CHAPTER VII
SUMMARY AND CONCLUSION

In this thesis, we tried to examine three aspects relating to health sector in general and secondary level district hospitals in particular in Andhra Pradesh (AP). Two of these are relating to hospital performance and efficiency, and the third one to financing health services. The performance of secondary level hospitals in AP was evaluated through combined utilisation and productivity analysis, a managerial technique, and hospital efficiency through estimation of hospital cost functions, a technique that is commonly used by health economists and policy makers in recent times. The financing aspect was examined through a theoretical discussion accompanied by a field study to assess the feasibility of introducing user fees as an alternative to government financing of health services.

The results of evaluating hospital performance and efficiency are broadly in agreement with similar studies for developing countries, namely public hospitals do suffer from the problem of low performance and allocative inefficiency. The theoretical arguments of health services financing and the empirical results from a case study, though preliminary in nature, do not seem to support the introduction or expansion of user fees in secondary level district hospitals of Andhra Pradesh. The details are as under.

As a background to the present study, in Chapter I we gave a brief outline of health sector in India and Andhra Pradesh. The efforts on improving health sector by the Government of India as well as AP during each five-year plan were also assessed. The need for the present study was justified. The chapter ended with the two broad objectives...
of the present study, namely evaluating the performance/efficiency of secondary level hospitals in AP and examining the viability of introducing user fees in these hospitals.

In Chapter II, we gave a brief review of the past studies on health sector performance/efficiency in general and hospitals in particular. In addition, the issues related to financing of health sector were mentioned briefly. The studies on health sector performance and efficiency were grouped on the basis of countries as well as methods/issues. As far as country-specific studies are concerned, it was observed that there are many studies for developed countries focusing on the issue of hospital performance and efficiency. In this process, there has been a substantial improvement in the methods of evaluating efficiency. Unfortunately, there were not many studies for the developing countries.

In Chapter III, we presented a detailed outline of the methods that are used for evaluating hospital performance and efficiency. Among the methods used for evaluating hospital performance and efficiency, we came across the method of cost accounting, ratio analysis, combined utilization and productivity analysis, econometric estimation of production and cost functions and data envelopment analysis. Though each methodology has its merits and demerits, it was found that econometric method was more commonly used for efficiency evaluation both in developed and developing countries. The reasons are understandable. The econometric methods address issues of interest to economists, such as economies of scale and scope, product specific cost elasticities, in addition to assessing allocative and technical efficiency. Moreover, other methods require detailed data on several variables that are not easily obtainable from the hospitals of developing and developed countries. In spite of the usefulness of this method, we have not come
across any published study in India. Therefore, the specific objectives of the present study were (1) to evaluate the performance of secondary level district hospitals in AP through the application of CUP analysis. (2) to analyse the hospital efficiency using econometric estimation of cost functions, and (3) to assess the issue of hospital financing from theoretical as well as empirical perspectives.

In Chapter IV, we gave a brief history of Andhra Pradesh Vaidya Vidhana Parishad (APVVP), which is the nodal agency for funding and monitoring secondary level district hospitals in AP. A brief discussion on the hospital statistics data used for the empirical analysis of this chapter is also given. We then tried to evaluate the performance of secondary level hospitals using combined utilisation and productivity (CUP) analysis. CUP analysis was carried out for each category of secondary level hospitals, namely community, area and district level hospitals, separately for each year during 1991-96 as well as combined. The methodology followed is similar to Lasso (1986).

The results of this analysis supported the general perception, namely low performance and wide differentials in performance indicators across hospitals in each category. Variability of bed occupancy rate (BOR) and bed turnover rate (BTR) was much higher than average length of stay (ALS). A large number of the hospitals are either in low turnover and low-occupancy group (about 30-3.5%) or high-turnover and high-occupancy group (about 42%). Although the trends are not systematic, there is a tendency of the hospitals moving towards low utilisation and low productivity region over the years. This indicates that the secondary level hospitals in the state of AP are associated with low performance and facilities. This result is similar to that of Mahapatra and Berman (1994), who have studied the secondary level health care system in AP during
1989-90 It may be added that the methodology of CUP analysis could be used as a managerial tool for quick identification of low performing hospitals. The low performing hospitals could further be investigated for finding out the appropriate reasons for their low performance. However, major economic decisions could not be made on the basis of the results from CUP analysis.

In the same chapter, as an extension to CUP analysis, we also tried to identify the possible determinants of hospital performance indicators (BOR and BTR) using multiple regression technique. In the absence of appropriate data on the demand and supply sides of hospital services (output), we treated BOR and BTR to represent these forces. Further, we used the same set of determinants for both BOR and BTR. It was found that, in the case of community level hospitals, where the data is rich enough, these determinants have played a significant and expected role in explaining the variation in both BOR and BTR. Due to limited data available for area and district hospitals, some perverse responses were noticed. Among other things, factors such as disease incidence pattern, geographical location, socio-economic conditions of the people surrounding the hospital, proximity of the hospital to the locality etc. play an important role in determining the utilisation and productivity of the secondary level hospitals. These factors seem to play a greater role in the case of district and area hospitals compared to community hospitals.

The objective of Chapter V was to evaluate the efficiency of secondary level district hospitals through econometric estimation of cost functions using pooled time series of cross-section data for 1995 and 1996. We used five types of cost functions, namely simple cubic cost function, flexible hybrid cost function, and three variants of translog family (Cobb-Douglas, Logarithmic-quadratic and translog cost function) for
this purpose. For each of the cost functions, we estimated factor shares, factor levels, factor ratios, marginal cost, economies of scale and scope, Allen-Uzawa elasticity of substitution etc.

In addition, the simple cost function was used to determine the shape of total, average and marginal cost curves for one particular output, namely inpatient days of the district hospitals in AP. The marginal and average cost curves exhibited their usual 'U' shape as expected. Unfortunately, the total cost function seems to violate the monotonicity property. This violation may be due to cross-section nature of the data and the heterogeneity of hospital services in our study. From the average cost curve, we traced the minimum point in order to find out the optimum values of output and cost. A comparison of the optimum values across the hospitals shows that there are only four hospitals (Eluru, Cuddapah, Anantapur, Nizamabad in 1995 and Eluru in 1996) which are near to the optimum values of output and cost. The hybrid cost function also gave similar results.

The estimated factor-shares, levels, and ratios differ significantly from their respective observed values. It is well known from microeconomic theory, that a wide difference between the observed and estimated factor levels indicates allocative inefficiency. Thus, from the empirical results, we find that many of the secondary level district hospitals in AP seem to operate under allocative inefficiency of varying degree. This result is also invariant to cost function specification. Overall results show that the district hospitals in AP over invest on manpower and under invest on other necessary inputs like drugs, materials, equipment and food. We may point out that the observed inefficiency could also be due to market imperfections, particularly, in factor markets,
rather than wrong decision-making by the hospital administrators. It is also possible that cost minimisation may not be the sole objective of these public hospitals.

Based on summary measures such as mean absolute percentage error (MAPE) and root mean percentage error (RMPE), it was found that the full translog cost function predicted the factor shares, levels and ratios more closely than the other two variants of translog family. The performance seems better for 1995 than for 1996. The nested likelihood ratio test has also shown that the translog model stands out at the best model statistically. However, for all the estimated models, we computed the marginal cost of each output category in each of the sample hospitals. For some of the outputs, the marginal cost was negative, implying violation of monotonicity property. As a result, the product specific cost elasticities were also negative for such outputs. Using product specific cost elasticities, we estimated the overall economies of scale. We noticed a high degree of overall economies of scale in the provision of hospital services in AP. Further, this result was independent of the specification of cost function. The estimated economies of scope between different pairs of outputs also show a high degree of scope in producing the outputs jointly rather than individually.

Chapter VI of the thesis discusses alternative ways of financing health services in the state of Andhra Pradesh. Towards this end, first few sections of this chapter were devoted to recapitulate the current theoretical discussions on health sector financing. Here, we discussed the nature of health-care good, its provisioning and financing sources. It was concluded that the preventive health services must be financed through government sources, whereas for the curative services, in addition to government financing, other alternative sources may have to be identified. In this context, a brief
discussion was made on the alternative methods of financing the curative services in some of the developing and developed countries. It was traced that 'user fees' seems to be the more frequently used way of financing the curative health services in many countries. Therefore, an attempt is made to look at the viability of imposing user charges for the curative health services in AP.

Our examination of feasibility of imposing/expanding user charges has two steps. First, through a brief assessment of the pattern of government health expenditure for the state of AP. Second, an investigation of the demand side factors associated with hospital care by a field study. The health expenditure analysis shows that the level of real expenditure on health and health-related services in AP has increased appreciably over the period, 1983-84 to 1995-96. However, its share out of government expenditure has not increased much. The expenditure on primary health care seems to be higher compared to expenditure on hospitals, medical education and training, and alternative systems of medicine. Greater emphasis on primary health care, which is mostly preventive care, is consistent with the objective of achieving 'health for all by 2000'. However, the per-capita annual expenditure on health was found to be much below the WHO norm of US$15. Therefore, given the budgetary constraint of the government for allocating additional resources, there exists the need for supplementing, if not fully self-financing, the curative health services in AP.

The idea of user fees started with the birth of APVVP itself in 1986. But, it never took off. The share of user fees out of health expenditure has still hovered around 1% in 1995 and 1996 across all district hospitals. In the field study, we looked at two major aspects that are closely connected to the imposition and collection of user fees, namely
the socio-economic profile of the hospital users and the quality of care provided by the hospital. The study had a sample of 125 inpatients and 125 outpatients from Karimnagar district hospital in AP.

It was found that most of the hospital users were either from lower or lower-middle class, with monthly household income between Rs. 1500-3000 in 1995. Almost all the hospital users were either illiterate or had education below secondary-level. Further, the quality of care, as perceived by users, is merely satisfactory and does not merit any worthwhile fees. Most of the recurrent inputs such as medicines & drugs, dressing materials, and other consumables including food, were found to be severely underfunded, thereby implying low quality of care. Likewise, though the patients seem to be somewhat satisfied with the services of the doctors, nurses and other medical staff, the same is not true with basic facilities such as water supply, sanitation and cleanliness. In almost all the cases, patients seem to be tolerant of these facilities due to their low economic condition. Therefore, it is concluded that user fees is justified only if there will be significant improvement in all the above mentioned aspects.

Another way of justifying the user fees may be on the basis of whether the patients bypassed the lower level facility before coming to the district hospital. If the patients bypass the lower level community and area hospitals, a penal charge may be levied. Like the existing user fees, this may not result in any significant cost recovery. Moreover, patients claimed that they had no option but to bypass lower level facilities because of either non-availability of the required service at community/area hospital or the severity of the illness requiring speciality treatment. If this were true, then there is no justification for penal levy either. Thus, from all counts, imposition of user fees may not
be justified as matters stand. Then, what are the possible ways of meeting the health sector expenditure? Two suggestions come to our mind.

(a) Restricting the government run facilities for the poor. This may help in reducing the number of nursing and other staff, the savings from which can be spent in strengthening the lower level facilities that are cost effective.

(b) The government may improve the quality of care to attract the better off patients. In this case, the government may follow discriminatory pricing, where the better off people could be charged cost recovery rates, thereby subsidising the low-income people.

The present study was a preliminary attempt to investigate the issues of efficiency and financing of health services in Andhra Pradesh. The field survey undertaken here covered only one hospital located in a backward district. In order to extend the findings to the whole of Andhra Pradesh, probably some more hospitals may also have to be covered in similar surveys. Though we made an attempt to cover most of the aspects related to health sector efficiency, due to data and other limitations some of the major issues like quality of hospital care, case mix issues etc. could not be covered in this study. The future research needs to take these issues into consideration. Furthermore, more recent techniques such as frontier cost and production function or data envelopment analysis could be used for evaluating technical and economic efficiency in a more meaningful way. A more detailed analysis of the factors affecting the performance indicators such as bed occupancy rate (BOR) and bed turnover rate (BTR) will enable the hospital administrators and policy makers to draw useful conclusions from the CUP analysis.