

Private Hospital Sector in Madras City: Some Preliminary Observations

V.R.Muraleedharan

Abstract:

This paper provides a description of the nature of hospital sector, with an emphasis on private hospital sector, in Madras city. It highlights some of the characteristics of the hospital sector, namely its size, distribution, range of services offered, manpower employed, and price differentials for outpatient care. A preliminary comparison of 35 private hospitals suggests presence of price-competition for outpatient care. Type of ownership (within private sector) is observed to have little association with fee for outpatient care, occupancy rates, outpatients served per day, and manpower per bed employed. Private hospitals are concentrated in a few zones in the city area, but outpatient charges are not significantly different between zones with different levels of competition (although zones with greater competition have a higher charge than those with less competition). The study highlights a number of policy relevant issues for future research.

Private Hospital Sector in Madras City: Some Preliminary Observations

V.R.Muraleedharan*

1. Introduction

During the recent past, a number of scholars have begun to show interest in studying the behavior of the health care system in India.¹ While they have thrown considerable light on utilization patterns of different health care services (demand side), very little attention as yet has been focused on the behavior of providers of care (supply side).² This paper makes a preliminary step in filling this gap in the literature on health care market in India. It attempts to describe some of the important characteristics of the private hospital sector in the city of Madras. Our preliminary analysis led to certain questions that require further study for a better understanding of the competitive behavior of private hospitals in urban India. Such studies will contribute to a more meaningful

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¹ For a comprehensive review of studies on health care market in India, see Gumber and Berman (1995). Also, see Berman (1995) for detailed information on health care expenditures by government and others.

² Several fundamental difficulties exist in studying the competitive behavior of hospitals, their market structure and their effects on price, quality and outcomes in local markets. For recent review of studies, see Ron B Thomson (1994); Dranove and White (1994); Manheim, et.al (1994); and Zwanziger J, et.al (1990)

debate on health care reforms, and to developing appropriate policies towards private health sector in India.

1.2 Basic Issues

In studying the nature of private hospital sector in urban India, several questions need to be asked: What are these hospitals? Who uses them? What is the market share of those hospitals competing in the market? How do they carve out a market niche for themselves? How do they price their services (for both inpatient and outpatient care?) Do they form a “network” to offer services? (providers in big cities are often known to have “informal pricing strategies” for certain services), How do they plan to expand their market share? How much of capital do they raise from different sources?; How much do they invest on human and capital inputs?. One could raise many more questions, all of which would be useful to policy makers. But, one is inevitably drawn to addressing two crucial questions: (1) What form of competition exists amongst hospitals in the market?; and (2) What are the effects of such competition on cost, quality and outcomes of care.³ Answers to these questions would throw considerable light on the behavior of private hospitals and would assist in designing appropriate policies for better delivery of care.

As Thomson (1994) points out, hospitals in competitive environments (such as in the US) engage in certain “*competitive strategies* and *tactics*” in order to increase their

³ Competing views exist on this question. In fact, it is possible to argue that it is not possible to create competition in the health care market, let alone sustain it in the long run. See Broomberg (1994) for a critical review of this view point. We do not address this issue here. Our concern here is with giving a broad account of the nature of the hospital sector in Madras.

market share.⁴ Conceptually it is difficult to distinguish one from the other. So I shall call all competitive means as strategies.

As a *strategy*, they may compete for “physician allegiance” as a means to patients, which is often considered more effective than direct competition for patients. It is a common practice for bigger, corporate hospitals to attract better-known physicians (particularly for specialties such as Cardiology, Urology, Neurology, and Cancer treatment) as a strategy to carve a market niche for themselves. Competing for “physician allegiance” involves providing both personal and professional amenities to the physicians. In the case of Madras city, while patients are referred to dependent hospitals by physicians, patients also go direct to the hospitals of their own choice. We have no information as of now to understand the extent of this phenomenon.

As a part of their *strategy*, hospitals may also compete for (institutional) payers of care. Some of the bigger hospitals in Madras city (such as Apollo Hospital) in are known to have contractual relationships with big industrial firms for providing medical care (both general and specialty care). Although it has not become a common feature, corporate hospitals in big cities where they have made a headway do consider such contractual arrangements with large industrial employers as an effective strategy for

⁴ The hospital sector in the US and India share an important feature, namely that both have a variety of ownership pattern, classified as public hospitals, voluntary non-profit (religious and non-religious) hospitals, for-profit (sole proprietorship, partnership, and corporate) hospitals. Also, despite differences in financing mechanisms, *providers* in both the markets are likely to exhibit many similar behaviors. We refer here to the contentious issue of "induced demand" which is a possibility under both fee-for-service (out of pocket) payment system (most common in India), and traditional indemnity insurance system (which was most common until recently in the US), *although it is likely to be more prevalent in the latter than in the former payment system*. However, it is not possible to rule out its existence in Indian health care market (refer section 5, for further discussion on this point). Such reasons form a basis to believe/expect that an understanding of the US hospital market would be useful in both formulating research questions as well as in devising policy measures with respect to hospital sector in India.

increasing their market share, especially for high-cost care such as cardiac and cancer treatment. It would be worthwhile to estimate how much of their market share is composed of such “captive patients” for different services.

Hospitals in competitive market environments (as seen in the US) are also known to engage in certain other competitive **strategies** (what Thomson calls “tactics”) in order to increase their market share. These include price and non-price competitive tactics. The latter includes measures to convey quality of services and the diverse range of services they offer under one setting, conveying a sense of “comprehensive service package” they can provide to the patients. This is supposed to create an impression on the patients that various forms of care could be obtained in the same hospital setting, thereby avoiding as far as possible the inconvenience of moving from one setting to another when they are ill. While this is to be expected in large hospitals, many smaller hospitals (of even less than 20 beds) in urban India are seen to be adopting this strategy, though offer a lesser range of services than the larger hospitals.

This paper attempts to provide a description of nature of (public and private) hospital sector, with a greater emphasis on the latter in Madras city, partly using the available information and partly on the basis of a survey conducted by the author in 1993. The paper is organized as follows: Section 2 describes the sources of data and propose a classification for collection of data that would be useful for future studies on hospital sector. Section 3 describes some of the characteristics of the hospital sector (both private and public) -- namely, its size, distribution, and range of services offered -- in Madras city. Section 4 presents a more detailed (if not a complete!) picture of private hospitals based on a survey conducted in Madras city in early 1992. In section 5, we discuss the

implications of the results of our analysis and identify issues for further study that would contribute to better health care policy in urban India.

2. Sources of Data

The database on the hospital sector, particularly on the private sector in India, is very poor. There is no periodic reporting by any official agency on the number of providers in the private sector, let alone on their bed size, fees schedules, inpatients and outpatients covered, or their performance (financial and otherwise). This does not mean that private hospitals do not submit any accounts to a government body. In fact they do. But they are not easily accessible to researchers for analysis.⁵ During the last decade, particularly since early 1980s, a number of hospitals providing both inpatient and outpatient care have been established in the Madras metropolitan area. They are called either “nursing homes” or “polyclinics”, meaning that they offer more than one type of specialty care. Existing government data sources classify private hospitals either as “voluntary” (non-profit) or “non-voluntary” (for-profit). We feel that such a two-dimensional classification is not useful for micro-level studies on hospital competition. For analytical purposes it would be convenient to classify hospitals according to:

1. Ownership:

- public (General hospitals, hospitals under state and central government insurance schemes)
- private : this can be divided into two categories, namely for-profit and not-for-profit hospitals (the former can be further divided into sole proprietor, partnership, or corporate (private or public limited company)⁶. Many of the not-for-profit hospitals in India are also called “voluntary” hospitals.

⁵ At present, the author is making an attempt to get access to this data.

2. Specialties offered; and

3. Bed size.

With the existing data source we can separate the government from non-government hospitals, but we can not tell the specific organizational forms of those in the private sector. Similarly, we can classify them according to bed size, but we cannot simultaneously classify them according to ownership and specialties. This paper makes use of three different sets of data for analyzing different aspects of the hospital sector in Madras city⁷.

(1) a list of public and private hospitals provided by the Corporation of Madras. This list contains a zone-wise distribution of hospitals in the city. This list contains only those private hospitals that were registered as of 1992, in addition to names and locations of 62 government hospitals and health centers in different administrative zones in the city. According to this list, there are 326 private hospitals in the city area, but this is an underestimate according to the official sources.⁸

2. A Directory of City Hospitals and Nursing Homes (1992), compiled and published by Statistical Analysis and Research Bureau (an independent research organization in Madras). This Directory does not cover all the hospitals in the city but gives the following information on 22 government and 133 private hospitals only.

⁶ Corporate Public Limited hospitals are quoted in stock exchange. They have more than 50 shareholders. When a company has more than 20 but less than or equal to 50 partners, it is called a corporate private company. Partnership companies have more than 1 but less than or equal to 20 partners.

⁷ There is no accepted use of the term "hospital" in Madras. Many of them are more in the nature of nursing homes, and clinics. Many of those registered as "hospitals" are very small (less than 20 beds); Those registered as "nursing homes" are likely to be small in size but not necessarily so. There are small nursing homes (less than 15 beds) that are registered as "corporate private limited companies". Also, there are sole proprietor hospitals that are bigger than some of the corporate private limited companies. Many of them are called "clinics", or "polyclinics" (usually with less than 15 or 20 beds), but may come under any of the organizational forms.

⁸ Many officials in the government recognize that there are a number of private hospitals that are (presumably run by qualified doctors but are) not licensed. These are also often referred to as "unregistered" hospitals. As a result, there is no record of their size, location, or health professionals employed by them.

- a. Name of the hospital
- b. Location (according to postal pin code)
- c. Number of Beds
- d. Departments (specialties offered)
- e. Tariff for inpatient care (per bed/day, air-conditioned and non-conditioned rooms)
- f. Out patient consulting fees (regular and specialties)
- g. Number of physicians under different specialties.

3. The third source of data contains the following information on 35 private hospitals in the city surveyed during January-February 1993.

- a. Name, year of establishment, and location (according to postal zip codes)
- b. Type of organization (sole proprietor, partnership, or Corporate)
- c. Bed size
- d. Number of inpatients and outpatients per day (average of previous 30 days)
- e. Number of regular, and visiting (i.e., consulting) physicians.
- f. Number of nurses employed.

We have used the above three sources for different purposes in this paper.

3. Characteristics of the Hospitals in Madras City

Madras city has a population of about 4.0 million, covering approximately an area of 200 square kilometers (20,000 population per sq.km.). According to the Corporation of Madras, the city has a total of 388 hospitals (1992 figures), of which 326 are in the private sector (see **Table 1**). Note that this does not give a breakup of private hospitals according to ownership categories. This will be an important piece of information, which may be available with the concerned ministry (with the Office of the Registrar of Companies), for more detailed studies.

Table 1: Number of Public and Private Hospitals in the Madras city, 1992

| | | |
|----|-----------------------------|-----|
| 1. | Number of public hospitals | 62 |
| 2. | Number of private hospitals | 326 |
| | a. voluntary hospitals | 8 |
| | b. non-voluntary hospitals | 316 |
| 3. | Total | 388 |

Source: Corporation of Madras, 1992.

This works out to about one hospital per 10,300 population and one private hospital per 12,270 population in the city.

3.1. Size

As already mentioned, we lack information on the total number of hospitals and their bed size in the city. According to the Directory (1992) the total bed size of the 22 government and 130 private hospitals in the city is 11,500 and 6,676, respectively. This amounts to an average bed capacity of 525 for the 22 government hospitals -- which is about 10 times that of the 130 private hospitals (51). Since we do not have data on all the 388 hospitals in the city, we can only estimate their relative size under different assumptions. It turns out that the private sector would account for about 40 to 60 percent of the total beds in the city, assuming an average bed size of 25 to 50 for the remaining 196 private hospitals, and between 50 and 100 for the remaining 40 public hospitals. It appears that despite the large number of private hospitals, the proportion of private beds is probably around half of the total beds in the city. However, the share of private sector beds to total beds in the city is

probably much above its state-level average (20.7 percent), and also its all-India average (29.9 percent) (Bhat, 1993).⁹

3.2. Distribution

The Madras metropolitan area is divided into ten administrative zones. It is clear from the data we have (see **Table 2**) that the hospitals are unevenly distributed in terms of the average population covered across zones. At this point of our analysis, we have no information on the extent of market served by hospitals. Here, we are merely describing their geographical distribution. It would be an interesting area of research, as argued later, to inquire into how hospitals choose their locations and how much of the market do they serve. The highest concentration of hospitals (private and public hospitals put together) is seen in zone 5 (95 in number, each serving an average of 4194 people only). Zone 10, ranked second in terms of the population covered per hospital, has only half the number of hospitals as zone 5 (though they both have a comparable zonal population (of close to 400,000 each). All the others serve an average population size close to 10,000 (zones 1, 4, 8 and 9) or above, with a maximum of 18,340 per hospital in zone 1.

⁹ According to Bhat's estimate (1988 data), the urban areas in Tamil Nadu accounts for 90 percent of the total beds in the state. The urban share of the hospital beds at all-India level is about 85 percent. The

Table 2: Zonal Distribution of Hospitals in Madras City.

| Zone | Number of Public Hospitals | Number of Private Hospitals | Total col.2+3 | Population per Hospital | Population per sq.km | Hospitals per square km. col.6/5 |
|-------|----------------------------|-----------------------------|---------------|-------------------------|----------------------|----------------------------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| I | 4 | 13 | 17 | 18,341 | 15,590 | 0.85 |
| II | 10 | 29 | 39 | 11,308 | 52,500 | 4.64 |
| III | 9 | 21 | 30 | 16,883 | 35,173 | 2.10 |
| IV | 8 | 34 | 42 | 9,793 | 14,934 | 1.52 |
| V | 6 | 89 | 95 | 4,194 | 13,062 | 3.11 |
| VI | 4 | 21 | 25 | 16,700 | n.a | n.a |
| VII | 7 | 22 | 29 | 13,755 | 17,658 | 1.28 |
| VIII | 1 | 37 | 38 | 11,029 | 19,909 | 1.8 |
| IX | 9 | 20 | 29 | 11,152 | 9357 | 0.83 |
| X | 4 | 40 | 44 | 8,409 | n.a | n.a |
| Total | 62 | 326 | 388 | 10,303 | 19,989 | 1.94 |

Source: Corporation of Madras, 1992.

What does such a distribution tell us about the physical access to health care? It is possible to make a few tentative observations in this respect. Zones 2, 3, 5 and 7 have large government hospitals (the first three of them have one teaching hospital each, with a bed capacity of 1271, 1999, and 426, respectively). Zone 5, in addition has a mental hospital with 1800 beds. It should also be noted that many of the private hospitals in zone 4 are located in its border area with zone 5, practically making them a part of zone 5. Hospitals therefore appear to be more concentrated in zones 2, 3 and 5 than in other zones --- the number of hospitals per square kilometers in these zones are 4.6, 2.1, and 3.1, respectively (see **Table 2**).

One thing is certain: Zones (2, 3, and 9) with highest number of public hospitals do not have the highest number of private hospitals. Zones (8, and 10) with very low

exception to this all-India pattern is Kerala, where rural areas have 80 percent of the total hospitals and 56 percent of the total beds in the state (Bhat,1993)

presence of public hospitals have a large presence of private hospitals. The remaining five zones (except zone 5) show a remarkable correlation between concentration of public and private hospitals.. Within zone 5, nearly 50% (44) of them have established themselves around a smaller region (postal pin code 10). This area has a large higher-income population and is also very close to two large public hospitals. However, it needs to be fully explained why a large number (27%) of hospitals in the private sector have located themselves in zone 5. This question acquires even more importance given the fact that the density of population in zone 5 (13,062 per square kilometer) is much less than that of most other zones.¹⁰

2.3. Range of Services

As mentioned earlier, theoretically private hospitals could engage in price and non-price competitive tactics in order to increase their market share. One of the non-price competitive behaviors refers to the range of services offered. This has a direct appeal to the patients. It creates an impression that hospitals can cater to different health care needs of the patients in one location. An analysis of the range of services also gives an idea about how the providers view the market for different types of care and how they position themselves in competitive environments.

Table 3 gives the number of private and public hospitals offering different services. This analysis is based on a sample of 22 government and 133 private hospitals (as reported in the Directory,1992). It should be borne in mind that these are self-reported

¹⁰ North Madras (consisting zones 1,2,3, and 4) is more densely populated than most other parts of city (see Table 2). It has also more industries, with a large industrial labor force living close to their workplace.

data, and that these services are not necessarily offered by providers with training in respective specialties.

Table 3: Number of Private and Public Hospitals Offering Different Services

| S.No | Services | Private No (%) (Sample:133) | Public No (%) (Sample:22) |
|------|---------------------------------|-----------------------------------|---------------------------------|
| 1 | General Surgery | 96 (72.1) | 10 (45.4) |
| 2. | Obstetrics & Gyn./Maternal care | 91 (68.4) | 9 (40.9) |
| 3. | General Medicine | 88 (66.1) | 9 (40.9) |
| 4. | Pediatrics | 63 (47.3) | 12 (54.5) |
| 5. | Orthopedics | 60 (45.1) | 7 (31.8) |
| 6. | ENT | 53 (39.8) | 9 (40.9) |
| 7. | Ophthalmology | 48 (36.0) | 6 (27.2) |
| 8. | Cardiology | 43 (32.3) | 5 (22.7) |
| 9. | Neurology | 38 (28.5) | 6 (27.2) |
| 10. | Dermatology | 37 (27.8) | 4 (18.1) |
| 11. | Radiology | 36 (27.0) | 7 (31.8) |
| 12. | Urology | 35 (26.3) | 5 (22.7) |
| 13. | Dentistry | 34 (25.5) | 8 (36.3) |
| 14. | Nephrology | 28 (21.0) | 6 (27.2) |
| 15. | Plastic Surgery | 28 (21.0) | 5 (22.7) |
| 16. | Psychiatry | 27 (20.3) | 6 (27.2) |
| 17. | Gastroenterology | 27 (20.3) | 5 (22.7) |
| 18. | Diabetology | 20 (15.0) | 3 (13.6) |
| 19. | Traumatology | 20 (15.0) | 2 (9.0) |
| 20. | Emergency Care | 19 (14.2) | 2 (9.0) |
| 21. | Ultrasonography | 18 (13.5) | n.a |
| 22. | Oncology | 14 (10.5) | 5 (22.7) |
| 23. | Chest/TB | 12 (9.02) | 8 (36.3) |
| 24. | Acupuncture | 10 (7.5) | 0 (0.0) |
| 25. | Endocrinology | 9 (6.7) | 1 (4.5) |
| 26. | Neurosurgery | 9 (6.7) | 3 (13.6) |
| 27. | Vascular Surgery | 9 (6.7) | 3 (13.6) |
| 28. | Allergy | 8 (6.0) | 3 (13.6) |
| 29. | Cosmetic Surgery | 3 (2.5) | 0 (0.0) |
| 30. | Rheumatology | 3 (2.5) | 1 (4.5) |
| 31. | De-addiction | 3 (2.5) | 1 (4.5) |
| 32. | Geriatric Care | 2 (1.5) | 5 (22.7) |

Source: Derived from Directory (1994)

It can be seen that more than 65 percent of those in the private sector report providing General Medicine, General Surgery and Obstetrics & Gynaecology/Maternal care. Whereas for the same services, public sector's participation in proportion to their total is 45, 41, and 41, respectively. Not surprisingly, public hospitals may be more diverse and offer more specialties than private ones. One can thus see clearly the kind of services usually the private hospitals concentrate on. It appears that competition is most intense in the market for General medicine and surgery, and Obstetrics&Gyn./Maternal care. This is followed by Pediatric, Orthopedic, ENT, and Ophthalmic care --- in the public sector too, Pediatrics, Obstetrics & Gynecology, ENT are the most frequently offered services. While it is in conformity with the expected figures, it is interesting to note that a substantial number of private hospitals offer cardiac care (43 of 133, or, 32.32.3%), and skin care (37 of 133, or, 27.8%).

About 28 percent in the private sector offer Neurological care, closely followed by Radiology, Urology, Dentistry, Nephrology and Plastic surgery. On the lower end of the spectrum, one can notice that only a few among the private hospitals provide services in the following areas: cancer, chest/TB, neurosurgery, cardio-vascular surgery, allergy, rheumatic complaints, deaddiction, geriatric care, and cosmetic surgery. A greater proportion of public sector hospitals than private hospitals provides services in the following areas: cancer, chest/TB, neurosurgery, cardio-vascular surgery, allergy, rheumatism, deaddiction, and geriatrics.

We do not address here the issue of why only a few in the private sector offer these services, but it is however possible to offer two plausible explanations for this behavior. (a) Services such as cancer treatment, cardio-vascular surgery, neurosurgery,

and kidney transplantation require large human and financial resources. This would mean that only those few (large corporate and other bigger) hospitals would have the necessary resources to invest in facilities to offer these services. But the competition amongst those who offer such services is likely to become intense if the demand for these services is high and growing. (b) On the other hand, it may be that the demand for these services is not yet large enough to attract many providers. It would be useful to analyze the extent to which both these forces have played a role in determining the number of providers for various services in the city. If demand is not a limiting factor, then inpatients requiring such specialty care should account significantly for the overall occupancy rates, in addition to occupancy rates for those services themselves being high. This requires further empirical research.

The data we have suggest that a large number of providers in the private sector try to tap the demand for care relating to the following areas: Obstetrics & Gyn.\Maternal care, Pediatrics, Orthopedics, and Ophthalmology (apart from General medicine and surgery). A substantial number of them also offer high-cost services such as Cardiology, Nephrology, Neurology, Urology, and Dentistry. In reporting these specialties, hospitals are not necessarily constrained by their bed size. Take, for example, Cardiology and Nephrology (see **Table 4**).

Table 4: Proportion of Private Hospitals Offering Different Specialties According to Bed Size (Sample size :130)

| Bed size | Cardiology Number (%) | Nephrology Number (%) | Obs.&Gyn / Maternal Care Number (%) | Orthopedic Number (%) |
|---------------|--------------------------|--------------------------|---|--------------------------|
| 20 or less | 10 (23.8) | 3 (10.7) | 35 (38.5) | 20 (33.3) |
| 21-50 | 14 (33.3) | 11 (39.2) | 32 (35.2) | 25 (41.6) |
| 51-100 | 10 (23.8) | 8 (28.5) | 14 (15.4) | 7 (11.6) |
| more than 100 | 8 (19.0) | 6 (21.4) | 10 (11.0) | 8 (13.3) |
| Total | 42 | 28 | 91 | 60 |

Source: Derived from Directory (1994). Figures in parentheses represent percentage of respective totals.

Though bigger hospitals usually offer cardiac care, many smaller ones (10 out of 42 with less than 20 beds) also offer this service. In the case of Nephrology, the size does seem to matter more (only 3 out of 28 hospitals in this market have a bed size 20 or less)¹¹. If these two services are contrasted with two more widely offered services, such as Obstetrics & Gyn/maternal care, and Orthopedic care, one can observe that a much larger number of smaller private hospitals are competing with each other for market share.

An analysis of this kind can be more useful if we also have information on beds used for different types of care according to different categories of hospitals (defined by bed size or ownership). This will give a more accurate picture of the providers'

dependence on the market for different inpatient care.

In the next section, we shall address in more detail the issue of competition among the private hospitals in Madras city. Our analysis is tentative but throws additional light on the behavior of the private hospital sector in the city. The results suggest that private hospitals across different organizational forms are engaged in price-competition for

¹¹It is possible that these smaller hospital were established up a particular specialist. It would be worthwhile to analyse organizational forms of these hospitals offering specialty services.

outpatient (ambulatory) care. We do not have adequate data to comment on competition for inpatient care and hospitals' market share for different services. But we have speculated a bit on the possible nature of competition in the Indian context and formulated certain questions for further analysis.

4. Competition in the Private Hospital Sector

In the remaining part of this paper, we shall address the following questions:

- How do hospitals differ in pricing their services?
- How do they differ in terms of manpower employed?
- How do they differ in terms of the coverage of inpatients and outpatients?

Given the lack of adequate data, we will not be able to do any sophisticated analysis to answer the above mentioned questions. However, it is possible to throw some light on these issue by analyzing the available data. The analysis is done primarily across *ownership categories*. As mentioned earlier, the behavior of health care market is determined by a number of factors (Berman and Rannan-Eliya,1993), ownership-pattern being one among them. We have also examined whether bed size of hospitals show any pattern of association with coverage of patients, prices and manpower employed. In this section, we first briefly describe the data collection process of the survey conducted. We then present the results of the analysis, followed by a discussion in the next section.

Hospitals were chosen based on convenience. Initially, we sent a preliminary questionnaire to more than one hundred private hospitals but the response rate was very poor (about 10 per cent). We then decided to visit hospitals personally and explained the purpose of our study to the concerned authorities. As a result, we collected information

only from those that were willing to provide them. In the process we were also helped by some of them in obtaining information from other hospitals. The selection of hospitals to a large extent was thus necessarily dictated by forces outside our control. We ended up visiting 50 hospitals but found that we could only use the data for 35 of them.¹² The following data were collected from the sample hospitals.

1. Name of the hospitals
2. When established
3. Ownership category
 - *sole proprietorship
 - *partnership, or
 - *corporate (private or public limited company)
4. Postal pin code
5. Number of beds
6. Number of inpatients per day(average of past 30 days)
7. Number of outpatient per day (average of past 30 days)
8. Number of consultants, regular (employed) physicians and nurses.

In addition, the **Directory 1994** provided information on the following for some of the sample hospitals.

1. Outpatient (regular and specialist) charges
2. Bed charges (air-conditioned and non-air-conditioned rooms) per day

Table 5 shows some background information on our sample hospitals. To maintain anonymity, each hospital is given a fictitious name.

Table 5: Bed size and Organizational Forms of Sample Hospitals.

| Name | Year of | Type | Zone | Bed size | Occupanc | Outpatients |
|------|---------|------|------|----------|----------|-------------|
|------|---------|------|------|----------|----------|-------------|

¹² This survey was a part of a larger survey conducted by the author and S.Sukanya during January-February 1993. For further details of this survey, see Sukanya (1994).

| | Establishment | of organization | | | rate ^b | per day ^b |
|-------|---------------|-----------------|----|-----|-------------------|----------------------|
| Hsp1 | 1989 | sole proprietor | 7 | 18 | 50 | 20 |
| Hsp2 | 1976 | do | 7 | 10 | 70 | 15 |
| Hsp3 | 1980 | do | 8 | 60 | 75 | 50 |
| Hsp4 | 1940 | do | 8 | 20 | 75 | 75 |
| Hsp5 | 1947 | do | 10 | 9 | 77 | 50 |
| Hsp6 | 1982 | do | 8 | 14 | 35 | 12 |
| Hsp7 | 1975 | do | 5 | 15 | 100 | 50 |
| Hsp8 | 1973 | do | 5 | 15 | 80 | 20 |
| Hsp9 | 1983 | do | 6 | 10 | 50 | 5 |
| Hsp10 | 1987 | do | 8 | 12 | 41 | 35 |
| Hsp11 | 1983 | do | 8 | 14 | 35 | 200 |
| Hsp12 | 1986 | do | 5 | 22 | 68 | 10 |
| Hsp13 | 1981 | do | 9 | 20 | 60 | 30 |
| Hsp14 | 1960 | do | 7 | 10 | 20 | 30 |
| Hsp15 | 1949 | Partnership | 10 | 200 | 100 | 100 |
| Hsp16 | 1947 | do | 5 | 22 | 50 | 100 |
| Hsp17 | 1986 | do | 10 | 14 | 50 | 20 |
| Hsp18 | 1960 | do | 5 | 50 | 60 | 50 |
| Hsp19 | 1934 | do | 7 | 10 | 40 | 20 |
| Hsp20 | 1990 | do | 5 | 32 | 78 | 150 |
| Hsp21 | 1936 | do | 8 | 5 | 20 | 150 |
| Hsp22 | 1990 | do | 7 | 40 | 12 | 20 |
| Hsp23 | 1989 | do | 8 | 10 | 100 | 15 |
| Hsp24 | 1985 | Corporate | 10 | 55 | 72 | 40 |
| Hsp25 | 1990 | do | 10 | 200 | 22 | 100 |
| Hsp26 | 1990 | do | 10 | 65 | n.a. | n.a. |
| Hsp27 | 1970 | do | 10 | 24 | 100 | 50 |
| Hsp28 | 1985 | do | 5 | 70 | 57 | 10 |
| Hsp29 | 1992 | do | 5 | 90 | 11 | 15 |
| Hsp30 | 1982 | do | 9 | 40 | 62 | 150 |
| Hsp31 | 1981 | do | 5 | 50 | 90 | 25 |
| Hsp32 | 1970 | do | 8 | 15 | n.a. | n.a. |
| Hsp33 | 1986 | do | 10 | 18 | 66 | 50 |
| Hsp34 | 1982 | do | 8 | 81 | 49 | 50 |
| Hsp35 | 1989 | do ^a | 10 | 150 | 62 | 150 |

a: This is the only corporate public limited company in our sample. All others are corporate private limited companies

b: This represents the average of 30 days prior to the date of survey.

Source: survey (1993)

The hospitals are grouped according to organizational forms: sole proprietorship (14), partnership (9) and corporate hospitals (12). The sample size represents 10.7 percent of the hospitals in the private sector in Madras city.

The zonal distribution of the sample hospitals, along with their postal pin-codes are given below. Postal pin-code areas are smaller than administrative zones and they often have areas spread over different administrative zones. It turns out 30 of the sample hospitals (except four in zone 8 and one in zone 9) form themselves into two distinct clusters. The shaded areas shown in the city map (**Appendix 1**) indicate the two clusters. This allows us to compare outpatient charges across these two clusters, to test whether outpatient charges on average are less in cluster 1 (zone 5, with a larger number of providers) than those in cluster 2. The samples drawn from different zones are shown in **Table 6**.

Table 6: Zonal Distribution of Sample Hospitals

| Zone | Sample size | Sole proprietor hospitals | Partnership hospitals | Corporate hospitals |
|-------|-------------|---------------------------|-----------------------|---------------------|
| 5 | 9 | 3 | 2 | 3 |
| 6 | 1 | 1 | 0 | 0 |
| 7 | 5 | 3 | 1 | 0 |
| 8 | 9 | 5 | 2 | 2 |
| 9 | 2 | 1 | 0 | 1 |
| 10 | 9 | 1 | 2 | 6 |
| Total | 35 | 14 | 9 | 12 |

Tables 7 and 8 provide summary statistics and other results.

Table 7: Mean Values of Hospital Variables According to Ownership.

| Variables | Sole Proprietor Hospitals (n) | Partnership Hospitals (n) | Corporate Hospitals (n) | p value (n) |
|-----------------------------------|-------------------------------|---------------------------|-------------------------|-------------|
| Bed size | 17.78 (14) | 42.55 (9) | 67.66 (12) | 0.0016 (35) |
| Occupancy Rate | 59.71 (14) | 56.66 (9) | 59.10 (10) | 0.9459 (33) |
| In-patients per day | 11.71 (14) | 32.55 (9) | 34.60 (10) | 0.0075 (33) |
| Out-patients per day | 43.00 (14) | 69.44 (9) | 64.00 (10) | 0.3678 (33) |
| Out-patient charges per day | | | | |
| (a) Regular | 35.6 (8) | 43.22 (5) | 42.22 (9) | 0.7027 (22) |
| (b) Specialist | 57.1 (8) | 81.00 (5) | 88.88 (9) | 0.2533 (21) |
| Manpower | | | | |
| (a)Total | 16.36 (11) | 40.11 (9) | 75.37 (8) | 0.0012 (28) |
| (b)Regular physicians | 2.92 (13) | 5.78 (9) | 13.37 (8) | 0.0004 (30) |
| (c)Visiting physicians | 9.00 (12) | 15.22 (9) | 27.12 (8) | 0.0082 (29) |
| (d)Nurses | 5.58 (12) | 19.11 (9) | 36.44 (9) | 0.0015 (30) |
| <u>Manpower per bed (col.6/1)</u> | | | | |
| (a) total per bed | 1.170 | 1.316 | 1.464 | 0.5790 |
| (b) Regular physician / bed | 0.200 | 0.288 | 0.285 | 0.5372 |
| (c) Visiting physician / bed | 0.640 | 0.583 | 0.589 | 0.6539 |
| (d) Nursed /bed | 0.418 | 0.441 | 0.583 | 0.1030 |
| (a)Bed charges per day (non-a/c) | 84.0 (7) | 131.0 (4) | 160.0 (7) | 0.1400 |
| (b)Bed charges per day (a/c) | 150.0 (4) | 262.0 (4) | 360.0 (7) | 0.015 |

Source: Survey (1993)

Table 8: Correlation between bed size and hospital variables

| Variables | Pearson correlation |
|----------------|---------------------|
| Occupancy rate | 0.00 |

| | |
|--|------|
| Outpatients/day | 0.06 |
| Outpatient charge (regular) | 0.11 |
| Outpatient charge (specialist) | 0.08 |
| Regular physicians/bed | 0.15 |
| Consulting physicians/bed | 0.16 |
| Nurses/bed | 0.02 |
| Tariff (air-conditioned room) per day | 0.46 |
| Tariff (non air- conditioned room) per day | 0.26 |

The survey also obtained information on types of non-clinical services (namely, kitchen, and laundry services) and laboratory services offered by the hospitals (refer **Table 9**), which we discuss later in this section.

Table 9: Number of Hospitals offering non-clinical and laboratory services*

| Services provided | Sole proprietary | | Partnership | | Corporate | |
|---------------------|------------------|----|-------------|----|-----------|------|
| | Yes | No | Yes | No | Yes | No |
| Kitchen services | 0 | 14 | 4 | 5 | 6 | 3 |
| Laundry services | 2 | 12 | 5 | 4 | 6 | 3 |
| Laboratory services | 13 | 1 | 8 | 1 | 9 | n.a. |

* Not all 35 hospitals provided information.

We summarize below the results of our analysis before we turn to a discussion of the nature of issues involved and the kinds of questions that need to be taken up for further study.

1. The average bed size of a corporate hospital is 3.8 times that of a sole proprietorship hospital and 1.59 times that of a partnership hospital. The average bed size of a partnership hospital is 3.39 times that of a sole proprietorship hospital.

2. Average bed size, and number of inpatients covered per day vary significantly across ownership categories ($p=0.0016$, $n=35$, and $p=0.0075$, $n=33$, respectively, **Table 7**). But, occupancy rates and outpatients coverage per day do not exhibit a similar pattern ($p=0.945$ and $p=0.3678$, $n=33$, respectively, **Table 7**).

3. Also, average total manpower employed varies significantly across ownership categories, but *manpower per bed* does not do so (**Table 7**). The smaller proprietor hospitals have a slightly greater reliance on visiting physicians per bed than others.

4. Ownership also has no statistically significant association with fee for outpatient care per visit and bed charges per day. But, as can be seen from **Table 7**, the average outpatient charges and per day bed charges in sole proprietorship hospitals are substantially lower than those for other two categories of hospitals. Also, it should be noted that in partnership and corporate hospitals, specialist (outpatient) charges are much greater than regular (outpatient) charges (88% and 109%, respectively). The difference is not so pronounced in sole proprietorship hospitals (60%).

5. We also find no significant difference in outpatient charges between hospitals in cluster 1 and cluster 2 ($p=0.5310$), although the average outpatient charge in cluster 1 is (Rs.45, $n=9$) higher than that in cluster 2 (Rs.32, $n=20$). This is again indicative of price competition in among providers for outpatient care in the city in general.

6. Bed size shows virtually no association with occupancy rate (**Table 8**). We have not gone into determining the reasons for this, but we have speculated a bit on plausible reasons for this phenomenon. Also, bed size shows a weak correlation with outpatients served per day, and outpatient charges (specialists and regular). The implications of this are discussed in the next section.

7. Physicians per bed is weakly (though positively) correlated with bed size. But, nurses per bed shows almost no association with bed size. (**Table 8**)

8. Bigger hospitals usually have a higher tariff (room rent) per day. Our results support this, though the degree of association is not very high. (**Table 8**) This means that the non-clinical part of the total cost of inpatient care in smaller hospitals are not necessarily lower than that in larger hospitals.

9. From **Table 9** one can observe an important feature of the private sector. Kitchen and laundry services are not usually provided by smaller (sole proprietary) hospitals, but it is important to note that many larger (corporate) hospitals too do not provide these services. For example, two of the corporate hospitals (with 70 and 40 beds each, with occupancy rates 57 and 62, respectively) do not provide these two services. It would be useful to study how large and small hospitals actually manage such services. What kinds of contractual arrangement do they have and why do many of them not have. This indicates that there is a large scope for contracting out non-clinical services. Laboratory services are usually provided by all (except a few) hospitals.

5. Discussion.

Four broad observations can be made about the nature of the private hospital market in Madras city, which reflects the nature of the hospital market in urban India.

- Private hospitals are segmented according to bed size by ownership.
- Bed size of hospitals have little relationship with occupancy rates or levels of inputs
- Private hospitals seem to engage in price-competition in the *outpatient market*. We do not have adequate information on the inpatient market.
- There is an excess capacity (of about 40%), irrespective of bed size and ownership, which is suggestive of an intense competition amongst private hospitals.

The preliminary analysis suggests presence of an intense competition amongst providers in the *outpatient market* by offering services at similar price levels. This is true if one compares hospitals across ownership. Bed size and outpatient charges are not highly correlated. But this alone can not adequately explain why there is no significant difference in the number of outpatient served per day across hospitals of different ownership categories. The behavior of hospital market is a result of a complex play of factors from both demand and supply sides of the market (Berman and Rannan-Eliya,1993).

It is possible to argue that the similarity observed in the outpatient charges could be a result of "collusion" among the providers, rather than a result of competition. If such a "collusion" was achieved, it would be difficult to sustain it given the fact that there are more than 300 private hospitals in the city. Pending more detailed and refined analysis,

the results may be taken as indicative of price-competition in the outpatient care market in the private sector.

It is possible to make a case that there is intense competition in the inpatient care market, too, since (a) there is an excess bed capacity of about 40%, and (b) hospitals employ a comparable level of health professionals per bed, indicative of a form of non-price competition in the market. In fact, our results show that smaller private hospitals have a slightly greater ratio of health professionals per bed than bigger hospitals. Also, private hospitals in Madras city on average offer 5 to 6 different clinical services.¹³ The latter observation needs to be seen in the light of findings that competition among hospitals within an open-ended reimbursement environment takes the form of non-price competition through acquisition of expensive clinical facilities (Luft et al, 1986), though a large proportion of patients in India pay out of pocket rather than through a third party payers. Robinson's (1988) study shows that hospitals in more competitive markets tend to employ a higher ratio of health professionals per beds than those in less competitive markets. Such non-price competition, under fee-for-service payment system, is likely to result in excessive duplication of services and facilities, and increased intensity of services and visits.¹⁴ To some extent the cost of this excess capacity is probably passed on to the patients (in inpatient care).

¹³ But there is as yet no study on the extent of scale and scope economies for different services in the Indian context.

¹⁴ Many studies have shown that fee-for-service payment is likely to result in increased intensity and more visits. For a fuller discussion of possible effects of different incentives and financing methods, see Monrad Aas (1995). It should be noted that “**who pays?**” matters a lot. As explained in foot note 4, in the case of open-ended reimbursement environment, such as in the US, where a third party pays for care, there is a greater scope for over provision of care than in markets where patients pay out of pocket. A number of studies conducted in the US in the 1980s and early 1990s have shown a negative relationship between market concentration and hospital costs in metropolitan areas. (Thomson, 1994). This has been

I would speculate the following scenario in the market for health care provided by the private hospital sector. Given the lack of regulation on the conduct of providers in India, and given that consumers pay mostly out of pocket, two phenomena may be taking place simultaneously: (a) the poor may be paying a low price for care but at considerable risk of receiving less than appropriate level of care; and (b) the rich may be consuming more than what is necessary in the name of receiving better quality of care, thus spending more than necessary. The experience of hospital sector in competitive environments (such as in the US), such phenomena as described above, motivated largely by financial incentives to the providers, cannot be ruled out. It is thus necessary for policy makers in India to recognize this possibility and undertake more detailed studies on the types of questions suggested below in order to work towards designing appropriate health policy.

Addressing these issues have direct relevance to equity, costs, and quality of care.

- Why and how do new private hospitals continue to get established in the city? (with the existing data base it is not possible to calculate the rate at which the number has grown in the past, but it can not be denied that it continues to be growing.); this question acquires importance given an excess capacity of about 40%. A related question is: what factors led the present zonal distribution of private hospitals in the city?
- What is the market share for different services for different types of hospitals in the city?
- What impacts their distribution and pricing policies have on access to care for different sections of the population?. Many consulting physicians (in specialties such as Oncology, Cardiology, Nephrology and Neurology) in Madras city are known to have

explained as due to intense non-price competitive behavior (such as adoption of latest technology and extra capacity available for medical staff) as adopted by hospitals in more competitive markets. More recent developments in healthcare market (particularly the evolution of Preferred Provider Organizations in California) have changed the nature of relationship between competition and price (Dronov and White, 1995). But these findings hold good only for the metropolitan areas in the US. In the case of non-metropolitan urban and rural areas, the relationship between market concentration and hospital costs is not clear.(Vogal and Miller, 1995).

contracts with many hospitals. It important to map their practice locations to throw light on access to such specialties care.

- What kinds of financial incentives do providers under various organizational form receive?. To put it differently, what kinds of contracts exist between promoters and providers? It is also important to understand the nature of contracts between different large employers (private manufacturing companies, for example) and providers.
- What kinds of contractual arrangement do providers/promoters have for non-clinical (kitchen and laundry) services?
- What trends can we expect in the future in the behavior of investors, physicians and other stakeholders in the hospital market?
- What have been the effects of such a growth on volume, costs and quality of care?

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