

**Cost of in-patient care at 16-50 bedded township hospitals
in Yangon Division (2003-2004)**

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Economists define cost as the value of resources used to produce something which includes a specific health service or a set of services. By analyzing and understanding the cost of in-patient care at township hospitals, it could provide one piece of information for policy formulation on cost recovery schemes at the township hospitals. The objective of the study is to examine the cost of in-patient care in 16-50 bedded hospitals so as to provide inputs for policy formulation on cost recovery schemes at the township hospitals. Two 50-bedded, four 25-bedded and two 16-bedded township hospitals from Yangon Division were included in the study. Cost per in-patient day was calculated for each of these hospitals for one fiscal year from 1 April 2003 to 31 March 2004. The general approach that was used in the cost calculation involved calculating: capital cost and recurrent cost incurred by health care providers for each hospital for the fiscal year 2003-2004; patient-days for each hospital for the same fiscal year; and cost per patient-day. A comparison was also made between the unit costs of the hospitals included in the study. The study identified that cost per patient day ranged from Kyat 439.52 to Kyat 5269.41, with an average of Kyat 1931.60. It was revealed in the study that there were 3 hospitals which could be considered lagging behind in efficiency *relative to* other hospitals in the study. This quick and simple methodology of calculating in-patient care cost per patient day can be a useful managerial tool to understand performance of 16-50 bedded hospitals in Myanmar where general care services are being provided mainly for acute patients.

INTRODUCTION

Economists define cost as the value of resources used to produce something which includes a specific health service or a set of services [1]. Costs are generally categorized as capital (or developmental) and recurrent (or operating), the distinction between the two types being based on life expectancy [2]. Resources having a life expectancy of one year or more usually are called capital costs and resources that are purchased and used (or replaced) within one year's time are referred to as recurrent costs. Costs can

then be further classified as direct or indirect. Direct costs are directly attributable to the service. Indirect costs are the costs of supporting the services. These basic classifications of cost form the frame in cost analysis of our study.

Cost information is useful in meeting requirements for accountability and judging efficiency as well as achieving other goals. Health service delivery unit is more efficient when it provides more beneficial effects from the use of a given set of resources. If we can calculate cost for each resource input in

terms of an absolute value, we can calculate average (unit) costs, for example, cost per in-patient. Generally, cost per in-patient is expressed as cost per patient day [3].

By analyzing and understanding the cost of in-patient care at township hospitals, it could provide one piece of information for policy formulation on cost recovery schemes at the township hospitals.

Objective

The objective of the study is to examine the cost of in-patient care in 16-50 bedded township hospitals so as to provide inputs for policy formulation on cost recovery schemes at the township hospitals.

STUDY METHODS

Scope of the study

The scope of the study for cost analysis was on providers' inputs incurred for in-patients admitted to 16-50 bedded township hospitals in Yangon Division during one fiscal year from 1 April 2003 to 31 March 2004.

Sample size

Township hospitals were the sampling units. There are ten 16-50 bedded township hospitals in Yangon Division, four in the northern part and six in the southern part. Initially, five hospitals were chosen randomly so that the sample included two hospitals from the north and three hospitals from the south. However, due to availability of funding for travel expenses to include additional hospitals in the study, four hospitals were selected randomly and included in the study. All these four hospitals were from the southern part. In describing and discussing the study data in this paper, those data from one of the 50-bedded hospitals from the northern part (Hmawbi) was excluded because it was the pre-test site and some changes were made in

data collection approach basing on the experiences of the pre-test.

Two 50-bedded township hospitals --- Taikykyi (TKI) and Thon-gwa (TGW), four 25-bedded hospitals --- Kun-cha-kon (KCK), Kyauk-tan (KTN), Kayan (KYN) and Twante (TTE), and two 16-bedded hospitals --- Htantabin (HTB), Kaw-hmoo (KHM) --- were included in the study. All these hospitals are acute hospitals although some chronic patients with emergency situations may be hospitalized for certain periods.

Cost calculation and analysis

The following **general approach** was used.

- (1) Capital cost and recurrent cost incurred by health care providers for each hospital under study were calculated for the fiscal year 2003-2004.
- (2) Patient-days (for hospitalized patients) were calculated for each hospital for the same fiscal year.
- (3) Unit cost per in-patient day was calculated.
- (4) A comparison was made between the unit costs of the nine township hospitals included in the study.

The basic calculation of a unit cost (often called average cost) is:

$$\text{Unit cost} = (\text{total cost})/\text{quantity}.$$

In our study, unit cost per in-patient day = (total cost)/total patient-days for the study period.

The capital and recurrent cost categories (for the fiscal year 2003-2004 and all reported in 2003-2004 prices in Kyat) were included. They were either used as direct or as indirect health service costs. Only those costs to the Township Health Department (Department of Health, Ministry of Health) were measured and valued. Time, travel or other private costs incurred by patients (and their families) when using health services were not assessed. The following is the description of the methodology of calculating the costs in our study.

For the calculation of **capital cost**, the cost categories were categorized broadly into three: (1) capital cost contributions from existing hospital buildings; (2) capital cost contributions from medical and surgical instruments that were directly related to in-patient care; and (3) cost contributions from capital items, other than those from the previous two categories, that were indirectly related to in-patient care (for example, an electricity generator, a vehicle, a hospital bed, a cabinet, etc).

Capital cost contribution from existing hospital buildings was calculated as follows.

- In our study, the original costs of most of the hospital buildings were not available. So, we used the price of the buildings for the year under study. This could be estimated by estimating the Per Area Estimate (PAE), with the price for the fiscal year 2003-2004, for all the existing buildings in the hospital compound. By proceeding the calculation from this point means the previous life span of the building had already been taken into account [2]. The PAE estimation was done with the assistance of engineers from Township Construction Department. In this approach, the life expectancy for each hospital building is the remaining life span of the building.
- The research team made an assumption that the life expectancy of all these structures was 10 years. The current rate of interest is taken as 10%. Then a reference was made to an “annualization table”[2]. The table gave the annualization factor value of 0.1627, for an asset with 10 years life expectancy and an interest rate of 10%.
- Another assumption was made that proportion of building space utilized for in-patient care was 30% and accordingly a multiplication factor 0.3 was used for to calculating cost contribution from existing space for in-patient care.
- Then, capital cost contribution from

existing hospital buildings was calculated as: PAE of township hospital A in Kyat (for the fiscal year 2003-2004) x 0.1627 x 0.3

Calculation of the capital cost contributions from other two categories followed the same steps described above, except for the first step. Instead of estimating PAE, market price estimations were made for the capital items (for the fiscal year 2003-2004) with the assistance of merchants engaged in selling and purchasing similar items (old and new).

For the calculation of **recurrent cost**, the cost categories were categorized broadly into three: (1) salaries of staff directly and indirectly involved in in-patient care; (2) cost contributions from recurrent items that were related directly to in-patient care (tablets, injections, syringes, needles, plaster, bandages, cotton wool, methylated spirit, etc.); and (3) cost contributions from recurrent items related indirectly to in-patient care (electricity, water supply, etc.).

Before calculating recurrent cost contributions from salaries of staff, interviews were made at study hospitals with staff directly and indirectly involved in in-patient care as regards their opinions on the average proportion of time spent by each category of staff in in-patient care. These proportions were taken as multiplication factors for calculating recurrent costs contributed by salaries of staff for in-patient care. After multiplying the annual total salary of each staff with respective multiplication factor, the results were added up. This gave the recurrent cost contributed by the hospital staff salary for in-patient care.

For calculation of recurrent cost contributed by recurrent items directly related to in-patient care, lists of these items used for in-patient care during the study period were prepared from sub-stock books available at the study hospitals. The price lists for these items for the study period were collected

from drug sellers. The total number of each item used was next multiplied by the price for each item. Adding up the results gives the recurrent cost contributions from items directly related to in-patient care. Because of lack of proper patient recordings, the amount of recurrent items used, and related cost, for each disease category of patient could not be calculated.

For the cost contributions from recurrent items related indirectly to in-patient care, information was obtained from budget sheets of each hospital. Because of difficulties in estimating the portions of each of the items utilized for in-patient care, the total figures for the study period were taken, since most of them had been utilized for in-patient care one way or either.

Patient-days for each hospital was calculated by adding the lengths of hospital stay in days for all patients admitted during the one-year study period [3].

STUDY RESULTS

Cost of in-patient care per patient day, average length of hospital stay in days and range of hospital stay in days for each study hospital for the year under study are shown in Table 1. The results indicate that cost of in-patient care per patient-day at 16-50 bedded township hospitals during the fiscal year 2003-2004, from providers' perspectives, ranged from Kyat 439.52 to Kyat 5269.41, with an average of Kyat 1931.60.

A matrix was prepared where the cost of care per patient-day was plotted against the average length of hospital stay (in days) for the eight hospitals as shown in Fig. 1. In this matrix, the cut-off point for a long average length of stay was taken as 6.4 days which is the national average length of stay for 16-50 bedded hospitals in Myanmar [4]. The cut-off point for cost of care per patient-day

is taken from the average of costs of care of the 8 hospitals included in the study. This figure was rounded as Kyat 1900.

Table 1. Cost of in-patient care in Kyat per patient day, average length of hospital stay in days and range of hospital stay in days for each study hospital (2003-2004)

Sr. No.	Hospital (bedded)	Cost of in-patient care in Kyat per patient day	Average length of hospital stay & (range of hospital stay in days)
1	TKI (50)	1123.49	4.7 (1-43)
2	TGW (50)	1142.99	7.2 (1-39)
3	KCK (25)	1039.15	4.8 (1-29)
4	KTN (25)	643.05	5.2 (1-29)
5	KYN (25)	439.52	5.7 (1-29)
6	TTE (25)	2671.12	5.1 (1-34)
7	HTB (16)	3124.07	3.9 (1-26)
8	KHM (16)	5269.41	6.8 (1-30)

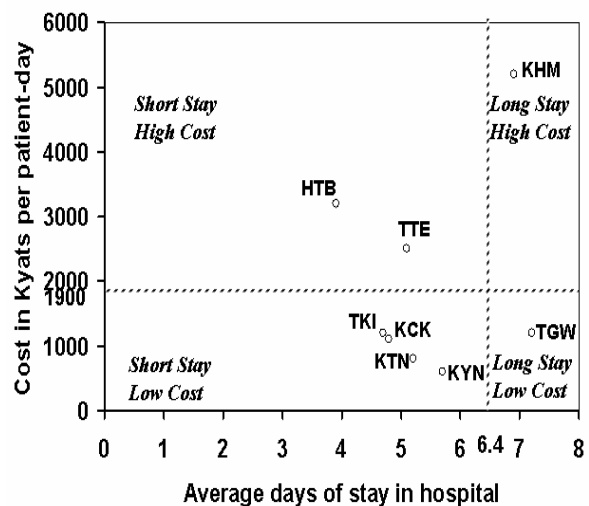


Fig. 1. Graph showing the relationship between cost of in-patient care per patient-day and average length of hospital stay for the eight hospitals (2003-2004)

The graph indicates that two hospitals (HTB and TTE) fell into “short stay/high cost” category, and that one hospital (TGW) fell into “long stay/low cost” category.

DISCUSSION

For hospitals of comparable sophistication and quality, a low cost per patient-day is an indication of good efficiency, while a high cost per patient-day may suggest poor efficiency [5]. We attempted to compare the *relative* efficiency of the eight hospitals in our study after plotting a graph shown in Figure 1.

Roughly, 3 hospitals with high cost of in-patient care per patient-day could be considered lagging behind in efficiency *relative to* other hospitals in the study. Those hospitals that fell either into the “short stay/high cost” category or into the “long stay/low cost” category needed further analysis. “Short stay/high cost” could arise out of underutilization of in-patient care services, or due to certain disease conditions requiring high cost therapies. The most possible explanation for the “long stay/low cost” category was that most of the expenses for care at the hospital being incurred by the patients themselves.

In our study, due to small sample size, there is a mix of small numbers of 16-bedded and 50-bedded hospitals. Although these are acute hospitals and there do not exist specialist care services, bed strengths and staff strengths differ between these hospitals. This is a limitation in our study in attempting to prepare a graph like the one shown in Figure 1 for observing relative efficiency between different hospitals included in our study. We should have prepared separate plots for different bedded hospitals if we have more sample sizes for each of these categories.

CONCLUSION

In this study, we measured only use of health service resources through duration of in-patient stay. In this endeavour, we could not list diagnoses of in-patients by codes in the International Classification of Diseases, due to incompleteness of information in

diagnostic and therapeutic recordings in many of the in-patient record sheets. Thus it was not possible for us to calculate cost by disease category or by using a diagnosis related groups (DRG) system as used in other studies [6-7].

Even though the costs estimated in our study could be considered gross estimations, the study did provide information on the cost of care being borne by the government in 16-50 bedded hospitals in Yangon Division. The data, when compared between the hospitals under study, also gave some information on relative efficiency of performance by these hospitals.

This quick and simple methodology of calculating in-patient care cost per patient day can be a useful managerial tool to understand performance of 16-50 bedded hospitals where general care services are being provided mainly for acute patients.

We propose that the methodology should again be applied in other 16-50 bedded township hospitals and basing on the experiences encountered it should be further refined to make it user-friendly for health services managers at central and State/Division levels. The methodology can be applied as a managerial tool to monitor trends in in-patient care costs and efficiency of performance of 16-50 bedded hospitals.

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