ORIGINAL RESEARCH

'Top heavy' systems and quality of health care: A survey of select departments in R.G. Kar Medical College and Hospital, India

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Abstract

The paper is based on a survey of 1095 patients from the Medicine, General Surgery, and Cardiac departments in R.G. Kar Medical College and Hospital, a major public sector health care institution in the metropolitan city of Kolkata, India. The results show that public health care institutions remain a vital life support system for the poorer sections of the population. However, this is not a matter of choice, but necessity. The breakdown of the three tiered referral system in the region has resulted in the hospital, originally conceived as a tertiary referral center for patients from the adjacent district of North 24 Parganas, functioning as a diagnosis unit. The resultant pressure has exceeded the carrying capacity of the institution and led to poor quality of health care in the hospital. Revitalizing lower level institutions is therefore essential not only to increase accessibility of health services, but also to ensure efficiency in higher level health care institutions.

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Introduction

In India, policy makers have relied on a decentralized public health care system to ensure an efficient and accessible health care system. Sub-Centers and Primary Health Centers were established to provide basic health services at the village level.[*] These units are supposed to serve as the primary unit of diagnosis and to refer cases to block level health care units (Rural Hospitals and Block Primary Health Centers).[1] Higher levels include the Sub-divisional Hospitals and a District Hospital which is the administrative center of the district. The seven Medical Colleges and Hospitals in West Bengal serve as the ultimate referral institutions and diagnostic units for specialty cases.

While it was hoped that this three tiered system would serve to even out the substantial pressure exerted by India's population, there are indications that this has not occurred. The District Human Development Reports for Maldah and Birbhum[2,3] document a 'top heavy' health care system with bed turn-over rates at district and sub-divisional hospitals being substantially higher than corresponding rates in Block Primary Health Centers. This suggests that a large section of the population may be by-passing the primary units of health care and relying more on higher level institutions.

There is also growing evidence that the poor are getting shunted out of the public health care system

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[*] The national population norms are one Sub-Center for 5000 persons and one Primary Health Center for 30,000 persons in plain areas. In tribal, hilly, and backward areas, the norms are one Sub-Center for every 3000 persons, and one Primary Health Center for every 20,000 persons.

in urban areas.[4,5,6] Given rising costs, patients from middle income families are relying more on public health care institutions for diagnostic tests. In such institutions, diagnostic tests are undertaken only for patients referred by Departments in the hospital. A study in New Delhi has shown that this leads relatively affluent patients to visit outpatient departments and get referrals for diagnostic tests.[4]

Consequently, the health care system is failing to provide good quality health care services to the poor even in urban areas.[6] This is creating serious equity issues in a society already characterized by sharp differences in opportunities and access.

Based on a survey of patients in RG Kar Medical College and Hospital, one of the largest public health care institution in Calcutta, the capital of the state of West Bengal,[†] this paper examines whether the flow of patients seeking diagnosis, coupled with the influx of comparatively affluent urban residents, is imposing a heavy burden on the hospital system. It also examines the quality of health care provided by these institutions and their role in alleviating or aggravating inequities in the health care outcomes.

Setting

Kolkata is one of the largest metropolitan cities in India. According to the 2001 Census it has a population of 4.57 million. About 20 percent of the city's population lives in slum areas. The population density is 24,718 persons per sq. km. The state health department is the major provider of health care in the city. There are 34 government hospitals with an aggregate bed strength of 13,695. The inadequate public health care infrastructure, relative to the large population of the metropolis of Kolkata, puts immense pressure on the basic health care facilities. This can be seen from the high bed turnover rates of 47, bed occupancy rates of 85 percent, outpatient per bed per day rate of 1.2, proportion of major surgeries to admissions of 17 percent, proportion of deliveries to admissions of 19 percent, and emergency admission rates of 49 percent.[7]

[†] West Bengal is a state where decentralization is supposed to have been successfully implemented in different spheres such as health care, education, political activites, etc.

RG Kar is a state run subspeciality hospital (tertiary referral center) situated in North Kolkata. The hospital has a total of 1160 beds across all Departments. While the number of OPD visits in 2005 was 468,612, there were 51,527 admissions to Wards and 9,043 major surgeries in this period.[7]

Methods

Patients were interviewed from three Departments – General Medicine, General Surgery and Cardiology. Medicine and Surgery were chosen as they represent core departments, offering basic health services to the largest section of patients in any general public health care institution. Among the specialities, Cardiology was selected as it provides sophisticated life-saving treatment at affordable rates to low income households. The survey period was March-April, 2008.

Patients were interviewed in Wards and waiting areas of Out Patient Departments (OPD) – either when they were waiting for treatment or (preferably) after their consultation was over – by postgraduate students of economics. These students had been trained before the survey. The authors accompanied them for the first week and were personally present for about 40% of the interviews. All patients (or their accompanying persons) present on survey dates were interviewed if they gave their consent. Verbal consent was obtained because of the low educational standards of most patients. Seventy patients – representing 5.8% of the 1,269 patients approached – refused to be interviewed. While most of those refusing were in a hurry to return home or collect medicine, a handful were suspicious of our motives and even hostile. If the patient was unable to speak personally, because he or she was too ill or infirm, investigators interviewed persons accompanying the patient. Such cases constituted about 22 percent of all respondents. In addition, medical files were accessed in about 80 percent of the cases to check the information provided and obtain precise information about the subject's medical condition. About 20 questionnaires were incomplete as the patients were reluctant to reveal their income or occupation. Forty-three respondents left midway to collect their medicine or because they were in a hurry to return home. In about 15 cases, information

Table 1: Distribution of Sample across Wards

Departments	Wards	Male	Female	All
Medicine	OPD	103	102	205
	Inpatient	105	103	208
Surgery	OPD	102	112	214
	Inpatient	106	76	182
Cardiac	OPD	121	65	186
	Inpatient	85	15	100
Total		622	473	1095

on the survey was found be internally inconsistent and the entire survey was not included in the final analysis. During editing, some responses were found contradictory. This mainly related to educational level, occupation, and income. For instance, some respondents with low educational status claimed to be engaged in occupations requiring high educational qualifications; again, obviously poor respondents engaged in lowly paying occupations claimed to have high income levels. Such cases were rare, and consisted of 15 in all. We omitted a further 22 respondents aged below 18 years as the information provided by them about household income was not very reliable.

Results

Gender and Ward distribution.

The survey contained 1095 valid cases, of which 473 (43 percent) were female patients. The ward, department and gender profile of patients is given in Table 1. It should be noted that the targeted gender ratio of the sample was based on average rates of turn over in OPDs of the departments studied and actual number of beds in Male and Female Wards of the concerned Departments.

Socio-Economic Profile of Respondents

It had been reported earlier that relatively high income patients were pushing poorer patients out of the public health care system in metropolitan cities like New Delhi.[4] In the absence of time series data it is not possible to check for a similar trend in Kolkata. Table 2, however, reveals that a substantial proportion of patients (over 90%) in RG Kar are in the bottom four income group with family income below Rs. 8000; this corresponds to roughly double the urban poverty line. Interestingly, patients with income levels above Rs. 8,000 constitute a significant proportion of patients among Surgery and Cardiac Departments, particularly in the

Inpatient wards. Such patients constitute 9 and 16 percent of patients in these wards, respectively. Such patients possibly prefer the public health care system because of its substantially lower costs vis-à-vis the private sector. Given the scarcity of beds in RG Kar, this reduces access of low income households to the cheap inpatient facilities in the public sector. Consequently, such households are forced to delay treatment or seek treatment in the private sector, which they can ill afford.[‡]

As patients were reluctant and sometimes even unable to calculate their average monthly family income, the question on monthly family income was made close ended, with respondents being asked to place themselves in the appropriate category of the income ranges given in Table 2. The last range was kept open ended (Rs. 20,000 and above) and this prevents estimation of mean and statistical tests of differences. Further, given the skewed nature of income distribution, median offers a better measure of central tendency.

Table 3 presents median income. The median values obtained are not very high, supporting our earlier finding (Table 2) that the majority of patients belong to the low income groups. It appears that public healthcare institutions still remains a vital life support system for the poor.

In contrast to studies observing lower income levels among in-patients, relative to OPD patients[9], we found that in the Surgery and Cardiac Departments ward patients had higher levels of income, compared to OPD patients. Median income of ward patients in the Cardiac Department is about 11% higher than median income of OPD patients. This indicates that the middle income sections of the population also access this department. This is possibly because of the exorbitant costs of cardiac care and diagnosis in private health care institutions

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[‡] This leads to indebtedness of low income households.[8]

Table 2: Distribution of Patients by Monthly Income Class

Income Classes (Rupees)	Medicine	Surgery	Cardiac	Total
<Rs.2000	17.9	31.6	17.5	22.7
Rs.2001≤Rs.3000	35.8	23.5	19.9	27.2
Rs.3001≤Rs.5000	35.1	25.0	31.5	30.5
Rs.5001≤Rs.8000	8.7	12.4	22.7	13.7
Rs.8001≤Rs.12000	2.4	5.6	6.3	4.6
Rs.12001≤Rs.15000	-	1.5	-	0.5
Rs.15001≤Rs.20000	-	0.5	0.3	0.3
Rs.20001 and above	-	-	1.7	0.5

Note: One Rupee is equivalent to about 2 US cents.

in Kolkata. In comparison, getting an OPD 'ticket' entitling one to consultation, costs only about two rupees (that is, 4 US cents).

Support for our finding that members from low income households comprise the majority of patients in RG Kar is also provided by an analysis of the occupational and educational profiles of respondents.

A comparison with the occupational distribution of the population aged 18 years and above shows that persons linked to agriculture do not comprise a significant proportion of the patients in RG Kar. In contrast, persons working in the informal sector, retired persons, and housewives are over-represented among patients in this institution. About 27 percent of male patients work in the informal sector. The median family income of this group (Rs.2443) is lower than that of other occupational groups, except those engaged in agricultural activities.

Table 3: Median Monthly Income of Patients in Wards (Rs.)

Departments	OPD	Ward
Medicine	3059 (USD 61.18)	2772 (USD 55.44)
Surgery	2688 (USD 53.76)	2822 (USD 56.44)
Cardiac	3677 (USD 73.54)	4071 (USD 81.42)

The low level of education among patients in RG Kar is striking. Most of the patients were unable to provide their complete address or zip codes. This not only indicates lack of education, but also absence of regular contacts with the world outside their village. Nearly three-fourths of patients have less than 10 years of schooling (that is, completed secondary level). Predictably the median monthly family income of such patients – ranging from Rs.2688 to Rs.3740 – is lower than the median income of more educated patients.

It can be seen that the educational profile of patients seeking treatment at RG Kar does not correspond to the educational profile of the population of the state. While persons with primary and below secondary level of education are over-represented among patients in the institution, illiterate and secondary schooled persons are under-

represented. Interestingly, the proportion of graduates and professional degree holders among patients of RG Kar is quite high and corresponds to the state average.

Income levels of patients below the higher secondary level of education is less than the state average. This again reflects the fact that the latter includes persons from districts where educational levels are lower than that in Calcutta and its surroundings.

The survey also identified the catchment zones of RG Kar. As expected, almost half of the patients

Table 4: Distribution of Patients by Occupation in Departments

Occupation	Frequency (%)		Median Monthly Family Income*		
	Survey	West Bengal	Survey		West Bengal
			INR	USD	(INR)
Business	11.9	11.1	3349	66.98	1926
Agriculture	4.6	21.7	2382	47.64	2425
Informal Sector	18.6	12.8	2443	48.86	2872
Retired	10.6	2.9	4059	81.18	2872
Housewife	36.8	32	3127	62.54	2990
Service	13	13.8	3791	75.82	3027
Unemployed & Students	4.6	5.8	2643	52.86	3226**

*[Source: Figures for West Bengal have been estimated from NSS 61st Round unit level data, 2004-05 data] * NSS surveys collect data on monthly family expenditure, not income. **The high value (3236) for Students and Unemployed is surprising. The possible reason is that NSS reports family expenditure, not individual income. The high expenditure levels of students (Rs.4896) may be due to the income level of their parents. The expenditure level of unemployed is on the lower side (Rs.2587)*

Table 5: Distribution of Patients by Educational Level

Educational Level	Frequency (%)		Median Income*		
	Survey	West Bengal	Survey		West Bengal (INR)
			Rupees	USD	
Illiterate	27.2	30.4	2688	53.76	2196
Primary Level	16.5	12.9	2799	55.98	2540
Below Secondary Level	30.0	18.3	2895	57.9	2878
Secondary Level	13.3	24.7	3740	74.8	3573
Beyond Secondary	6.0	5.9	4131	82.62	4798
Graduate and above	6.4	7.8	5858	117.16	5756
Professional degree	0.3		6501	130.02	

Table 6: Residential Pattern of Patients (%)

Residence of Patient	Medicine	Surgery	Cardiac	Total
Kolkata	40.2	53.3	50.0	47.5
North 24 Parganas	53.5	34.3	35.7	41.9
Other adjoining districts	3.2	7.1	9.4	6.2
Other Districts in West Bengal	3.1	4.8	4.5	4.1
Other States in India	-	0.5	0.3	0.3

were from Kolkata, while about 42 percent of patients came from the neighboring district of North 24 Parganas. In all, almost 89 percent of patients availing of health facilities in RG Kar came from these two areas. The high proportion of patients from North 24 Parganas is expected given the fact that Barasat, the district head quarter of North 24 Parganas, is only about 12 kilometers from the outskirts of Calcutta along the National Highway (about 15 kilometers from the hospital) and its adjoining areas have fairly good transport links with RG Kar.

Referral System

Finally we analyzed referral pattern for patients. In particular we examined whether patients come directly to the tertiary level hospitals when they decide to seek treatment or are they referred by any other institution or practitioner. This is important in determining whether RG Kar functions as a unit of diagnosis or a unit of referral (as it is meant to be).

Although one would expect a large proportion of patients in RG Kar to be referred by the primary units of diagnosis (like Block Primary Health Centers and Primary Health Centers) or primary unit of referral (district hospitals), such patients constitute only 15 percent of total patients. A private practitioner referred about one out of every five patients in RG Kar. As much as 40-70 percent of patients sought treatment directly. To rule out the possibility of misunderstanding, patients who claimed to have come without referral were subjected to confirmatory questions – whether they had sought treatment at their place of residence (or elsewhere); if so, what the doctor had suggested, etc. Even if we consider only patients outside Kolkata, 50 percent come directly, private practitioners refer 20 percent, and lower level public health care units refer only 22 percent.

The referral pattern was also analyzed based on the geographic origin of the patient. In all but one case, the majority of patients had come directly to the institution or been referred by private practitioners. Only in the case of North 24 Parganas was referral by lower level health care institutions of any importance.

It was also observed on inspection of the medical papers of surveyed patients that the diagnosis and other notations by the attending doctors on the medical card or discharge certificate were either completely absent or inadequate for the continuation of appropriate treatment in local institutions. For instance, the diagnosis, treatment undergone, follow-up suggested, and other vital details of the diagnosis and treatment procedure were not always stated. This means that the patient becomes tied to RG Kar for follow-up treatment as he/she cannot return to lower level institutions with a complete record of their symptoms, diagnosis, and treatment even if the symptoms/diseases can be treated in such institutions. This either imposes a monetary and opportunity cost on the patient forced to return to RG Kar for a follow-up, or leads to deterioration in the patient's health (if he or she does not return to RG Kar). The dependence of patients for diagnosis and subsequent treatment on what is supposed to be a referral institution imposes a heavy burden on the institution, adversely affecting its efficiency.

Conclusion

The findings of this survey indicate that the public health care system in West Bengal still remains an important lifeline of the poor. However, it should also be emphasized that for patients this is not a matter of choice but of necessity. The substantially higher costs of treatment in private health care institutions rule out the possibility of seeking treatment in these institutions. Patients from low income households have no recourse but to flock to public institutions even though the quality of health care is appalling in such institutions. All patients do not get beds; some are kept on mattresses on the floor. Burn cases are kept with other surgical cases – even at the risk of infection. In the medicine ward, patients lie in corridors so dark that the attending doctor has to check pressure and other physical signs with the help of a flash light. Toilet facilities are dirty and unhygienic. In the OPD adequate seating arrangements are not available. Patients seem bewildered and lost in the labyrinthine RG Kar. A large number of patients find it difficult to identify which Department is 'appropriate' for their ailment; many find it difficult to locate the

Department and wander from one floor to another. It is imperative to improve the physical conditions in such institutions to provide a minimum level of health care.

One reason for the concerning state of affairs is the high volume of patients seen at RG Kar. We had referred to a 'top heavy' health care system in Maldah and Birbhum earlier. Our study also finds a large proportion of patients utilizing the developed transport links between North 24 Parganas and Kolkata to access health facilities in RG Kar. This is also observed in districts like South 24 Parganas where blocks with good transport links to Kolkata had a poorly utilized local health infrastructure, while inaccessible blocks had higher bed occupancy and turn over rates.[10] Our study clearly shows that RG Kar virtually functions as a unit of diagnosis and treatment, and not as a unit of referral, with a large proportion of patients coming directly to RG Kar. This imposes an excessive load on the institution, exceeding its carrying capacity and reducing its efficiency.

Researchers have identified several reasons why the district population does not rely on lower level institutions.[11,12] The number of sub-centers, PHCs, and BPHCs do not correspond to the population norms, resulting in a deficiency in physical infrastructure. The absence of adequate staffing (resulting in many posts lying vacant), absenteeism by the medical staff, lack of medicines, and inadequate medical equipment (that is often non-functional) have seriously impaired the functioning of primary units of diagnosis and referral. This leads patients to bypass primary health care institutions and directly seek help from higher level institutions.

This possibly explains why the medical staff at higher level facilities 'accepts' this pressure and why they do not refer their patients back to lower level institutions.[§] The staff at higher level institutions realizes that lower level public health care units are inadequate in terms of medical staff, infrastructure, and availability of medicine. It is not that patients are bypassing the lower level units, but these units are mostly non-functional in rural areas, so that referring back patients to lower level public

health care units will condemn them to be either without treatment or force them to seek treatment in the readily available but often inefficient private sector (consisting of under-qualified doctors, quacks, traditional practitioners, etc.).

The Alma Ata Declaration of 1978 emphasized the necessity of sustaining primary health care through "integrated, functional and mutually supportive referral systems." This paper, however, shows that the effectiveness of higher level referral institutions depends upon well-functioning primary health care institutions. It is therefore necessary to create trust and confidence in lower level institutions by ensuring the efficient functioning of Block Primary Health Centers and Primary Health Centers. This is important, not only to increase accessibility of health services, but also to ensure efficiency in higher level health care institutions.

Further research should examine the different stages in the process of treatment, the source of treatment (whether local or higher level), the nature of the health care provider (public, private, traditional), etc., and to identify the socio-economic factors influencing treatment seeking behavior. The presence and quality of public and private health care facilities existing at the local level as well as the money and opportunity costs of seeking treatment are also relevant in this context.[13] Such research would help to explain choices relating to health seeking behavior, identify features in health care system blocking easy access, and enable policy makers to design a health care system that can be easily accessed by the poor and under-privileged sections of the population.

[§] Inadequate documentation at the hospital, in fact, rules out treatment at lower level institutions.

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