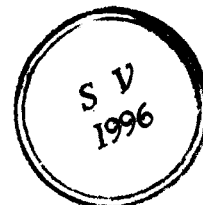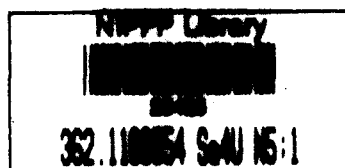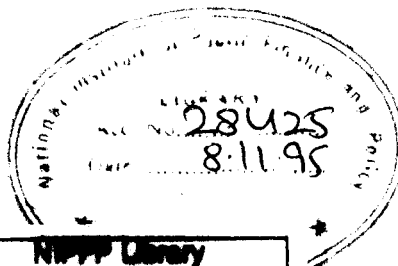# UTILIZATION PATTERN AND FINANCING OF PUBLIC HOSPITALS: A REPORT

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NEW DELHI 110 067

PREFACE

The National Institute of Public Finance and Policy is an autonomous non-profit organisation established for carrying out research, undertaking consultancy work and imparting training in the fields of public finance and policy.

Financial support for the present study came from the Ford Foundation as a part of the Programme of Studies on Health Financing, commissioned by the Foundation at the Institute. The Ministry of Health and Family Welfare also endorsed the study and issued an appeal to the hospitals to participate in the study. The study is based on a probability sample of secondary and tertiary Government hospitals from all over the country. The objective of the study was to examine the utilization of hospitals and their finances with a view to investigating the inadequacy of spending and suggesting how hospital finances can be improved. By its very nature this study is aggregative and meant to provide, probably for the first time in India, a broad view of the financial situation of government general hospitals in the country. The study also brings out strikingly how public hospitals can augment their resources internally by recovering a part of the cost of services provided by them even while exempting a bulk of the population from payment of user charges.

The study was planned and initiated by V. B. Tulasidhar in March 1993. S. K. Sanyal joined the team in June 1993 and helped in designing and conducting the sample survey. While the survey was going on Shri Sanyal went abroad on a UN assignment for a few months in October 1993. V. B. Tulasidhar also joined the Asian Development Bank India office in January 1994 but continued his association with the study and supervised the team until S. K. Sanyal joined again in July 1994 to take it over. The report has been jointly written by them.

The methodology, findings and recommendations of the study report were discussed in an NIPFP seminar held on August 4, 1995. The report has since been revised in the light of the comments received during the seminar. The Governing Body of the Institute does not take any responsibility for the views expressed in this report. The responsibility belongs primarily to the authors.

14 August 1995   Parthasarathi Shome
New Delhi   Director

ACKNOWLEDGEMENTS

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Preface

Study on Utilisation Pattern and Finances of Public Hospitals

Chapter 1

Introduction

Background

1.1   Public hospitals in India, despite the growing importance of private providers remain the major source of health care and serve the goal of distributive justice as a larger proportion of poorer patients use public hospitals than well off patients[1]. And the propensity to use public hospitals is even higher in cases of acute illness. The objective of this study is to closely examine the finances of public hospitals in India. The referral hospitals having 100 beds or above,[2] designated in this study as secondary and tertiary hospitals define the universe of the study. Out of a total supply of over 230 thousand general hospital beds in 1988 public hospitals accounted for about 68 percent. The share of public sector beds in the secondary and tertiary segments of hospitals is even higher (77 percent) as private hospital beds are concentrated mainly in small nursing homes. Thus, the secondary and tertiary medical care in this country is largely provided by public hospitals. Within the segment of larger hospitals, the tertiary hospitals which provide the most sophisticated medical care, teaching and research facilities are almost entirely in the Government sector. The performance of public hospitals in providing secondary and tertiary medical care underscore their importance in the overall health infrastructure of the country. Availability of secondary and tertiary medical care has far reaching implication for the health of the labour force, the most productive segment of the population.

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[1]   The results of the 42nd round (1986-87) survey of NSSO show that 61 percent of hospitalised cases in bottom decile of the population (according to per capita monthly expenditure) in rural areas and 69 percent in urban areas used public hospitals as against 44% and 46% respectively in the top decile, Sarvekshana Vol 15 (4) 1992.

[2]   The justification for choosing hospitals with a size of 100 beds or above is given in Appendix 1 where the sampling design issues are discussed. The study does not analyse the secondary and tertiary hospitals as separate analytical categories. However, it assumes that as the size of the hospital increases, its ability to provide tertiary care also increases.

1.2 Preponderance of public hospitals in the secondary and tertiary care segment demands commitment of sizeable financial resources of the Government. Consequently they claim a bulk of resources spent on health care. Typically in developing countries 40 to 70 percent of public expenditure on health care is spent on hospitals[3]. In our context too, the hospitals exhaust 56 percent of the expenditure on medical relief[4], although the share tends to vary across States.

1.3 Although secondary and tertiary hospitals claim a large share of the public sector resources, the share in their claim on the resources declined during the eighties and possibly has become even worse during the post reform period beginning 1990-91[5]. This has happened on account of two reasons: i) While the real health expenditure as a whole increased faster than the growth of the GDP, expenditure on the minor head "medical relief" grew very slowly and in some states the growth rate was almost zero; and ii) At the time when the supply of funds for medical facilities was curtailed, state governments substantially enhanced the allocation to primary health centres in the post new health policy era beginning 1982. The shift in allocation of funds to primary and community health centres (PHC) occurred in a majority of states[6]. A sudden shift in the allocation of resources to PHC was necessitated by the considerable upgradation of the coverage of primary health centres in the new health policy[7]. To implement the programme of the upgraded PHCs the Central Government

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[3]   Mills, Anne: The Economics of Hospitals in Developing Countries (Parts I & II), Health Policy and Planning, Vol 5, Nos. 2 & 3 pp 107 - 17 and 203 - 18

[4]   The share will be over 75 percent if the Employees State Insurance and Medical Education Research are included. The share of hospitals in medical relief is computed from the State Budgets of 1991-92. In India health expenditure is made under the major heads "Medical and Public health" constituting health care expenditure. Out of this medical relief constitutes over 50 percent of spending. Expenditure on health care facilities such as hospitals, dispensaries and primary health centre is included under this minor head.

[5]   Tulasidhar, V.B.: States Financing of Health Care, National Institute of Public Finance & Policy, 1992

[6]   The shift in resource flow to Primary health centre was found to be statistically significant in seven out of ten states for which test was done see, V.B. Tulsidhar, Allocation of Resources to PHC; Did New Health Policy make any difference? (Forthcoming IHPP Dissemination Paper)

[7]   Under the New Health policy (NHP, 1982) the population coverage of a PHC was reduced from 1,00,000 to 30,000. A new first level referral centre called Community Health Centre (CHC) was envisaged for 100,000 population, having at least three specialities. The NHP thus

provided initial support to the States under the National Minimum Needs Programme, which in turn acted as a strong incentive to State Governments to suddenly alter their priorities.

1.4   The sudden shift in States' priorities in favour of primary health care occurred when the States themselves began to have dissaving on their current account due to the sharp increase in non-plan spending. The dissaving gradually led to compression of the capital expenditure and the revenue expenditure on certain components of social service like Medical relief, because of which the overall budget allocation to medical facilities did not grow fast enough to absorb the additional expenditure requirements arising out of the upgraded PHCs. Thus the shift towards PHC ate into the real resource of the secondary and tertiary facilities. This happened at a time when the cost of hospital care was increasing due to the adoption of new technologies and diagnostic facilities[8]. The compressed spending hurt the secondary and tertiary hospitals variously in different States depending upon their financial situation. They were affected more in the States with weaker financial health. The present study is undertaken against this background with a view to assessing the impact of financial difficulties on the adequacy of spending on hospitals. And also to find out how inadequate finance affects efficient functioning of hospitals.

1.5   Although public hospitals have a pivotal role to play in providing sophisticated health care services, their finances and utilisation pattern have not been studied at the national level. Nor there is any statistical publication which provides utilisation, performance and financial data on hospitals - even for those in the public sector. Due to this inadequacy, cost efficiency, financial performance and utilisation patterns of public hospitals have not been studied. The only large scale study done on hospital finances was for Maharashtra[9], in which the financing, unit costs, utilisation, and pricing issues have been studied. The remaining studies relate to specific hospitals. The results of such individual hospital based studies are

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envisaged substantial upgradation of primary health care

8   See J.K. Satia and N.S. Deodhar (1993), "Hospital costs and Finances in Maharashtra " in P. Berman & ME Khan (ed) Paying for India's Health Care", New Delhi, Sage 1993, pp 227 - 260.

9   J.K. Satia, N.S. Deodhar (1993) op cit.

quite often not comparable.[10]

1.6   The objective of the present study is to examine the utilisation and financing of secondary and tertiary hospitals in India with a view to ascertaining the efficacy of use of resources and the unit costs.   It also seeks to assess inter state inequalities in financing of hospitals and its impact on their efficient functioning. In this study, 'efficiency' refers to operational efficiency of a hospital. Given a facility size, a large proportion of the total cost is fixed in the short run. Salaries, regular preventive maintenance of hospital assets, diagnostic equipments, vehicles and other utilities constitute the important elements of fixed cost. Owing to the predominant share of fixed cost, hospitals operate in a declining average cost environment. We therefore, equate efficiency with better utilisation rates of hospitals. The level of spending on a facility, its utilisation and unit costs are inter-linked. Given any level of spending, unit costs tend to move inversely with utilisation rate. Further, when there is inadequate expenditure on complementary and non-wage inputs, utilisation rates will be low and will improve with higher spending on such inputs. This happens because, when the expenditure on non-wage inputs (such as drugs, diagnostics, food and maintenance) is inadequate, the quality of care suffers even if the facility is adequately staffed. Utilisation rates drop when the quality of care falls; unit costs increase.

1.7   Inadequate provision of resources for complementary inputs is believed to have become a widespread problem in most hospitals funded by State Governments. For instance, within the hospital sector, if the secondary hospitals are funded inadequately in a relative sense, they will suffer from low utilisation rates and relatively high unit costs. When this happens, cases flow to tertiary hospitals which by their very nature are high cost hospitals thereby increasing the overall cost care. To this one has to add the time cost congestion at tertiary hospitals imposed on patients. This kind of lopsided allocation of resource was noticed in at least two Asian countries, Bangladesh and Indonesia. However, nothing is known about the relative adequacy of funding of secondary and tertiary hospitals in India.

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[10]   Anand et al (1985), Baride (1986), Biswas (1987), Ramaiah (1976) and Sadananda (1986) are some of the studies based on single hospitals.

Objectives

1.8　Given the background stated above the study addresses the following specific issues:

i) The pattern of funding of hospital in different states: the level of funding by hospital size and type and the relative share of tertiary and secondary hospitals in the health budget.

ii) The utilisation pattern of hospitals in different states: the utilisation by size of hospital; duration of stay and case mix. The relationship between utilisation, and the pattern of financing.

iii) The inter state and inter size variation in the facility specific attributes such as availability of diagnostics, life saving facilities, acute care beds, and the level of spending on various inputs such as maintenance, drugs, food etc.

iv) Scope for enhancing utilisation rates/hospital efficiency by reallocating resources or enhancing the level of spending.

1.9　These issues are addressed at appropriate places in the analysis which is organised in the following manner. The next section of this chapter discusses the methodology scope and coverage of the study. In the next chapter, utilisation pattern of hospitals is reviewed and efficiently performing states identified. This is followed by discussion on quality specific attributes and productivity of hospitals and diagnostic and life saving facilities in the hospital in Chapter 3. Chapter 4 is devoted to an investigation of financing of hospitals, pattern of allocation of resources and unit cost of care in different states by size of hospitals. In addition, the link between utilisation, unit costs, and adequacy of funding is also examined. The last chapter presents major findings of the study.

Method of data collection

1.10   The information required to carry out the study is not available in any published source. Even the records kept at the Directorate of Health cannot provide the information. Therefore, data had to be collected directly from hospitals by canvassing questionnaires. Keeping the objectives in mind, the study identified the universe as the Government General Hospitals with a bed size of 100 or more.

1.11   A probability sample of about 100 hospitals was selected for the survey from the sampling frame of Government General Hospitals, prepared from the latest Directory of Hospitals published by the Ministry of Health. The frame related to the year 1987. Initial efforts to canvas a mailed questionnaire to the sample hospitals failed, as the response rate was a minimal 10 percent. The strategy to send investigators to the sample hospitals for helping the hospital authorities to fill up the questionnaire paid off as the non-response was reduced considerably to 4%. The survey was conducted during October 1993 - January 1994. The details of the sampling design adopted for the survey are provided in Appendix 1.

Scope and Coverage

1.12   The sample survey was confined to all the major states and the Union Territories; the states of Himachal Pradesh and Jammu & Kashmir in the north and the whole of north-eastern region except Assam were excluded from the purview of the survey. As a further limitation of the geographical coverage, Bihar a major state, even though surveyed could not be included in the analysis because it was found during the survey operations that the sample hospitals were run by public enterprises and not by the State Government.   This was due to imperfections in the sampling frame. The All India results presented in the report are therefore, exclusive of the above mentioned areas and based on 14 major states and 3 Union Territories. Further, as the universe for sampling excluded the very small Government General hospitals of 100 beds or less, the study is confined to secondary and tertiary hospitals only.

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Chapter 2

Pattern of Utilisation of Government General Hospitals

Introduction

2.1   This chapter presents survey findings on utilization of hospitals in India.   The utilization can be measured in two ways: in the global context one can examine what proportion of morbid population in a State are using hospital services; and at the facility level one can assess how well the hospitals are utilized in different regions.   The former gives an idea about the intensity of use of hospital services in different States and the latter measure indicates how efficiently hospital facilities are utilized.   The chapter shows both the measures of utilization.   In the context of utilisation of hospitals, availability of medical personnel and their productivity are also discussed in the chapter.

2.2   The concepts/measures used to assess the utilization are: **Bed Days Utilized (BDU); the Patient Turnover Rate (PTR); the Average Length of Stay (ALS); and the Bed Occupancy Rate (BOR).**   The BDU per bed shows the days for which any given bed is occupied in a year.   Normally a bed can yield up to 365 BDU in a year[11].   The PTR indicates on an average the number of patients using any given bed during a year.   By dividing the BDU per bed with the PTR (or total BDU with the total in-patients admitted in a year) one can get the ALS.   The ALS indicates on an average the number of days a patient stays in the hospital.   The BOR, which is considered as a summary facility level measure of utilization, is the ratio of the BDU and the bed days available (beds multiplied by 365) expressed in percentage terms.   Usually, the BOR should be less than 100 but in the event of extreme congestion, when the BDU per bed exceed 365, it can exceed 100.

2.3   As one can see, all these four measures are inter related and the knowledge of any two of them will permit computation of the remaining two.   Further, one can also notice that, the

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[11]   In the event of extreme congestion, hospitals admit more patients than there are beds. When this occurs the BDU can exceed 365 per bed.

value of BOR is not invariant of the ALS. For any given number of in-patient admissions, the BOR increases as the ALS increases. Thus the ALS plays a crucial role in determining the value of BOR and hence one should analyse the BOR taking into account the ALS.

2.4 The ALS, which is an important indicator of hospital efficiency, depends on a number of factors. Case-mix, case severity, and the prevailing treatment practices determined by the medical technology are considered as primary factors determining the ALS. For example, communities with a high proportion of infectious diseases tend to have shorter ALS and chronic and severe episodes of illness require longer hospital stays. Thus, a hospital has little control on the primary factors. Besides these, certain secondary factors also influence the ALS. These are scheduling of diagnostic and surgical procedures; hospital cost reimbursement procedures; recovery environment in the post hospital care; institutional structure for taking care of certain chronic illnesses which require long term but low intensity medical care; and permitting hospital physicians to do private practice. If the secondary factors cause an increase in the ALS, it will be considered as a sign of inefficiency.

2.5 Among the secondary factors influencing the ALS listed above, hospitals have control on two factors: the scheduling of procedures in the hospital and the physician behaviour. The remaining factors fall in the realm of health care policy and any individual hospital can do little about them. For instance, in societies where the in-patient hospital costs are reimbursed on per-diem basis, the ALS tends to be longer as hospitals gain by keeping patients for longer duration. This happens because the intensity of medical care falls with the length of stay; the marginal cost of treating an in-patient also falls commensurately. On the contrary, if the reimbursement is made as a fixed fee for each diagnostic related group, hospitals tend to reduce the ALS and strive to increase the PTR, for that would maximise their net revenues. Similarly, if low cost institutions are created to take care of chronic diseases that require long term low intensity medical care, the ALS for the tertiary and secondary hospitals tend to fall. For these reasons, the ALS varies considerably across countries. In Indonesia the ALS varies between 5.9 to 9.4 days with an average of 6.6 days[12]. Zimbabwe too has a comparable ALS,

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[12] Burnum, H., "Hospital Expenditure in Indonesia", PHN Technical Note:87-17, Washington DC: The World Bank 1987.

varying between 6.1 to 7.8 with an average of 7.1 days[13]. In contrast, the ALS in China is extremely long, varying between 13.7 to 26.1 days with an average of 19.1 days[14]. While one should expect China to have a higher ALS compared to other developing countries due to its low fertility rates and lower incidence of infectious diseases, very long duration of stay is attributed to the reimbursement mechanism based on per-diem cost.

Utilization of Hospitals: Global Estimates

2.6   The estimates are based on a survey of a sample of 94 Government General Hospitals spread over 14 major states and 3 Union Territories. The pooled data are used to estimate a few important characteristics for the selected states/Union Territories taken together, hereafter referred to as all India with the limitation of geographical under-coverage. The survey estimates an annual inflow of 10 million in-patient visits to the secondary and tertiary Government General Hospitals and 137 million out-patient visits, the availability of beds being 0.17 million (Appendix II). On an average, 60 in-patients are admitted annually per bed with an average length of stay (ALS) of 5.68 days. The ALS compares well with another similarly placed country like Indonesia. The total bed days utilised (BDU) are estimated to be 58.4 million, yielding a per bed BDU of 343 reflecting a satisfactory situation. The Bed Occupancy Rate (BOR) is revealed to be 94 per cent indicating a high level of utilisation of health care facilities provided by the Government hospitals at all India level.

2.7   These absolute magnitudes do not show the intensity of use of hospitals as they do not indicate to what size of population they relate to. Ideally, intensity should be measured by the BDU for a given size of morbid population, being the probability of seeking secondary and tertiary hospital care per episode of illness. But, information on morbidity is not available to us to estimate such a statistic. As an alternative, which can only serve as an approximation of intensity of use, population has been used to estimate the intensity. This

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[13]   Hecht, Robert M. (ed), Zimbabwe: Financing of Health Services, (A World Bank Country Study), Washington DC: The World Bank 1992

[14]   Burnum, H., "Economic Issues in Planning the use of Health Resources for Chronic Diseases in China", Washington DC: The World Bank 1989.

statistic has been computed for each State. Due caution has to be taken while interpreting the results as the morbidity pattern may be different in different States due to the differences in age and sex composition of the population and the fertility rates. Table 2.1 presents the information on the intensity of use of hospital services, actual in percent and also relative to all India by States. The intensity of use varies considerably across states and Union territories: it is much higher than the national average in Chandigarh, Pondichery, Kerala, Tamil Nadu, and West Bengal; and very low in Uttar Pradesh, Gujarat, Orissa, and Goa. It appears that the intensity of utilisation is primarily determined by the availability of facilities and physicians as reflected by the bed to population and doctors to population ratios. Expectedly, the correlation between the intensity of use (standardised[15]) and bed to population (0.84) and physicians to population ratio (0.75) is high and statistically significant. The use is thus essentially supply determined and it appears that there is possibly an un-met demand, in a normative sense, in the states where there is low intensity of use. What is intriguing is the fact that some of these States also have a low standardised BOR[16]. One possible explanation for this could be the relative inaccessibility of facilities in the States where their availability is low which in turn, enhances the out of pocket cost of seeking health care. Deeper probe is needed to identify other possible reasons for low BOR in some of the States with low bed population ratios. The reasons need to be identified.

Utilization of Hospitals: Facility level estimates

2.8   The survey being confined to hospitals having more than 100 beds, the utilisation pattern examined in this chapter primarily focuses on the bed utilisation in terms of BOR, PTR and ALS by size of hospitals. Indicators of efficiency of bed utilisation are discussed for the small (100 - 399 beds), medium (400 - 999 beds) and large hospitals (1000 & above beds). Inter-state differentials in the utilisation pattern are also highlighted, though because of the small sample sizes associated with the states, the reliability of the survey findings for states is less compared to those of the strata; the first stratum represents secondary, the second

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[15]   Standardised intensity of use (not shown in Table 2.1) has been computed using the BDUs computed on the basis of national average ALS instead of the State specific ALS. This standardisation rules out inflation of BDU due to possible excessive stays.

[16]   Standardised using the national ALS.

Table 2.1 : Utilization of Hospitals: Global Estimates

States	B O R (A)	Bed Days Utilised	Intensity of Use		Beds per Lakh Population	Doctors per Lakh Population	Beds per Doctor	In-Patients per Doctor
			Actual (%)	Relative				
Andhra Pradesh	94.34	4609198	6.6	0.86	19.09	2.00	9.53	312.26
Assam	89.52	1894254	8.3	1.08	25.25	3.17	7.96	240.42
Gujarat	80.93	1436445	3.3	0.44	11.25	0.74	15.16	486.04
Haryana	88.79	897915	5.2	0.68	15.99	1.98	8.05	453.99
Karnataka	90.29	4647006	9.9	1.30	29.98	0.90	33.43	1151.06
Kerala	95.11	6168999	20.5	2.69	59.16	5.84	10.12	489.63
Maharashtra	99.40	7123990	8.5	1.12	23.52	1.97	11.95	950.28
Madhya Pradesh	114.81	5515845	7.8	1.03	18.72	1.52	12.34	1191.59
Orissa	84.33	1273653	3.9	0.51	12.54	1.41	8.92	486.11
Punjab	81.76	1220781	5.8	0.76	19.32	2.73	7.07	305.07
Rajasthan	81.89	2695297	5.8	0.76	19.28	1.64	11.73	775.70
Tamil Nadu	112.81	9358201	16.2	2.13	39.41	3.43	11.49	895.00
Uttar Pradesh	74.41	2928370	2.0	0.26	7.31	0.79	9.30	357.14
West Bengal	83.35	7949365	11.1	1.45	36.32	4.68	7.76	565.83
Chandigarh	104.60	335981	47.9	6.28	125.48	45.77	2.74	101.78
Goa	75.15	49373	3.7	0.49	13.61	2.72	5.00	268.92
Pondichery	110.37	256617	29.5	3.87	73.25	NA	NA	NA
All India	94.02	58361289	7.6	1.00	22.22	2.14	10.40	628.09

representing a mixture of secondary and tertiary and the third stratum the tertiary hospitals.

Stratum Differentials

2.9   Since the average BOR (94 per cent) may not bring out its distributional pattern, it would be instructive to examine the distribution of the estimated number of hospitals by size classes of BOR. For this purpose, the BORs of individual sample hospitals, as obtained through the survey were first examined. The BORs as calculated by the sample hospital authorities were found to be incorrect, for some hospitals. The distribution given in Table 2.2 is based on the computed values obtained from the information provided on BDU and number of beds. It is quite apparent from Table 2.2 that a substantial proportion of the hospitals (48%) is facing the crisis situation with a bed occupancy rate of more than 100. While 75% of hospitals (with BOR above 80) are facing congestion in providing in-patient care, only about 15 per cent (with BOR less than 60) the hospital beds are not utilised properly.

2.10   The previous analysis was limited to the pooled data of all the strata of hospitals. The size of a hospital being a determinant of both the availability of health care facilities and its cost, the various indicators discussed so far ought to be studied for the small, medium and large hospitals among the secondary and tertiary hospitals.   Among the hospitals with more than 100 beds, the size distribution is highly skewed; 78% of hospitals could be classified as small, 17% medium and only 4.6% as really large

Table 2.2: Distribution of estimated number of hospitals by size classes of BOR, All India, 1992-93.

Size class of BOR	Percentage Distribution
less than 40	2.55
41-60	12.48
61-80	10.13
81-100	26.48
101 & above	48.36
All classes	100.00

hospitals. Table 2.3 presents some important indicators of Bed Utilisation by size of hospital.

Table 2.3: Bed Utilisation by size of hospital: All India 1992-93.

Size of hospital (no. of beds)	Number of sample hospitals	Percentage distribution of estimated no of hospitals	In-patients per bed (PTR)	ALS	BDU per bed	BOR
(1)	(2)	(3)	(4)	(5)	(6)	(7)
100-399	41	78.20	76	4.72	357	97.93
400-999	35	17.20	57	5.86	326	92.23
1000 & above	18	4.60	31	10.40	322	88.18
Total	94	100.00	60	5.68	343	94.02

2.11   Some interesting findings emerge from Table 2.3. In-patients per bed (PTR), in smaller hospitals is higher compared to the larger hospitals, as the ALS increases with the size of hospitals. This is what one expects in an ideal situation. As the larger tertiary hospitals are expected to cater to more severe and chronic cases, the ALS should be high. The ALS in tertiary hospitals in India is nearer to what was observed in Indonesia and Zimbabwe but far less than in China. Another surprising finding is that unlike in Indonesia and in a large number of other countries[17], lower level hospitals in India are better utilised and enjoy high BOR and PTR. In most developing countries, lower level .facilities are not adequately endowed in terms of manpower and capital equipment resulting in diversion of less serious cases to larger hospitals where the costs per bed tend to be high. This results in congestion at tertiary level hospitals and inadequate utilisation of secondary hospitals. It appears that inefficient use of resources on this account is not taking place in India. In fact as indicated below, there appears to be excessive congestion at lower level hospitals.

Ideal Bed Occupancy Rate

2.12   The bed occupancy rate that is, the BOR being the indicator of the utilisation efficiency with the standard as 365 days shows an inverse relationship with the size of the hospitals, indicating that the medium and large hospitals are relatively having lesser problems of tackling the load of in-patients. This measure straight away does not indicate whether there

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[17]   See Burnum, H (1987), Hecht (1992).

is congestion in hospitals. Although one can visualise a maximum of 365 BDU per bed (BOR of 100), it is seldom possible to achieve it without causing congestion. When patients change, some time would be needed to prepare the bed. Shorter the ALS, more frequent will be the changes and fewer will be the bed days available for patients. For this purpose let us assume that an 8 hour duration (hypothetical) is needed for preparation of the bed vacated. In other words, one day is not occupied for every 3 x ALS days of occupancy (i.e. if the ALS is 4, for every 3 patients one BDU is lost). Or out of ((3 x ALS) + 1) days, one day is not occupied. Thus for any ALS one can compute the maximum BOR a hospital can have without causing congestion. The results for the three strata of hospitals are given below:

Stratum	Ideal BOR	Actual BOR	Difference	Remarks
1	93.4	97.9	4.5	Congestion
2	94.6	92.2	-2.4	Can take more load
3	96.9	88.2	-8.7	Can take considerably more load

2.13   The above illustration purports to reveal the prevalence of congestion in small hospitals. As against this, the large hospitals would stand to gain, if the BOR is given the attention it deserves. This aspect will again, be examined when BOR is assessed in relation to cost of the care provided which also varies with the size of the hospital.

Bed Utilisation by Wards

2.14   There are considerable differences in the utilisation of beds in different wards of the hospitals as evident from Table 2.4.

2.15   The survey, indicates as expected, the highest proportion of in-patients (21.5%) in the General Medicine Ward, though closely followed by Maternity ward (19%), Surgical (15%) and Paediatrics (14%). Considering the load of in-patients that is, the number of in-patients per bed the casualty ward understandably stands apart from others. The ratio is high because of smaller number of beds. Among others, Paediatrics and Maternity reveal much higher load compared to other wards, the Dental and ENT wards admitting very few in-patients.

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2.16 The average length of stay for most of the wards is in the range of 3-4 days, the notable exception being the Orthopaedics with ALS of 10.5 days. The Orthopaedics ward again, is the most utilised, reporting a ratio of 650 for BDU/bed and a BOR of 178. The BOR in fact, is indicative of extreme congestion in this ward and has policy implication of an increase in number of beds for this particular ward, if necessary by curtailing the number of beds in wards like Dental (BOR = 20), ENT (BOR = 30) and Eye (BOR = 38).

Table 2.4: Bed Utilisation by Wards - Selected Ratios: All India, 1992-93

Wards	Percentage distribution of in-patients	In-patients per bed	ALS	BDU per bed	BOR
Maternity	18.9	89	2.58	229	62.81
Paediatrics	14.2	108	2.86	309	84.76
Surgical	15.4	58	4.63	266	72.90
General Medicine	21.5	71	3.47	246	67.32
Eye	2.8	39	3.56	139	38.18
ENT	1.1	28	3.94	110	30.15
Dental	0.2	23	3.19	75	20.42
Casualty	9.1	317	0.54	170	46.56
Orthopaedics	5.5	62	10.49	650	178.2
Others	11.3	40	4.19	166	45.39
Total	100.0	60	5.68	343	94.02

Composition of Patients by size of hospital

2.17 It would be instructive to know the relative proportions of children and women flocking to the Government General Hospitals for their treatment and also a comparative study of these proportions for out-patients and in-patients. Table 2.5 presents the survey findings.

2.18 The proportion of children among out-patients and in patients going to small hospitals is revealed to be more than the other strata. The proportion, in fact goes down with the size. The proportion of women is observed to be the highest for medium hospitals irrespective of the fact that the patient is an out-patient or an in-patient. Further, the proportion of both

children and women admitted as in-patients in small and medium hospitals are much more than those obtaining for out-patients. The proportion of children among in patients is less than that for out-patients in large hospitals.

Table 2.5: Composition of out-patients and in-patients by size of hospital:
All India, 1992-93

Size of hospital	Out-patients			In-patients		
(no. of beds)	Children	Women	Others	Children	Women	Others
100-399	24.98	34.76	40.26	34.46	42.84	22.7
400-999	19.15	38.51	42.34	20.30	44.08	35.62
1000 & above	15.69	36.57	47.74	10.56	40.24	49.20
Total	22.32	35.99	41.69	26.32	43.05	30.63

Inter-State Differentials

2.19   Based on the estimates obtained for 14 major states and three Union Territories of important characteristics, Table 3 of Appendix II shows that West Bengal accounted for the largest proportion 15% of total number of beds, Tamil Nadu following with 13% and Maharashtra with 12% and Kerala 10%(see Figure 2.1). In terms of bed days utilised, however, the order of the States was slightly changed, Tamil Nadu (16%), West Bengal (14%), Maharashtra (12%) and Kerala (11%) being the top four States(Figure 2.1). Taking into account the population of the states, Kerala enjoys an advantage relative to other states in respect of beds per lakh population (59), Uttar Pradesh grossly deficient with only 7 beds per lakh population(Figure 2.2). Among the Union Territories, Chandigarh reported a much favourable ratio of 125, standing apart from all others including major states. Among the major states Uttar Pradesh, Gujarat, Orissa, Haryana, Punjab, Rajasthan and Andhra Pradesh reported a ratio less than 20 and would therefore, need attention for providing basic facility of increase in number of beds in secondary and tertiary hospitals.

2.20   Considering the flow of in-patients West Bengal again, had the largest share (18%) followed by Tamil Nadu (17%), Maharashtra(15%) and Madhya Pradesh (12%). Uttar Pradesh, the most populous state claimed only 4%. Kerala would appear to be relatively in an advantageous position with respect to the supply of Government doctors and nurses(11) per lakh of population; Uttar Pradesh is on the other extreme with a doctor per lakh and a

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Figure 2.1
Actual Beds Operational and Bed Days Utilised
in Public Hospitals In India.
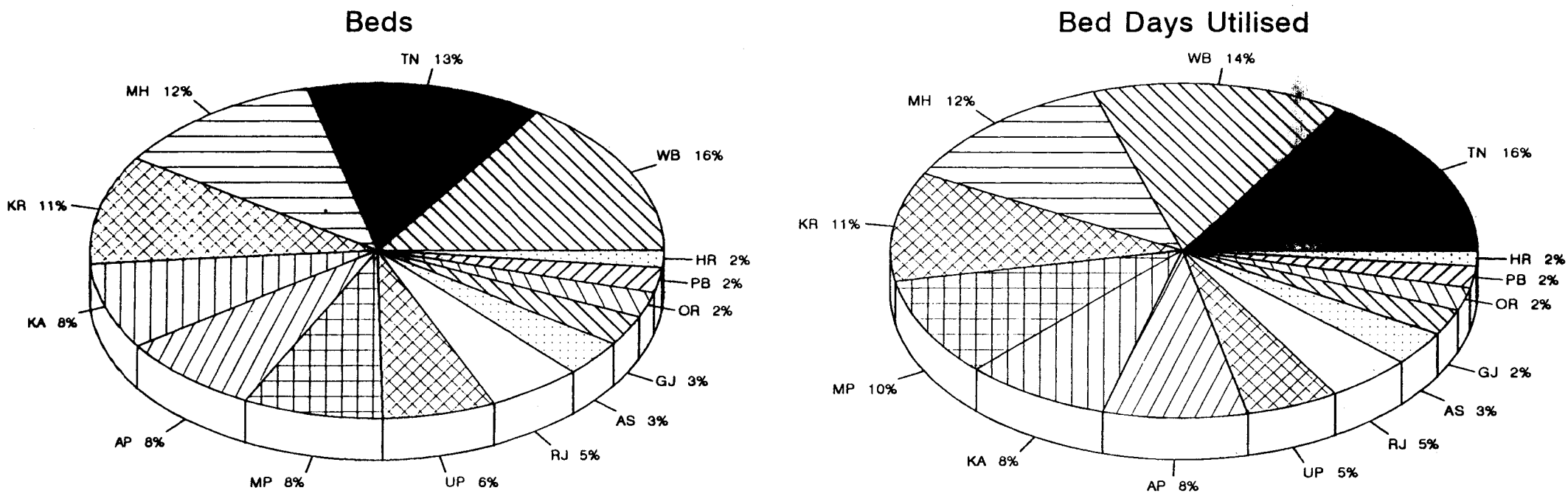
Figure 2.2
Beds per Lakh Population
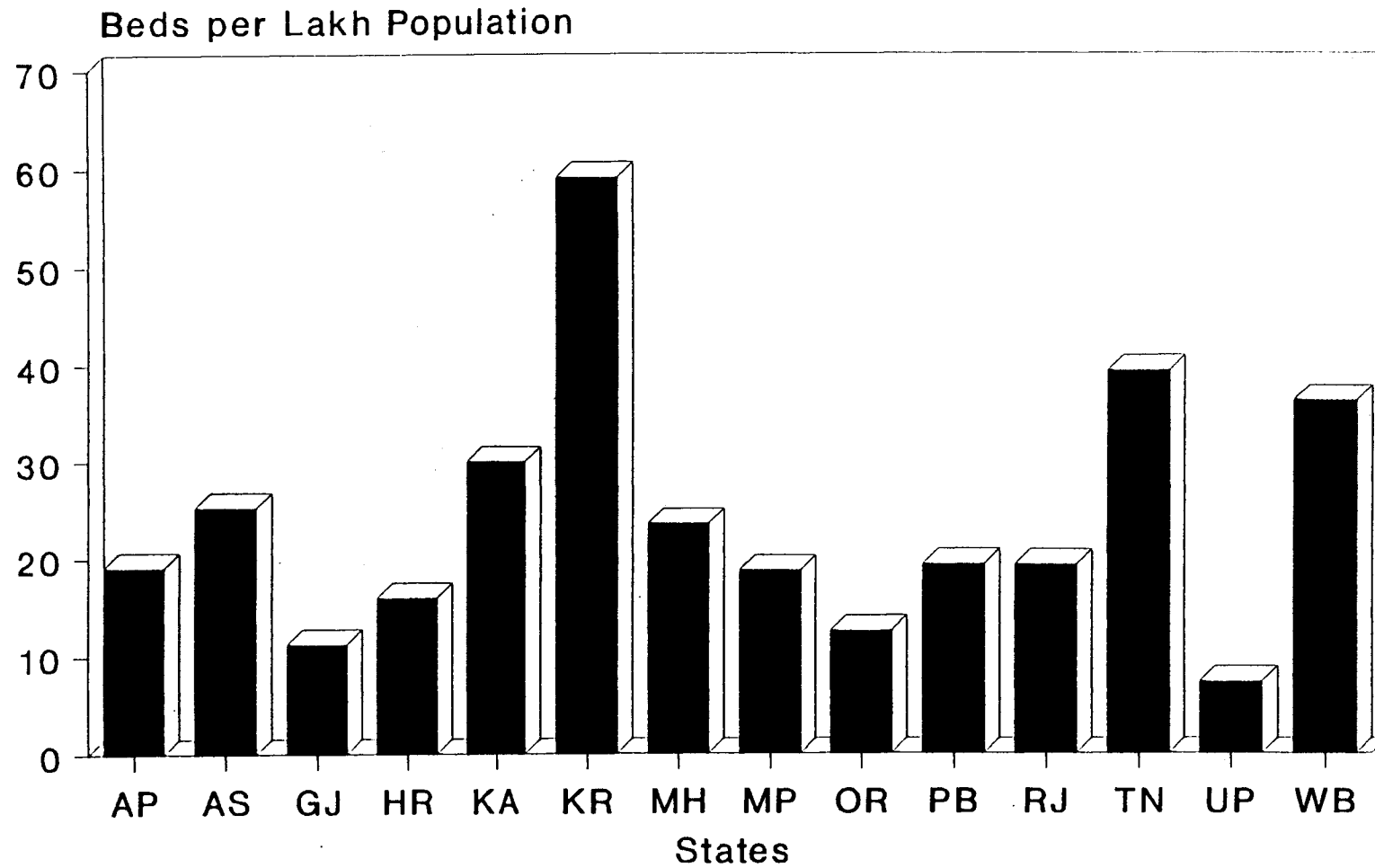
nurse per lakh of population. In absolute numbers, doctors as also nurses are concentrated in West Bengal, accounting for more than one fifth of each in all India.

Bed Utilisation

2.21   A few indicators of efficiency of utilisation of beds in different states/Union Territories are presented in Table 2.6. Assam, Gujarat, Andhra Pradesh, Karnataka, Chandigarh and Uttar Pradesh are observed to report an extremely low in-patient turnover, being less than 40 per bed. On the other extreme, Madhya Pradesh(97), Maharashtra (80), Tamil Nadu(78) and West Bengal(73) reported a fairly high turnover(Figure 2.3).

2.22   One of the reasons associated with the low turnover of in-patients in the set of states mentioned above appears to be the inordinately long stay, the average hovering around 9 to 10, (except Uttar Pradesh where the ALS is 7) compared to the ALS between 4 and 5 for the set of States with high turnover. Several issues remain unanswered though, because of non-availability of information relating to other variables. For example, the study being limited to the secondary and tertiary government, Government Hospitals, the absorptive capacity of the smaller government hospitals, the private clinics/hospitals or the voluntary and charitable hospitals is unknown. The low values of BDU per bed as obtaining in respect of Uttar Pradesh, Gujarat, Goa, Punjab and Rajasthan indeed signal for a close examination of the reasons for under utilisation of the bed capacity of secondary and tertiary hospitals.

2.23   The bed occupancy rate for different States/Union Territories display a wide range from 74 in case of Uttar Pradesh to 115 in respect of Madhya Pradesh, indicating under utilisation in Uttar Pradesh and Goa to crisis situation in Madhya Pradesh, Tamil Nadu and Chandigarh. The lack of supply of private beds in Madhya Pradesh (99.5 per cent of beds in Madhya Pradesh are in Government hospitals) and relatively small number of beds in the non government sector in Tamil Nadu (only 20 per cent of beds in private sector) could be the reason for high utilisation in these states[18]. As indicated in the introduction, the BOR is a summary measure of hospital utilization but it has to be used in conjunction with the PTR

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[18]   Table 14, Appendix II gives information about the availability of beds in the Government and non government sectors.

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Figure 2.3
In Patients per Bed by States.
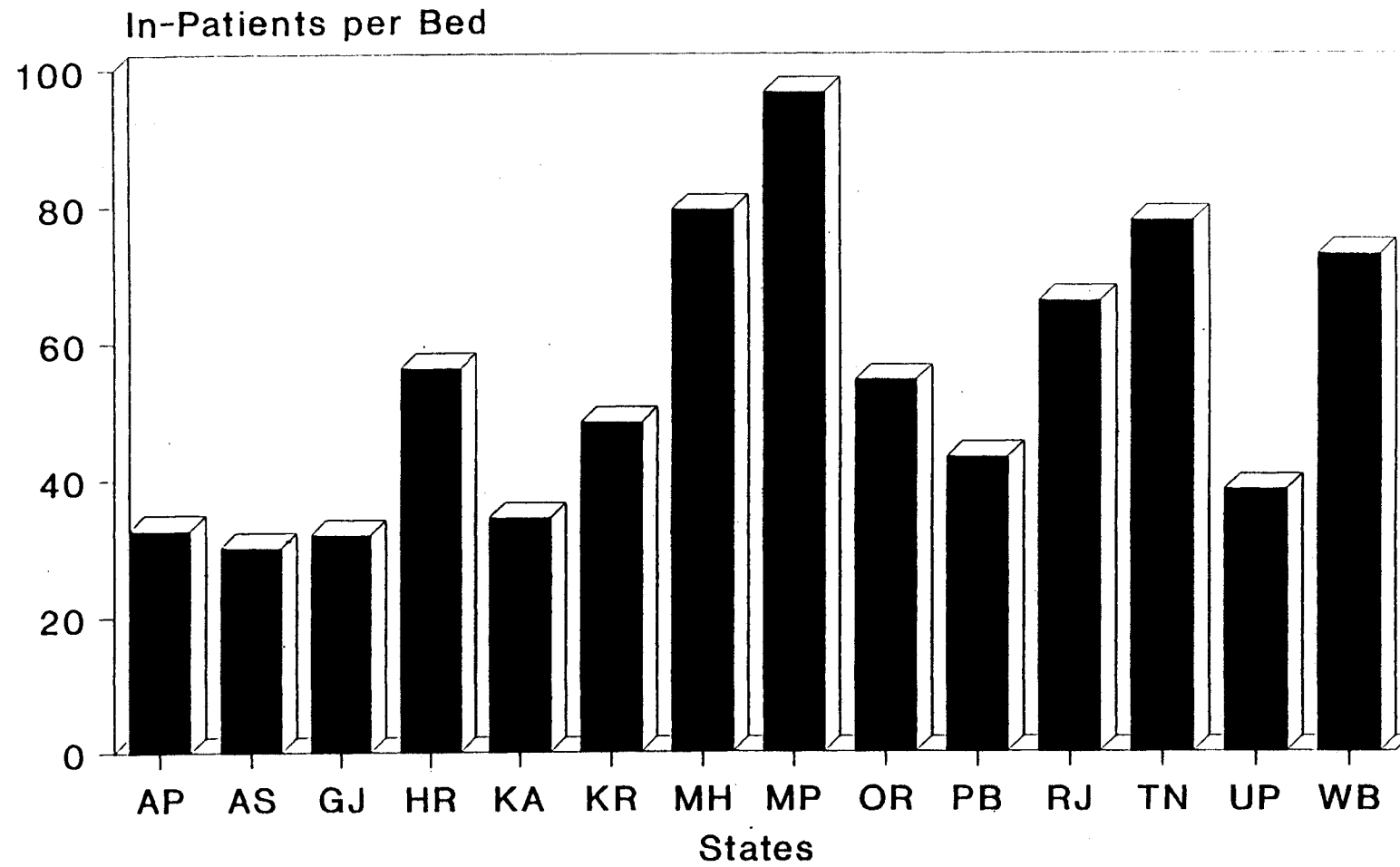
and ALS. Pabon Lasso[19] has suggested a graphical technique to assess the relative efficiency of hospitals. Using the technique, the PTR and BOR observed in different States are shown in Figure 2.4 using two letter abbreviation for the States/Union Territories which are self-explanatory. The four quadrants in the graph created by the national average PTR and BOR separate out States/Union Territories into four distinct groups. The States of Madhya Pradesh, Tamil Nadu, Maharashtra and Pondichery in quadrant I (North East) reveal high efficiency with high BOR and PTR, ALS being around the national average level. The cluster of eight states shown in the third quadrant (South West) exhibit inefficiency in the use of hospitals with low BOR and PTR. This suggests under utilisation of existing hospital beds and there may be even excess capacity relative to demand. Rajasthan and West Bengal fall in the second quadrant (North West) with an above average patient turnover, and below average BOR. This quadrant indicates any one or all of the following characteristics: excessive hospitalisation for patient observation, preponderance of less serious cases and possible excess capacity in relation to demand. Contrary is the situation where a high BOR is reached (4th quadrant, South East) with a low turnover in respect of Karnataka, Andhra Pradesh and Chandigarh. The explanatory factors for the distinctive behaviour of States of the fourth quadrant are: preponderance of very severe cases, or/and keeping patients unnecessarily for long duration in the hospital.

2.24   In as much as the BOR is not invariant of the ALS, the former can be standardized with respect to the latter, by using the all India ALS of 5.68. This gives us a counter factual scenario when all hospitals have similar admission and discharge policies so that the ALS remains more or less the same. This method will give us another relative ranking of states in terms of utilisation which can be compared with the results of graphical method used above. The standardized BOR (Table 2.6) gives a somewhat different story. West Bengal and Rajasthan according to the standardized BOR are revealed to be in a crisis situation whereas Karnataka, Andhra Pradesh and Chandigarh are seen to be under utilised, owing to very high ALS - the health administration of the latter three States might consider steps to reduce ALS

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[19]   Pabon Lasso, H. (1986), " Evaluating Hospital Performance through Application of Several Indicators", Bulletin of Pan-American Health Organisation, Vol 20 No. 4 pp 341-57.
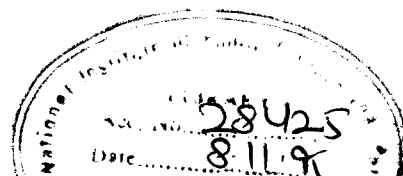
Figure 2.4
Indicator of Efficiency for
Public Hospitals in India
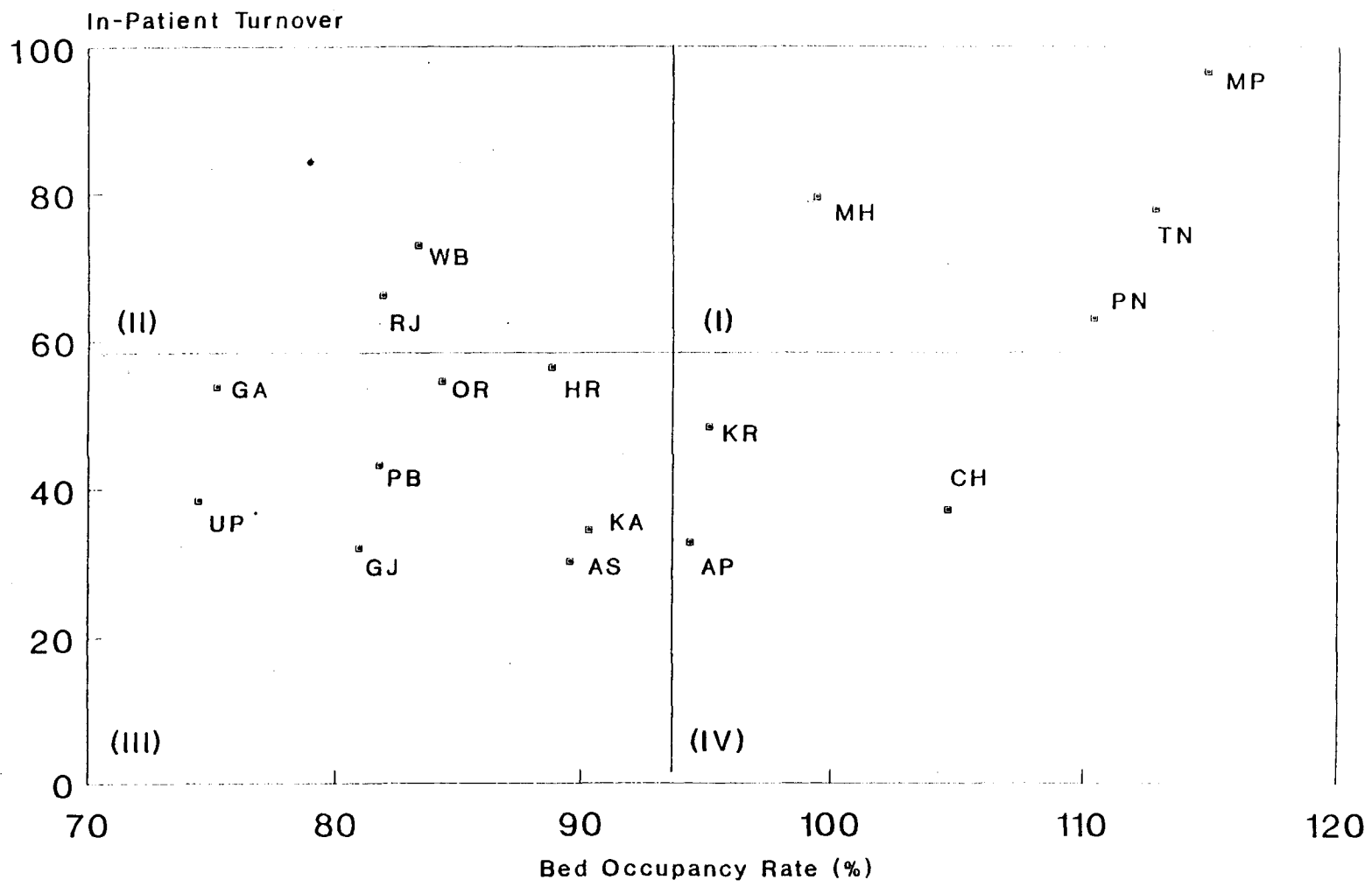
Table 2.6: Bed Utilisation by States, 1992-93

States	Number of sample Hospitals surveyed	In-Patients per bed	ALS	BDU per bed	BOR	BOR (Standardized*)
1	2	3	4	5	6	7
Andhra Pradesh	7	33	10.51	344	94.34	50.99
Assam	4	30	10.82	327	89.52	46.98
Gujarat	4	32	9.22	295	80.93	49.88
Haryana	3	56	5.75	324	88.79	87.72
Karnataka	6	34	9.57	330	90.29	53.58
Kerala	11	48	7.18	347	95.11	75.26
Maharashtra	8	80	4.56	363	99.40	123.77
Madhya Pradesh	9	97	4.34	419	114.81	150.26
Orissa	2	55	5.65	308	84.33	84.82
Punjab	2	43	6.91	298	81.76	67.19
Rajasthan	6	66	4.52	299	81.89	102.90
Tamil Nadu	11	78	5.29	412	112.81	121.22
Uttar Pradesh	8	38	7.07	272	74.41	59.75
West Bengal	10	73	4.17	304	83.35	113.47
Chandigarh	1	37	10.28	382	104.60	57.77
Goa	1	54	5.10	274	75.15	83.70
Pondichery	1	63	6.39	403	110.37	98.16
All India	94	60	5.68	343	94.02	94.02

Note : Col 7 = Col 6 x 5.68/Col 4

by stepping up improved administrative measures i.e., speeding up the diagnostic tests, allocation of resources towards proper maintenance of equipments and to examine whether improper sequencing of surgery and diagnostic testes, and permitting hospital physicians to do private practice are leading to excessive length of stay.

23

2.25   At all India level the survey shows 10 doctors and 20 nurses per 100 beds, there being 48 doctors per 100 nurses. Even as these ratios depict some bias towards deployment of more than proportionate doctors relative to nurses, the stratum differentials in the availability of manpower are interesting. Table 2.7 presents a few selected ratios in this context by size of hospitals.

Table 2.7: Selected Ratios on availability of Doctors and Nurses: All India, 1992-93

Size of hospital	Average number of beds	Per hospital		Per Bed		Doctors per nurse
		Doctors	Nurses	Doctors	Nurses	
100-399	179	19	32	0.10	0.18	0.59
400-999	594	47	144	0.08	0.24	0.33
1000 & above	1342	155	267	0.12	0.20	0.58
All Hospitals	304	30	62	0.10	0.20	0.48

2.26   A very high availability of doctors and nurses per hospital in tertiary hospitals is justified when seen in the light of average number of beds. In fact, the ratio of doctors per bed or nurses per bed is more meaningful. Though there is not much of variation in these ratios across strata the advantage marginally lies with the tertiary hospitals. Medium sized hospitals have a lower ratio of doctors per bed accompanied by a higher one for nurses per bed relative to the other strata. Compared to this stratum, the small and large hospitals would seem to be in abundance with respect to doctors relative to nurses. In fact, the ratio doctors per nurse is unevenly poised in these two strata against nurses. Whether it could be due to short supply of nurses or over dependence on doctors in the small and large hospitals is not known. In any case, the availability of doctors and nurses in due proportion perhaps, could contribute to effective functioning of the health care system. The survey findings thus have significant implications for health administrators.

Table 2.8 : In-patients and out-patients per Doctor and per nurse by states.

State	In-patient days per Doctor	In-patient days per Nurse	Out-Patients per Doctor	Out-Patients per Nurse
Andhra Pradesh	3485	2315	7958	5286
Assam	2602	2649	3306	3367
Gujarat	4684	1842	14206	5585
Haryana	2610	1661	4812	3062
Karnataka	5758	2766	17058	8194
Kerala	3940	1946	5411	2672
Maharashtra	5415	1123	6604	1369
Madhya Pradesh	4685	2478	7997	4231
Orissa	2745	2015	10982	8063
Punjab	2108	1359	3368	2172
Rajasthan	4102	1773	8198	3543
Tamil Nadu	3501	2010	16126	9256
Uttar Pradesh	2698	2287	4282	3630
West Bengal	2341	1084	4433	2052
Chandigarh	1047	390	2503	933
Goa	1371	851	3407	2115
Pondichery	-	-	-	-
All India	3479	1682	8144	3939

2.27   The differentials in the availability of doctors and nurses across the States/Union Territories could be examined with respect to the load per doctor or per nurse. In-patient days per doctor and out-patients per doctor and per nurse are presented in Table 2.8. It will be observed that in the States of Karnataka, Maharashtra, Madhya Pradesh and Gujarat, a doctor has an annual load of more than 4500 in-patient days. The States and Union Territories of Chandigarh, Goa, West Bengal distinguish themselves in having minimal load of less than 2500 in-patient days(Figure 2.5 & 2.6).

2.28   The load of out-patients per doctor has a much more grim story to tell. The doctors in Karnataka, Tamil Nadu, and Gujarat have a load of more than 14,000 outpatients (per

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Figure 2.5
In Patient Days Per Doctor

In Patients per Doctor (Thousands)
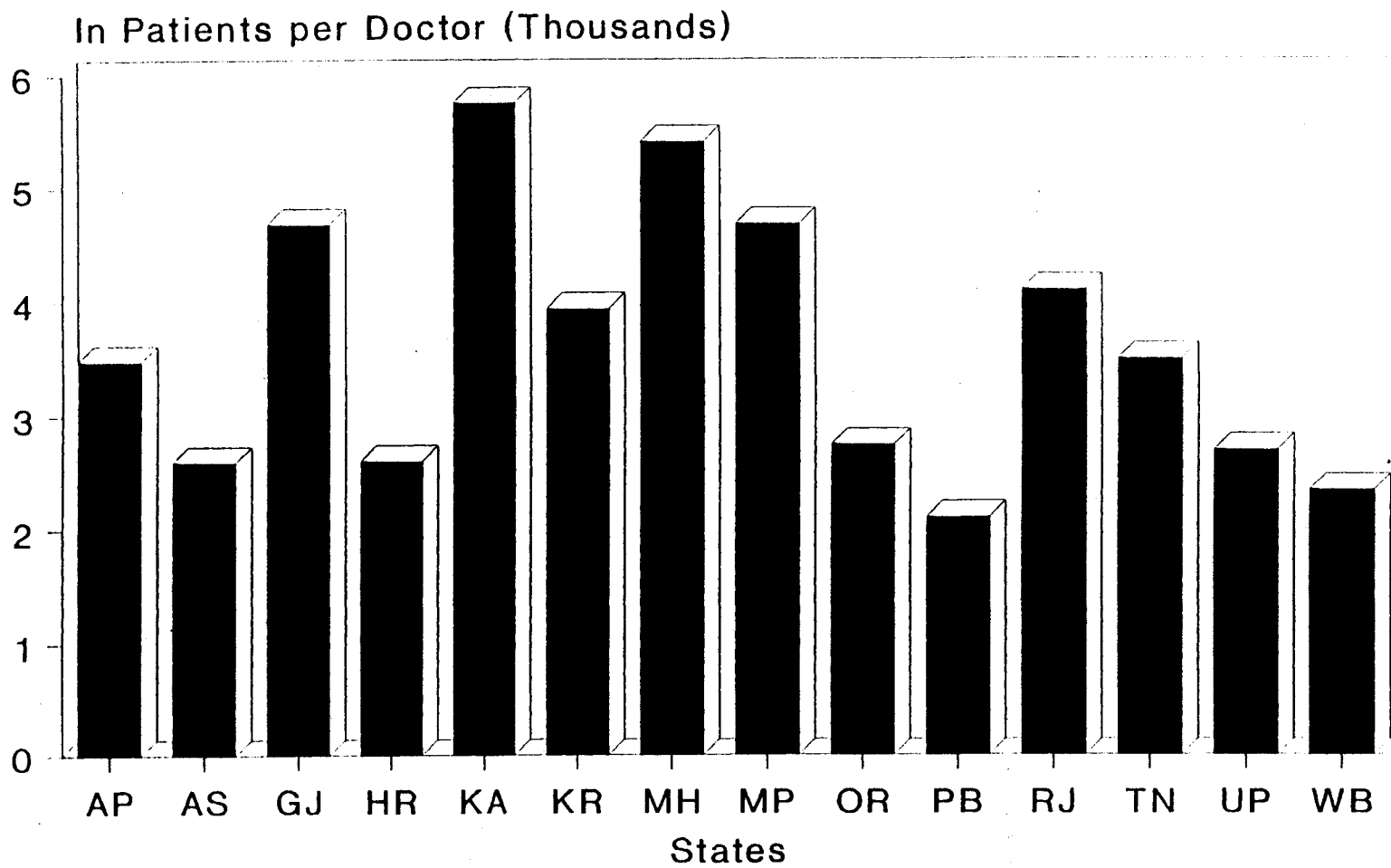
States

Figure 2.6
In Patient Days per Nurse
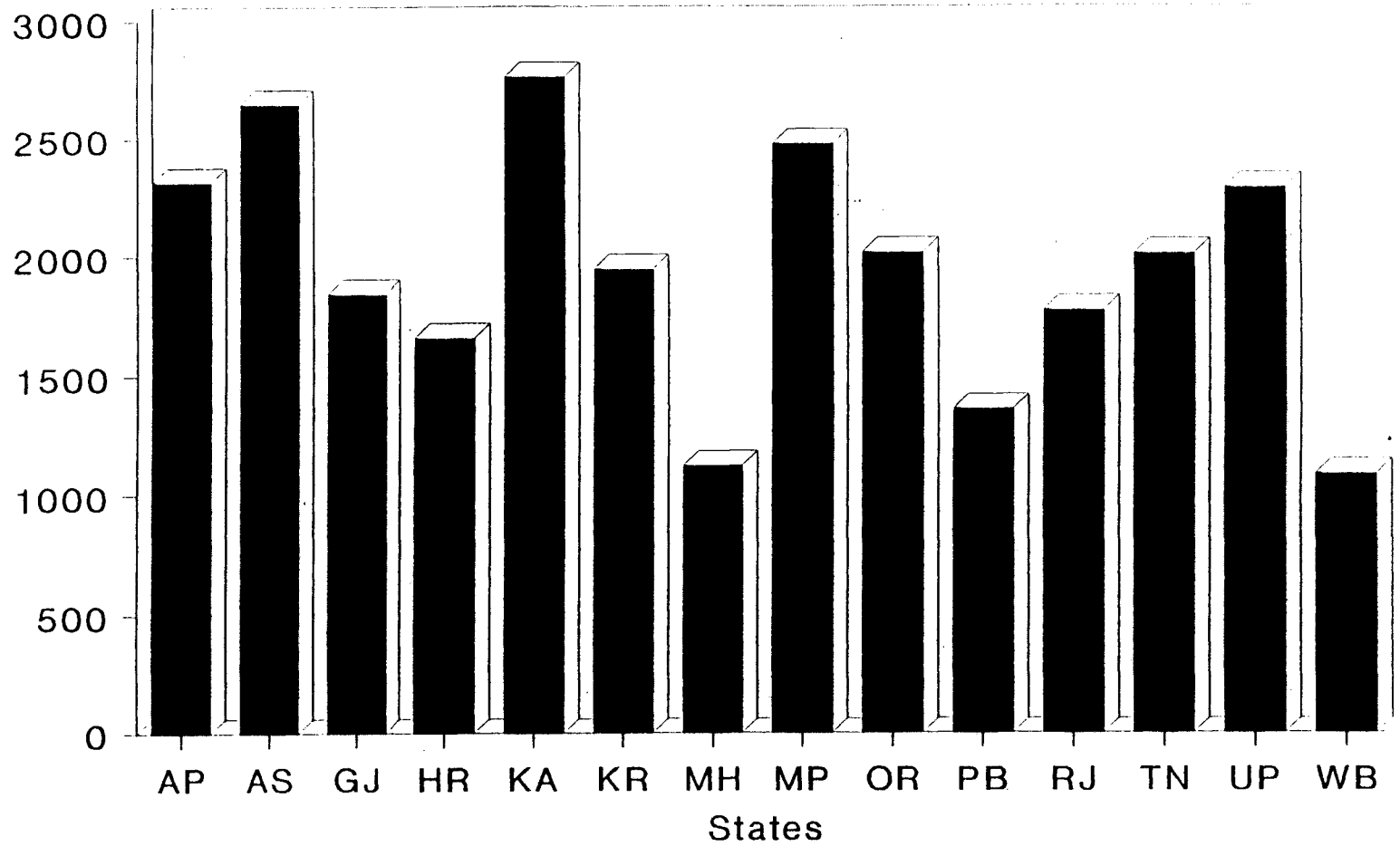
States

doctor) or 47 outpatients per working day. The States/Union Territories of Chandigarh, Goa, Punjab, Uttar Pradesh and West Bengal on the other extreme have only to attend to from 2500 to 4500 outpatients per doctor. Leaving aside the Union Territories of Chandigarh and Goa, the variation in in-patient days per nurse across the States is not as pronounced as in case of doctors, the range being from 1084 in West Bengal to 2766 in Karnataka. The same is however, not depicted for outpatients per nurse, the ratio varying widely from 1369 in case of Maharashtra to 8194 in respect of Karnataka.

2.29   A different indicator of availability of doctors and nurses per bed is used in Table 2.9 to bring out the inter-state differentials. The loads per doctor and per nurse are corroborated by the availability indicators per 1000 beds (see Figures 2.7 & 2.8), bringing out again, Karnataka(57),Gujarat (63) Maharashtra (67) as having poor supply of doctors. Punjab, West Bengal, Assam and Haryana are the four States having a relatively higher ratio of doctors per 1000 beds.

2.30   There are considerable differentials in the doctor-nurse ratio among the States/Union Territories. Doctors would appear to be disproportionately more in Assam (102%), Uttar Pradesh (85%), Orissa (73%), Andhra Pradesh (66%) and Haryana (64%). On the other extreme Maharashtra has the poorest supply of doctors (21%) in relation to nurses.

Case Mix

2.31   The clinical and non-clinical records of the out-patients and in-patients maintained by the sample hospitals and summarized by the Medical Records sections of the hospitals were used to determine the case mix in secondary and tertiary hospitals, though it was not stipulated to be one of the main objectives of the study. The disease categories as laid down in the questionnaire conformed to the broad classification system adopted by the International Classification of Diseases (WHO). Tables 6 and 7 of Appendix II give respectively the percentage distributions of out-patients and in-patients by size of hospital.

2.32   While the non-clinical part of the medical records are somewhat reliable, the quality of the clinical details is known to suffer from lack of adequate information, incompleteness

Table 2.9: Availability of Doctors and Nurses per thousand beds by States

State	Doctors	Nurses	Doctor/Nurse (%)
Andhra Pradesh	99	149	66.42
Assam	126	123	101.82
Gujarat	63	160	39.32
Haryana	124	195	63.64
Karnataka	57	119	48.04
Kerala	88	178	49.39
Maharashtra	67	323	20.73
Madhya Pradesh	89	169	52.91
Orissa	112	153	73.42
Punjab	142	220	64.48
Rajasthan	73	169	43.21
Tamil Nadu	118	205	57.40
Uttar Pradesh	101	119	84.78
West Bengal	130	281	46.30
Chandigarh	365	978	37.28
Goa	200	322	62.07
Pondichery	-	-	-
All India	99	204	48.37

Notes: "-" Data Not available

and inaccuracies since the attending physician who is primarily responsible for the details is not fulfilling this responsibility[20]. That the attending physicians have little time to note down the diagnoses of the ailments of the outpatients is evidenced by a high proportion (54% to 61%) of diseases classified as 'miscellaneous' in all sizes of hospitals (see Table 6, Appendix II). Such a high proportion of outpatients could not be taken as presenting a complex syndrome and hence not classifiable[21].

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[20] Marker, F.E. : Hospital records in India, in Social Statistics : Health & Education, Eds. Bose et al, Vikas Publishing House Pvt. Ltd., 1982.

[21] In one of the visits to the sample hospitals, this was the explanation forwarded for an inflated proportion of 'miscellaneous' cases.

2.33   It is expected nevertheless that the notes entered by the resident physician or the intern would be more complete and adequate for the in-patients as compared to the outpatients. Table 7 of Appendix II however, shows a decline in the proportion of miscellaneous cases in respect of 100 - 399 bed hospitals and 400 - 999 bed hospitals. For the tertiary hospitals, the proportion is seen to even increase from 61% to 66%, reflecting on the quality of morbidity data in the tertiary hospitals in particular. While the obvious explanation is that the physicians in the tertiary hospitals do not give proper attention to the usefulness of the medical records, the other possible explanation could be that a wider variety of diseases not covered in the classification are reported in tertiary hospitals relative to secondary ones.

2.34   Assuming the latter explanation and taking the information on disease categories for in-patients to be reliable, the results reveal the proportions of respiratory, gastro-intestinal, haematological & nutritional and infectious diseases among the morbid population (coming to secondary and tertiary hospitals) go down with the size of the hospital. In other words, the above four broad types of diseases do not figure as important ones for the tertiary hospitals.

Inter - State Differentials

2.35   Tables 8 and 9 of Appendix II giving the results of morbidity for outpatients and in-patients in respect of States (all sizes taken together) show the proportion of miscellaneous cases to be much less for in-patients. Restricting this analysis to the in-patients (Table 9, Appendix II), it is observed that very low values of this proportion (< 15%) are reported for Madhya Pradesh, Gujarat, Orissa and Rajasthan, giving some credence to the quality of clinical details of in-patients in these States. On the other extreme, Kerala, Punjab and Pondichery identify themselves as not so particular about the diagnostic reports of the in-patients, as judged from 40% or more of the proportion of miscellaneous cases.

2.36   Among the States for which the 'miscellaneous cases' do not occur significantly, infectious diseases accounted for 37% and respiratory diseases 19% in Gujarat (Table 9, Appendix II); in Madhya Pradesh 34% of the diseases reported happened to be infectious and 23% respiratory; in Rajasthan too 28% of the cases were respiratory and in Orissa, surprisingly, the renal disease was reported to account for 34%.

Figure 2.7
Doctors per Thousand Beds
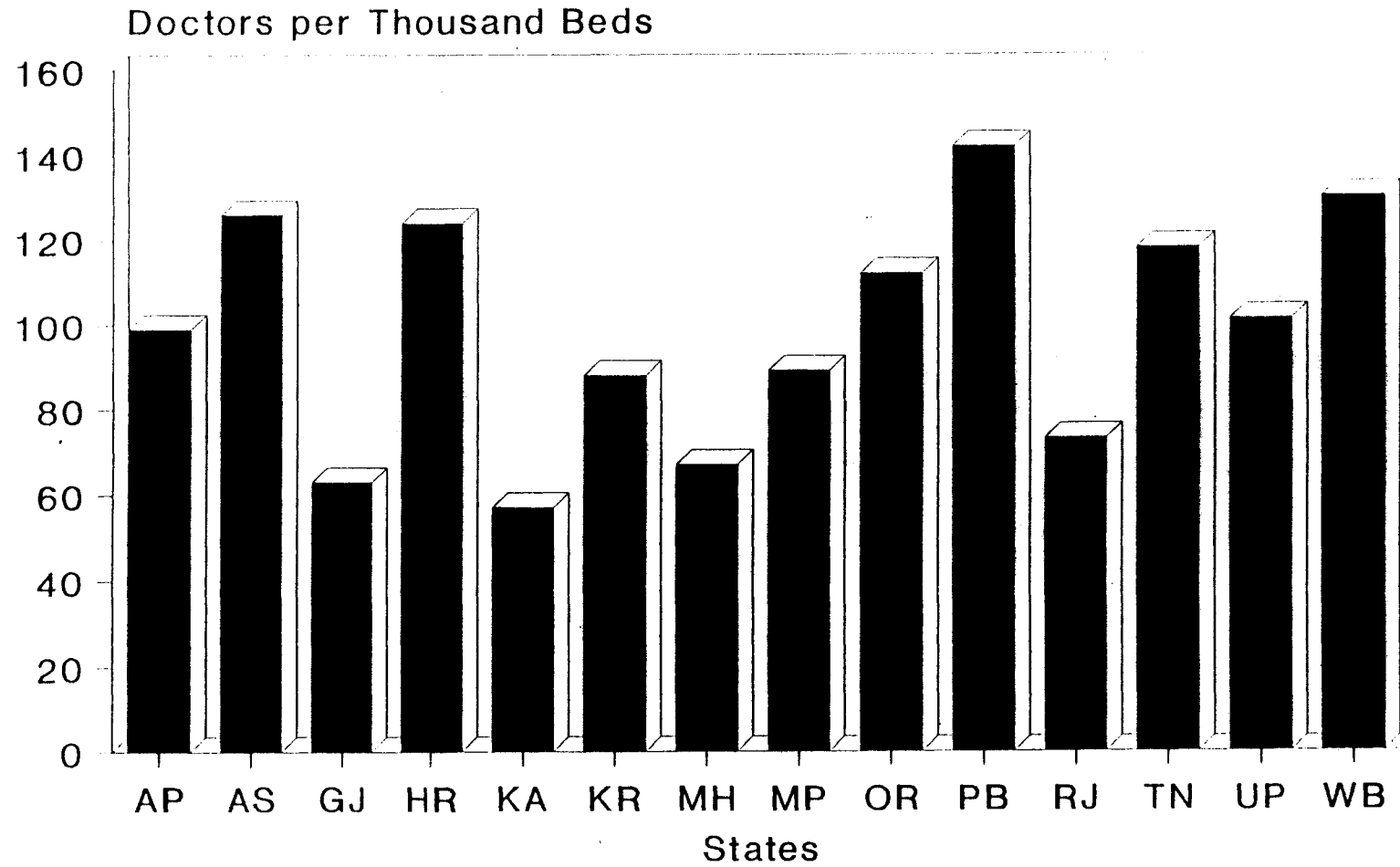
Figure 2.8
Nurses per Thousand Beds

Nurses per Thousand Beds
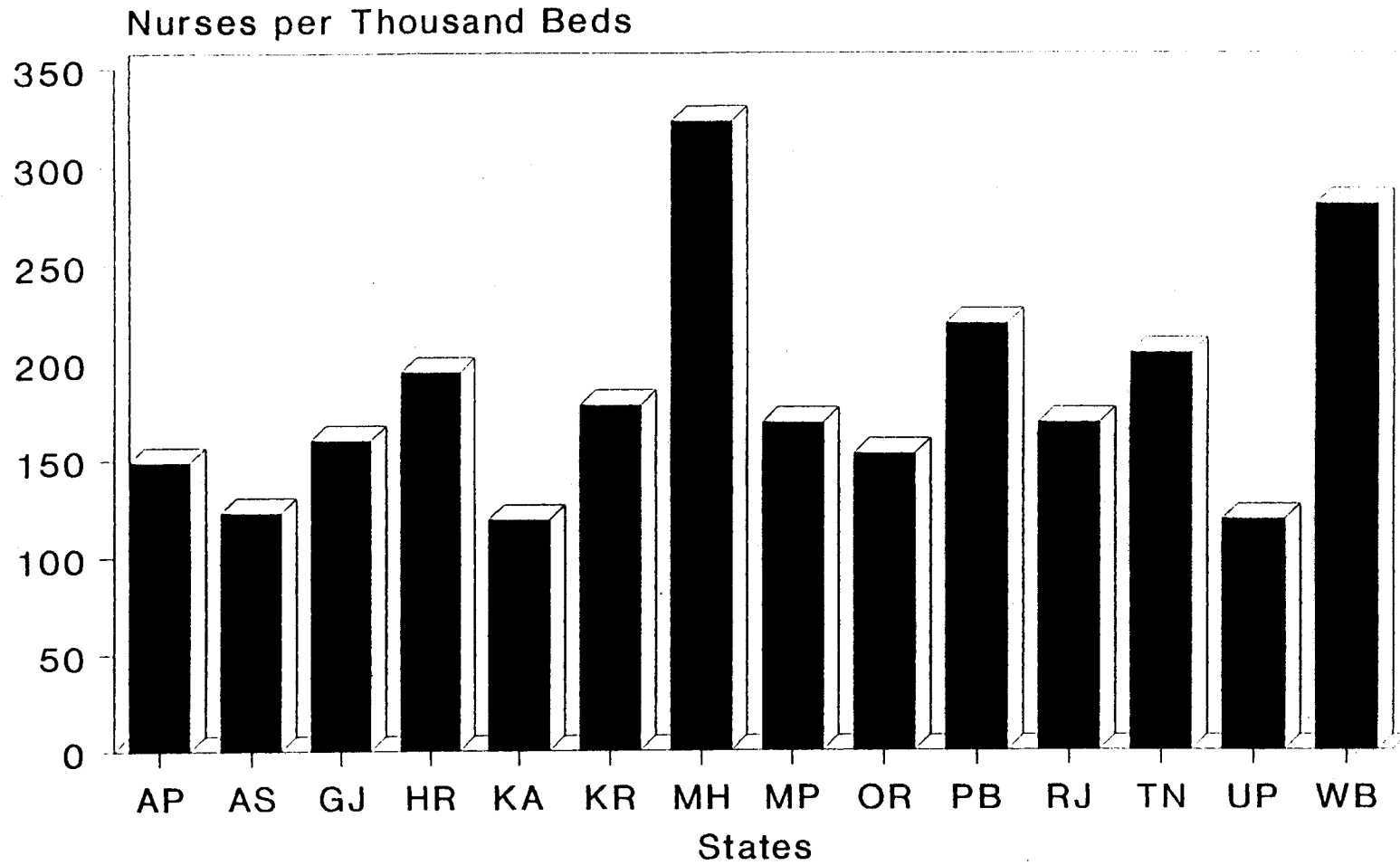
Chapter 3

Life support and Diagnostic Facilities and Utilisation

3.1   The earlier discussion was limited to efficiency of utilisation of beds in the secondary and tertiary hospitals. Health care extended to the ailing population however, depends on the various types of facilities available as much perhaps as the availability of technically skilled manpower. The survey therefore, sought to bring out the availability and utilisation of life support facilities in the hospitals surveyed. The facilities covered were the number of Intensive Care Unit (ICU) beds and Operation Theatres, the various equipments used for diagnostics (X'Ray, Cat Scan, ECG and Ultrasound) and their output; clinical tests performed in different departments (Bio-chemistry, Micro-biology and Pathology) with a view to assessing some quality specific attributes and productivity of the hospitals. The findings of the survey are presented in this chapter by size of hospital and by States.

Life Support Beds

3.2   55.5% of the totality of ICU beds are concentrated in the small hospitals, the medium sized hospitals accounting for 31.6% and the large 12.9%. The ICU beds constitute only 1.42% of the total number of beds at all India level, the proportion surprisingly seen to decrease over the size of the hospital (from 1.72% in small hospitals to 0.89% in large ones, Table 3.1). Ideally, one expects a higher proportion of ICU beds in larger hospitals with tertiary care. Not surprisingly, the efficiency of ICU bed utilisation, as depicted by the BOR increases with the size of the hospital, the BOR increasing from 46 in case of small hospitals to 71 for large ones. A possible reason for this feature could be the higher concentration of ICU beds in smaller hospitals where they are utilised the least relative to lower concentration in tertiary hospitals where they are needed most. The large hospitals utilise the ICU beds in a much more efficient way than the smaller hospitals also due to higher expenditure per bed (as we shall see later), better maintenance of the equipments and adequate staff. The latter two surmises reflecting on the quality of the services are examined separately in a later section.

Table 3.1: Utilisation of life support (ICU) beds by size of hospitals

Size of hospital (no. of beds)	Percentage of number of ICU beds	Proportion of ICU beds (%) to total no. of beds	BOR
100 - 399	55.51	1.72	46.54
400 - 999	31.60	1.34	53.08
1000 & above	12.89	0.89	70.71
All	100.00	1.42	51.72

Inter - State Differentials

3.3   The geographical dispersal of ICU beds (Table 3.2) shows Tamil Nadu, Rajasthan, Uttar Pradesh, Karnataka, Andhra Pradesh and Maharashtra to be the six top States in order with more than 10 per cent each, together accounting for 84% of ICU beds. However, when the proportion of ICU beds to total number of beds in a State is considered, the order among the major states changes, Rajasthan leading with 4.31%, followed by Uttar Pradesh (3.18%) Andhra Pradesh (2.24%), Karnataka(2.14%), Tamil Nadu(1.93) and Maharashtra (1.32%).

3.4   Because of the information being not available on the ICU bed days utilised, the BOR could not be calculated in respect of Haryana, Karnataka, Punjab, West Bengal and Pondichery. Among the remaining States/Union Territories, it appears that their utilisation is inversely related to the proportion of ICU beds. Kerala, Maharashtra and Madhya Pradesh reporting below national average proportion are seen to display efficient utilisation of ICU beds with BOR above 80%. Gujarat with a proportion of 1.48% and the highest BOR of 122 appears to be reporting a crisis situation in respect of ICU beds. There is gross underutilisation of ICU beds in the States of Uttar Pradesh, Andhra Pradesh and Assam and the Union Territory of Goa. Rajasthan with the highest proportion of ICU beds is not competently utilising those beds.

3.5   Overall, it appears that the ICU beds are not properly utilised in a number of States, particularly those with relatively higher proportion due to excessive allocation to smaller

hospitals and inadequate maintenance. This situation indicates considerable scope for reallocation of ICU beds to larger hospitals and withdrawal of some of them as a cost saving measure.

Table 3.2: Utilisation of life support (ICU) beds by States

States	Percentage of number of ICU beds	Proportion of ICU beds (%) to total no. of beds	BOR
Andhra Pradesh	12.39	2.24	23.00
Assam	1.00	0.41	26.67
Gujarat	2.97	1.48	122.22
Haryana	0.33	0.29	NA
Karnataka	12.47	2.14	NA
Kerala	2.89	0.39	85.15
Maharashtra	10.74	1.32	92.07
Madhya Pradesh	3.26	0.60	80.91
Orissa	1.65	0.97	70.00
Punjab	NA	NA	NA
Rajasthan	16.07	4.31	70.86
Tamil Nadu	18.13	1.93	88.53
Uttar Pradesh	14.17	3.18	3.13
West Bengal	1.49	0.14	NA
Chandigarh	1.24	3.41	73.06
Goa ₄	0.08	1.11	35.21
Pondichery	1.12	4.24	NA
All India	100.00	1.42	51.72

Utilisation of Operation Theatres

3.6   The utilisation pattern of the operation theatres in the secondary and tertiary hospitals can be observed from Table 3.3 presenting number of procedures per 100 in-patients for five important departments by size of hospitals. The data on in-patients were not given for Neurology Department.

3.7   Considering all types of hospitals (secondary and tertiary), the Eye department reported the highest average number of procedures that is, 87 per 100 in-patients compared to 28 in Obstetric Department. However, some interesting findings emerge from Table 3.3. A declining trend of the average number of procedures over the size of hospitals is observed for Surgical, Eye and Obstetric Department while an increasing one for ENT and Orthopaedic Departments, in both cases, the increase was quite sharp for the tertiary hospitals. It appears that the Orthopaedic Department in tertiary hospitals is the most sought after department from the point of view of number of operative procedures per in-patient (3.57). A majority (over 83%) of these Orthopaedic procedures were minor ones (computed from Table 4, Appendix II).

3.8   The distinction between a major or minor operation was left to the hospital authorities (respective wards). Since this analysis attempts a retabulation of medical records as maintained by the hospitals, no standard norm could be prescribed (if it were possible) for delineating the major and minor operations. It would appear that the attribute (major or minor) is hospital specific because it is possible that certain procedures which are considered major in smaller hospitals are taken to be minor ones in large hospitals because of the availability of superior personnel expertise and/or superior equipment with the latter, most of which have teaching or research facilities.

Table 3.3: Utilisation of Operation Theatres by size of hospital -
number of cases handled per 100 in-patients by
departments.

Size of hospital (no. of beds)	Surgical	ENT	Eye	Obstetric	Orthopaedic	Major/Minor
100-399	67	49	138	31	32	0.49
400-999	55	71	75	27	44	0.74
1000 & above	47	130	49	19	357	0.65
All hospitals	59	72	87	28	51	0.60

3.9   Three major operations were taking place for every five minor ones in secondary and tertiary hospitals taken together indicating the importance of this segment of hospital care. The ratio of major cases to minor cases is seen to be maximum for hospitals having 400-999

beds, underlining the overriding importance of the medium sized hospitals in the Government sector.

Major and Minor Operations Vs. Size of hospital

3.10 The proportion of major cases handled in a particular ward of a hospital is an indicator of the inflow of complex or acute cases and thereby the importance of the hospital. A value of this proportion more than 0.5 assigns a special status to the ward/hospital. An analysis of this proportion for different wards across the size of the hospital would make an interesting study.

3.11 A very high value of 79% for Neurology (Table 3.4) is indicative of the fact that Neurology is a super speciality of the tertiary hospitals, one which is not obtaining in the secondary hospitals. Going by the values of the proportion of major cases, the ENT and Eye departments establish themselves as attending to acute cases proportionately more than the minor cases in all the secondary and tertiary hospitals. Using the same yardstick, the medium sized (400-999 beds) and the large sized (1000 & above) hospitals, reporting more than 50% of major cases in respect of Obstetrics and Gynaecology prove to be indispensable for acute or complex cases.

Table 3.4: Percentage of major cases handled to total cases by departments and by size of hospital

Department	Size of hospital (no. of beds)		
	100 - 399	400 - 999	1000 & above
Surgical	31.8	43.2	34.4
ENT	51.6	60.2	55.8
Eye	62.4	51.6	68.8
Neurology	-	-	79.3
Obstetrics & Gynaecology	45.9	65.5	53.3
Orthopaedics	23.2	36.2	16.9
All Departments	32.9	42.5	39.0

3.12   The utility of medium sized hospitals is evidenced by the peak value of the proportion of major cases for the Surgical, ENT, Obstetrics & Gynaecology and Orthopaedics which would mean that relatively the large hospitals attend to a larger proportion of minor cases in these wards.   In other words, either the large hospitals do not have the same speciality (for these four wards) as the medium sized ones or the latter are able to meet up the demand substantially, reducing the referrals to a minimum.

3.13   The percentage distribution of major cases (Table 4, Appendix II) by the departments shows Surgery, Obstetrics and Eye to account for the bulk of major cases irrespective of the size of the hospital. It is surprising to find that even amongst the minor cases the tertiary hospitals show the highest proportion for Surgery and Orthopaedics.

3.14   The relative utilisation pattern of the three size categories could again, be examined by looking at the prevalence rate of major and minor cases of operation per 100 in-patients. In respect of the major cases, the medium-sized hospitals have the highest load in respect of Surgery, Eye and Obstetrics and Gynaecology, whereas for Dental, ENT and Orthopaedics, the prevalence increases with the size of the hospitals.   Thus even though the proportion of major cases is less in the tertiary hospitals in respect of ENT and Orthopaedics, the comparative load of acute cases of in-patients is more than the medium sized hospitals.

3.15   When the prevalence of minor cases is considered, a decrease over the size of the hospitals is noticed only for Surgical and Obstetrics.   While this should be the expected situation, the increase in number of minor cases of ENT and Orthopaedic with the size of the hospital is surprising.

Pattern of Utilisation of Operation Theatres in States

3.16   The statistic (major cases/minor cases) is not expected to vary across states if we assume that the distribution of events leading to the use of operation theatre is uniform and has no geographical barriers. The observed variation in the value of this ratio ranging from 16% in Karnataka to 174% in Chandigarh (Table 5 of Appendix II) is too wide to carry conviction. As mentioned earlier, the sample size in general, for the States is too low and as

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such high sampling error may be associated with this statistic. Another possible reason could be the inter-state movement of the acute cases for better treatment.

3.17 The differences in the utilisation pattern of the operation theatre by different departments are brought out for the States in Table 5, Appendix II. The salient features are:

i) The Surgical department accounts for 37% of all procedures, major or minor, followed by Obstetrics & Gynaecology (21%) at all India level. Except for Punjab, Tamil Nadu, Chandigarh, Goa and Karnataka the bulk of the procedures is claimed by the surgical department.

ii) The operation theatre finds its maximum use in the Obstetrics department in Tamil Nadu and Goa and in Dental department in Punjab and Karnataka. The Eye department makes the most of the operation theatre in Chandigarh.

iii) The proportion of procedures claimed by the Orthopaedic department is next only to the Surgical department in only two States - West Bengal and Haryana.

3.18 The ratio of number of operation procedures per 100 in-patients is used in Table 3.5 as a measure of the load on the particular department concerned with the operation theatre and may include out-patients too. We get a curious mix of the cases, the load varying among the departments and across the States. The Eye department surpasses other departments in respect of this ratio in Andhra Pradesh, Maharashtra, Punjab, Tamil Nadu and Chandigarh; the Surgical in Assam, Karnataka, Kerala, Rajasthan, Uttar Pradesh; the Orthopaedics in Haryana and West Bengal; the ENT in Orissa.

Diagnostic Facilities

3.19 The survey sought information on the diagnostic facilities available in the sample hospitals and the output, measured by the number of cases in respect of each of the facilities - X'Ray, ECG, Cat Scan and Ultra Sound. However, because of very low sample size for Cat Scan the results are not presented. While the labour productivity of each of these facilities

could be computed, the information collected on days remaining unutilised due to breakdown of the equipment could be used to compute percentage days in breakdown or maintenance. Besides these measures, the intensity of use of the equipments could be assesed by the ratio output per patient. Tables 3.6 - 3.8 present these findings.

Table 3.5: Number of Operation Procedures per 100 in-patients by Departments by States

States	Surgical	E N T	Eye	Obstetrics	Orthopaedics
Andhra Pradesh	125	111	302	30	34
Assam	87	70	57	76	44
Gujarat	15	64	15	15	6
Haryana	99	103	231	22	510
Karnataka	32	9	29	5	9
Kerala	79	69	54	50	20
Madhya Pradesh	23	80	30	14	22
Maharashtra	126	137	197	32	98
Orissa	158	289	161	14	129
Punjab	241	320	650	131	296
Rajasthan	148	52	36	83	86
Tamil Nadu	29	82	153	48	37
Uttar Pradesh	183	47	106	21	113
West Bengal	52	69	82	15	185
Goa	42	-	-	300	-
Pondichery	-	-	-	-	-
Chandigarh	137	364	452	-	76
All India	59	72	87	28	51
Notes : " - " Data not available.					

Table 3.6: Output per patient (or the intensity of use) and output per employee (productivity) for the various types of facility

	X' ray	ECG	Ultra Sound
1. Intensity			
i) Output per in-patient	1.00	0.23	0.11
ii) Output per out-patient	0.05	0.01	0.01
2. Productivity			
Output per employee	1752	1764	543

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3.20 The summarised picture for all India reveals quite high ratios of use of the radiological equipments, in particular, of the ECG and Ultrasound for the in-patients. The ECG and Ultrasound again, are used for diagnostic purposes for 1% of the outpatients. The respective output per employee could be seen for each of the facilities, though this could be better observed from Table 3.7, given by size of hospital.

Table 3.7: Output per patient and output per employee of all the diagnostics taken together by size of hospital

Size of hospital (no. of beds)	Output per bed	Output per in-patient	Output per out-patient	Output per employee
100 - 399	28	0.40	0.03	1247
400 - 999	34	0.65	0.06	1521
1000 & above	86	2.69	0.18	3533

3.21 All the measures relating to intensity of use indicate progressively better use over the size of the hospitals, the increase in intensity being quite sharp for the tertiary hospitals. This feature holds good for the productivity per employee too. One of the policy implications could be the under utilisation of the sophisticated equipments (ECG, Cat Scan & Ultrasound) in smaller hospitals i.e. the secondary hospitals, the reason being improper maintenance of the machines, as evident from Table 3.8.

Table 3.8: Percentage days of diagnostic equipment in breakdown or maintenance by size of hospital

Size of hospital (no. of beds)	X' Ray	Ultrasound
100 - 399	19.23	41.67
400 - 999	7.14	59.17
1000 & above	3.53	0.00

Note: No information on other equipments was furnished in the questionnaire.

Intensity of use of Diagnostic Departments

3.22 The intensity of use in terms of output per patient is studied by size of the hospital (Table 3.9) for the Departments of Bio-Chemistry, Micro-Biology and Pathology.

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Table 3.9: Output per patient and per bed by size of hospitals

Item	Size of hospital (no. of beds)		
	100 - 399	400 - 999	1000 & above
A. Bio - Chemistry			
1. Output/in-patient	.0.25	1.06	5.02
2. Output/out-patient	0.33	1.08	3.14
3. Output/bed	24.72	68.72	157.87
B. Micro - Biology			
1. Output/in-patient	0.23	0.49	0.68
2. Output/Out-patient	0.02	0.06	0.04
3. Output/bed	25.56	32.78	23.39
C. Pathology			
1. Output/in-patient	2.22	2.02	2.08
2. Output/Out-patient	0.16	0.21	0.13
3. Output/bed	152.28	118.10	64.47

3.23   All the three indicators of intensity of use show a progressively increased dependence on bio-chemical tests. As the size of the hospital increases, the tertiary hospitals significantly report high values compared to the secondary ones. This feature is not discernible in case of both Micro-biology and Pathology department. On the other hand, output per bed for the tertiary hospitals is seen to be much less than the smaller hospitals in the Pathology department, even as a very stable ratio of output/in-patient is obtaining in different sizes of the hospital.

Chapter 4

Expenditure Pattern of Hospitals and Financing

4.1   The main objectives of this chapter are to study the finances of secondary and tertiary hospitals, examine the expenditure pattern and, to see how far financial crunch has affected the utilisation and quality of services in these hospitals. The financing of hospital utilisation pattern has been viewed from two angles: from a global perspective in terms of the level of spending per capita and from a micro perspective at the facility level in terms of spending per bed/in-patient and the nature and composition of spending.   The details of total spending in the sample hospitals culled from the administrative records provided data on the expenditure pattern by size of hospitals and by States.   The total expenditure was comprised of the expenditure on i) salaries and allowances ii) transport including maintenance of vehicles iii) drugs and consumable material iv) maintenance of diagnostic facilities v) machinery vi) maintenance of life support facilities which included operation theatres, ICU etc. vii) food supply to patients and viii) other items.

Total Expenditure in Secondary & Tertiary Hospitals

4.2   The secondary and tertiary hospitals spent during the year 1992-93, an estimated amount of Rs. 852 crores (Table 2, Appendix II), 64% of which was on salaries. The average total expenditure per hospital was Rs. 1.52 crores. Tertiary hospitals were having an average total expenditure of Rs. 8.36 crores, three times as expensive as the medium-sized hospitals and about 10 times that of the small hospitals. The distribution of the number of hospitals was highly uneven; the small hospitals which accounted for 78% of the totality of secondary & tertiary hospitals, spent 43% of the total expenditure whereas the tertiary hospitals constituting less than 5% in number, spent more than 25% of the total expenditure.

4.3   The distribution of estimated number of hospitals by total expenditure class for all strata taken together (Table 4.1) bears out that 74% of the hospitals had an average expenditure below the average (Rs. 1.52 crores)

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Table 4.1 :Percentage distribution of estimated number of hospitals by size of total expenditure and by size of hospital: All India, 1992-93

Size class of total expenditure (Rs. Crores)	Size of hospital (number of beds)			
	100-399	400-999	1000 & above	All Hospitals
below 0.50	30.7	-	-	23.4
0.50 to 0.74	32.6	-	-	25.0
0.75 to 1.49	30.3	12.6	-	25.5
1.50 to 2.49	1.9	31.1	-	7.3
2.50 to 3.49	2.6	36.9	7.7	9.3
3.50 to 4.99	1.9	13.6	26.9	5.3
5.00 & above	-	5.8	65.4	4.2
all sizes	100.0	100.0	100.0	100.0

4.4   The expenditure differentials across different sizes of hospital (strata) are very distinct and they justify the study of expenditure pattern by strata, the combined picture obliterating the differentials. In fact, the manner in which the bulk of small hospitals are at the lower end of the expenditure class, the medium towards the middle and the large ones at the upper end suggest adoption of the total expenditure classes as another measure of the size of the hospital.

Level of Spending in Hospitals

4.5   The total expenditure[22] per in-patient is Rs. 840 for all hospitals, varying between Rs. 624 for small hospitals and Rs. 2087 for the large ones. The cost of health care of an in-patient in medium hospitals is about 1.5 times that of small ones and in large hospitals thrice that of small ones (Table 4.2). The cost per bed shows the same feature of an increased spending by larger hospitals, though the rate of increase is not so steep as observed for cost per in-patient. On an average a total expenditure of Rs. 50843 is incurred per bed at all India level. The expenditure per bed was Rs.47,253 for smaller hospitals and Rs.64,624 for the largest group yielding a cost differential ratio of 1.37. The differentials in cost per bed and

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[22]   Because of abnormal expenditure reported for Chandigarh, the averages for all India are shown, including Chandigarh, as well as excluding Chandigarh. For the purpose of discussion however, the latter is used.

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Table 4.2 : Selected ratios relating to cost of health care by size of hospitals - all India, 1992-93.

Indicator	Expenditure (in Rupees)				
	100 - 399	400 - 999	1000 & above	All Hospitals	All Hospitals *
1. Total Expenditure / In-Patient	624	947	2087	881	840
2. Total Expenditure / Bed	47253	54397	64624	53211	50843
a. Salary / Bed	33038	33353	37281	34014	33188
b. Non-salary Expenditure / Bed	14215	21044	27343	19197	17654
i) Transport / Bed	303	398	80	289	278
ii) Drugs / Bed	5313	8435	9791	7278	6968
iii) Maintenance (Diagnostics) / Bed	383	643	1568	713	717
iv) Machinery Expenditure / Bed	991	576	4117	1493	1487
v) Maintenance (life Support Facilities) / Bed	499	917	2069	961	966
vi) Food / Bed	1802	1961	1804	1855	1834
vii) Other Expenditure / Bed	4925	8114	7914	6607	5404

Notes: This table is exclusive of Bihar.

"*" - is exclusive of Chandigarh.

cost per in-patient compare well with the differentials observed in many developing countries[23]. An important feature noticed in the finances of hospitals is the almost constant level of salary expenditure per bed across all sizes of hospitals. The salary expenditure per bed is more or less the same of about Rs. 33,000 in the first two size groups of hospitals and is slightly higher at about Rs. 37,000 for the larger hospitals. This is corroborated by the fact that the medical staff size per bed is more or less uniform across different sizes of hospitals. Uniform spending on salaries across different sizes of hospitals is likely to have a significant bearing on the utilization of smaller hospitals. As the spending on salaries is almost the same in magnitude, there are marked differentials across the sizes of hospitals for non-salary expenditure per bed. The tertiary hospitals spend twice as much (per bed) as the small hospitals on non-salary expenditure. In particular the differences between the various sizes of hospitals in the per bed expenditure on machines and maintenance is even more pronounced (Table 4.3). The higher capacity of larger hospitals to spend on maintenance activities is undoubtedly demonstrated.

Composition of Spending

4.6   The shares of the components of total expenditure provide the insight into the expenditure pattern of hospitals of different sizes. Table 4.3 exhibits the comparative picture of small hospitals being at a disadvantage of a higher proportion (70%) spent on salaries and allowances of the hospital staff leaving minimal non-salary expenditure (30%) for complementary inputs and maintenance of required facilities for health care. Since the ratio of non-salary to total expenditure is seen to increase progressively over the size of the hospital, the tertiary hospitals have, it seems relatively less of financial problems in keeping up the utilisation rate. For example, the proportion of expenditure on drugs, maintenance & machinery is seen to be 27% for the tertiary hospitals as compared to 15% for small and 19% for medium ones, there being not much of difference in regard to proportion spent on food. If we separate out the maintenance and machinery component which includes maintenance of

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23   Cost per bed differentials in small and large categories of hospitals were 1.40 in Indonesia (1985), 1.22 in Rwanda (1988), 1.11 in Papua New Guinea (1990), 1.66 in China (1989) and 1.42 in Jamaica(1989). Source : Mahapatra, Prasanta & Berman, P : Sub Allocation of Hospital services in Andhra Pradesh, India, during the eighties, Institute of Health Systems, Hyderabad, 1992.

diagnostic and life support facilities and excludes maintenance of vehicles (clubbed with transport expenditure), the trend of an increase becomes more pronounced,

Table 4.3 : Percentage share of components of Total Expenditure by size of hospitals - All India, 1992-93.

Expenditure	Size of hospital (no. of beds)			
	100 - 399	400 - 999	1000 & above	All Hospitals *
A. Salary Expenditure	69.92	61.31	57.69	65.28
B. Non-salary Expenditure	30.08	38.69	42.31	34.72
i) Transport & maintenance of vehicles	0.64	0.73	0.12	0.55
ii) Drugs & other consumable materials	11.24	15.51	15.15	13.71
iii) Maintenance & machinery	4.06	3.92	11.89	6.23
a) Diagnostic Facilities	0.81	1.18	2.43	1.41
b) Life Support Facilities	1.05	1.68	3.2	1.9
c) Machinery	2.10	1.06	6.37	2.92
vi) Food	3.81	3.60	2.79	3.61
vii) Other Expenditure	10.42	14.92	12.25	10.63
Notes: "*" - is exclusive of Chandigarh.				

corroborating the fact that the proportion of breakdown time of machinery being minimum for tertiary hospitals as observed earlier, is primarily the reason for better utilisation of life support facilities in tertiary hospitals. This finding is of crucial importance for the health planners and administrators related to financing of secondary hospitals.

Proportion of non-salary expenditure

4.7 Taking the lead from Table 4.1 in stratifying the hospitals into three broad strata of total expenditure class that is, stratum 1: total expenditure < Rs. 1.50 crore, stratum 2: total expenditure Rs. 1.50 - 3.49 crores and stratum 3: total expenditure Rs. 3.50 crores and above, the distribution of estimated number of hospitals by size classes of non-salary expenditure (%) is given in Table 4.4.

Table 4.4: Percentage distribution of hospitals by size classes of proportion of non-salary expenditure (p) for each stratum: All India, 1992-93.

Stratum (Total expenditure in Rs. Crore)		Non-salary (as percentage to total expenditure)					
		< 20	21 - 30	30 - 40	40 - 50	50 & above	all
1.	< 1.50	44.8	24.4	18.2	9.4	3.2	100.0
2.	1.50 to 3.49	11.0	39.5	31.9	13.2	4.4	100.0
3.	3.50 & above	14.3	8.2	26.5	22.4	28.6	100.0
All		36.5	25.7	21.3	11.0	5.5	100.0

4.8   The distribution of hospitals by size classes of 'p' (the proportion of non-salary expenditure) is a consistently declining one, indicating the endemicity of a high cost for personnel with a low slice for adequate supply of drugs and maintenance of equipment. A survey of cost structure of hospitals in developing countries indicated that the non-salary inputs range between 30-70 per cent of the total hospital costs[24]. Even if one takes the minimum proportion of 30 per cent observed as a norm, only about 38 per cent of the hospitals were having a favourable 'p'.

4.9   Stratum distributions depict distinct pattern. About 69% of hospitals in stratum 1 report p < 30% ; 71% in stratum 2 with p between 21% - 40% and 78% in stratum 3 with p 30% & above. The proportion of hospitals in stratum 1 having a peak at the outset (p < 20%) decreases monotonically; in stratum 2 increases but has a peak at p between 21% and 30% and decreases thereafter and in stratum 3, increases monotonically with the peak at p > 50%. These features establish clearly the progressively increasing capacity of the medium and high spending hospitals in allocating a greater share of finance for non-personnel complementary inputs of health care facilities.

Inter - State Differentials

4.10   Considerable variation in cost of health care in secondary and tertiary hospitals is noticed among the States (Table 10, Appendix II). The total expenditure per in-patient varies from a very low Rs. 318 in Madhya Pradesh to Rs. 1737 in Haryana (excluding the highly

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[24]   Mills, Anne (1990) p.209.

abnormal figure of Rs. 13699 for Chandigarh). In Madhya Pradesh, Kerala, Orissa, Tamil Nadu and West Bengal cost per inpatient is below the all India average of Rs. 840. Haryana, Gujarat and Andhra Pradesh appear to be the high cost states with expenditure per in-patient exceeding Rs. 1400 per bed.

4.11   Ignoring Chandigarh again, cost per bed is the least in Kerala; Madhya Pradesh, Assam and Orissa also report figures much lower than the national average of Rs. 50843. The high cost states of Gujarat and Andhra Pradesh according to cost per in-patient, however, are seen to spend less than the national average per bed expenditure. In other words, even though these two states spend relatively less on the facility, the cost of care is high on account of low turnover of patients. Maharashtra on the other hand, presents a contrary picture of a high total expenditure per bed compared to close to average total expenditure per in-patient obviously because of a very high PTR.

4.12   While Madhya Pradesh, Punjab, Maharashtra and Rajasthan deploy between 43% and 47% of their expenditure for non-salary items, Goa, Pondichery and Assam allocate 20% or less. The States of Karnataka, Orissa, Uttar Pradesh and West Bengal too identify themselves as very low spending States on non-salary account. Rajasthan and Tamil Nadu are seen to spend a much higher proportion on machinery and maintenance compared to other States. The variation in relation to other items could be seen from Table 11, Appendix II.

Total expenditure *Vs* Efficiency of Utilisation (BOR)

4.13   The distribution of hospitals by size classes of BOR for different sizes of total expenditure (represented by three strata as before, Table 4.5) reveal tertiary hospitals to be the best utilised ones among all the strata, there being a progressively increasing proportion of hospitals after BOR = 60%. The small secondary hospitals report 72% as above the BOR limit of 80 as against 77% in case of tertiary hospitals. The stratum with a mixture of secondary and tertiary hospitals (stratum 2) has a larger number of hospitals with BOR below 80. It is however, remarkable that all the three strata appear to be in a crisis situation with more than 40% of them having BOR more than 100.

Table 4.5: Percentage of estimated number of hospitals by size class of BOR for each stratum (total expenditure class): All India, 1992-93.

Stratum (total expenditure in Rs. Crores)		BOR (%)					
		< 40	40 - 60	60 - 80	80 - 100	100 & above	All
1.	< 1.50	9.3	14.7	3.7	24.1	48.2	100.0
2.	1.50 to 3.50	2.2	6.7	31.1	18.9	41.1	100.0
3.	3.50 & above	5.7	3.8	13.2	30.2	47.2	100.0
All		7.8	12.4	9.1	23.8	46.9	100.0

Total expenditure per bed *Vs* Standardized BOR

4.14   The average length of stay (ALS) is an important factor affecting the utilisation of beds. The BORs calculated for the States hide the variation due to ALS. The BORs of States are therefore standardized with respect to the All India average ALS of 5.68 (Table 4.6). Figure-4.1 shows the scatter of the States by standardized BOR and total expenditure per bed. The figure is divided into four quadrants using the all India averages of the two variables as separators for grouping the states according to efficiency of spending.   In this figure a ray from the position of a state through the origin indicates the relative cost of care in that state. This is so because, since the BOR is standardised it varies directly with the patient turnover. States located closer to the x-axis are the ones with lower cost per in-patient and as the ray rotates towards the y-axis the cost per inpatient increases.

4.15   Madhya Pradesh, is the solitary State (4th quadrant, South East) which appears to be having a higher rate of utilisation at a lower level of expenditure per bed relative to all other States. Consequently the cost per in-patient is the lowest in this state. On the other hand, Haryana, Goa and Punjab are placed in the opposite quadrant II (North West), reveal very high expenditure per bed with a lower rate of utilisation and also high cost of care per inpatient.   In these states the high cost per patient is mainly on account of high facility level spending. While Maharashtra, Pondichery, Rajasthan, West Bengal and Tamil Nadu also have higher expenditure per bed (quadrant I- North East), the cost of care per patient is low on account of high utilisation rates.   The cluster of remaining 7 States (see Figure-4.1) placed in the opposite quadrant III (South West) shows a low expenditure per bed and low

Figure 4.1
Total Expenditure per bed to
Standardised Bed occupancy rate

Total Expenditure per bed (Rs. Thousand)

Standardised Bed occupancy rate (%)
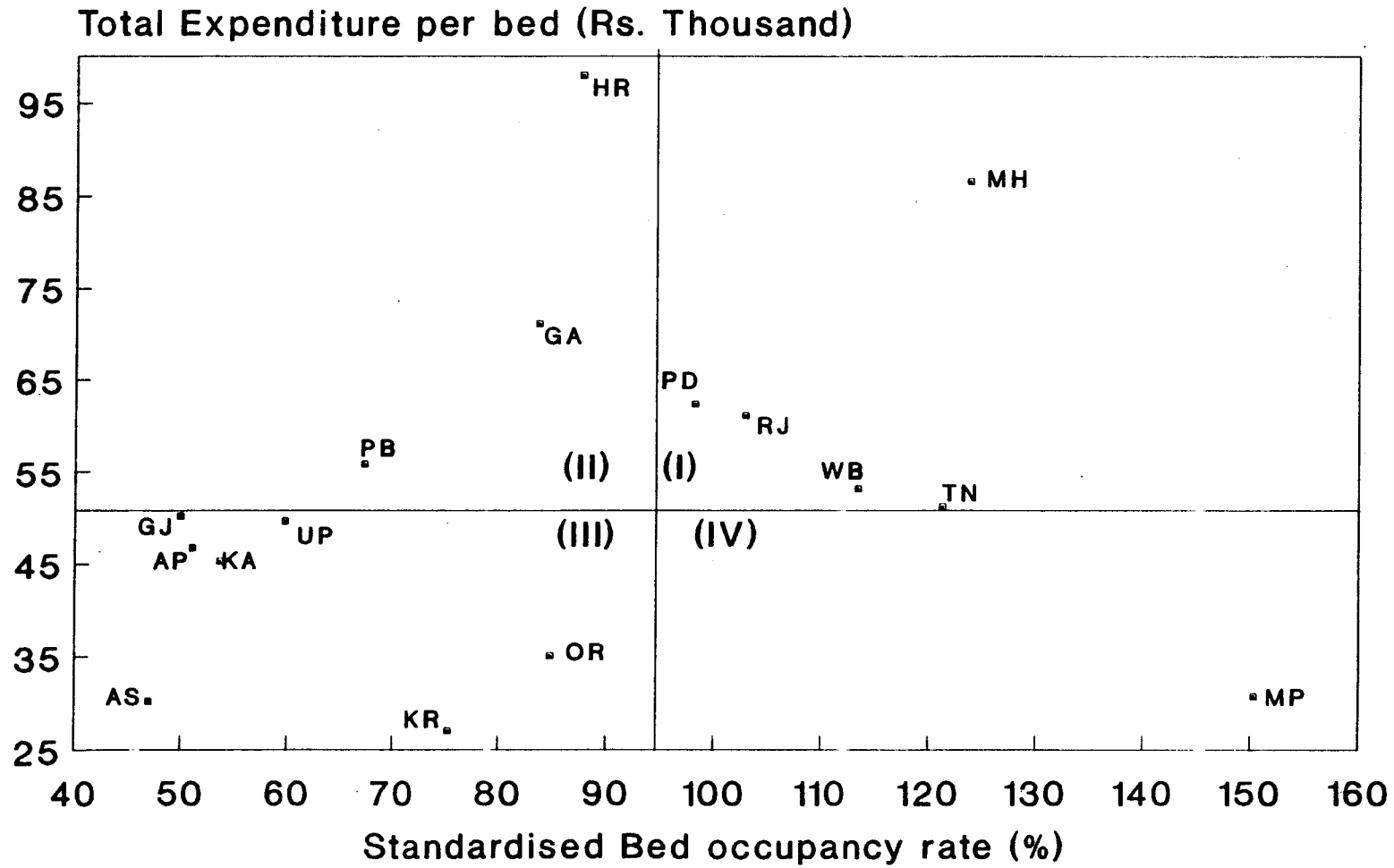
Table 4.6 : Standardised BOR, Average Length of Stay and Total Expenditure per bed by States : 1992-93.

States	ALS	BOR (A)	BOR (S)	Total Expenditure per bed (Rs.)	Non-Salary Expenditure per bed (Rs.)
Andhra Pradesh	10.51	94.34	50.99	46717	15486
Assam	10.82	89.52	. 46.98	30207	6151
Gujarat	9.22	80.93	49.88	50152	16204
Haryana	5.75	88.79	87.72	97895	37649
Karnataka	9.57	90.29	53.58	45275	11761
Kerala	7.18	95.11	75.26	27035	9023
Maharashtra	4.56	99.40	123.77	86556	38553
Madhya Pradesh	4.34	114.81	150.26	30742	14387
Orissa	5.65	84.33	84.82	35142	9151
Punjab	6.91	81.76	67.19	55810	24917
Rajasthan	4.52	81.89	102.90	61056	26156
Tamil Nadu	5.29	112.81	121.22	51178	18022
Uttar Pradesh	7.07	74.41	59.75	49620	11605
West Bengal	4.17	83.35	113.47	53134	14127
Chandigarh	10.28	104.60	57.77	508600	315864
Goa	5.10	75.15	83.70	71083	9702
Pondichery	6.39	110.37	98.16	62353	10964
All India	5.68	94.02	94.02	50843	19197

Note: "B O R(S)" refers to Standardised Bed Occupancy Rate.
"B O R(A)" refers to Actual Bed Occupancy Rate.
"ALS" refers to Average Length of Stay.

utilisation rate. Consequently, the cost per inpatient is much above the national average. It is a moot question whether these States (Gujarat, Uttar Pradesh, Andhra Pradesh, Karnataka, Assam, Kerala and Orissa) could reduce the ALS, and put in efforts to increase the number of in-patients per bed in order to improve the utilisation rate. If the low utilisation is on account of low facility level spending, an increase in the expenditure per bed may improve efficiency by reducing the cost of care. It is observed that all these States except Orissa happen to have a high ALS and probably the first alternative of finding out ways to reduce ALS would be desirable. Considering the net State Domestic Product,

perhaps Orissa (and Kerala, Assam and UP) with meagre financial resources would prefer to move into the 4th quadrant (South East) and Gujarat, Andhra Pradesh, Haryana and Goa and Karnataka (high + medium income groups) into the 1st quadrant (North East) by spending more per bed. Although figure 4.1 indicates that Karnataka and Kerala are low spending states in terms of expenditure per bed and afflicted with low turnover rates, their populations seem to enjoy high intensity of use of hospital mainly because of higher supply of hospital beds. As shown in Figure 4.2, there is a strong association between per capita expenditure on hospitals and the intensity of use of hospital services. The correlation between the two is 0.87 and statistically significant. Thus the supply constraint on hospital beds is noticed in certain states mainly on account of inadequate allocation of budgetary resources for secondary and tertiary public hospitals.

Table 4.7 : Intensity of use of hospitals and per capita expenditure (in ascending order), 1992-93.

States	Intensity of Use	Expenditure per Capita (Rs.)
Uttar Pradesh	0.26	3.63
Orissa	0.51	4.41
Gujarat	0.44	5.64
Madhya Pradesh	1.03	5.75
Assam	1.08	7.63
Andhra Pradesh	0.86	8.92
Punjab	0.76	10.78
Rajasthan	0.76	11.77
Karnataka	1.30	13.57
Haryana	0.68	15.65
Kerala	2.69	15.99
West Bengal	1.45	19.30
Tamil Nadu	2.13	20.17
Maharashtra	1.12	20.36
All India	1.00	11.30

Figure 4.2
Intensity of Use and
Expenditure per Capita
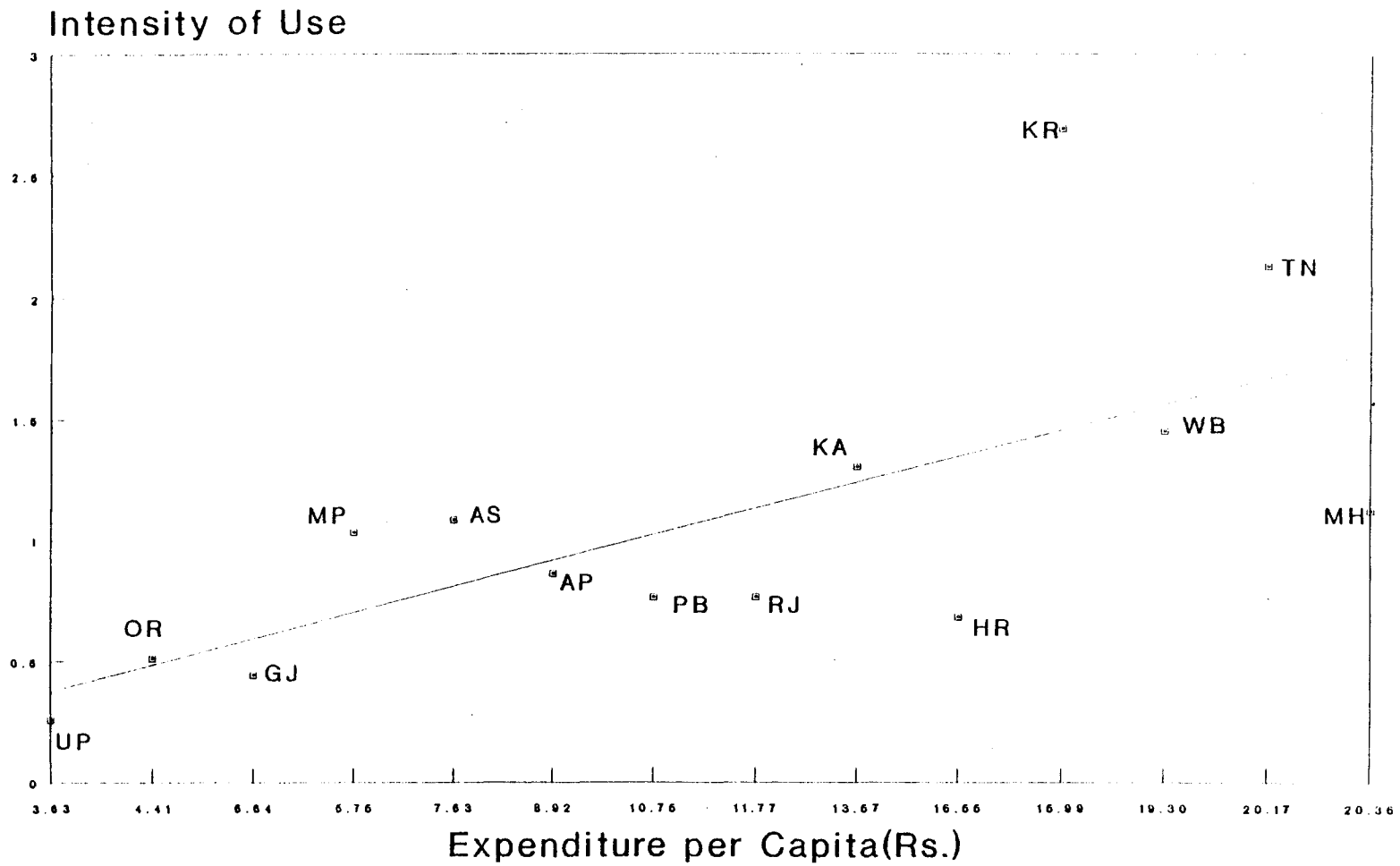
Figure 4.3
Non Salary Expenditure per Bed to
Standardised Bed occupancy rate (%)
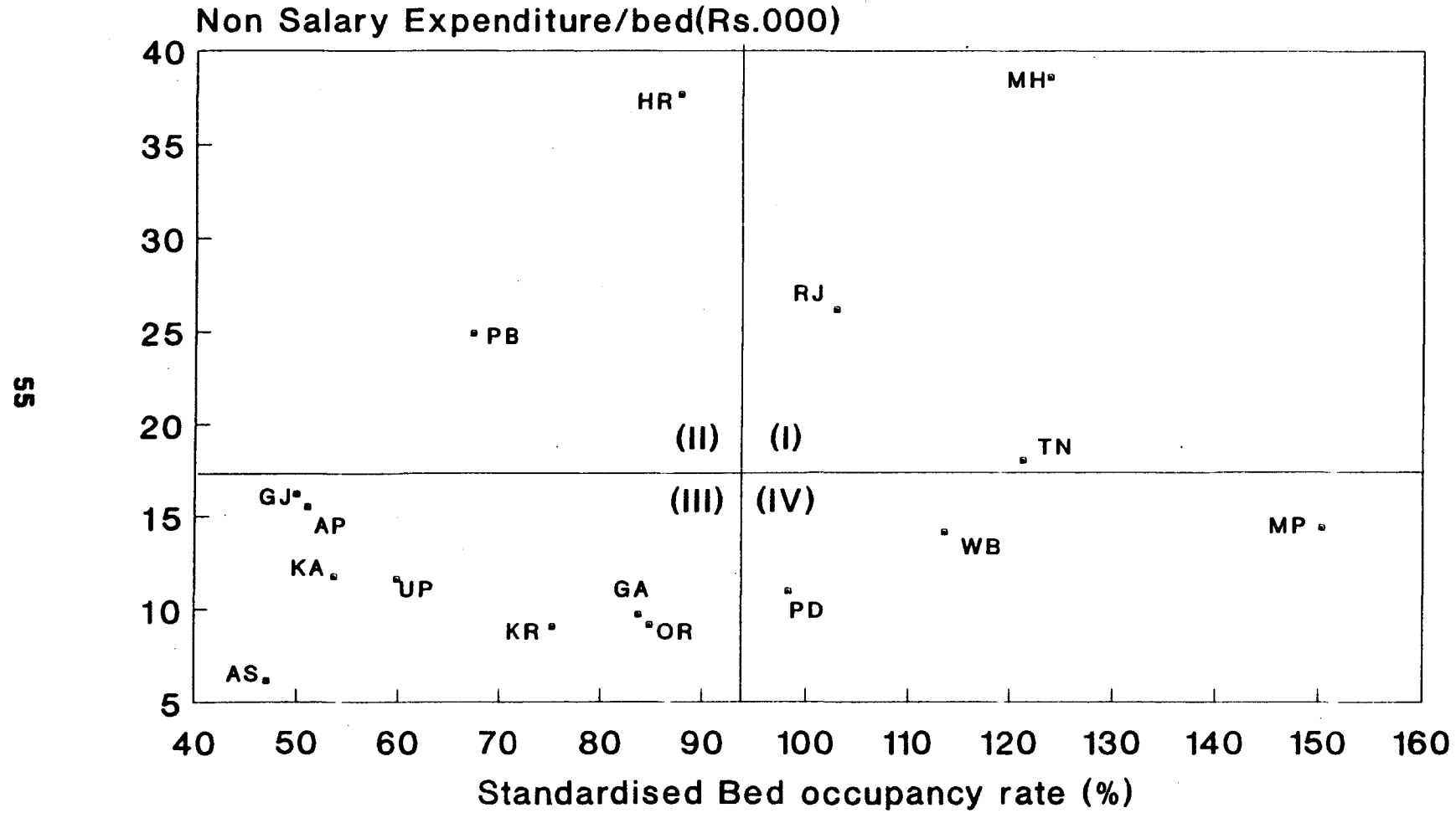
4.16   Considering only the non-salary expenditure, Figure-4.3 brings out a linear displacement of West Bengal, Goa and Pondichery as compared to Figure-4.2. The rest of the States remain unaffected. Goa is placed in the low expenditure - low BOR category. West Bengal and Pondichery join the efficient group of low-expenditure high BOR group.

Expenditure Pattern in States grouped by Per Capita Income

4.17   The States when grouped into low, middle and high income categories[25] exhibit distinctive features of expenditure pattern. The results (Table 4.8) show the total expenditure per in-patient in middle income States (Rs. 787) to be more than in low income States (Rs. 675), the per bed expenditure being respectively Rs. 45644 and Rs. 42212. There is however, a very sharp increase in the values of these important ratios for high income States viz., Rs. 1191 and Rs. 77902 respectively. The capability of high income States for secondary and tertiary health care is again, manifest when we look at the components of total expenditure per bed. While the expenditure per bed on salaries in high income States is a little more than 1.5 times that of low income States, that on non-salary component is more than twice, establishing the financial capacity of high income States to provide relatively adequate funds for complementary non-salary inputs.

4.18   The pattern of expenditure in respect of the components of non-salary account (Table 4.9) shows however, some interesting findings. The low income States spend in terms of proportion more than the middle income ones on non-salary items per bed, in particular transport, drugs and machinery. In respect of expenditure on machinery, the low income States are observed to spend even more than the high income States.

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[25]   Low income States are Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh; the middle income Andhra Pradesh, Assam, Karnataka, Kerala, Tamil Nadu and West Bengal and the high income Gujarat, Haryana, Maharashtra and Punjab.

Table 4.8: Expenditure pattern by Low Income, Middle Income and High Income States

Expenditure (Rs.)	High Income States	Middle Income States	Low Income States	All India*
1. Total Expenditure / In-Patient	1191	787	675	840
2. Total Expenditure / Bed	77902	45644	42212	50843
a. Salary / Bed	44673	31701	27688	33188
b. Non-salary Expenditure / Bed	33229	13943	14544	17654
i) Transport / Bed	812	139	196	278
ii) Drugs / Bed	14096	5308	5521	6968
iii) Maintenance(Diagnostics) / Bed	466	871	570	717
iv) Machinery Expenditure / Bed	1480	1138	2286	1487
v) Maintenance (Life Support Facilities) / Bed	1137	1146	407	966
vi) Food / Bed	1918	1969	1441	1834
vii) Other Expenditure / Bed	13321	3373	4123	5404
Note: * includes the Union Territories of Goa & Pondichery but excludes Chandigarh.				

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Table 4.9 : Percentage share of components of Total Expenditure by State groups - all India, 1992-93.

Indicator	Expenditure					
	High Income	Middle Income	Low Income	U.T's	All India	All India *
A. Salary	57.34	69.45	65.55	42.67	63.92	65.28
B. Non-salary Expenditure	42.66	30.55	34.45	57.33	36.08	34.72
i) Transport	1.04	0.30	0.46	0.45	0.54	0.55
ii) Drugs	18.09	11.63	13.08	11.89	13.68	13.71
iii) Maintenance (Diagnostics Facilities)	0.60	1.91	1.35	0.05	1.34	1.41
iv) Machinery Expenditure	1.49	2.49	5.42	0.47	2.81	2.92
v) Maintenance (life Support Facilities)	1.46	2.51	0.96	0.49	1.81	1.90
vi) Food	2.46	4.31	3.41	1.66	3.49	3.61
vii) Other Expenditure	17.10	7.39	9.77	42.33	12.42	10.63

Notes: This table is exclusive of Bihar.
  "*" - is exclusive of Chandigarh.

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Cost per bed & Cost per Occupied day Vs. Per Capita Income

4.19 Inter - State differentials in expenditure pattern in secondary and tertiary hospitals are now examined with respect to the per capita income in different States. For this purpose the Net State domestic product (NSDP) series for the year 1991-92 (actuals) is used. The expenditure per bed is expressed as a multiple of annual per capita income for a particular State (Table 4.10). This statistic λ_1 provides insight into the expenditure pattern of low, middle and high income States. Similarly, using the bed occupancy rate (BOR), expenditure per occupied day is first derived and then expressed as percentage of annual per capita income for a particular State. This statistic λ_2 assesses the impact of low occupancy on cost per day. The two ratios thus obtained in Table 4.10 help us identify the States according to the judiciousness or otherwise of spending in secondary and tertiary hospitals.

4.20 The States could be grouped into the following categories based on the two statistic's.

I   High relative spending in Low Income States: Orissa, Uttar Pradesh, Rajasthan (all with low occupancy rates)

II   High spending in Middle Income States: Tamil Nadu (high occupancy rate pushing down the cost/day), West Bengal (low-occupancy rate)

III   Low spending in high income States: Punjab (low occupancy could not push up the cost per day as proportion of per capita income because of very high income)

IV   High spending in high income States: Haryana (low occupancy pushes up the cost/day), Maharashtra.

V   Low spending in Low Income States: Madhya Pradesh and Kerala and to some extent Assam display the most judicious use of financial resources considering both the statistic's .

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Table 4.10 : Expenditure per bed as multiple of per capita annual income and percentage of annual per capita income spent per occupied day in Government hospitals by States : 1992-93.

States	Expenditure per bed	NSDP per Capita	λ_1	BOR(A)	Expenditure (in Rs.) per Occupied day [Estimate-1 based on BOR(A)]	λ_2
Andhra Pradesh	46717	5299	8.8	94.34	136	2.6
Assam	30207	4543	6.6	89.52	92	2.0
Gujarat	50152	6097	8.2	80.93	170	2.8
Haryana	97895	8396	11.7	88.79	302	3.6
Karnataka	45275	5693	8.0	90.29	137	2.4
Kerala	27035	4506	6.0	95.11	78	1.7
Maharashtra	86556	7647	11.3	99.40	239	3.1
Madhya Pradesh	30742	4175	7.4	114.81	73	1.8
Orissa	35142	3702	9.5	84.33	114	3.1
Punjab	55810	9387	5.9	81.76	187	2.0
Rajasthan	61056	4169	14.6	81.89	204	4.9
Tamil Nadu	51178	5005	10.2	112.81	124	2.5
Uttar Pradesh	49620	3816	13.0	74.41	183	4.8
West Bengal	`53134	5065	10.5	83.35	175	3.4
All India	50843	5187	9.8	94.02	148	2.9
Median			9.5			2.8

4.21   The results furnished in Table 4.10 could again, be used with respect to the median of λ_1 the 'multiple of annual per capita income' (9.5) and the median of λ_2 'percent of annual per capita per occupied day' (2.8%). The States of Andhra Pradesh, Assam, Kerala, Madhya Pradesh and Punjab could be seen to have managed their finances well, adjudged from the values of both the statistic's below the respective medians. On the other extreme, Haryana, Maharashtra, Orissa, Rajasthan, Uttar Pradesh and West Bengal report both the statistic's above the respective medians, requiring closer scrutiny. The latter four States are observed to under-utilise the bed capacity pushing up the cost per day. In particular, Rajasthan spending 14.6 times its per capita annual income to support one Government bed and Uttar

Pradesh 13 times, ought to be singled out for a study of the outcome being due to low per capita income or unnecessary expenditure, particularly in the background of Madhya Pradesh, a low income State reporting expenditure per bed as 5.8 times the per capita income and the percentage of per capita income spent per day as 1.8%, quite low relatively.

Financial Crunch & Inadequacy of Staff

4.22   The survey questionnaire sought to elicit the opinion of the medical superintendents of the sample hospitals on the various factors affecting the quality of services of the individual wards. Out of the 94 sample hospitals, 16 did not furnish any information and 6 maintained that the quality was not affected. The data furnished by 72 sample hospitals were analysed. On the basis of multiple reasons forwarded in respect of each ward, percentage distributions were obtained for each ward and presented in Table 4.11. Since the quality of data suffered on account of insufficient attention to the details required, no attempt has been made to present the estimated distributions. The results for States could not be presented because of very small sample sizes of the respective wards in the States. Of the variety of reasons affecting the quality of the services, of different wards, 17% to 25% could be classified as 'inadequacy of staff' and 75% to 83% as 'inadequacy of funds.' The financial crunch could be diagnosed as the principal reason for the deterioration in quality, the wards most affected being Paediatrics, Surgical, General Medicine and ENT.

4.23   The supply of drugs and/or consumable hospital materials is seen to be most affected by shortage of funds (18% in Cardiology to 26% in Eye), including even the Casualty ward. The maintenance of diagnostic facility and life support facilities too, suffered in most of the wards; financial crunch was reported for 34% of the reasons for Paediatrics. The capital expenditure on purchase of machinery was affected due to insufficient funds constituting 14% to 21% of the reasons in different wards, in particular Cardiology, Orthopaedics and Surgical.

4.24   Inadequacy of staff accounted for 25% of the reasons for deterioration in quality of services in Cardiology and 22% in Casualty.

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4.25 Adhering to the broad dichotomy of the reasons as i) inadequacy of staff and ii) financial crunch, the most affected wards are identified in Table 4.12. It is observed that Cardiology, Maternity and Surgical wards suffered most on account of shortage of personnel. The financial crunch affected most Surgical, followed by Paediatrics, General Medicine and Maternity wards.

Hospital Receipts

4.26 The issue of raising hospital revenues in the context of expenditure compression[26] was addressed to the medical superintendents of the sample hospitals with a view to obtaining the opinion of the medical personnel about the varied ways in which it could be done. Sixteen sample hospitals did not respond out of 93. The opinions of the medical superintendents of the remaining 77 hospitals are compiled in Table 12 of Appendix II in the form of percentage distribution of hospitals (which reported one or more of the ways in which revenue could be raised). Since it was an open response query posed to the heads of the hospitals, there was a wide array of answers. The same were however, grouped into eight distinct categories. As mentioned earlier, individual States carry with them low sample sizes and hence are indicative of a less reliable picture than that of all India.

4.27 23 percent of the hospitals are reported to be not in favour of any change or have no opinion on the subject. It is quite apparent that those who manage hospital services have felt the necessity of raising hospital revenues, as only about 6% still wanted to extend free hospital services.

4.28 Among the various possible ways for raising hospital revenues which comprise only a meagre 1% of total expenditure, 26% voiced for 'nominal charges for diagnostic services', 23% for 'nominal charges for in-patients, whereas 45% expressed that there should be a hike in OPD charges or in absence of any OPD charges, nominal charges should be realised.

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[26] Tulasidhar, V.B.: Expenditure Compression and health sector outlays, Economic and Political Weekly, Nov. 6, 1993.

Table 4.11 : Percentage distribution of reasons affecting Hospital Wards for each ward: All India, 1992-93.

Reasons	Hospital Wards											Not Affected
	Maternity	Paediatrics	Surgical	General Medicine	Eye	E N T	Dental	Casualty	Orthopaedics	Cardiology	Others	
Inadequate Staff	20.74	17.29	17.76	17.42	19.57	18.18	19.51	22.08	20.62	24.56	20.99	7.79%
Financial Crunch	79.26	82.71	82.24	82.58	80.43	81.82	80.49	77.92	79.38	75.44	79.01	
1. Supply of drugs and/or consumable material	23.70	23.31	23.68	22.73	26.09	23.86	21.95	23.38	22.68	18.42	18.52	
2. Maintenance of diagnostics facility	14.81	18.05	17.11	16.67	15.22	15.91	14.63	12.99	15.46	14.04	16.05	
3. Purchase of machinery	14.81	14.29	16.45	13.64	14.13	15.91	14.63	14.29	16.49	18.42	20.99	
4. Maintenance of life support facility	14.07	15.79	13.82	15.15	13.04	13.64	13.41	10.39	12.37	12.28	13.58	
5. Supply of food to patients	7.41	7.52	6.58	9.09	9.78	10.23	10.98	11.69	9.28	9.65	3.70	
6. Others	4.44	3.76	4.61	5.30	2.17	2.27	4.88	5.19	3.09	2.63	6.17	

Table 4.12 : Percentage shares of different wards by reasons affecting quality : All India, 1992-93.

Reasons	Hospital Wards											
	Maternity	Paediatrics	Surgical	General Medicine	Eye	ENT	Dental	Casualty	Orthopaedics	Cardiology	Others	All Wards
Inadequate Staff	12.02	9.87	11.59	9.87	7.73	6.87	6.87	7.30	8.58	12.02	7.30	100.00
Financial Crunch	11.26	11.58	13.16	11.47	7.79	7.58	6.95	6.32	8.11	9.05	6.74	100.00

4.29   That there should be some consideration for the poor in raising the hospital revenues figured among the responses received. Income specific slabs may be thought of in pricing of all investigations, operations and nursing-this was the opinion of 36% of the hospital heads. The need was felt in 25% of hospitals of establishing private wards wherever they don't exist or increasing the present capacity combined with increased fee. Among the other ways which claimed 19%, are auctioning of used hospital materials, charges for medical certificates, post mortem, diet, ambulance, parking of vehicles, medicines and collecting funds through donations.

4.30   In the States of Maharashtra, West Bengal, Tamil Nadu, Pondichery and Goa, a sizeable proportion of hospitals refrained from giving any suggestion. Could it be due to the lack of any incentive to generate internal revenues in the present system of budgeting[27] is a question requiring further probe. In other States, there seems to be the urge for establishing or increasing the number of private or special wards and/or to increase the fee. Imposition of nominal charges for out-patient registration is another suggestion in most of the States.

4.31   While the above relate to the views of the medical superintendents on the pricing of health services, the questionnaire also sought to obtain quantitative responses on the rates for different services prevailing in sample hospitals. The data furnished, however, suffered on account of partial non-response and incompleteness with regard to details. The analysis given below is, therefore, limited to 75 responding sample hospitals out of the 94 surveyed.

4.32   The survey findings reveal that the hospital receipts on an average amount to 1.4 per cent of the total expenditure incurred by the hospitals, there being only a marginal decline in this proportion when examined by size of hospitals (Table 4.13).

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[27]   Tulasidhar, V.B. Op cit.

Table 4.13 : Percentage share of hospital receipts in total expenditure: All India, 1992-93

Size of hospital (No. of beds)	Number of sample hospitals	Hospital receipts/total expenditure (%)
100 - 399	32	1.55
400 - 999	31	1.41
1000 & above	12	1.30
all	75	1.39

4.33 The recovery rate as defined by the proportion of total expenditure recovered from hospital receipts was more or less 2 per cent in Rajasthan, Assam, Haryana and Madhya Pradesh. In other States it was much less, the States of Andhra Pradesh, Uttar Pradesh and Orissa reporting even less than 0.5 per cent (Table 15, Appendix II).

Extent of Free Services

4.34 It is well known that the public hospitals in India serve the ailing population, either exempting them from any payment or charging only a nominal fee. The sample responses of 75 hospitals bring out the varying practices prevailing in different States with a wide array of rates of services (see Table 15, Appendix II) in respect of out-patients, general and special beds, ICU, X'Ray and ECG. The variation within a State comes as a surprise leading one to infer that the pricing of health services is by and large, arbitrarily determined and may not be related to the cost structure. However, the extent of free services rendered to the patients in public hospitals is brought out clearly in Table 4.14.

Table 4.14:   Percentage of sample hospitals providing free service: All India, 1992-93

Size of Hospital (No. of beds)	OPD	General Bed	Special Bed	ICU	X'Ray	ECG
100 -399	75.00	68.75	18.75	62.50	37.50	46.88
400 -1000	45.16	48.39	12.90	38.71	9.68	19.35
1000 & above	33.33	58.33	16.67	41.67	16.67	25.00
All	56.00	58.67	16.00	49.33	22.67	32.00

4.35   75 per cent of the lower level hospitals extend free services to outpatients compared to only 33% of the large hospitals. Full subsidization in respect of 56% of the secondary and tertiary hospitals indicates the vast potential of raising internal revenues, considering the large numbers of outpatients visiting these hospitals, notwithstanding the allowance for persons below poverty line. In respect of 'General bed' in these hospitals, again, a larger proportion of the lowest level hospitals extend free service to patients hospitalized. In all 59% of the hospitals allot free beds to in-patients, a pointer again, to the source of revenue untapped so far.

4.36   Varying proportions of hospitals are seen to be providing free services in respect of special bed, ICU, X'Ray and ECG. The feature of a larger proportion of the lowest level hospitals extending these free services, is evident from the table.

Cost of Recovery in Hospitals

4.37   The need for cost recovery of public hospital services arises on account of the difficulties in obtaining adequate financing from the budget. As is evident from the analysis presented above and the views expressed by the Heads of the hospitals, inadequacy of budgetary funds appears to be an endemic problem in India at present. Principles and alternative ways of cost recovery in hospitals to mobilize additional resources to supplement hospital budget are discussed in this section. Cost recovery can be used for i) supplementing the existing hospital budgets so that the problem of inferior quality of service arising from the inadequacy of budgetary resources is addressed; ii) correcting the problem of bypassing of lower level facilities arising from free provision of health services; iii) substituting for the existing budgetary support so that the government can spend its tax revenues on some other activities; and iv) helping the government raise resources for the budget. Out of these objectives, the focus of the study will be on the first two. As regards the remaining two, it is suffice to say that they are not relevant in our context in view of the absence of a universal or near universal health insurance programme.

4.38 Health services suffer from all important sources of market failures: consumer ignorance; economies of scale; externalities; incomplete integration of markets; and public goods. The presence of these problems prevent private markets from efficiently allocating resources in the health sector. While public sector provision of health services, as is done in India, addresses to these problems to a large extent, public sector's involvement itself introduces a new set of problems depending on how health services are financed. The inefficiency arises when the cost of health care exceeds the incremental benefits it gives to the society. The deviation between costs and benefits arise if the financing mechanism alters the behaviour of producers to provide excessive services and/or consumers to seek excessive care. Provision of health services free of cost may lead to excessive consumption of health care or seeking health care at an inappropriate level facility. Similarly, fixation of prices without adequately taking into account the absolute and relative costs of production may create pockets of heavy profits and encourage health care producers to supply such services in excess who in turn induce consumers to consume them. This can happen even in public hospitals, when they retain hospital receipts. Thus cross subsidization of services provided by public hospitals has to be done carefully in order to prevent creation of such adverse incentives. An appropriate pricing system that can achieve the balance between costs and benefit is difficult to devise, because all financing mechanisms have potentially unacceptable allocation effects. The objective of pricing should be to minimize these undesirable effects[28]. This can be done by: fixing prices to reflect the relative cost of care and to direct patients to the appropriate level of facility; link prices to quality and quantity of care; and subsidize services that have considerable positive externalities or those which prevent negative externalities.

4.39 Hospital services at the secondary and tertiary hospitals are by their very nature expensive. The average cost of an episode of illness treated in these hospitals will be equivalent to a significant proportion of per capita GDP. Since sickness is random and cost of treatment is high, some form of risk sharing in the form of insurance as a medium of financing health care is essential from the economic efficiency point of view. But in most developing countries health insurance markets are not developed due to high administrative

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[28]   Barnum and Kutzin, 1993, p.147.

costs, inadequate regulation of health sector, administrative difficulties in covering rural areas, and low purchasing power. Even those which exist, as in our case, are poorly designed and cover only a small fraction of the total population. Some of these schemes cause considerable welfare loss as they are high cost[29], exclusively meant for relatively better paid organized sector employees and yet in receipt of partial government support. Since all the existing health insurance schemes exclude the poor either because they cannot pay the premia or due to administrative difficulties, provision of free health care to the poor will be necessary as a form of social insurance for them. Cost recovery policies should not lose sight of these realities. Further, equity considerations require withdrawal of budgetary support to various insurance schemes for organized sector employees progressively, as hospitals start collecting fee for services.

4.40   The main objective of equity consideration is not to deny access to essential care on account of inability to pay for services. To imbibe this principle, pricing will have to be either discriminatory or should totally exempt the poor and recover the cost mainly from the better off section of the society. Optimal pricing rules also suggest such price discrimination. But the discrimination scheme should be amenable to implementation. Thus administrative consideration will determine the number of rate categories. In this study we assume complete exemption of the poor (except for a nominal entry fee) if they come through proper referral system, and partial cost recovery from a majority of the remaining patients. Pricing of services even in their cases needs to be done without losing sight of the level of per capita income in the country. Full cost recovery is justifiable for those who can afford to subscribe to private insurance schemes.

4.41   The extent of cost recovery is another issue which has a significant bearing on the level of prices. There are no clear answers to the question of what proportion of cost should be recovered. In the overall systems context, the extent of cost recovery cannot be divorced from how the health services delivery system is organized, regulated and financed. Because

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[29]   The average cost of treatment per bed in Government General hospitals according to this study is Rs. 50843. But in a hospital exclusively meant for the subscribers of Employees State Insurance (ESI) the cost per bed is more than double at Rs. 1,58,000 (Goldar 1994). ESI hospitals receive partial government support but are not open to general public.

of this the extent of recovery of hospital costs through pricing varies considerably across different countries[30]. The recovery rate is above 90 per cent in China, about 20 per cent in Indonesia, about 7 per cent in Zimbabwe and less than 5 per cent in large number of developing countries. The recovery rate is very high in China mainly because hospitals get most of their revenues from health insurance funds. A similar situation exists in some other countries with developed health insurance system. In societies where risk pooling in the form of insurance does not exist, full/substantial cost recovery at secondary and tertiary facilities will not be desirable from both equity and efficiency points of view. Such a policy imposes substantial financial burden on a family already traumatized by episodes of serious sickness needing tertiary care. For a number of reasons discussed below, no society expects an individual to foot the bill of tertiary and catastrophic health care. Hospital pricing will have to take into account three broad objectives of efficiency, equity and revenue.

Determining prices of hospital services

4.42 Keeping the above principle in view, an attempt is made to work out indicative prices of hospital services based on relative costs of hospital services. Prices are worked out for outpatient care, inpatient care, X'Rays and surgical procedures. The indicative prices are based on the absolute cost of providing services as estimated by our study and the relative cost structure estimated by a study[31] in a medium sized tertiary care facility.

4.43 The cost structure of the hospital (size: 400 beds, BOR : 113 and ALS: 6.60) in percentage terms allocating to casualty & inpatient (56.91%), operation theatre (17.14%), outpatient department (11.53%), laboratories (9.03%) and radiology (5.39%) was used to obtain the estimated expenditure on these heads, using the total estimated expenditure as obtained from the survey. Taking the survey estimates of outpatients, inpatients, X'Ray procedures and major & minor (combined) operations, the prices were calculated for low and high values of both recovery and exemption. The results are given in Table 4.15.

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[30] Barnum and Kutzin, 1993, op cit

[31] Goldar (1994). The unit costs are based on account based costs. Apportioning of personnel costs and other overheads to individual cost components has been done using a scientifically done detailed work motion study of the same hospital by Khokar et al in 1992.

Alternative price estimates are made for different fee exemption levels and recovery rates to indicate how the level of prices change at different equity and revenue objectives.

4.44 The prices for outpatients, inpatients and X'Ray as obtained from this exercise would appear to be plausible and lower than the prices obtained in another exercise for the same combination of recovery and exemption levels done with survey data (see Table 16, Appendix II).[32]. The low-high combination of recovery (20%) and exemption (50%) leads us to the outpatient charge per visit as Rs. 2.88, inpatient charge per day as Rs. 33.24, X'Ray charge per procedure as Rs. 26.39 and operation charge as Rs. 790. Except for the surgical procedure, the prices apparently would not be too much of a burden to the not-so-poor population.[33] Assuming that a major operation costs four times that of a minor one (based on the estimates of unit costs by Goldar), and using the number of major and minor procedures estimated by our survey as weights, the prices of major and minor procedures in the low-high combination come out to be Rs. 1394 and Rs. 374.

4.45 A significant finding emerges from this above illustrative exercise. The hospital prices required to recover 20 per cent of costs even after exempting 50 per cent of patients from user charges, are quite low compared to the per capita GDP (PGDP). At this level of recovery and exemption, an average patient staying in the hospital for a period of the national average length of stay, undergoing diagnostic tests at the observed average rates would have to pay an amount equivalent to about 4 per cent of PGDP for non-surgical care

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[32] For the six types of service: the OPD, General Bed, Special Bed, ICU, X'Ray and ECG, the estimated number of units (outpatients, BDUs, procedures) were converted into paying units by discounting the proportions utilising free services. Using next, the State sample observations regarding the rates per unit, all India averages of the rates for the six types of services were obtained and these when multiplied by the respective estimates of number of paying units gave the estimated receipts and subsequently the percentage shares claimed by the different types. The total estimated expenditure after a deduction of 25 per cent for laboratories and operation theatre (the items for which the rates are not available) was then distributed over the six types of services, using the percentage distribution of the hospital receipts. The total allocated expenditure under different types of services thus obtained were then used for obtaining prices of a particular service under various combinations of recovery rate and exemption level.

[33] The exemption of 50% may be viewed in the light of the findings of the NSSO survey of 42nd (1986-87) revealing that 56 per cent of hospitalised cases in public hospitals in rural areas belong to the upper six deciles (60-100) of the population (according to per capita monthly expenditure) and 52 per cent in urban areas, Sarvekshana, op cit.

and an amount equivalent to about 20 per cent of PGDP for surgical care. Since the poor

Table 4.15: Estimates of rates of selected hospital services by different levels of recovery and exemption

1. Outpatient Charges per visit (Rs. 0.00)		
Exemption Recovery Rate	50% (High)	30% (Low)
20% (Low)	2.88	2.05
40% (High)	5.76	4.10
2. Inpatient Charges per day (Rs. 0.00)		
Exemption Recovery Rate	50% (High)	30% (Low)
20% (Low)	33.24 #	23.74
40% (High)	66.48	47.48
3. X'Ray Charges per procedure (Rs. 0.00)		
Exemption Recovery Rate	50% (High)	30% (Low)
20% (Low)	26.39	18.85
40% (High)	52.78	37.70
4. Operation Charges per operation (Rs.)		
Exemption Recovery Rate	50% (High)	30% (Low)
20% (Low)	790 @	564
40% (High)	1580	1128

This is an average price. At this level of recovery, a special bed would cost Rs. 229 and a general bed Rs. 20 per day.

@   This is an average price. At this level of recovery, a major operation would cost Rs. 1394 and a minor Rs. 374.

are to be exempt from payments altogether, the average level of income of the non-poor will be much higher than the PGDP and the burden of fee correspondingly lower. The high cost of surgical care is a cause for concern. This problem can, however, be overcome by cross subsidizing from the low cost non-surgical care. The scope of cross subsidization is considerable since surgical cases account for only about 15 per cent of the total patients admitted in the hospital.

Chapter 5

Major Findings

5.1   The attempt in this study has been to bring out the main characteristics of the Government level health care provided in secondary and tertiary hospitals. In highlighting the major findings at the national and stratum levels in this chapter, the limitation of certain geographical undercoverage may be noted. The inter-state differences may also be seen in the light of small sample sizes. However, notwithstanding some loss of precision in the estimates, the signals for the health administrators are clear and unambiguous.

Utilisation

5.2   The secondary and tertiary Government General hospitals in India exhibit fairly high level of utilization as measured by BOR. In particular, contrary to what is happening in most of the developing countries, the smaller secondary hospitals in India are better utilized enjoying high BOR and PTR. Compared to larger sized hospitals, they appear to have some more congestion and at all India level there is no inefficiency due to inadequate utilization of smaller secondary level hospitals.

5.3   The ALS is reasonable at 5.7 days and is comparable to other similarly placed countries. The distribution of ALS across different sizes of hospitals appears to be in accordance with the nature of treatment those hospitals are expected to provide. In general, the ALS is small (4.7) in smaller hospitals and it progressively increases to 10.4 days in larger hospitals which provide predominantly tertiary care, catering to more severe and chronic cases.

5.4   There are however, considerable inter-state differences in the utilization pattern across states. At the global level, the intensity of use by population is below the national average in States where the availability of the Government beds (secondary and tertiary) is relatively less. Assuming that the morbidity pattern is likely to be similar, the low intensity of use in certain states indicates possible unmet demand in those states in a normative sense. At facility level too, there are considerable inter-state differences in the utilization of hospitals.

In as many as 8 states, both the PTR and BOR are low indicating a low level of utilization; in some of these states, the intensity of use of hospitals is low due to inadequate availability of beds. Some of the states where BOR and PTR are very high have relatively smaller private sector presence (Madhya Pradesh typifies sole presence of the Government in the secondary and tertiary health care). The issue of utilization then has to be examined taking into account the availability of secondary and tertiary beds in the non-Government sector, for which data are not available.

5.5   Adequate availability of doctors and nurses at secondary level hospitals seems to be an important factor for high utilization levels in the secondary segment. While smaller hospitals have one doctor for 10 beds, the ratio is marginally better for tertiary hospitals at one doctor for 8 beds. But there appears to be an adverse doctor nurse ratio of 1:2 at the national level. A bias towards deployment of more doctors relative to nurses than what is required, is very evident. Whether this is due to overdependence on doctors or short supply of nurses is not known. There are considerable inter state differences in the doctor-bed and doctor-nurse ratios. But the differences do not seem to have any systematic relation with the level of per capita income of the states. Only in Maharashtra, where the utilization of hospitals is also better, the doctor nurse ratio of 1:5 would seem to be in the realm of what needs to be achieved.

5.6   The productivity of doctors and nurses, measured by inpatient to doctors, in a majority of states with high availability of doctors is low. While in some states a high doctor bed ratio may be due to high outpatient load per doctor, in the remaining states (Assam, Haryana, Punjab and West Bengal) the high availability of doctors indicates a possible over staffing.

5.7   Utilization of hospital beds by specializations indicate a lopsided allocation of beds to different wards. Beds for Orthopaedics seem to be inadequate as a BOR of 178 suggests acute congestion. While there is a need to have some excess capacity in General Medicine and Casualty wards to take care of emergencies and seasonality, the utilization pattern points towards the necessity of a considerable reallocation of beds so as to restore certain parity in the BOR across specialities.

5.8   In the life support facilities, there appears to be an excess provision of ICU beds in smaller hospitals where their utilization is relatively less. Similarly in many of the states where the proportion of ICU beds in the total beds is high, the utilization level is low. Although the ICU is an emergency facility requiring some amount of excess capacity, the utilization situation suggests reallocation of ICU beds in favour of tertiary hospitals. There is considerable scope of down sizing in some States (Uttar Pradesh, Rajasthan, Andhra Pradesh).

5.9   The use of operation theatres is broadly in accordance with the expected pattern , though possible definitional differences apart, slicing down of minor cases in ENT and Orthopaedics wards of large sized hospitals is perhaps necessary.

5.10   The use of diagnostic facilities is also in accordance with the expected pattern. Their intensity of use increases with the size of hospitals. What is interesting is that the productivity of manpower in the larger hospitals is much better. One possible reason for this is very low down time due to adequate maintenance in the larger hospitals. The breakdown time in the largest hospitals for example, of the X'Ray equipment is roughly one-sixth that of the smallest size group. This indicates that, the maintenance budgets for smaller hospitals is relatively inadequate. It is possible to increase the productivity of workers in these hospitals if the down time is reduced.

Financing

5.11   The main thrust of the study was financing of Government General hospitals and its impact on the quality of services. At the global level, an estimated Rs. 852 crores was spent on secondary and tertiary hospitals with an average total expenditure of Rs. 1.52 crores per hospital. 64% of this expenditure was on salaries alone. The large hospitals (1000 beds & above) were spending three times that of the average medium sized hospital and about ten times that of the small. The expenditure distribution was highly skewed with 78% hospitals (small) spending 43% of the total expenditure, whereas the tertiary hospitals constituting less than 5% spent more than 25% of the total expenditure. The survey brings out an expenditure of Rs. 50 thousand per bed and Rs. 840 per patient or about Rs. 150 per patient day. This

varies across hospitals of different sizes. The differences in per bed expenditure between the smallest and the largest size groups is 1.37 which is comparable with what is observed in other similarly placed countries. But what is important is, the cost per inpatient in tertiary hospitals is Rs. 2087 as against Rs. 624 in secondary hospitals due to low PTR in tertiary hospitals[34]. However, the large hospitals are observed to be the best utilised ones when cross classified by expenditure and BOR.

5.12   In terms of composition of spending, the salary cost per bed appears to be the same across all hospitals. What distinguishes the larger hospitals is their higher level of spending on maintenance of diagnostic and other support facilities. In general, richer states are able to spend more on salaries per bed and even more on non salary complementary inputs when compared to poorer states.

5.13   Except for Madhya Pradesh, most of the low spending states have low standardized bed utilization rates and a majority of them have high unit cost per patient. These states would do well to improve upon the utilization rate by reducing the ALS which is generally very high. On the contrary, except Punjab and Goa, rest of the high spending states have high standardized BORs and also slightly high unit costs. There appears to be a weak direct association between utilization and level of spending. This association has to be examined taking adequately into account the influence of other confounding factors such as the presence of private sector.

5.14   An illustrative exercise on alternative price estimates for different fee exemption levels and recovery rates reveals that the hospital prices required to recover 20 per cent of costs even after exempting 50 per cent of patients from user charges, are quite low compared to the per capita GDP (PGDP). At this level of recovery and exemption, an average patient staying in the hospital for a period of the national average length of stay, undergoing diagnostic tests at the observed average rates would have to pay an amount equivalent to

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[34]   While this was the situation in 1992-93 according to the present study, the NSSO survey of 1986-87 pertaining to all types of Government hospitals brought out an average total expenditure of Rs. 643 per hospitalised case in rural public hospitals against Rs. 714 in urban. The average amount of payment per hospitalised case for government hospitals was Rs. 320 in rural areas against Rs. 385 in urban: Sarvekshana, opcit

about 4 per cent of PGDP for non-surgical are and an amount equivalent to about 20 per cent of PGDP for surgical care. Since the poor are to be exempt from payments altogether, the average level of income of the non-poor will be much higher than the PGDP and the burden of fee correspondingly lower. The high cost of surgical care is a cause for concern. This problem can, however, be overcome by cross subsidizing from the low cost non-surgical care. The scope of cross subsidization is considerable since surgical cases account for only about 15 per cent of the total patients admitted in the hospital.

Some Emerging Issues

5.15 From what has been revealed by the survey on the inadequacy of financing *vis-a-vis* inefficient utilisation, the following issues would seem to be important from health financing point of view:

i)   regional inequalities in spending

ii)   identification of the hospital size for facility level creation of additional capacity

iii) identification of the inputs needing attention and

iv)   scope for raising revenues internally

Some fairly definitive answers to these questions can be found using the findings based on quantitative information on utilisation and financing and the qualitative responses provided by the medical superintendents of the hospitals.

5.16 The secondary and tertiary Government hospital beds are unevenly distributed across States resulting in considerable inter-state differences in intensity of visits to these hospitals. The vacuum created by the inadequate availability of beds in certain States (many of them are poor) would have been filled in by the private sector, with consequential adverse implication for welfare given that private hospitals provide care on full cost recovery basis. The direct cost of tertiary care is found to be very high, being about 40 percent of per capita income even in the Government hospitals. Since the provision of health care is the responsibility of the State governments, it is difficult to formulate a national policy that

would bring about a certain parity in the availability of hospital beds across States.

5.17   Clearly, strengthening of smaller sized secondary hospitals ought to come as a priority in order to reduce congestion. Besides, any additional capacity creation should be in smaller sized secondary hospitals again, to minimise the referral cases to tertiary hospitals. Further, the smaller hospitals, if properly manned and adequately provided with finances to take care of the maintenance of diagnostic facilities in particular and complementary non-salary inputs in general, can take a bulk of the referral cases due to their physical accessibility. Since unit cost of care in these hospitals is much less than in tertiary hospitals (and would be so even after adequate funding), it would be cost effective to expand capacity in these hospitals.

5.18   In terms of inputs, there is considerable inadequacy in the provision of non-salary complementary inputs. The problem is more acute in small sized hospitals. This is corroborated by the financial data analysed as well as the qualitative responses of over 75 percent of the medical superintendents of the sample hospitals. The cuts in non-salary inputs have impaired the functioning of diagnostic facilities at smaller hospitals and has had an adverse impact on the overall utilisation of hospital beds. With adequate provision of these inputs, the efficiency of hospitals could be enhanced with very little marginal cost. As far as the physician/nurse inputs are concerned, there is utter need of the rectification of the doctor-nurse ratio which at present is highly biased towards doctors.

5.19   A sizeable number of hospital administrators expressed the view that hospital services should be priced to partially recover the cost in order to supplement the hospital budgets. The issues of how much to raise and the ways in which internal revenues could be raised will have to be examined carefully. Clearly, full cost recovery of hospital costs, in the absence of a social health insurance system, is ruled out as no society expects an individual to meet tertiary health care costs on his own. The risk is generally pooled or the care is provided by the State as in our country. Full cost recovery again, is not feasible considering the direct hospital cost of tertiary care per in-patient which constitutes about 40 percent of per capita GNP (or 5 months earnings approximately).

5.20 To this one has to add other costs, an individual would have to bear viz. loss of wages, travel cost and cost of drugs and other materials, the hospital may not provide and the cost of stay outside his residence. The total cost of tertiary care may exceed the per capita GNP. Therefore, given the level of our income and the absence of any insurance mechanism for a majority of people, only partial cost recovery up to 20% of cost would be feasible and also desirable from welfare point of view. Partial cost recovery would act as co-financing and reduce unnecessary hospital care. It would also augment hospital budgets. This brings us to the next question of how to raise the revenue.

5.21 In the present set up, hospitals have no incentive to raise revenues, as whatever is raised accrues to the funds of the State and not to the hospital budgets. In an attempt to get over this problem (so as to retain hospital revenues), district hospitals in Andhra Pradesh have been handed over to an autonomous agency with partial budgetary support. This could be tried in other States too. Large hospitals could be handed over to stand alone trusts controlled by the Government, as is the case with All India Institute of Medical Sciences, New Delhi and Nizam Institute of Medical Sciences in Hyderabad. The latter was earlier a government facility but subsequently transformed into a non profit trust.

5.22 If however, tertiary care is privatised, as is being mooted in certain quarters, the high cost of tertiary care will have serious repercussion by way of enhancing the cost still further. This would prove detrimental to the welfare objectives in absence of insurance and a proper regulatory authority to check pricing and costs at private facilities.

Methodology, Sampling Design & Quality of Data

1.   The study is based on the data maintained in Government General Hospitals in the form of clinical, non-clinical and administrative & financial records.   No survey was conducted with a view to obtaining primary data.   Considering the resources of both personnel required and the cost constraint it was decided to delimit the universe of government general hospitals to 100 beds and above and to cull the relevant data from the medical records of a sample of secondary and tertiary hospitals for purposes of analysis, the broad objectives being:

i)   to study details of utilisation of facilities e.g. bed utilisation, use of life support facilities, diagnostic facilities, laboratory tests and

ii)   to examine the cost structure on the basis of administrative and financial records of the hospitals.

Methodology

2.   A questionnaire designed to take into account the above objectives was first pre-tested and after suitable changes mailed to the hospitals sampled from the Directory of Government hospitals (1988) in April 1993 in instalments with subsequent reminders at equal intervals. The response rate at the end of June 1993 was a meagre 10 percent.   It was then decided to send trained investigators to the sample hospitals to help the hospital authorities in the task of filling up the questionnaires.   The procedure of selection of the sample as explained in subsequent paragraphs was also refined to conform to the requirements of a probability sample.   The investigators were in the field in the beginning of October 1993 and the collection of data was completed by January 1994, the non-response reduced to 4%.

Sampling Frame

3.   Bearing in mind the differentials in bed utilisation and cost structure of the secondary and tertiary hospitals, the Directory of Hospitals (1988) giving statewise information on

number of beds (as on January 1, 1987) was explored for the purpose of obtaining the sampling frame by size of hospitals in terms of number of the beds. With some initial experimentation based on the number of beds and coefficient of variation, three strata as given below were formed:

Stratum	Number of Beds
1.	100 - 399
2.	400 - 999
3.	1000 & above

4.   The hospitals with 100 & above beds of different types as listed in the Directory were grouped according to the strata (Table 1). Table 1, illustrates that the proportion of number of beds in Government among all general hospitals, increases progressively over the strata. 95% of beds in all tertiary hospitals (stratum 3) and 88% of stratum 2 pertain to Government hospitals. The sampling frame of Government General Hospitals therefore, presented a good enough cross-section of general hospitals for purposes of the study.

5.   Although three-fourths of the hospitals in Government General category had less than 100 beds each, their share in the number of beds was only 23 per cent (Table 2). The secondary and tertiary hospitals therefore, constituted an important segment from the viewpoint of proportion of number of beds (77%), or in other words from the viewpoint of health care. The cut-off point of 100 beds for sampling was therefore, justified.

Sampling Design

6.   A uni-stage stratified sample of 100 hospitals was drawn from the sampling frame of secondary and tertiary Government general hospitals (discussed in the previous paragraph). For this purpose the hospitals in any State were arranged in an increasing order of number of beds to be delineated thereafter into three strata. The three Union Territories of, Chandigarh, Goa and Pondichery had only one hospital each and the same were selected for the survey. Thus the number of sample hospitals planned to be surveyed for 15 major states and three Union Territories was 103.

Allocation of sample

7.　The all India sample of hospitals in the first instance was allocated to the three strata on a joint consideration of the coefficient of variation and number of beds in respective strata. The stratum allocation was further distributed over the States in proportion to the number of beds. It is obvious that a sample of 100 hospitals split into 15 major states would yield an inadequate sample size for individual State. The emphasis in the principle of allocation was therefore, on the stratum sample size.

Selection

8.　Having decided upon the respective allocations to the three strata, the desired numbers were selected from the three separate frames of any State circular systematically with random starts.

9.　There was a shortfall in the sample planned. Due to frame inaccuracy, the hospitals surveyed in Bihar were found to be public sector hospitals and were thus not considered for analysis. There was further, a shortfall of 5 hospitals in stratum 1 and 2 hospitals in stratum 2, due to sparse information supplied or non-response. There was an increase in the sample for stratum 3 by 2 on rectification of the frame inaccuracy. In effect, 94 hospitals were considered for tabulation.

Estimation Procedure

10.　Let y_{ki} be the observation of any characteristic for the ith sample hospital in kth stratum (k = 1,2,3). The estimate of y at any level (State/UT/All India) is given by

$$\hat{Y} = \sum_{k=1}^{3} \frac{N_{ki}}{n_{ki}} \sum_{i=1}^{n_{ki}} y_{ki}$$

where N and n stand for the total number of hospitals and number of sample hospitals.

The estimate of a ratio R = Y/X at any level is given by

$$\hat{R} = \hat{Y} / \hat{X}$$

where $\hat{Y}$ and $\hat{X}$ are obtained at the required level using the formula given above.

Quality of Data

11. The clinical and non-clinical records maintained in hospitals are known to suffer from general apathy and indifference of the medical personnel themselves and in some situations from shortage of adequate statistical staff resulting in use of non-technical staff as substitutes. The forms used are not standardized even though the relevance and importance of the same continue to be emphasized upon in several fora of health planners and administrators. The present survey, keeping in mind the lacunae in hospital records sought to ascertain whether the medical records conformed to the formats specified by the Director General of Health services (DGHS) and if not, whether the hospitals had a Medical Records Department.

12. Out of 94 sample hospitals, 12 did not furnish any information. Among the 82 which supplied the information, for the 38 hospitals that is, 46% the forms as suggested by the DGHS were being used (see Table 13, Appendix II). Out of the remaining 44 hospitals, 50% did not have any Medical Records Department. Thus even in secondary and tertiary hospitals, 27% of the responding hospitals did not have any department for medical records. A sad commentary though, it was possible to obtain minimal information required for the study through the services of investigators deployed for the purpose.

13. The deficiencies of the medical records were reflected in the absence of details for some hospitals, required for the purpose of analyses with respect to utilisation and cost structure of the hospitals. Some of the examples are given below:

    i)   wardwise information not supplied in respect of a) operation theatres b) number of in-patients c) reasons for deterioration in quality

    ii)   non-salary items lumped up

    iii) laboratory tests by departments not fully furnished

The immediate result of such deficiencies in data processing stage was a decrease in the number of samples which in turn, necessitated changes in weights at different levels (stratum) and consequent load on tabulation. The reliability of the results too suffered on this account because of the lowering of sample size.

14.   As mentioned earlier, the State estimates and ratios are subject to a larger sampling error than the stratum estimates and ratios. The sample being a probability one, inferences drawn during the analysis are valid and the study does point out the magnitudes of both the utilisation performance and the efficacy of funding, as measured by the ratios.

Table 1: Number of Hospitals and Beds by type of General Hospital

Size of Hospital (number of Beds)	Government		Private		Public Sector		Voluntary		All Hospitals	
	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds
100 - 399	458 (63.8)	83724 (66.1)	92 (12.8)	13931 (11)	26 (3.6)	4888 (3.9)	142 (19.8)	24035 (19)	718 (100)	126578 (100)
400 - 999	102 (86.4)	64167 (87.8)	8 (6.8)	4351 (6)	0 (0)	0 (0)	8 (6.8)	4525 (6.2)	118 (100)	73043 (100)
1000 & Above	27 (96.4)	28837 (95.4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3.6)	1399 (4.6)	28 (100)	30236 (100)
All Hospitals	587 (67.9)	176728 (76.9)	100 (11.6)	18282 (8)	26 (3)	4888 (2.1)	151 (17.5)	29959 (13)	864 (100)	229857 (100)

Note : Figures in parentheses are percentage to total hospitals.

Source : Directory of Hospitals in India, CBHI, GOI, 1988.

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Table 2: Number of Government General Hospitals and beds by State and size of hospital

STATES		< 100		100 to 399		400 to 999		1000 & above		Total		Proportion of hospitals & beds with <100 beds	
		Hosp.	Beds	Hosp.	Beds	Hosp.	Beds	Hosp	Beds	Hosp	Beds	Hosp	Beds
1.	ANDHRA PRADESH	244	5811	23	4893	6	4381	3	3283	276	18368	88.41	31.64
2.	ASSAM	61	1612	12	1845	1	590	2	2048	76	6095	80.26	26.45
3.	GOA	7	288	3	629	1	437	0	0	11	1354	63.64	21.27
4.	GUJARAT	81	3142	27	4505	4	1965	0	0	112	9612	72.32	32.69
5.	HARYANA	45	1553	13	1920	0	0	1	1074	59	4547	76.27	34.15
6.	KARNATAKA	81	3023	22	5513	9	6086	1	1050	113	15672	71.68	19.29
7.	KERALA	68	3379	55	9055	11	7462	2	2862	136	22758	50.00	14.85
8.	MAHARASHTRA	262	7654	46	9728	18	11856	4	6366	330	35604	79.39	21.50
9.	MADHYA PRADESH	145	3274	45	7571	7	4098	2	2072	199	17015	72.86	19.24
10.	ORISSA	195	3781	13	2143	2	1383	1	1252	211	8559	92.42	44.18
11.	PUNJAB	163	5073	19	2721	3	2258	0	0	185	10052	88.11	50.47
12.	RAJASTHAN	94	2834	30	5767	5	3009	1	1150	130	12760	72.31	22.21
13.	TAMIL NADU	215	6846	42	7148	15	8608	4	1399	276	24001	77.90	28.52
14.	UTTAR PRADESH	110	4241	54	9395	4	2898	0	0	168	16534	65.48	25.65
15.	WEST BENGAL	33	747	54	10891	12	6586	6	6281	105	24505	31.43	3.05
16.	CHANDIGARH	1	30	0	0	2	1294	0	0	3	1324	33.33	2.27
17.	PONDICHERY	1	50	0	0	2	1256	0	0	3	1306	33.33	3.83
	ALL INDIA	1806	53338	458	83724	102	64167	27	28837	2393	230066	75.47	23.18

Source : Directory of Hospitals in India, CBHI, GOI, 1988.

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APPENDIX II

Table 1: Estimated number of selected characteristics by size of hospitals, All India*, 1992-93.

Size of hospital (No of beds)	Number of sample hospital surveyed	Estimated Number of							
		Beds (000)	Bed Days Utilised (lakhs)	In-patients (lakhs)	Out-Patients (lakhs)	Out-Patients / In-Patients	Doctors	Nurses	Doctors / Nurses
1	2	3	4	5	6	7	8	9	10
100-399	41	78.20	279.4	59.20	789.30	13	8199	13938	0.59
400-999	35	57.00	191.9	32.70	350.10	11	4543	13797	0.33
1000 & above	18 .	34.90	112.3	10.80	226.90	14	4036	6953	0.58
Total	94	170.10	583.6	102.70	1366.30	13	16778	34688	0.48

* Excludes Bihar, Himachal Pradesh, Jammu & Kashmir and whole of North-Eastern region except Assam.

Table 2 : Estimated expenditure by size of hospitals, All India*, 1992-93.

Size of hospital (No. of beds)	Number of sample hospitals surveyed	Estimated umber of hospitals	Estimated Expenditure (Rs. Crores)			Average total expenditure per hospital (Rs. Crore)
			Salary	Non-Salary	Total	
1	2	3	4	5	6	7
100-399	41	437	258.27	111.12	369.39	0.84
400-999	35	96	173.20	92.19	265.39	2.76
1000 & above	18	26	126.05	91.25	217.30	8.36
Total	94	559	557.52	294.56	852.08	1.52

* Excludes Bihar, Himachal Pradesh, Jammu & Kashmir and the whole of North-Eastern region except Assam.

Table 3 : Percentage distribution of number of beds, patients and manpower by States, 1992-93

States	No. of Beds	Bed Days Utilised	Number of Patients		Manpower		Beds per lakh pop	Doctors/ lakh pop	Nurses/ lakh pop
			In	Out	Doctors	Nurses			
Andhra Pradesh	7.87	7.90	4.27	7.70	7.88	5.74	19	1.89	2.84
Assam	3.41	3.25	1.70	1.76	4.34	2.06	25	3.17	3.11
Gujarat	2.86	2.46	1.52	3.19	1.83	2.25	11	0.71	1.80
Haryana	1.63	1.54	1.52	1.21	2.05	1.56	16	1.98	3.12
Karnataka	8.29	7.96	4.73	10.08	4.81	4.84	30	1.72	3.57
Kerala	10.45	10.57	8.36	6.20	9.33	9.14	59	5.21	10.56
Maharashtra	11.55	12.21	15.20	6.36	7.84	18.29	24	1.58	7.60
MadhyaPradesh	7.74	9.45	12.37	6.89	7.02	6.42	19	1.67	3.17
Orissa	2.43	2.18	2.20	3.73	2.77	1.82	13	1.41	1.92
Punjab	2.41	2.09	1.72	1.43	3.45	2.59	19	2.73	4.24
Rajasthan	5.30	4.62	5.80	3.94	3.92	4.38	19	1.40	3.25
Tamil Nadu	13.36	16.03	17.23	31.55	15.93	13.42	39	4.63	8.07
UttarPradesh	6.34	5.02	4.03	3.40	6.47	3.69	7	0.74	0.87
West Bengal	15.36	13.62	18.54	11.02	20.24	21.14	36	4.72	10.19
Chandigarh	0.52	0.58	0.32	0.59	1.91	2.48	125	45.77	122.77
Goa	0.11	0.08	0.09	0.09	0.21	0.17	14	2.72	4.39
Pondichery	0.37	0.44	0.39	0.87	0.00	0.00	73	na	na
All India	100.00	100.00	100.00	100.00	100.00	100.00	22	2.19	4.53

Table 4 : Major and minor cases handled in the operation theatre by Departments, 1992-93

Department	Major/ Minor	Percentage distribution		Per 100 in-patients	
		Major Cases	Minor Cases	Major Cases	Minor Cases
A. Tertiary Hospitals (1000 beds and above)					
Surgical	0.52	35.15	43.2	16	31
Dental	0.98	13.48	8.92	3079	3157
ENT	1.26	6.70	3.42	73	58
Eye	2.21	13.81	4.04	34	15
Neurology*	3.84	6.3	1.06	-	-
Obstetrics & Gynaecology	1.14	14.82	8.37	10	9
Orthopaedics	0.20	9.75	31.00	60	297
All Departments	0.64	100.00	100.00	618	958
B. Secondary Hospitals (400 - 999 beds)					
Surgical	0.76	32.76	31.85	24	31
Dental	0.11	4.89	31.59	192	1672
ENT	1.52	7.99	3.90	44	29
Eye	1.07	13.12	9.11	39	37
Neurology*	-	0.77	0	-	-
Obstetrics & Gynaecology	1.90	31.93	12.45	18	9
Orthopaedics	0.57	8.54	11.11	16	29
All Departments	0.74	100.00	100.00	191	258
C. Secondary Hospitals (100 - 399 beds)					
Surgical	0.46	39.78	41.96	21	46
Dental	0.08	3.67	23.44	2	26
ENT	1.06	2.27	1.04	1	1
Eye	1.66	18.46	5.46	10	6
Neurology*	-	0.00	0.03	-	-
Obstetrics & Gynaecology	0.85	28.85	16.71	15	18
Orthopaedics	0.30	6.98	11.35	4	12
All Departments	0.49	100.00	100.00	54	109

* Ratios were not calculated because of very small sample size.

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Table 5 : Percentage share of utilisation of operation theatre by different departments by States, 1992-93

States	Surgical	Dental	E N T	Eye	Neurology	Obstetrics & Gyane	Orthopaedics	All Dept's	Major cases / Minor cases (%)
Andhra Pradesh	43.51	21.92	3.90	10.48	0.97	12.90	6.34	100.00	86.47
Assam	36.44	17.01	4.54	6.07	-	34.36	1.59	100.00	21.53
Gujarat	36.68	35.28	3.34	7.10	1.24	11.08	5.27	100.00	75.05
Haryana	30.55	27.41	2.51	9.02	-	8.01	22.50	100.00	150.35
Karnataka	35.15	36.03	4.39	10.83	-	7.74	5.86	100.00	15.73
Kerala	46.50	3.39	4.74	6.33	-	29.45	9.58	100.00	62.52
Maharashtra	42.44	13.03	4.75	7.94	-	17.57	14.28	100.00	79.93
Madhya Pradesh	35.28	11.84	2.17	17.73	0.32	20.43	12.23	100.00	51.22
Orissa	44.36	15.49	4.30	5.56	-	15.80	14.49	100.00	43.42
Punjab	9.54	62.89	3.40	11.20	-	7.49	5.49	100.00	39.43
Rajasthan	60.00	9.87	2.51	1.43	0.03	15.14	11.02	100.00	31.10
Tamil Nadu	13.51	19.31	4.37	12.97	0.63	44.78	4.42	100.00	85.87
Uttar Pradesh	47.23	18.21	2.89	12.29	0.16	9.54	9.68	100.00	94.38
West Bengal	38.40	5.16	1.25	6.69	2.46	21.84	24.20	100.00	55.89
Chandigarh	16.49	16.88	13.81	20.81	16.86	9.77	5.38	100.00	173.59
Goa	27.65	-	-	10.78	-	56.01	5.56	100.00	41.41
Pondichery	52.49	-	11.65	29.54	-	-	6.32	100.00	16.59
All India	37.25	16.75	3.36	9.46	0.61	21.19	11.38	100.00	53.26

Notes : "-" refers to Data Not available

Table 6 : Percentage distribution of out-patients by disease categogy and by size of hospital, All India, 1992-93

Disease Classification	Size of hospitals (no. of beds)		
	100 - 399	400 - 999	1000 & above
Cardio Vascular	2.00	4.15	2.91
Respiratory	8.92	10.56	2.73
Gastro-intestinal (Total)	6.70	6.26	1.50
Gastro-intestinal (Hepatic)	1.60	0.75	0.01
Central Nervous System	0.81	1.40	7.89
Rheumatology & Immunology	1.62	1.14	7.81
Haematology & Nutrition	5.04	5.61	3.98
Endocronic & Metabolic	0.94	1.49	2.45
Renal Disease	0.58	1.80	0.50
Infection (Total)	9.27	11.05	4.04
Infection (Tuberculosis)	1.97	4.71	3.33
Infection (Diahorrea)	6.03	2.38	0.23
Infection (Malaria)	0.99	3.15	0.02
Infection (Leprosy)	0.28	0.81	0.45
Dermatology & VD (Total)	3.55	2.96	5.25
Dermatology & VD (Sexually Transmitted)	0.15	0.43	0.70
Miscellaneous	60.57	53.56	60.92
Total	100.00	100.00	100.00

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Table 7: Percentage of distribution of in-patients by disease category and by size of hospital, All India, 1992-93

Disease Classification	Size of hospital (no. of beds)		
	100 - 399	400 - 999	1000 & above
Cardio Vascular	6.95	8.02	6.07
Respiratory	19.19	14.56	4.60
Gastro-intestinal (Total)	22.35	12.41	7.48
Gastro-intestinal (Hepatic)	4.16	1.54	0.68
Central Nervous System	4.35	2.50	5.13
Rheumatology & Immunology	4.18	2.55	1.55
Haematology & Nutrition	13.21	5.83	0.61
Endocronic & Metabolic	3.78	1.96	1.74
Renal Disease	7.62	3.97	2.09
Infection (Total)	2.82	5.01	2.40
Infection (Tuberculosis)	7.66	5.15	1.97
Infection (Diahorrea)	13.13	8.40	1.25
Infection (Malaria)	4.15	4.15	0.37
Infection (Leprosy)	1.03	0.19	0.16
Dermatology & VD (Total)	2.60	4.63	1.28
Dermatology & VD (Sexually Transmitted)	0.17	0.08	0.15
Miscellaneous	12.95	38.58	67.05
Total	100.00	100.00	100.00

Table 8: Percentage distribution of Out-Patients by disease cateogry and by States & All India, 1992-93

States	Disease Category Codes																
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Andhra Pradesh	2.77	5.21	7.51	7.16	1.93	11.05	10.56	3.59	0.99	5.02	1.50	2.11	0.90	0.51	6.16	0.85	45.23
Assam	0.91	13.47	1.08	0.09	0.50	0.56	0.61	0.25	0.57	10.71	1.26	9.24	0.02	0.19	6.17	0.01	65.18
Gujarat	1.24	16.92	5.72	0.11	0.71	0.85	11.52	0.53	5.17	30.89	5.47	11.21	13.50	0.72	3.89	0.39	22.56
Haryana	1.37	8.72	1.46	0.04	3.63	2.55	2.72	0.40	1.70	1.58	0.27	1.25	0.04	0.01	7.75	0.00	68.13
Karnataka	2.78	9.89	8.55	0.06	0.19	0.52	2.51	0.24	0.60	5.04	1.50	2.92	0.58	0.04	3.68	0.31	66.01
Kerala	3.43	15.71	7.80	0.63	1.11	3.32	12.54	2.06	0.89	3.99	1.73	2.19	0.00	0.08	0.41	0.11	48.73
Maharashtra	0.29	3.58	2.63	0.06	0.13	0.03	3.85	0.29	1.11	28.06	14.94	0.30	12.79	0.03	1.27	0.12	58.74
Madhya Pradesh	6.48	27.46	8.68	3.90	0.53	2.73	3.92	3.08	0.22	19.34	5.04	9.59	3.22	1.49	2.88	0.09	24.69
Orissa	1.64	23.25	15.55	0.63	0.57	4.89	13.78	0.57	2.71	2.73	1.31	1.12	0.02	0.28	0.60	0.00	33.72
Punjab	0.73	2.62	1.03	0.18	0.10	0.13	0.70	0.33	0.25	5.05	0.34	1.97	1.67	1.06	10.84	0.14	78.21
Rajasthan	2.18	21.40	12.88	1.14	6.07	0.64	12.41	0.34	0.55	7.77	1.69	3.19	2.86	0.03	0.79	0.003	34.96
Tamil Nadu	0.80	1.41	3.13	0.00	0.63	0.00	0.83	0.03	0.04	6.88	1.21	5.53	0.05	0.09	3.36	0.15	82.90
Uttar Pradesh	6.71	14.41	21.88	2.08	1.84	0.77	4.19	0.45	1.56	16.47	4.44	10.67	0.24	1.12	3.95	0.29	27.75
West Bengal	8.30	10.49	9.95	0.08	8.64	2.14	11.88	5.52	2.36	16.65	12.78	2.44	0.12	1.31	0.88	0.34	23.20
Chandigarh	2.61	1.05	0.97	0.43	3.16	0.61	0.15	0.79	1.34	0.20	-	-	-	0.20	4.28	0.06	84.82
Goa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pondichery	-	-	-	-	-	-	-	-	-	4.39	-	3.80	0.57	0.02	13.88	0.05	81.74
All India	2.45	8.70	6.48	1.26	1.46	1.99	4.93	1.11	0.73	8.88	2.47	4.87	1.18	0.36	3.47	0.23	59.81

Notes: "-" refers to Data Not Available.
Disease category codes are described seprately

Disease Category	Code No.
Cardio Vascular	01
Respiratory	02
Gastro-Intenstinal Diseases	03
Gastro-Intenstinal - Hepatic	04
Central Nervous System & Other Neurological Diseases	05
Rheumatological & Immunological	06
Haemotological & Nutritional	07
Endocrine & Metabolic	08
Renal Disease	09
Infection - Total	10
Infection - Tuberclosis	11
Infection - Diarrhoeal	12
Infection - Malaria	13
Infection - Leprosy	14
Dermatological & V.D. Total	15
Dermatological & V.D. - STD	16
Miscellaneous	17

Table 9: Percentage distribution of in-patients by disease category and by States & All India, 1992-93

States	Disease Category Codes																
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Andhra Pradesh	4.27	7.49	19.92	6.93	4.50	6.65	5.15	8.42	5.14	17.69	7.21	8.59	1.09	0.81	3.50	0.00	17.26
Assam	3.99	14.77	4.56	2.21	3.09	1.46	3.38	0.91	5.84	25.07	4.59	18.53	1.95	0.00	3.38	0.02	33.55
Gujarat	2.94	18.72	7.47	0.20	0.94	2.06	5.31	1.57	3.19	37.16	5.90	17.73	13.25	0.29	11.97	0.72	8.66
Haryana	1.19	11.74	33.02	0.15	3.56	0.60	2.83	0.95	3.36	15.85	2.19	13.15	0.49	0.00	0.01	0.01	26.88
Karnataka	10.05	8.67	18.95	1.23	2.04	2.58	2.89	1.11	1.80	13.98	6.13	6.65	0.65	0.55	2.03	0.14	35.91
Kerala	4.62	12.00	9.77	0.29	0.85	1.37	18.04	0.47	1.34	5.15	0.69	4.30	0.03	0.13	0.93	0.05	45.46
Maharashtra	14.55	10.98	12.44	1.21	2.46	1.75	3.71	1.07	3.71	18.12	7.76	8.84	1.36	0.16	3.91	0.08	27.30
Madhya Pradesh	9.17	23.02	7.02	4.99	3.69	3.04	4.99	3.30	0.69	33.93	3.96	15.37	11.84	2.76	4.42	0.00	6.73
Orissa	5.17	7.84	6.58	5.69	3.43	3.25	5.66	0.10	33.65	21.58	5.66	8.79	5.05	2.08	1.70	0.00	11.04
Punjab	5.39	12.56	9.62	1.98	2.73	1.83	1.82	1.75	4.73	14.49	10.46	4.03	0.00	0.00	2.61	0.00	42.48
Rajasthan	4.29	28.18	13.12	5.02	8.17	1.52	10.79	1.26	1.64	16.69	3.11	12.35	1.13	0.11	1.89	0.00	12.44
Tamil Nadu	10.01	6.93	16.98	2.52	3.17	1.30	3.89	2.41	3.53	22.28	11.24	7.44	2.97	0.63	1.17	0.21	28.33
Uttar Pradesh	5.73	15.19	26.31	1.19	2.45	0.95	6.73	0.93	6.98	18.02	5.89	10.57	1.55	0.00	0.08	0.00	16.64
West Bengal	8.70	19.17	19.46	0.74	4.84	4.11	7.58	2.12	5.12	11.96	6.25	4.20	1.46	0.05	0.08	0.00	16.87
Chandigarh	27.15	12.33	24.34	13.61	7.81	3.98	2.38	4.95	6.23	7.86	4.28	2.75	0.34	0.49	2.98	0.02	0.00
Goa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pondichery	-	0.005	12.4908	0.06	-	-	-	-	-	0.39	0.05	0.34	-	-	1.58	-	85.54
All India	6.20	13.78	14.76	2.44	3.16	2.84	7.94	2.48	4.90	17.87	5.30	8.78	3.25	0.54	2.77	0.11	23.29

Notes: "-" refers to Data Not Available.

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Table 10: Selected ratios relating to cost of health care by States & All India, 1992-93

Selected Ratios	Expenditure (Rs.)								
	Andhra Pradesh	Assam	Gujarat	Haryana	Karnataka	Kerala	Maharashtra	Madhya Pradesh	Orissa
1. Total Expenditure/ In-Patient	1426	1000	1565	1737	1315	559	1088	318	645
2. Total Expenditure/ Bed	46717	30207	50152	97895	45275	27035	86556	30742	35142
a. Salary Expenditure/ Bed	31230	24056	33948	60246	33514	18013	48002	16355	25992
b. Non-salary Expenditure/ Bed	15486	6151	16204	37649	11761	9023	38553	14387	9151
i) Transport/ Bed	106	61	517	180	148	23	1099	125	736
ii) Drugs/bed	6109	2931	6391	605	5884	1803	17953	6237	4136
iii) Maintenance(Diagnostics)/ Bed	211	211	247	136	95	248	639	451	408
iv) Machinery Expenditure/ Bed	801	445	2782	17	1125	246	1609	207	24
v) Maintenance(life Support Facilities)/ Bed	2514	175	527	0	36	151	1664	148	306
vi) Food/ Bed	975	1774	1761	54	2581	1565	2537	1924	1532
vii) Other Expenditure/ Bed	4771	554	3978	36656	1892	4987	13052	5295	2009

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Table 10 : Selected ratios relating to cost of health care by States - All India, 1992-93   (Contd.)

Selected Ratios	Expenditure (Rs.)									
	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal	Chandigarh	Goa	Pondichery	All India	All India *
1. Total Expenditure/ In-Patient	1293	923	657	1292	729	13699	1322	989	881	840
2. Total Expenditure/ Bed	55810	61056	51178	49620	53134	508600	71083	62353	53211	50843
a. Salary Expenditure/ Bed	30892	34900	33156	38015	39007	192736	61381	51389	34014	33188
b. Non-salary Expenditure/ Bed	24917	26156	18022	11605	14127	315864	9702	10964	19197	17654
i) Transport/ Bed	213	178	162	162	209	2384	479	125	289	278
ii) Drugs/bed	13876	5891	6659	6260	5793	66886	1320	558	7278	6968
iii) Maintenance(Diagnostics)/ Bed	116	1167	1326	471	1657	0	1257	0	713	717
iv) Machinery Expenditure/ Bed	300	9649	3116	523	204	2667	0	0	1493	1487
v) Maintenance(life Support Facilities)/ Bed	104	887	930	486	1909	0	0	3810	961	966
vi) Food/ Bed	397	1489	2483	598	1974	5952	3211	3886	1855	1834
vii) Other Expenditure/ Bed	9912	6895	3346	3106	2382	237974	3436	2584	6607	5404

"*" - is exclusive of Chandigarh.

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Table 11: Percentage share of components in the total expenditure by States & All India, 1992-93

Item	Expenditure (%) by States								
	Andhra Pradesh	Assam	Gujarat	Haryana	Karnataka	Kerala	Maharashtra	Madhya Pradesh	Orissa
A. Salary	66.85	79.64	67.69	61.54	74.02	66.63	55.46	53.20	73.96
B. Non-salary Expenditure	33.15	20.36	32.31	38.46	25.98	33.37	44.54	46.80	26.04
i) Transport	0.23	0.20	1.03	0.18	0.33	0.09	1.27	0.41	2.09
ii) Drugs	13.08	9.70	12.74	0.62	13.00	6.67	20.74	20.29	11.77
iii) Maintenance(Diagnostics)	0.45	0.70	0.49	0.14	0.21	0.92	0.74	1.47	1.16
iv) Machinery Expenditure	1.71	1.47	5.55	0.02	2.48	0.91	1.86	0.67	0.07
v) Maintenance(life Support Facilities)	5.38	0.58	1.05	0.00	0.08	0.56	1.92	0.48	0.87
vi) Food	2.09	5.87	3.51	0.06	5.70	5.79	2.93	6.26	4.36
vii) Other Expenditure	10.21	1.83	7.93	37.44	4.18	18.45	15.08	17.22	5.72

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Table 11: Percentage share of components in the total expenditure by States & All India, 1992-93 (Contd.)

Item	Expenditure (%) by States									
	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal	Chandigarh	Goa	Pondichery	All India	All India *
A. Salary	55.35	57.16	64.79	76.61	73.41	37.90	86.35	82.42	63.92	65.28
B. Non-salary Expenditure	44.65	42.84	35.21	23.39	26.59	62.10	13.65	17.58	36.08	34.72
i) Transport	0.38	0.29	0.32	0.33	0.39	0.47	0.67	0.20	0.54	0.55
ii) Drugs	24.86	9.65	13.01	12.62	10.90	13.15	1.86	0.90	13.68	13.71
iii) Maintenance(Diagnostics)	0.21	1.91	2.59	0.95	3.12	0.00	1.77	0.00	1.34	1.41
iv) Machinery Expenditure	0.54	15.80	6.09	1.05	0.38	0.52	0.00	0.00	2.81	2.92
v) Maintenance(Life Support Facilities)	0.19	1.45	1.82	0.98	3.59	0.00	0.00	6.11	1.81	1.90
vi) Food	0.71	2.44	4.85	1.21	3.71	1.17	4.52	6.23	3.49	3.61
vii) Other Expenditure	17.76	11.29	6.54	6.26	4.48	46.79	4.83	4.14	12.42	10.63

"*" - is exclusive of Chandigarh.

Table 12 : Percentage distribution of hospitals by ways in which hospital revenues can be raised by States and All India, 1992-93

States	No Opinion/ Suggestions/ Satisfied with the present system	all to be free	Nominal Charges for			Income specific charges for all Services	Establish/ Increase private wards with increased fee	Others #
			Diagnostic services	In Patient Charges	Out-Patient Charges			
Andhra Pradesh	0	0	29	29	86	100	43	43
Assam	0	0	25	25	75	75	75	0
Gujarat	25	25	25	0	25	50	0	25
Haryana	33	0	33	67	67	33	0	100
Karnataka	0	33	67	33	100	67	33	0
Kerala	0	13	38	38	75	25	13	50
Maharashtra	50	13	0	0	0	13	0	0
Madhya Pradesh	0	0	50	17	33	33	33	33
Orissa	0	0	50	100	100	0	50	0
Punjab	0	0	0	0	0	0	50	50
Rajasthan	0	0	40	40	60	40	40	0
Tamil Nadu	67	17	0	17	17	0	33	17
Uttar Pradesh	17	0	50	33	33	50	0	0
West Bengal	50	0	0	0	30	20	20	0
Chandigarh	0	0	100	100	100	100	100	0
Pondichery	100	0	0	0	0	0	0	0
Goa	100	0	0	0	0	0	0	0
All India	23	6	26	23	45	36	25	19

Notes : (1) # - auctioning of used hospital materials, charges for (medical - legal certificates, postmortem, diet, ambulance, parking of vehicles, medicine), and collection of funds through donation

(2) The percentages are based on the effective sample and exceed 100 when added because of multiple reporting.

Table 13: Distribution of sample hospitals according to certain attributes of medical records by States 1992-93

States	Standardised form of DGHS ?		Medical Record Department established ?		Information not Furnished (Nil)
	Yes	No	Yes	No	
Andhra Pradesh	1	5	2	3	1
Assam	1	3	2	1	0
Gujarat	3	0	0	0	1
Haryana	2	1	0	1	0
Karnataka	5	1	0	1	0
Kerala	6	5	3	2	0
Maharashtra	7	0	0	0	1
Madhya Pradesh	2	5	3	2	2
Orissa	0	1	1	0	1
Punjab	2	0	0	0	0
Rajasthan	0	6	4	2	0
Tamil Nadu	2	7	6	1	2
Uttar Pradesh	1	7	0:	7	0
West Bengal	4	2	0	2	4
Chandigarh	1	0	0	0	0
Goa	1	0	0	0	0
Pondichery	0	1	1	0	0
All India	38	44	22	22	12

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Table 14: Percentage of number of Government general hospitals and percentage share of the number of beds in Government general Hospitals.

States	Size (no. of beds)									
	< 100		100 to 399		400 to 999		1000 & above		Total	
	Hospital	Beds	Hospital	Beds	Hospital	Beds	Hospital	Beds	Hospital	Beds
Andhra Pradesh	63.87	59.27	38.33	46.23	100.00	100.00	100.00	100.00	61.20	65.47
Assam	71.76	62.43	63.16	56.87	50.00	57.45	100.00	100.00	70.37	68.48
Goa	10.14	23.24	75.00	86.28	100.00	100.00	0.00	0.00	14.86	56.30
Gujarat	14.21	26.75	56.25	62.15	100.00	100.00	0.00	0.00	18.01	45.86
Haryana	91.84	91.14	81.25	82.76	0.00	0.00	100.00	100.00	89.39	89.19
Karnataka	72.97	71.26	59.46	70.42	64.29	67.58	100.00	100.00	69.33	70.83
Kerala	5.18	12.94	44.35	42.90	68.75	73.98	100.00	100.00	9.35	37.82
Maharashtra	32.67	45.41	56.79	60.34	85.71	87.76	100.00	100.00	36.34	67.37
Madhya Pradesh	98.64	97.44	100.00	100.00	100.00	100.00	100.00	100.00	99.00	99.50
Orissa	91.55	87.46	81.25	83.45	100.00	100.00	100.00	100.00	90.95	89.85
Punjab	86.70	86.63	90.48	87.24	75.00	76.41	0.00	0.00	86.45	84.26
Rajasthan	83.93	85.90	83.33	89.23	100.00	100.00	100.00	100.00	84.42	91.66
Tamil Nadu	87.04	86.42	68.85	68.26	100.00	100.00	80.00	50.00	84.15	80.54
Uttar Pradesh	67.90	70.47	68.35	71.71	100.00	100.00	0.00	0.00	68.57	75.10
West Bengal	30.28	33.13	77.14	77.80	92.31	92.36	100.00	100.00	53.03	82.60
Chandigarh	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	100.00	100.00
Pondichery	100.00	100.00	0.00	0.00	100.00	100.00	0.00	0.00	100.00	100.00
All India	39.60	49.66	63.79	66.14	86.44	87.85	96.43	95.37	44.12	68.24

Source : Directory of Hospitals in India, CBHI, 1988

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Table 15 : Recovery Rate and the range of prices for different hospital services based on sample observations, by States;1992-93

State	Recovery Rate *	Range of prices (Rs.)							
		OPD	General Bed	Special Bed	ICU	X-Ray	ECG	CAT SCAN	ULTRA SOUND
Andhra Pradesh	0.48	FREE	FREE	15-35	FREE	0-45	0-30	0-250	FREE-150
Assam	2.03	FREE	FREE	11.25-60	FREE	FREE	FREE	FREE	FREE-200
Gujarat	0.64	FREE	FREE	40	40	0-5	5-16	FREE	NA-FREE
Haryana	2.00	0-1	0-2.25	5.25-400	5.25-400	0-40	0-1100	750-2000	25-200
Karnataka	1.13	0-2	0-2	0-30	0-30	0-112	0-10	NA-FREE	0-150
Kerala	0.78	0-2	0-5	0-5	0-2	0-15	0-10	NA-FREE	65
Maharashtra	1.73	0-5	0-5	0-80	0-35	0-20	0-15	NA	0-65
Madhya Pradesh	1.92	FREE	0-2	5-35	0-2.5	15-36	10	NA	0-250
Orissa	0.25	FREE	FREE	0-20	FREE	9-12	0-12	NA	NA
Punjab	1.77	0-1	0-5	5-25	FREE	8-30	30	NA	NA
Rajasthan	2.10	0-0.5	0-2.85	0-60	0-3.75	35	0-22	NA	0-50
Tamil Nadu	0.55	FREE	0-8.5	8-36	8.5-36	0-130	8-25	700-2000	0-155
Uttar Pradesh	0.42	1-6	0-2	5-25	0-2	0-40	0-50	NA	NA-FREE
West Bengal	0.57	0-3	0-10	8-300	0-400	0-400	0-20	NA-800	0-400

Note: * Recovery rate = Hospital Receipts expressed as percentage of total expenditure

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Table 16: Rates of different hospital services under different recovery and exemption levels: All-India, 1992-93

RECOVERY RATE	SERVICE	RATES (Rs.) UNDER EXEMPTION LEVELS		
		30%	45%	50%
15%	OPD	3.02	3.85	4.23
	GENERAL BED	6.19	7.88	8.67
	SPECIAL BED	73.41	93.43	102.77
	ICU	40.37	51.38	56.52
	X-RAY	68.61	87.33	96.06
	ECG	77.19	98.24	108.06
20%	OPD	4.03	5.13	5.64
	GENERAL BED	8.25	10.50	11.55
	SPECIAL BED	97.88	124.57	137.03
	ICU	53.83	68.51	75.36
	X-RAY	91.49	116.44	128.08
	ECG	102.92	130.99	144.09
30%	OPD	6.05	7.69	8.46
	GENERAL BED	12.38	15.75	17.33
	SPECIAL BED	146.82	186.86	205.54
	ICU	80.75	102.77	113.05
	X-RAY	137.23	174.65	192.12
	ECG	154.38	196.48	216.13
40%	OPD	8.06	10.26	11.28
	GENERAL BED	16.51	21.01	22.11
	SPECIAL BED	195.75	249.14	274.06
	ICU	107.66	137.03	150.73
	X-RAY	182.97	232.87	256.16
	ECG	205.84	261.97	288.17

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