Chapter V
Analysis And Interpretation

The health scenario in Kerala is characterized by over medicalisation solely encouraged by the magical growth of private hospital sector in the state. This has led to the escalation of cost of treatment of diseases. General utilization pattern of hospitals shows that only around 28.5% of the sick use public health facilities as against 58.01% going in for private medical care. (Kunhikkannan and Aravindan, 2000) A similar trend is reflected in the case of utilization of obstetric care in the state. More than 58% of the obstetric cases take place in private institutions while around 39% of the deliveries take place in public health care facilities.

The study of comparison of efficiencies of private and public hospitals in Ernakulam district was undertaken in this context. Data was collected from selected samples of private and public hospitals using questionnaires. (Details have been discussed in Chapter Two)

Data collected from the hospitals in the district was analysed using Data Envelopment Analysis. DEA is now being used extensively in health literature to study technical inefficiency. This is a LP-based technique for measuring relative performance of organizational units, sometimes referred to as decision-making units (DMU's). DEA is an increasingly popular and practical management tool and is used to identify the 'best' performer or practice (benchmarking).

Data envelopment analysis (DEA) was first introduced in the literature in 1978 (Charnes et al. 1978). It is an empirically based methodology that eliminates the need for some of the assumptions and limitations of traditional efficiency measurement approaches. It was originally intended for use as a performance measurement tool for organizations that lacked a profit
motivation, e.g., not-for-profit and governmental organizations. However, since its introduction, it has been developed and expanded for a variety of uses in for-profit as well as not-for-profit situations.

**Data Envelopment Analysis**

The study uses Data envelopment analysis (DEA) approach to analyse the data. Lovell (1993)\(^3\), cites the argument made by Pestieau and Tulkens (1990)\(^4\) that, due to differences in objectives, public and private providers should only be compared on the criterion of productive (i.e., technical) efficiency because it is “the only objective shared by both types of producer and the only objective not in conflict with other goals of the public producer”.

In light of the points made in the theoretical background of this work, it was essential to use a methodology that could assess and compare efficiency between these two categories of hospitals – private and public. This is where the use of data envelopment analysis became imperative. The other reason for using DEA as an analysis tool was the flexibility of DEA in handling multiple input and output measures, which was required essentially in this study. During the pilot survey, it was found that it is practically not possible to get data related to costs. DEA model does not use the data related to cost, but uses the data for the size of the hospital labour force, the number of beds, the number of patients, and hospital specific/service specific characteristics which are relatively reliable.

**Technical efficiency**

Different efficiency concepts may apply to different levels of the decision-making process. Technical efficiency is, however, a relevant measure of facility performance in this context, since it is concerned with the use that is made of a given quantity of inputs. Technical efficiency implies producing maximum output with given inputs. It measures average productivity attainable at the most productive scale size and this is a pre requisite for cost-
efficiency. (Banker et al., 1984) Under standing technical efficiency will provide meaningful insight in to the optimal allocation of hospital resources.

In the study, efficiency scores of public (government) and private medical institutions were calculated based on Data Envelopment Analysis. The efficiency score of each hospital is thus expressed as a single value which ranges from a maximum score of 1 (one) for the efficient hospital to a score of less than one (above zero) for the inefficient hospital. Having calculated the efficiency score, the explanatory variables were regressed on the efficiency score, by means of truncated regression model. The truncated regression model indicates a relationship between the efficiency score and influencing factors.

**Data and variables**

For the purpose of analysis, several variables were identified and defined. The variables were of three types: input, output and explanatory variables. Variables and their definitions are given in the

The measurement of the variables is done according to the method devised in 'Health Facility Survey - Gujarat 2000 Grant-In-Aid Institutions In Gujarat State' by IIM, Ahmedabad. (Bhat, Verma, Reuben, 2001) The measures adapted in the study were for the comparison of hospitals in Gujarat in general. They had to be adapted to suit this study, which focused in the obstetric care department of hospitals.

An index is devised to measure in dichotomous terms (0 for non-availability and 1 for availability) the presence or absence of the different health care services provided (or equipments) out of a standard list of services (or equipments), where each service (or equipment) in the list of standard services (or equipments) carries equal weightage. The summation of dichotomous data for every hospital is then reduced to a decimal
representation (the index) between 0 and 1, representing the ratio of the number of services (or equipments) provided by a particular hospital to total number of standard health care services (or equipments) that were required to be provided or available.

Input variables

The variables are broadly classified in to capital, labour and technological input. Eleven input variables were defined to measure input variable, common to all hospitals. The level of aggregation or disaggregation of each head (staff, capital or technology) depended on the information available. The break up of total staff strength in terms of the number of doctors, number of nurses, etc., were available, the input variable of total staff strength, under the head of 'staff input' was disaggregated as per information available in to number of gynaecologists, nurses, paramedical staff and administrative staff.

The essential infrastructure like OPD, consultation room, normal delivery room, theatre etc. are measured by creating an index to assess the presence and absence of the standard items of infrastructure (the list included in the questionnaire was arrived at in consultation with the technical personnel and the pilot study). Similarly, the index for basic instruments and facilities like scanning machine, stethoscope, spatula, etc., is created by adding the numbers of functional instruments available in the hospital. The assumption underlying this index is that all hospitals included in this study are homogenous in infrastructure and technological standard as they operate at the same level (only the hospitals with obstetric care department giving basic obstetric care and emergency obstetric care are only considered).

Two measures of capital input are available, a measure based on number of beds per hospital and the expenditure on the maintenance of equipments, machinery, vehicles, infrastructure etc. to measure the quantity of

194
capital investment. In order to measure the quality of service, investment on essential drugs is used. Beds are often used to proxy for capital stock in hospital studies usually because a reliable measure of the value of assets is not usually available.

Staff inputs were measured by total time devoted for attending the patients. The staff involvement is measured by the number of hours devoted to the OP and IP departments and laborotary facilities. The disaggregated measure of staff is derived by using the number of staff days of each type deployed. This measure included gynaecologists, nurses, non-technical staff etc. For this analysis, variables representing the inputs of doctors, nursing staff, infrastructure, equipment and non-technical staff are considered.

Output variables

Hospitals providing obstetric care provide two major services: Out Patient services and In-patient services, i.e., deliveries (normal or caesarean). Given this homogeneity in types of services provided, the number of cases treated/handled under each category was chosen as a representative measure of the three output variables.

Selection of variables

Once the various measures (or variables) and the measurement scales for input and output were derived from the data, the next step involved was identifying the relevant input and output variables, which contribute towards explaining the right input and output measures of the hospital. To identify these relevant variables, a series of stepwise regressions were performed to identify the relation between these variables. The input variables, for which the co-efficient of regression (when regressed with any of the output measures) turned out to be not significant after a regression, were excluded from the final model. This resulted in the elimination of input variable of administrative staff and the drugs/maintenance expenditure.
The explanatory variables consist of two types of variables: quantitative and qualitative. The quantitative variables are explained first.

Obstetric care services are measured through the variables—bed occupancy ratio, nurses' availability ratio, non-technical staff availability ratio, doctor availability ratio, physical infrastructure index and total number of equipments.

In order to measure the quality of services, staff intensity index was created by measuring the number of staff availability per in-patient.

The model was run using various input output combinations.

Analysis and results

A DEA model was run after feeding the input and output variables into the programme. The hospitals were clustered into two types: Government hospitals and private medical institutions and fed into the model for analysis of technical efficiency. The DEA programme used for analysis uses the methods based on the work of Fare, Grosskopf (1997), and Lovell (1993).

As the hospital caters to a similar kind of population and operates at the same level, only CRS model was employed. Since no information was available on the cost of inputs, cost efficiency measures were not employed. DEA was performed with "input orientation". "Input orientation" was used, as the requirements were to identify the inefficiencies in the usage of various input resources of the hospitals under study.
The technical efficiency for the two type of hospitals are given in table 5.1:

### Table 5.1

**Summary of Efficiency**

| Type  | Mean  | Std deviation | Coeff of variation | Minimum | Maximum | Variance | Kurtosis | Skewness | % of hospital with efficiency
|-------|-------|---------------|--------------------|---------|---------|----------|----------|----------|-----------------------------
| Priv. | 0.8197| 0.28080       | 34.26              | 0.19    | 1.00    | 0.079    | -0.193   | -1.199   | 63.6
| Govt. | 0.6648| 0.41939       | 63.09              | 0.17    | 1.00    | 0.176    | -2.717   | -0.398   | 57.1
| Total | 0.7926| 0.30872       | 38.95              | 0.17    | 1.00    | 0.095    | -0.661   | -1.043   | 62.5

The hypothesis is rejected as private hospitals were found to be more efficient than public hospitals.

The efficiency score of 0.8197 (approximately 0.82) for the private hospital indicates on an average that the hospitals could increase the output using the same level of resources or reduce the input usage or input costs by 18% to deliver the same amount of health care. Only 63.6% of the hospitals are able to efficiently utilize their resources. In the case of government hospitals, mean efficiency score is 0.6648 (approximately 0.66), which means that such hospitals could increase the output using the same level of resources or reduce the input usage or input costs by 24% to deliver the same amount of health care. More than 57% of the hospitals are found to have efficiency score of one. When one looks at the coefficient of variation as a measure of consistency of services provided, it can be understood that the efficiency scores of public hospitals are more dispersed than those of private hospitals.

(Figures 5.1, 5.2)
Technical efficiency scores only refer to relative performance within the sample. Hospitals given an efficiency score of one are efficient relative to all the other hospitals in the sample, but may not be efficient by some absolute or world standard necessarily. The plot for individual technical efficiency scores of PMIs is plotted in Fig 5.1. More than 63 percent (63.6%) of PMI were found having efficiency score of 1.

Around 70 percent (69.7%) i.e., 23 hospitals were found to have an efficiency score above 80%. Seven hospitals were showing efficiency below 0.5%, they were found to be hospitals outside the city - in the not-so urbanize areas. This may be interpreted to indicate with fewer medium/large hospital in the not-so urbanized areas, and a resulting higher market concentration geographical markets become less competitive, which, in turn, makes the hospital staff less productive and less sensitive to the efficient allocation of resources. Alternatively, an excess capacity of hospitals in small cities may significantly result in a low occupancy rate, which would be followed by low productivity and low profitability. Probably, this phenomenon has come in t
action in the case of Ernakulam district, where, nearly 18.5% of hospitals have
dlosed down in the city suburbs after 1997.

Fig 5.2

The plot for individual technical efficiency scores of government
hospitals has been plotted in Fig 5.2. Slightly over 57 percent (57.1%) of
government hospitals have efficiency score of 1. There is a wide difference
between the best performing hospitals and the inefficient hospitals. The
efficiency score of the inefficient hospitals is well below 0.3. These hospitals
are those hospitals in the not-so urbanized areas. Efficiency score 1 was
obtained by those government hospitals in the city and its immediate vicinity
and the hospital reserved for maternity care.

Institutional Contributors of Inefficiency

In the second stage, having calculated the efficiency score, the
explanatory variables were regressed on the efficiency score, by means of
truncated regression model. The truncated regression model indicates a
relationship between the efficiency score and influencing factors.
Table 5.2

Regression Scores - Private Medical Institutions

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-.118</td>
<td>.178</td>
<td>-.663</td>
</tr>
<tr>
<td>Bed occupancy ratio</td>
<td>-.417</td>
<td>.403</td>
<td>-1.036</td>
</tr>
<tr>
<td>Nurses availability ratio</td>
<td>.386</td>
<td>.143</td>
<td>2.703</td>
</tr>
<tr>
<td>1 Non technical ratio</td>
<td>-1.512E-02</td>
<td>.067</td>
<td>-.226</td>
</tr>
<tr>
<td>Doctor availability ratio</td>
<td>-.197</td>
<td>.053</td>
<td>-3.695</td>
</tr>
<tr>
<td>Phy ratio</td>
<td>-.221</td>
<td>.144</td>
<td>-1.531</td>
</tr>
<tr>
<td>Eqtotal</td>
<td>.375</td>
<td>.257</td>
<td>1.459</td>
</tr>
</tbody>
</table>

F=2.653, P=.038
R = .616

The model is significant at 5% significance level.

Nurses’ availability ratio has a positive effect on the probability that a private medical institution is efficient. A 10% increase in number of nurse days available, given the number of in-patients, will lead to an increase in the probability of efficiency by 3.86%. It can be perceived that the number of nurse days available (perceived as number of nurses available for service by the customer) has a strong bearing on the concept of amenities available to the customer. In the case of maternal care, the service of nurses become crucially important since the services of an experienced person is highly essential for both the mother and the newborn. Certainty of skilled attention positively influences the choice of the provider.

Doctors’ availability ratio and physical infrastructure ratio - both are having negative influences on efficiency. This could be interpreted in two
First, economies of scale might exist in the case of availability of doctors, which means average productivity of doctors' increases as hospital size (and thus the number of patients) increase. Second, excessive numbers of doctors can be a proxy variable of poor skills in hospital management, which results in inefficiency. Another interpretation could be that, a particular doctor might be a consultant in different hospitals. The profit he gets as a result of the business dealings with different hospitals will also be different. Hence, he might feel inclined to refer more patients for delivery to the hospital/s where he is getting higher share. This might result in the doctor's negative contribution to efficiency.

In the case of physical infrastructure index also, these interpretations would hold good – either that it is because of the action of economies of scale or it is so because of large number of under utilized infrastructure, which is a proxy of poor skills in hospital management. It could also be due to the fact that, once the availability of essential equipments (that is right from a scanning machine to a cardio-tocographic monitor) is guaranteed under one roof, the availability of services of a doctor assumes a secondary position.

The explanatory variable of equipment index is found to have a positive effect on the efficiency of hospitals. As interpreted earlier, a 10% increase in the equipment number would lead to a 3.75% increase in the efficiency of hospitals.

The bed occupancy ratio has a strong negative effect on the efficiency score. It can be due to the fact that economies of scale might exist in the utilization of beds, which means average productivity of bed size increases as hospital size (and naturally, the number of patients) increases. As private hospitals have a large number of beds, for which there is under utilization, the average productivity per bed days tend to be low. For example, in a large and modern hospital, for a caesarean operation, the gut used for stitch could be of
hat kind which is absorbed by the body. In a hospital of a much smaller size
in a hospital where the modern techniques cannot be afforded, the stitches
might require manual removal, which might require a longer period of stay,
adding to bed occupancy for a longer period. Attracting more patients and
improvement of efficiency of management to assure that utilization of
facilities is smooth running will guarantee an increase in the average
productivity in hospital production.

Table 5.3

Regression Scores – Government Hospitals

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-3.839</td>
<td>5.589</td>
<td>-.687</td>
</tr>
<tr>
<td>Bed occupancy ratio</td>
<td>-4.607</td>
<td>5.163</td>
<td>-.892</td>
</tr>
<tr>
<td>Nurse availability ratio</td>
<td>.751</td>
<td>1.727</td>
<td>.435</td>
</tr>
<tr>
<td>Doctor availability ratio</td>
<td>.302</td>
<td>.406</td>
<td>.742</td>
</tr>
<tr>
<td>Phy ratio</td>
<td>-6.203</td>
<td>7.478</td>
<td>-.830</td>
</tr>
<tr>
<td>Eqtotal</td>
<td>10.948</td>
<td>4.567</td>
<td>2.397</td>
</tr>
</tbody>
</table>

\[ F = 2.935 \, P = .415 \]

\[ R = .968 \]

In the case of government hospitals, nurses’ availability ratio, doctors’
availability ratio and equipment availability ratio are found to influence the
efficiency of a hospital positively. Physical infrastructure ratio and bed
occupancy rate are found to influence the efficiency of the public hospital
negatively.

In public hospitals, the number of beds for maternity services is low
when compared to the private hospitals. In the inefficient hospitals there is
under utilization of beds as is shown by a lower rate of bed occupancy and in
the efficient ones, there is over crowding. Either way, the utilization of beds is
not taking place in the most efficient way. High occupancy rates could also be taken to suggest that the problem is more of under-capacity than oversupply. That could be the reason why bed occupancy rate is having a negative impact on hospital efficiency.

Physical infrastructure is seen to contribute negatively to efficiency. In public hospitals, the excessive units of physical infrastructure can be a proxy variable for poor skills in hospital management which results in inefficiency. It is seen that if infrastructure is there, it is either not functioning effectively or the red tapism leads to the inefficient use of the infrastructure. In one of the public hospitals, it was seen that the hospital had purchased a scanning machine. A radiologist was not there to operate the machine. The machine remained idle for almost a year before the authorities could get sanction for appointing a part time, contract doctor to come there and render services.

Nurses’ availability ratio is contributing positively to efficiency. As discussed earlier, in the case of maternal care, the service of nurses becomes crucially important since the services of an experienced care-provider is highly essential for both the mother and the newborn.

Doctors’ availability ratio is a positive contributing factor. In the private hospitals, the economies of scale and the economical decisions of the management might lead to the availability of service of a much smaller number of doctors. In government hospitals, a minimum number of doctors’ posts will be there and they will be available there. Since the area of study was Ernakulam district, the city with the largest density of urban population, all the doctors appointed to these hospitals were found to be attending duty. Almost all the taluk hospitals considered are located in urban areas. (This is not the case in rural areas where, the appointed doctors go on long leave, as they are not prepared to live away from the so-called ‘civilisation’.) Cost, (here, the doctor’s fee) is definitely the most important factor, but since that is not
considered here, no assured comments can be made on it. But it can be
definitely surmised that a considerable number of patients coming to the
doctor for ante natal check-ups will definitely come to the hospital for
delivery. This contributes positively to the efficiency of hospitals.

Equipment index was also found to contribute positively to the
efficiency of hospitals. This points towards the efficient utilization of the
equipments available. Probably, this has a bearing on the efficient functioning
of doctors and nurses.

Ratio analysis

The simplest way of measuring efficiency is through the use of simple
ratios, such as staff intensity ratio, bed occupancy ratio, etc.

A t-test was conducted to compare the means of explanatory variables
like bed occupancy ratio, nurses availability ratio, non-technical staff ratio,
doctors availability ratio and ratio of number of OP handled. A t-test is
calculated to determine whether two sample means are equal.

The explanatory variables considered for comparison of means are bed
occupancy ratio, nurses’ availability ratio, non-technical ratio, doctors’
availability ratio and number of OP cases handled by the doctor per week.

Bed occupancy ratio is calculated as ratio of total number of inpatient
days to bed days. Bed days are calculated by multiplying the number of beds
per hospital by three sixty-five days. Bed occupancy ratio is the ratio of total
number of inpatient days to bed days. Nurses’ availability ratio is calculated as
a ratio of number of inpatient days to nurse days. Number of nurse days
available is the product of the number of nurses and number of days they are
available. Non-technical ratio is the ratio of inpatient days to non-technical
staff days available days. Non-technical staff days, again, is the product of
number of non-technical staff available and number of days they are available. Doctors’ availability ratio is the number of inpatient days to doctor days available. Doctor days is got from multiplying number of doctors and number of days they are available. The next explanatory variable is the number of OP cases handled by the doctor per week. The comparison of means of all the explanatory variables is calculated. This is shown in Table 5.4.

Table 5.4

| T-Test Results |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| **Hospital**    | **N** | **Mean** | **Std. Deviation** | **t** | **df** | **Sig. (2-tailed)** |
| **Bed occupancy ratio** | | | | | | |
| Private | 33 | .1119 | .23164 | -.570 | 38 | .572 |
| Government | 7 | .1690 | .28462 | | | |
| **Nurses availability ratio** | | | | | | |
| Private | 33 | .9242 | .76597 | 1.222 | 38 | .229 |
| Government | 7 | 1.4201 | 1.70118 | | | |
| **Non technical ratio** | | | | | | |
| Private | 33 | 1.4342 | 1.57043 | .411 | 38 | .684 |
| Government | 7 | 1.1478 | 2.15405 | | | |
| **Doctor availability ratio** | | | | | | |
| Private | 33 | 2.0968 | 2.27331 | -.835 | 38 | .409 |
| Government | 7 | 2.9714 | 3.53976 | | | |
| **NOOPD** | | | | | | |
| Private | 32 | 42.1875 | 29.31854 | 6.489 | 37 | .000* |
| Government | 7 | 141.1429 | 61.61014 | | | |
| **Physical infrastructure ratio** | | | | | | |
| Private | 33 | 1.2991 | 0.74436 | 3.44 | 38 | 0.002 |
| Government | 7 | 0.3685 | 0.2349 | | | |
| **Equipment Total** | | | | | | |
| Private | 33 | 0.4711 | 0.37418 | 0.537 | 38 | 0.595 |
| Government | 7 | 0.3925 | 0.1922 | | | |

* significant

When the staff availability ratio of the public hospitals is compared with that of the private hospitals, we can see that the availability of the staff is less for the public hospitals. To put it in other words, the staff of public hospitals can be seen over strained or over utilized. When for each nurse day, there is an average service of 1.42 inpatients rendered in public hospitals, the
same ratio is just 0.92 for the private hospitals. So the ‘service ratio’ (which could be defined as the number of in-patients served per staff day available) is higher for public hospitals. This must be contributing positively to the assessment of advantages of the hospitals. They will naturally think that nurses would be readily available in the private hospitals vis-à-vis public hospitals.

In the case of doctors also, the same over utilization can be seen. The number of in-patients attended to by a doctor comes to approximately three when the same ratio is around two for private hospitals. This will, as far as the patients are concerned, guarantee personalized service when compared with public hospitals. It is not the case with non-technical staff ratio. Analysis reveals that the public hospital is better equipped with a more relaxed service ratio (one staff attending to 1.15 in-patients compared with private hospital, where each non-technical staff has to take care of 1.43 inpatients). In the case of number of outpatient cases handled by a doctor per week, there is a very significant difference between the private sector and the public sector. The number of outpatient cases per doctor per week is found to be 141.14 in the case of public hospitals as against of 42.19 cases in the private sector. The scale of difference is much lower than the in-patient (in this specific case, number of deliveries) servicing (where it is three patients per day as against two per day).

Beds can be viewed as an all-encompassing basic input for those hospitals providing inpatient facilities because the expansion of other inputs revolves around this key input.

Bed occupancy rate is 0.11 for the private sector as against 0.17 for public hospitals. Number of in-patients per bed days is 0.11 for private hospitals. To put it otherwise, 0.11 patients are served per bed day in a private hospital as compared to 0.17 patients per bed day in a public hospital.
High occupancy rates and turnover rates could also be taken to suggest that the problem is more of under-capacity than oversupply.

When the infrastructure and equipment availability are concerned, the private sector is at a much better position when compared to the public sector. Index of physical infrastructure (which shows the availability of physical infrastructure per hospital) in private sector is 1.2991 vis-a-vis 0.3685 in public hospitals. This shows that the private hospitals are in a far better position as far as the infrastructural facilities are concerned. This is proved when we compare the amount going in to the annual maintenance expenditure. The amount, on an average, earmarked for maintenance expenditure in private medical institutions alone is thirty times the amount, on an average, earmarked for maintenance in public hospitals. Maintenance forms only a part of infrastructural facility, as it is solely concerned with the retaining of productivity of existing equipments.

Index of total number of equipments (which shows the total number of equipments per hospital) is 0.4711 in the private sector vis-a-vis 0.3925 in the public hospitals. This is proof to the fact that the availability of equipments is higher in the private sector when compared with the public sector.

Summary of findings

From the series of analyses performed on the data collected, it is clear that the private hospitals are definitely in a better position as far as the technical efficiency is concerned.

As regards the technical efficiency, the attempt is to look at the provision and utilization of obstetric care services from the providers’ perspective. The problem is the most efficient utilization of the facilities provided. The nurses availability ratio and equipment index are found to contribute positively to both public hospitals and private hospitals. This could
be due to the essentiality of the particular staff and also equipments in the case of obstetric care. The process of delivery, which consumes an average of four to five days of hospital confinement in a woman's life, has now a days become high-tech in nature. The process of delivery has become highly equipment-centered. Even in the absence of a qualified medical practitioner, the experienced staff (nurses) can keep efficient vigil with the help of the equipments. Foetal and maternal distress can be detected and monitored even in the absence of a doctor and timely intervention can be precisely planned by the time the qualified medical practitioner arrives.

Doctors' availability is another positive contributor to efficiency as far as the public hospitals are concerned. This is due to the negligibly paid service available in the public hospitals. It is only natural that the poorest of the poor still have only one resort – the public hospitals. Medical care is highly physician centered. In the case of government doctors, they belong to the 'private in public' segment of providers. So they assure that whoever is approaching them for OP consultation, will be their clients till term. The availability of beds (which cannot be guaranteed other wise) are guaranteed for such patients. In the private sector, economies of scale, economy measures of the management and multiple-hospital consultancy of gyanaecologists together makes it a negative influence on the efficiency of hospitals. The other factors like non-technical ratio, bed occupancy ratio, and physical infrastructure ratio are found to have a negative effect on efficiency of hospitals.

The poor performance of the public hospitals can be well justified with the fact that the capital expenditure going in to the health sector is getting reduced year after year. The combined contribution of the government and the hospital development societies is not found enough to pull up the public institutions to a satisfactory level of functioning.
When the essential staff ratio of the private hospitals are compared with those of public hospitals, the customers are found better disposed in the case of private hospitals. When the doctors in the private hospital take care of 2.09 in-patients per doctors' day, those in the private hospitals take care of 2.97 in-patients per doctors' day. This may not be due to the over-supply of patients. This could be so because, as far as the number of doctors available is concerned, there is an under capacity with respect to the hospital. Another possible factor is that, in government hospital recruitment of doctors do not take place that often. The strength of staff does not increase that often. It is already discussed that even though the salary component of health expenditure rose, it did not result in increased staff strength. Manpower in the government allopathic system declined or remained static during the 1990s while the bed strength grew moderately. (Kutty.VR, 1999)9

When the nurses on an average take care of 0.92 inpatients per nurse day, those in the public hospitals take care of 1.42 in-patients per nurse day. This could be due to the fact that there is an excess number of nurses in the private sector as against the public sector. This is a case of exploitation of labour. The nurses, in the public sector, on an average, take home a salary of around rupees six thousand per month. It has to be noted that they are all graduates in nursing care. In the private sector, the hospitals are found employing nurses, who are only diploma holders, for an average salary of around two thousand per month. So, naturally in the place of one nurse in the public hospital, a private hospital can employ at least three more nurses. Another trend found in the private hospitals is that, most of the large hospitals have nursing schools run by them. The students joining the course are forced to execute a bond assuring the management that they will serve the hospital for a specified period of time on payment of a stipulated stipend. All these add to the total number strength of the 'nurses' force' (sans proper qualification) in the private medical institution.
As far as non-technical staff is concerned, in the private sector, 1.4 inpatients are served per staff day as against 1.1 in-patients per staff day in the public sector. But this is not a very significant difference. It can be interpreted that the doctors, the nurses and beds remain underutilized in the case of private hospital, or that there is idle capacity in the case of private hospital.

The comparison of mean values of explanatory variables show that there is an over-utilisation of facilities in the public sector as compared to the private sector. The available resources are found maximum utilized in the government sector. As the efficiency score clarifies, this cannot be a final test for efficiency. It can be confirmed that the over utilized facilities offer low quality care. High occupancy rates and turnover rates could also be taken to suggest that the problem is more of under-capacity than oversupply. One doctor for every ten beds is the usually observed ratio seen in other countries. According to the study in Ernakulam, in the public hospitals, it is seen to be one doctor for 17.5 beds and one doctor for 19 beds in private doctors. Bed-nurse ratio was found to be 8.25 for private hospitals and 8.4 for public hospitals. This stands well against the state average of 8.3. Bed to other staff ratio is normally 4.2 according to international trend.

The number of OP cases per doctor per day is an indicator of the average productivity of doctor. (Varatharajan et al, 2002) A doctor in the public sector has 141.14 OP cases per week as against 42.19 cases per doctor per week in the private sector. In-patient turnover is two per doctor for private sector while it is three per doctor in public sector. Even then, it is seen that only around 5626 deliveries take place in the public hospitals when 30,234 deliveries take place in the private sector. This might be due to the fact that those coming to the government doctor for antenatal check up might go to private hospital for delivery. This ratio is seen contributing negatively to the efficiency of private hospitals (may be, due to economies of scale, economy measures of the management, which restricts the number of doctors, or the
consultancy of the same doctor in many hospitals) and positively to the efficiency of public hospitals (the contributing factor could be the negligibly paid service along with the assurance that the clients of the government doctors belonging to the private in public category go only to them for delivery).

Since health is a state subject, state’s policies and financial soundness greatly influences the evolution and strength of the health system. As mentioned earlier, Kerala’s fiscal deficit, public debt and debt servicing have crossed all acceptable limits during the 1990s. Persistent economic stagnation, growing unemployment and an acute fiscal crisis in Kerala are raising serious doubts about future health prospects. (Varatharajan, 2004)  

A steep increase in the salary component in the revenue expenditure led to a cut back on supplies and maintenance; the cutback was felt heavily by the district and taluk hospitals, which formed the sample of study (Kutty, 1999). Capital expenditure as a proportion of total government health expenditure also dropped to 3.3% in 2002-03 from 7% in 1994-95; and it was estimated that it might decline further to 2.8% in 2003-04. The share of government health expenditure per se has come down from 1.46% of GSDP in 1992-93 to 1.17% in 2001-02. Health’s share in total government maintenance expenditure has come down from 1.39% in 1990-91 to 0.78% in 1999-2000. Its share in total revenue expenditure came down from 40.12% in 1990-91 to 25.83% in 1999-2000. Hence, an increase in government health expenditure did not lead to the non-salary component.

Even though the salary component of health expenditure rose, it did not result in increased staff strength. Manpower in the government allopathic system declined or remained static during the 1990s while the bed strength grew moderately. Therefore, the increase in government expenditure failed to improve healthcare access to the people for whom the public health care
system exists. Therefore, one can come to the conclusion that high occupancy rates and turnover rates of the government institutions, as shown by the data, could be taken to suggest that the problem is more of under-capacity than oversupply. Hence, an increase in budgetary allocation to health is a necessary, but not a sufficient condition for better health care.

Whatever be the staff service ratios, equipment index or the physical index indices, the effective utilization pattern, is ultimately influenced by factors such as the feeling of provision of adequate care in private hospital, physical accessibility, behaviour of staff and doctors, etc.

In a study conducted on the preference for private sector in Andhra Pradesh in 2002, the respondents, who were patients, gave a positive rating to the doctor's attitude, timely availability of service and other advantages in the private sector.
The Private sector is preferred in Andhra Pradesh, India

A study of consumer and producer attitude was conducted in six districts in the southern India state of Andhra Pradesh. The study included 72 in-depth interviews and 24 focus groups.

<table>
<thead>
<tr>
<th>Private</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATTITUDES OF DOCTORS</strong></td>
<td><strong>ATTITUDES OF DOCTORS</strong></td>
</tr>
<tr>
<td>&quot;They speak well, inquire about our health.&quot;</td>
<td>&quot;Does not talk to me, does not bother (about my feelings or the details of my problems)&quot;</td>
</tr>
<tr>
<td>&quot;Ask about everything from A to Z&quot;</td>
<td>&quot;Don't tell us what the problem is, first check give us medicines and ask us to go&quot;</td>
</tr>
<tr>
<td>&quot;Look after everyone equally&quot;</td>
<td>&quot;They are supposed to give us Rs. 1000 and 15 kg of rice for family planning operations; they give us Rs. 500 and 10 Kg rice and make us run around for the rest&quot;</td>
</tr>
<tr>
<td>&quot;They take money ... so give powerful medicine .... treat better.&quot;</td>
<td>&quot;Any how they will get their money so they don't pay much attention&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONVENIENCE</th>
<th>CONVENIENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Treat us quickly ...&quot;</td>
<td>&quot;Do not attend to us immediately&quot;</td>
</tr>
<tr>
<td>&quot;We spend money but get cured faster&quot;</td>
<td>&quot;Have to stand in line for everything&quot;</td>
</tr>
<tr>
<td>&quot;I know Mr. Reddy. He is a government doctor but I go to him in the evening&quot;</td>
<td>&quot;Doctor is there from 9a.m. to 4 p.m. _when we need to go to work&quot;</td>
</tr>
<tr>
<td>&quot;Can delay payment by 5-10 days. He is OK with that, he stays in the village itself&quot;</td>
<td>&quot;I have not been there, but seeing the surrounding ... I don't feel like going&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COST</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Recent expenses came to Rs. 500 for 3 days ...had to shell out money immediately&quot;</td>
<td>&quot;While coming out, compounders ask us for 10-20 Rs&quot;</td>
</tr>
<tr>
<td>&quot;We have to be prepared to pay, you never know how much it is going to cost you&quot;</td>
<td>&quot;Any how, we have to buy medicine from outside&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>ADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Even if I have to take a loan I will go to private place, they treat well&quot;</td>
<td>&quot;Malaria treatment _they come, examine blood, give tablets&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;For family planning operations&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Polio drops&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;In case I do not get cured in private hospital, but it is very rare&quot;.</td>
</tr>
</tbody>
</table>


This environment of the perceived inefficiency of the Government medical facilities is one of the factors that provided the impetus for the growth of the private medical care set up in the state. The social milieu of the state is changing and features of a consumer society are visible in all occupations. This has led to the commercialization and the commodification of health care. Health is no more seen as a right but as a commodity to be purchased by money. The huge remittance of foreign exchange from gulf countries even to
the low and middle-income group houses further reinforced this attitude. All these tendencies are leading to a virtual uncontrolled growth of the private medical care facilities in the state. (B.Ekbal, 2000)\textsuperscript{13}

---

References


6 Ramesh Bhat, Bharat Bhushan Verma, Elan Reuben, July 2001 ‘An empirical analysis of district hospitals and grant-in-aid hospitals in Gujarat state of India’, Indian Institute of Management Ahmedabad Paper prepared as part of the capacity development effort of Health Policy Development Network (HELPONET), India


8 Lovell, C. A. K, 1993, op.cit

214


Kutty, V.R., 1999, op.cit