interval also showed a highly significant negative effect on mortality in childhood. The risk of infants and child mortality were (1-0.552)*100= 45% and (1-0.617)*100=38% lower for preceding birth intervals > 24 months as compared with birth intervals lower than 24 months.

Breastfeeding status of child also showed a strong significant effect on mortality risk of children. The relative risk of mortality for never breastfed children was much higher in infancy than in childhood. For childhood the risk of mortality was about 13 times higher; risk of mortality for infants who were never breastfed was 138 times higher than for infants who were ever breastfed. Breastfeeding is a unique source of nutrition that plays an important role in infant growth, development and survival, particularly in poorer environments where the early introduction of other milk is of particular concern.

Respondents' socio-economic status showed a significant effect on mortality risk in childhood but not in infancy. Relative risk of mortality was 26% lower for children of middle-class respondents, and 44% lower for children of higher-class respondents, than for those of poor respondents.

Birth order showed significant effect on mortality risk both in infancy and in childhood. The magnitude of effects of birth order remained largely unchanged in both cases. Higher birth order always shows increasing risk of mortality. The immature reproductive systems of young mothers, and the depleted physiological system of older mother due to repeated pregnancies, make them susceptible to pregnancy complications and bearing low-birth-weight babies (Miller 1993). Both conditions are associated with a higher risk of child death (Solis 2000).

Conclusion

Our study mainly examined the influence of preceding birth interval on child survival and investigated determinants of mortality in both infancy and childhood. The life table method demonstrated that the probability of survival was much higher for longer birth intervals (54–60 months). Survival probability was lowest for short birth intervals (below 12 months) for the whole study population. Generally, we may conclude that birth intervals of 60 months and above are the standard for a new child. Birth intervals were much lower and maximum births occurred before 18 months for women whose previous child had already died before conception of the next, the index child. Probability of dying was highest for infants less than a month old with a short birth interval. A short birth interval increased the risk of both infant and child mortality. It is very difficult to explain the probability of survival for a child when the preceding child had already died before the next was conceived.

One of the major limitations of this study is that it failed to give biological explanations for mortality because of lack of information. The logistic regression model identified that respondent education, religion, current age, preceding birth interval, breastfeeding status and birth order significantly influenced mortality in infancy. For childhood mortality, respondent education, working status, socio-economic status, current age, preceding birth interval, breastfeeding status and birth order showed a significant effect. So along with demographic variables, socio-economic variables had

more influence on child mortality than on infant mortality. Although this study has demonstrated that child and infant mortality risk vary because of some socio-demographic variables, the analysis did not include healthcare factors; the information was not available in the collected data. Exclusion of this important determinant therefore inflated the magnitude of the effect, which is another limitation of this study. However the findings of the present study suggest some policy implication to mitigate child mortality.

Intervention policies should encourage women and couples to adopt appropriate birth spacing (5 years and above) in order to reduce child death in an impoverished society.

Intervention policies should encourage women and couples to adopt appropriate birth spacing (5 years and above) in order to reduce child death in an impoverished society. Education appears to be the key factor, through various causal mechanisms. Education delays marriage, and the maturity that comes with age may result in more effective contraception, so influencing the birth interval. Education also increases the opportunity for paid employment in the modern economy, and this competes with the demand for child-bearing. Through increasing her odds of becoming employed outside the home and thus becoming an income-producing member of the family, a woman is more likely to acquire a role in decisions concerning all aspects of family life, including the number and spacing of her children. Hence we can conclude tentatively that an improvement in female education levels will help increase birth intervals and breastfeeding practices, thereby reducing infant and child mortality. To realize these benefits, the government should provide free and compulsory education for children up to 14 years of age.

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