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**HEALTH SECTOR FINANCING PROJECT**  
**MONOGRAPH SERIES**

**STUDY ON  
OPERATIONAL AND MAINTENANCE COST  
OF GOVERNMENT HOSPITALS  
FISCAL YEAR 1988/1989**

**Monograph No. 8**

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Ministry of Health, Republic of Indonesia  
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**STUDY ON  
OPERATIONAL AND MAINTENANCE COST  
OF GOVERNMENT HOSPITALS  
FISCAL YEAR 1988/1989**

**Health Economics and Policy Analysis Unit  
Bureau of Planning  
Ministry of Health, Republic of Indonesia**

**JAKARTA, MARCH 1991**

**Health Sector Financing Project USAID Grant No. 497 - 0354**

is a joint project between the Ministry of Health and the United States Agency for International Development. Since its inception in June 1988, the project has provided technical assistance toward the development of a managed health care program (DUKM/JPKM), improved hospital management, efficient drug management and rational drug use, and health policy and economic analysis. The fundamental goal of the project is to reallocate and increase resources for child survival programs in Indonesia.

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## CONTENTS

	Page
FOREWORD .....	i
LIST OF TABLE .....	ii
LIST OF APPENDIX .....	iv
LIST OF CHART .....	v
LIST OF DATA COLLECTORS .....	vi
CHAPTER I BACKGROUND AND OBJECTIVES .....	1
CHAPTER II CONCEPTUAL FRAME WORK AND METHODOLOGY .....	5
CHAPTER III RESULTS : AN ILLUSTRATION OF TOTAL O&M COSTS .....	14
A. Total O & M Costs .....	14
B. O & M Costs By The Source .....	23
C. O & M Costs By Item .....	26
CHAPTER IV RESULTS : THE CALCULATION OF UNIT COSTS	28
A. Total Unit Costs .....	29
B. Unit Costs Without Drugs .....	35
C. Unit Costs Without Salaries .....	41
CHAPTER V THE VARIATION IN THE UNIT COSTS AND THEIR COMPARISON WITH TARIFFS .....	43
A. Variation in unit costs .....	43
B. Variation in unit costs of food .....	45
C. Cost Recovery Rate .....	48
CHAPTER VI DISCUSSIONS AND CONCLUSION .....	53
A. The Planning of The O & M Budget .....	53
B. The Development of The Hospital Accounting System .....	59
C. Strategic Pricing Policy .....	65
APPENDIX	

## **FOREWORD**

This report features the result of the study of the operational and maintenance costs of hospitals conducted in 14 hospitals in Indonesia.

The study was implemented under the coordination of the Dirjen Yanmed (Directorate General of Medical Services) by the Team for the Analysis of the Operational and Maintenance Costs consisting of elements of The Bureau of Planning, The Bureau Finance, and The Health Economics and Policy Analysis Unit of The Bureau of Planning. Finance for the study was obtained from the Health Sector Financing Project, and was a grant from USAID.

The initial results of this study were first presented in a workshop held in February 1990 at Cisarua. A considerable number of inputs gathered from the workshop were then used to conduct further analysis and to prepare the draft of this report.

The accomplishment of this study can be attributed to the various parties, who had been providing us with all the help we needed right from the time of preparation for the study were made through to the time this report was completed. Invaluable support was also given by the management and staff of Persahabatan Hospital, Bekasi General Hospital, and Pasar Rebo Hospital during the testing of instruments to be used in this study. Similarly, it was due to the support given to the data-collectors by the management and the staff members of the 14 hospitals subjected to the study that a larger proportion of the data needed were obtained. This study would, indeed, not have been successful had it not been for the hard work and the dedication of all the 34 data collectors from the Bureau of Planning, the Bureau of Finance, the Ditjen. Yar.med, the P4K of Surabaya, and the RSAB Harapan Kita.

To all those parties mentioned above and other parties that had contributed to the succes of the study the Team for the Analysis of RSU Operational and Maintenance Costs would hereby like to pass its utmost gratitude.

We would also like to thank Evi and Isti of the Health Economics and Policy Analysis Unit for their administrative and secretarial support, without which this study would not have been completed. Similarly, we wish to thank Mr.Syaiful and Mr. Amin for whose perseverance in accomplishing the validation and verification of the figures,--so many of them-- we had been able to perform the analysis and come up with more convincing interpretation of the results. The author of this report is DR. Gani Ascobat. Any inquiry regarding the content of the report as well as the methodology used, can be addressed to the author.

Head of  
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## LIST OF TABLE

Number	Page
II. 01 Performance of Hospital Subject to The Study . . . . .	10
III.01 Total O & M Costs . . . . .	15
III.02 Dependent Variable of the Total O & M Cost . . . . .	22
III.03 Sources of O&M Finance For Government Hospitals . . . . .	23
III.04 Percentage of O & M Costs by Source . . . . .	25
III.05 Percentage of The Type of O & M Costs . . . . .	27
IV.01 Unit Costs of General Outpatient Services . . . . .	30
IV.02 Unit Costs of Specialized Outpatient Treatment . . . . .	31
IV.03 Unit Costs of Specialist Outpatient Treatment in Type A,B,C Hospital and Control . . . . .	33
IV.04 Unit Costs of Specialist Outpatient Treatment in Type D Hospital and Control . . . . .	33
IV.05 Unit Costs of the Emergency Unit Service . . . . .	35
IV.06 Unit Costs of 3rd Class of General Inpatient Treatment . . . . .	35
IV.07 The Unit Costs of Surgery Action . . . . .	37
IV.08 Unit Costs of Laboratorium Examination . . . . .	39
IV.09 Unit Costs of Xray Examination . . . . .	39
IV.10 Unit Costs Without Drugs . . . . .	40
IV.11 Unit Costs Without Salaries . . . . .	42
V.01 Variations in Unit Costs of Inpatient Treatment . . . . .	44
V.02 The Degree of Efficiency of The Unit Cost of Food . . . . .	47
V.03 Unit Costs and Tariffs Ratio of General Outpatient Treatment . . . . .	51

<b>V.04 Unit Costs and Tariffs Ratio of Specialized Outpatient Treatment</b> .....	<b>51</b>
<b>V.05 Cost Recovery of 3rd Class of General Inpatient Treatment</b> .....	<b>52</b>
<b>V.06 Unit Costs and Tariffs Ratio of Intensive Care Unit</b> .....	<b>52</b>
<b>VI.01 Projection of O &amp; M Budget Needs of the Sumedang General Hospital</b> .....	<b>57</b>
<b>VI.02 O&amp;M Budget Planning of Sumedang General Hospital Fiscal Year 1989/90</b> .....	<b>58</b>
<b>VI.03 Data to be Recorded by Hospital Cost Centres in the Managerial Accounting System</b> .....	<b>63</b>
<b>VI.04 Tariffs adjusment by Marginal Cost</b> .....	<b>68</b>

## LIST OF APPENDIX

Appendix		Page
1.	Distribution of O & M Costs, Moeloek General Hospital .....	
2.	Distribution of O & M Costs Mataram General Hospital .....	
3.	Distribution of O & M Costs Soewondo General Hospital .....	
4.	Distribution of O & M Costs Bojonegoro General Hospital .....	
5.	Distribution of O & M Costs Wlingi General Hospital .....	
6.	Distribution of O & M Costs Lubuk Linggau General Hospital .....	
7.	The Distribution of O & M Costs Palangkaraya General Hospital .....	
8.	Distribution of O & M Costs Palopo General Hospital .....	
9.	Distribution of O & M Costs Batang General Hospital .....	
10.	Distribution of O & M Costs Baturaja General Hospital .....	
11.	Distribution of O & M Costs Tegalyoso General Hospital .....	
12.	Distribution of O & M Costs Pandeglang General Hospital .....	
13.	Distribution of O & M Costs Sumedang General Hospital .....	
14.	Distribution of O & M Costs Boyolali General Hospital .....	

## LIST OF CHART

Chart No.		Page
1.	Bar Diagram of O&M costs and Number of Bed Days .....	17
2.	Bar Diagram of O&M costs and Number of Bed .....	17
3.	Bar Diagram of O&M costs and Number of Outpatient Treatment .....	18
4.	Bar Diagram of O&M costs and Number of Specialist Outpatient Treatment .....	18
5.	Bar Diagram of O&M costs and Number of Surgery Actions .....	19
6.	Bar Diagram of O&M costs and X-ray Exam ..	19
7.	Bar Diagram of O&M costs and Number of Laboratory Examination .....	20
8.	Bar Diagram of O&M costs and Number of Medical Personnel .....	20
9.	Bar Diagram of O&M costs and Number of Paramedical Personnel .....	21
10.	Bar Diagram of O&M costs and Number of Non Medical Personnel .....	21
11.	Economies of Scales .....	46
12.	Relationship between Tariff and Outpatient Services .....	72
13.	Relationship between Tariff and Inpatient Services .....	73

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## CHAPTER I BACKGROUND AND OBJECTIVES

The basic policy in the hospitals sector in Pelita V is to improve the quality of hospital services and management functions, and at the same time, to promote the quality of physical appearance of hospitals.

In conjunction with this, it has often been said that the low performance of hospitals is a result of insufficiency of the Operational and Maintenance (O&M) finance; consequently, the growing concern is with the fulfilment of O&M cost needs in the future.

Nevertheless, one question that has frequently been raised is how much fund must actually be allocated for O&M, if the budgeting is to be accurate. Studies of the cost of hospitals conducted in the past as yet have not provided an appropriate answer to the question of what level of hospital funding is appropriate, either because the methods applied were not meant for the measurement of O&M costs, e.g the study of the costs of 40 hospitals conducted by Demography Institute of University of Indonesia (LDUI), or because the number of hospitals in the samples was too small, e.g the study of Samarinda Hospital made by the Faculty of Public Health University of Indonesia (FKMUI). The report of the World Bank (**Indonesia, Issues in Health Planning and Budgeting, 1988**) indicated that during Pelita IV there had been a decline in the non-salary costs of the hospitals of Indonesia. Under such circumstances, hospitals experienced a number of insufficiencies, e.g. insufficiencies of drugs, reagents, finance for maintenance and travel. All of these insufficiencies led to a decline in the degree of productivity and the quality of services overtime.

Further the World Bank Report estimated that in 1985/86 expenses on O&M for government hospitals totalled 141.4 billion :

24.5 billion for A-class Hospitals;  
52.2 billion for B-class Hospitals; and  
66.7 billion for C- and D-class Hospitals.

In fact, according to calculations (by using the normative unit costs per bed as the basis), the financial needs for O&M during that year totalled 359.3 billion, i.e.

56.3 billion for A-class Hospitals;  
92.1 billion for B-class Hospitals;  
115.9 billion for C-class Hospitals; and  
95.0 billion for D-class Hospitals.

The figures above show that in total C and D-class Hospitals experienced the largest shortage of finance. The available O&M finance was approximately one-third of the total needs. For A and B-class hospitals, the finance available was only half of the total need.

The rough estimates of the World Bank show that it is necessary to have a more detailed and specific calculation of O&M costs of hospitals in Indonesia. In such a case, another aspect that is equally important is the development of a system of financial recording and reporting, that will enable a better evaluation of the sufficiency and efficiency of hospital finance, particularly the O&M costs.

#### **ESTIMATES OF O&M FINANCE NEEDED**

There are two types of needs as far as the estimation of O&M cost needs are concerned. The first is the "rough" estimate, which while rough, is still fairly representative of the actual needs. The "rough" estimation of O&M costs is calculated on the basis of the condition that a hospital is performing its functions efficiently, thus minimizing either over-estimation or under-estimation. The criteria of efficiency is described in the next section.

It is, indeed usually not that easy to calculate the costs (unit costs, in particular) of a hospital. The calculation depend much on whether the system of accounting of the hospital is good or not. In addition, a hospital is firm in an industry with multiple types of products. The obscurity of the measures of the various types of product will only complicate the calculation of unit costs. This was what actually is faced in this cost analysis.

**The second** need is the calculation of O&M costs, which is to a larger extent normative in nature and based on certain standards. These standards include the standard of the procedure of the medical actions, the standard of the drugs and materials, the standard of the medical personnel, the standard of the equipment and the building, and the standard of the facilities and the supporting manpower. These standard will be developed as separate activities under the Project Implementation Officer (PIO)/Hospitals-Health Sector Financing Project (HSF-Project). Thus, the calculation of O&M cost based on these standards can not be made until the standards themselves have been completely developed; this will be some time in September 1991. The calculation of costs applying the second approach will be quite time-consuming.

## **T H E   O B J E C T I V E**

### **The Specific Objective**

The specific objective of this study is to establish an estimate of O&M costs for B-, C-, and D-class hospitals in Indonesia, both for hospitals in the aggregate and for individual hospitals concerned. To achieve this specific goal it is necessary to come up with the following outputs, which in fact represent the specific objectives of this study.

#### **1.     The Identification of Cost Centres and Cost Elements**

In this study an identification will be made of the various cost centres to be found in the hospitals. A cost centre is the unit(s) in which O&M funds are expended or used. Further, an identification will be made of all of those cost components classified as O&M costs. A calculation of how large each O&M cost component also will be made both for all hospitals and for each cost centres.

For each cost centre, efforts will be made to determine the units of production (outputs). By so doing it will be possible to calculate O&M unit cost for various kinds of outputs. Knowledge of the unit costs will ease the calculation of O&M cost needs, provided that projection of the future outputs can be determined in the annual planning of the hospitals.

## **2. The Identification and Description of the Sources of O&M Costs for Hospitals**

The next objective is to explore the sources of each O&M cost component. This will give a clear picture of what the sources are that have made available O&M finance for a hospital. Acquisition of this information will ease the planning of an integrated O&M costs. Furthermore, the information will be useful for the development of a system of financial recording and reporting, particularly as concerns O&M costs.

## **3. The Calculation of Unit Costs**

This study will also establish O&M unit costs of the various products or outputs of hospitals, e.g the unit costs of a bed day, the unit costs of outpatient treatment, the unit cost of medical procedures etc. A breakdown of the cost elements will be made for each unit cost. Information on the cost elements in a unit cost would be needed in order to develop a formula for the estimation of O&M cost needs.

## **4. The Calculation of O&M Financial Needs.**

Using the formula produced in objective 3 above, a calculation will then be made of O&M cost needs of each hospital and of all hospitals collectively, in accordance with the class to which they belong.

## **Additional Objectives**

In addition to the above-mentioned objectives, this study also attempts to analyse several alternatives to the options for adjusting tariffs based on unit costs. As will be described at length in the chapter on results, it is quite obvious that the tariffs in effect now are far below the unit costs expended. In this study a calculation has also been made of an "ideal tariff", i.e. a tariff that is at least equal to the "marginal cost", the extra cost associated with producing one extra unit of output.

## CHAPTER II THE CONCEPTUAL FRAMEWORK

### THE CONCEPTUAL FRAMEWORK

#### 1. O&M Costs

One of the method of classifying the types of costs is to use their volumes as the basis, i.e. **fixed costs and variable costs**. A fixed costs is a cost of which the amount is relatively unaffected by the volumes of the outputs. Usually, an investment cost belong to this category. That is why a fixed cost can also be referred to as an investment cost, even if other criteria (apart from their relationship with outputs) are needed to determine the nature of an investment cost, i.e. the time of their expenditure, which normally stretches over a period of more than a year.

A variable cost is a cost of which the level of expenditure or cost is affected by the volume of its outputs. Because the volume of production for the forthcoming year is regularly pre-planned in the preceding year, the amount of the variable cost can also be referred to as a routine cost or an operational cost.

Conceptually, an operational cost is a cost needed for the implementation of activities in a process of production; as such, they can also be referred to as the functional cost of an investment. Expenditure of an operational cost is routine in nature, usually annually, therefore it can also be referred to as a routine cost. Since it routine in nature, the expenditure occurs again and again, thus the operational costs also often are referred to as recurrent costs. An operational cost is one that is "exhaustible" in nature, meaning that commodity that is purchased with operational costs will be completely consumed, e.g. the time of personnel (salaries), drugs, materials, etc.

Particularly as concerns the cost of salaries, this is sometimes unaffected by volumes of the outputs. This is particularly true of a government facility where the cost of salaries usually remains stable, especially in cases where the volume of production of the facility is not high, thus, increases in outputs does not necessarily lead to increases in salaries. For this reason, there are some who believe that it is

less appropriate to look upon salaries as strictly "variable costs". It is also inappropriate, however, to categorize salaries under "fixed cost", because in theory the cost of salaries is also affected by the volume of outputs. That's why there are some who categorize the cost of salaries as a "semi-variable costs", on the grounds that salaries, while they are relatively stable in nature are yet recurrently expended in direct relation to the volume of output. Nevertheless, whatever the argument is, it is clear enough that the cost of salaries is an operational cost and not an investment cost.

A maintenance cost is the cost involved in course of ensuring that the invested goods will continue to function. Unlike the operational costs, commodities purchased with maintenance costs are very extensive in nature, ranging from the ones that are quickly used (e.g. lubricants) to the ones that are not immediately exhausted (e.g. replacement of vehicle spare-parts). In fact there are cases in which the maintenance cost almost resembles an investment cost, e.g. commodities which remain usable for more than a year (e.g. replacement of automobile tyres).

Both types of costs, operational and maintenance, have a strong influence on the routine activities of a production unit, e.g. a hospital. That's why information on the amounts of the costs and the components existing within them are very vital for the planning of a rational hospital.

Under all those definitions given above, it can then be said that as far as a hospital is concerned operational and maintenance costs are listed as follows:

1. Cost of Personnel(salaries, wages, honoraria, allowances, etc)
2. Travel
3. Drugs
4. Food
5. Exhaustible Medical Supplies: sputit, gauze, needle, etc.
6. Exhaustible Non-Medical Supplies (stationery, deter gents, other chemicals).
7. Maintenance of Medical Instruments.
8. Maintenance of Support Medical Instruments.
9. Maintenance of Non-Medical Instruments.

9. Maintenance of Non-Medical Instruments.
10. Maintenance of the Warehouse.
11. Maintenance of Vehicles.
12. Public Utilities (electricity, water, telephone).
13. Other O&M Costs.

In the budgetary system of Indonesia, the above-mentioned cost components are divided into two groups as is shown in the appendices of this report.

## **2. The Sources**

As already known, there are a number of sources for the O&M cost, e.g. the Central Ministry of Health Development and Routine Budget (DIP/DIK), Salary Expenditure (SDO), Non Salary Expenditure (SBBO), Sectoral Development (INPRES), Provincial Development and Routine Budget (DIPDA-1/DIKDA-1), District Development and Routine Budget (DIPDA-2/DIKDA-2), Parastatal National Insurance Budget (PHB), etc. An exploration will be made of the origin of every cost item of O&M finance in accordance with the sources mentioned above.

## **3. The Cost Center**

A cost center is a unit within a hospital where O&M finance is expended or used. Within the setting of a hospital, a cost center is normally classified into two types, namely support cost centers and productive cost centers. There are cost centers that concurrently function as support cost centers and productive cost centers, e.g. the radiology department which besides supporting other units diagnosis services also directly renders services in the form of radiotherapy.

In this study the Laboratory, the Radiology Department, and the Operating Room will be treated as productive cost centers so that a separate calculation of cost (the unit cost of outputs included) will be established in each of these cost centers.

## **THE METHODOLOGY**

### **1. The Analytical Approach**

#### **a. The Exploration of O&M Cost**

In this study two approaches are made to analyzing O&M costs. In the first approach an attempt is made to analyze items financed from each source. The second approach is the opposite: an attempt is made to calculate the cost of each item (the O&M component) in each cost centre and analyze its origin or source.

#### **b. The Cost Flow and Its Allocation**

In this study, in addition to the calculation of O&M costs for support cost centers and productive cost centers, calculations are also made of the unit costs of the types of main services -- for which the "products" or the outputs are clear -- produced by productive units. Thus, it is necessary to distribute O&M costs from support cost centres to productive cost centres. For this the "double distribution" method will be used, which requires a **basis of allocation**, such as the size of the building, the number of food portions, the weight (in kilograms or pieces) of laundry, etc.

#### **c. The Calculation of Unit Cost**

The allocation of cost as described in **step b.** produces the total unit cost of O&M at the productive units. The next step is to make a description of the outputs of each productive unit. If the output of a certain productive unit are homogenous, then the amount of the unit costs will be the total cost of the concerned productive unit divided by its total outputs. If its outputs are not homogenous (of different types), then to calculate the unit cost of each type of output it will be necessary to set a weight based on the case samples.

For those outputs which are not homogenous, data will be collected on manpower and drugs/material inputs for one type of output. The types of outputs will, however, be simplified, i.e. they will be classified into only three categories:

small/simple, medium, and large/sophisticated. The data on the inputs are used for determining the weights in the calculation of unit costs.

The final result of this step is the unit costs of O&M for the various outputs of the concerned hospital.

#### **d. The Calculation of O&M Cost Needs**

After determining unit costs it will be possible to estimate O&M cost needs, if utilization targets are specified, e.g. the length of stay or the number of general or specialist outpatients to be served during the next year, etc.

As can be seen later in the chapters on the results (Chapters IV, and V), and the chapter on discussion (Chapter VI), however not all services of hospitals permit the calculation of their unit costs. That's why the technique of calculating O&M cost needs presented in Chapter VI is of a nature of a combination of the conventional calculation and unit cost based calculation. Unit costs obtained in step c. is one that can be broken down into elements. These elements can be used in developing the calculation of the elements of the O&M cost, e.g. salaries, drugs, maintenance, etc.

## **2. The Determination of Hospitals with Optimal Performance**

The first step in this study was to identify which among all hospitals are operating efficiently. The criteria of efficiency used for this purpose was based on criteria provided by Barber Johnson. Four variables were used in the calculation :

1. The Average Length of Stay (ALOS)
2. Bed Turn Over Interval
3. Bed Occupancy Rate
4. Bed Turn Over Rate

Secondary data on the performance of all hospitals of Indonesia were analyzed using the Barber Johnson method. Calculations were carried out separately for B-, C-, and D-class hospitals.

It should be noted the selection of hospitals using the Barber-Johnson method has certain weaknesses. The first weakness was that no attempt is made to take outpatients into account in the determination of the efficiency of hospitals. The

second weakness concerns the use of the mean figures for the variables used in the Barber-Johnson formula, without any consideration given to their standard of deviations. It is well known, the mean figures can be affected by out-liers. To illustrate this point the fact that the ALOS of a hospital is 12 days could possibly be a result of the presence of a number of chronic cases treated for a long period; whereas, in fact, if these chronic cases are excluded from the calculation, the ALOS value only would be 7 days. Nevertheless, despite its weaknesses, the method is the best available to identify the degree of efficiency of hospitals selected in this study.

First, the Barber & Johnson formula was applied to secondary data concerning the performance of hospitals-available at the Central Office of the Ministry of Health (MOH). Next, the figures were revalidated by contacting those hospitals first chosen. In cases where the data were found to be incompatible, a re-selection was made in order to replace the original hospital with another hospital.

After the calculation, it was discovered that not many of the hospitals could be classified as efficient in terms of the criteria of Barber-Johnson. Therefore it was decided to select a sample of hospitals which most closely met the criteria of efficiency of Barber-Johnson. The results are shown in the Table II.1.

TABLE II.01 PERFORMANCE OF HOSPITALS SUBJECT TO THE STUDY.

Hospitals	No. of Beds	B.O.R.	L.O.S	B.T.O.	T.O.I
<b>B-Class</b>					
1. A.Moelock (Lmpg)	555	62.5	5	42	3
2. Mataram (N.T B)	233	75.7	5	49	2
<b>C-Class</b>					
1. RAA Soewondo (C.Java)	263	73.3	6	54	2
2. Bojonegoro (E Java)	163	79.0	6	49	2
3. Sumedang (W.Java)	164	76.6	6	44	2
4. Wlingi (E Java)	160	79.6	6	45	2
5. L.linggau (S Sumatra)	95	80.8	5	47	3
<b>D-Class</b>					
1. Palopo (S Sulawesi)	100	73.6	6	42	2
2. Batang (C Java)	84	57.6	5	45	3
3. Baturaja (S Sumatra)	108	59.5	5	42	3
4. Boyolali (C.Java)	162	74.3	5	53	2
<b>Controll</b>					
1. C-Class : Tgl.yoso Vertical-C.Java	330	63.4	6	35	4
2. D-Class : Pnd glang W.Java	123	16.5	3	21	15

Source : HEPA Unit (Unit AKEK).

Following the selection of sample hospitals as described above, it also was decided that an analysis should be made of a number of control hospitals (hospitals that would be used for the purpose of comparison). Hospitals selected for this purpose were those of which the performance is clearly and consisted of government hospitals and private hospitals. It should be noted that the data from private hospitals were not amenable to analysis and thus were of dropped from the control group.

Using the methods described above it was decided that 15 "efficient" hospitals would be selected as the main focus of the study. Out of these, 12 hospitals were considered to be most efficient: 2 B-class RSU, 5 C-class RSU, and 5 D-class RSU. In addition to these 3 control hospitals had been purposively selected: 1 vertical hospital, 1 inefficient hospital, and 1 private hospital the latter being discarded as mentioned above.

**The hospitals selected were :**

- B-Class** : 1. RSU Mataram (NTB)  
2. RSU Abd.Moeloek (Lampung)
- C-Class** : 3. RSU Soewondo (Central Java)  
4. RSU Sumedang (West Java)  
5. RSU Bodjonegoro (East Java)  
6. RSU Wlingi (East Java)  
7. RSU Lubuk Linggau (South Sumatera)  
8. RS.Palangkaraya (Central Kalimantan)
- D-Class** : 9. RSU Palopo (Southeast Sulawesi)  
10.RSU Batang (East Java)  
11.RSU Batu Raja (Lampung)  
12.RSU Boyolali(\*) (Central Java)  
(\* )not subject to the analysis due to lack of data.
- Control** : 13.RSU Tegalyoso(C-class, vertical) (CentralJava)  
14.RSU Pandeglang(D-class) (West Java)

## **2. The Development of Instruments for Pre-testing**

A set of instruments for the study consisted of forms used for the collection of non-financial data, and instruments for the collection of financial data (data on cost). The instruments were developed and tested in a number of hospitals in Jakarta, i.e. RS Persahabatan, RSU Bekasi, and RS Pasar Rebo. The development of the instruments was completed at the end of November 1989.

The collection of data using these instruments was conducted over a period of one year (1988/1989). The data collected included such variables as finance, facilities, use of drugs and materials, hospital manpower and outputs, e.g. Length of Stay (LOS), number of diagnostic examinations, actions, general and specialist outpatients, etc.

## **4. The Data Collection**

Data-collection was done by the trained data-collectors. Training was held in the first week of December 1989 (for 2 - 3 days); thus, the collection of the data of the selected hospitals was conducted in the second and the third week of December 1989.

The data-collectors had been recruited from the Directorate General of Medical Services, the Bureau of Planning, the Bureau of Finance, the P4K of Surabaya, and officers of the RSAB Harapan Kita. The involvement of the internal staff of the Ministry of Health (MOH) was necessary due to their familiarity and competence in conducting hospital cost studies.

## **5. The Data Processing**

The data collected were cleaned and later directly put into a spreadsheet format (Lotus 123). This was done during the period starting from the fourth week of December 1989 to the first week of January 1990.

## **6. The Analysis and Report-Writing**

The analysis was made in conformity with the approaches described above in section 1. The initial analysis took place from January to early February of 1990. Further refinements and revisions were undertaken after receiving comments and suggestions from experts who reviewed earlier drafts of the study.

## **CHAPTER III RESULTS**

### **AN ILLUSTRATION OF TOTAL O&M COSTS**

In the study of 15 hospitals, data were collected on O&M cost and other data needed from 14 of them. For the calculation of unit costs, the final analysis covered only 11 of them. The results of the analysis are presented in Chapter V. As already stated above, no analysis could be made of O&M costs at RSU Boyolali, because the data gathered were incomplete. O&M costs analysis for the RSU Mataram and RSU Abdoel Moloek up to the time that this report was written has not yet been completed, because both these hospitals have a very large cost centres. The report of the analysis of cost of both these hospitals will be submitted separately.

This chapter will first will present estimates of the total cost of the hospitals studied. This will be followed by an analysis based on the sources, the cost items, and cost allocation and in accordance with their cost centres.

#### **A. TOTAL O&M COSTS**

The estimates of total O&M costs of the hospitals studied were based on the amount of each O&M budget item realized. These were gathered through secondary data: records of the realization of budgets of the Central level, the Provincial (Dati I), the District (Dati II), the Parastatal National Insurance Company (PHB), etc. The total amount of costs that can be classified as O&M cost is shown in Table III.01 below.

In Table III.01 it can be seen that the use of O&M cost varied considerably from one hospital to another. For the RS Mataram and the RS Moeloek, both of which were B-class hospitals, O&M costs were respectively Rp. 1.5 billion and Rp. 2.57 billion.

For C-class hospitals O&M costs ranged between Rp.145 million and Rp.850 million. And if the RS Tegalyoso(the control hospital) were to be included in this group of C-class hospitals, O&M cost reached Rp.1,35 billion. Similarly, a variation was seen in the O&M costs of D-class hospitals, ranging from Rp. 63 million in the case of RS Baturaja to Rp. 259 million in the case of RS Batang.

**TABLE III.01 TOTAL O&M COSTS**

<b>B-Class</b>	
Mataram	Rp. 1.500.569.367
Moeloe	Rp. 2.577.686.004
<b>C-Class</b>	
Soewondo	Rp. 841.794.725
Bojonegoro	Rp. 897.510.690
Sumedang	Rp. 624.352.818
Wlingi	Rp. 601.061.337
Lubuklinggau	Rp. 374.347.025
<b>D-Class</b>	
Palopo	Rp. 119.138.917
Batang	Rp. 259.132.400
Baturaja	Rp. 63.827.240
<b>Controll</b>	
Tegalyoso (C)	Rp. 1.355.091 783
Pandeglang (D)	Rp. 63.505.047

Source : HEPA Unit (Unit AKEK).

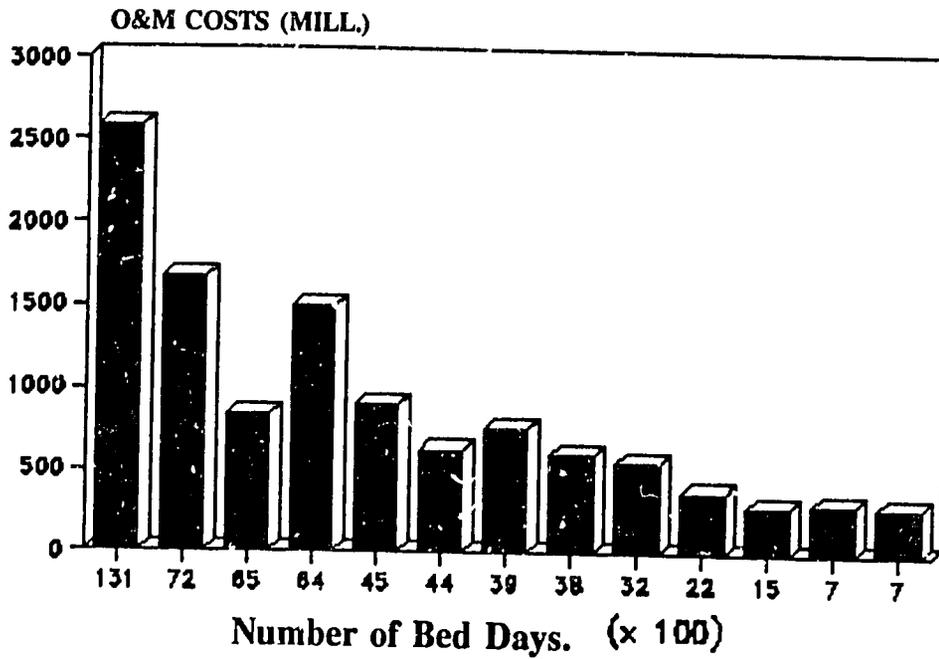
What were the factors that had contributed to such wide variations of O&M costs? The following bar diagrams perhaps roughly answers the question. The ordinate (vertical line) shows the total costs, while the abscissa (horizontal line) shows the variable data.

As can be seen from the diagrams, roughly speaking it can be said that the amount of the O&M costs shows a positive correlation with the following variables:

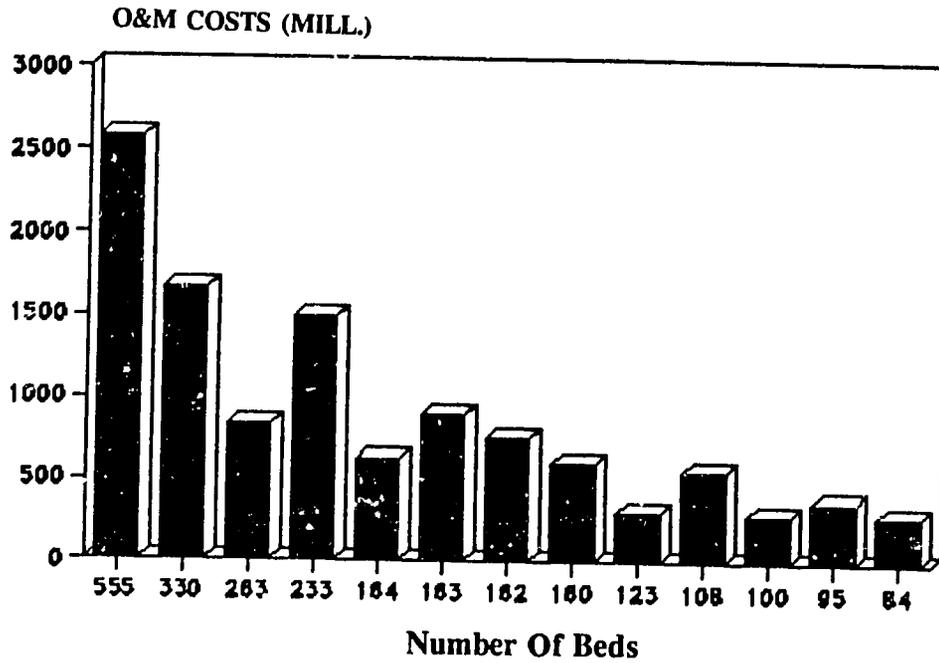
1. Length of Stay
2. Number of Beds
3. Number of X-ray examinations conducted
4. Number of Paramedics
5. Number of Administrative Personnel
6. Number of Laboratory examinations

What is interesting is the fact that the relationship between the total of O&M costs and the number of surgery procedures, the number of general and specialist outpatients, and the number of medical personnel is ambiguous.

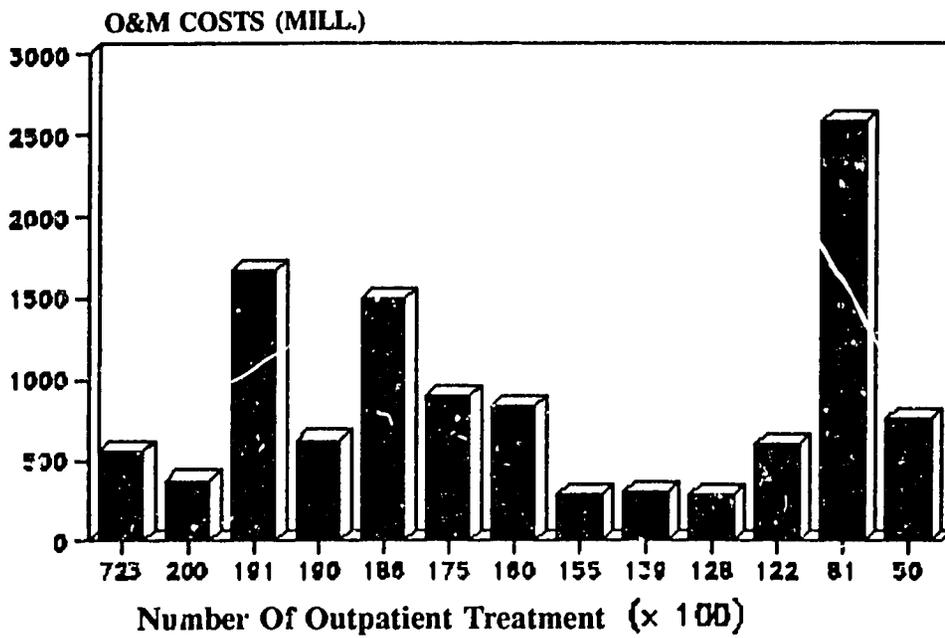
**CHART 1. O&M COSTS AND NUMBER OF BED DAYS.**



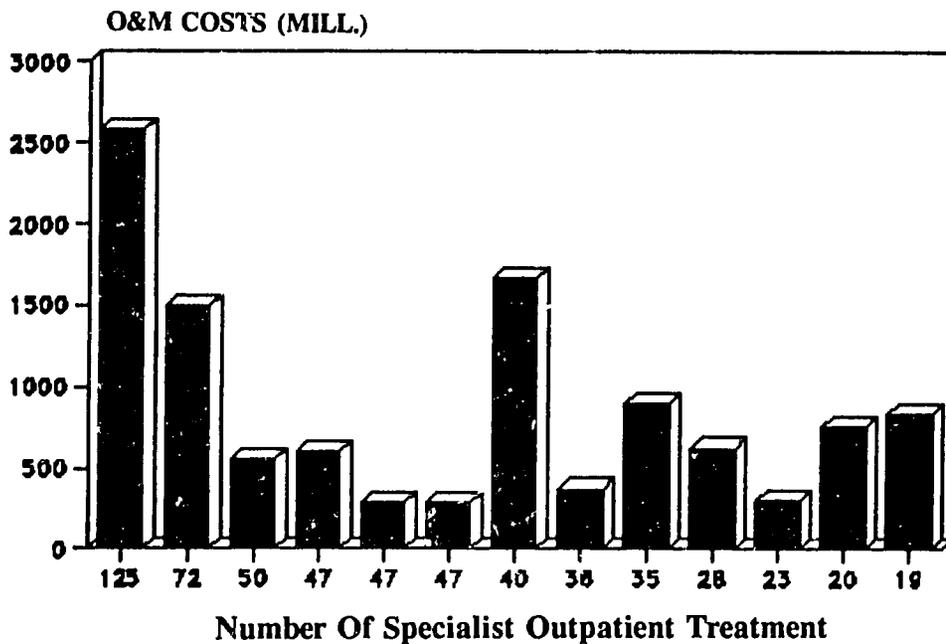
**CHART 2. O&M COSTS AND NUMBER OF BEDS**



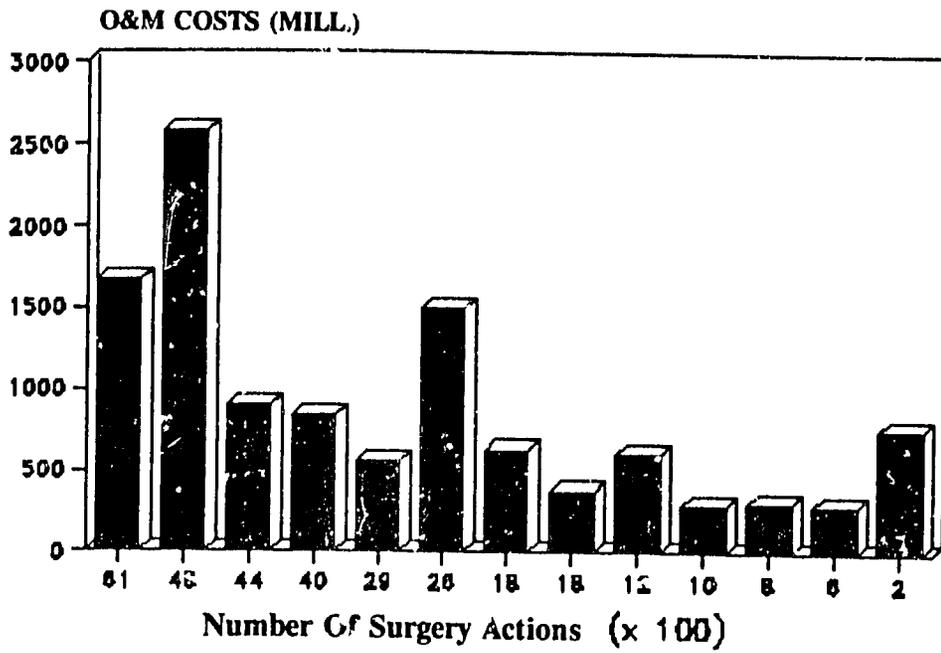
**CHART 3. O&M COSTS AND OUTPATIENT TREATMENT**



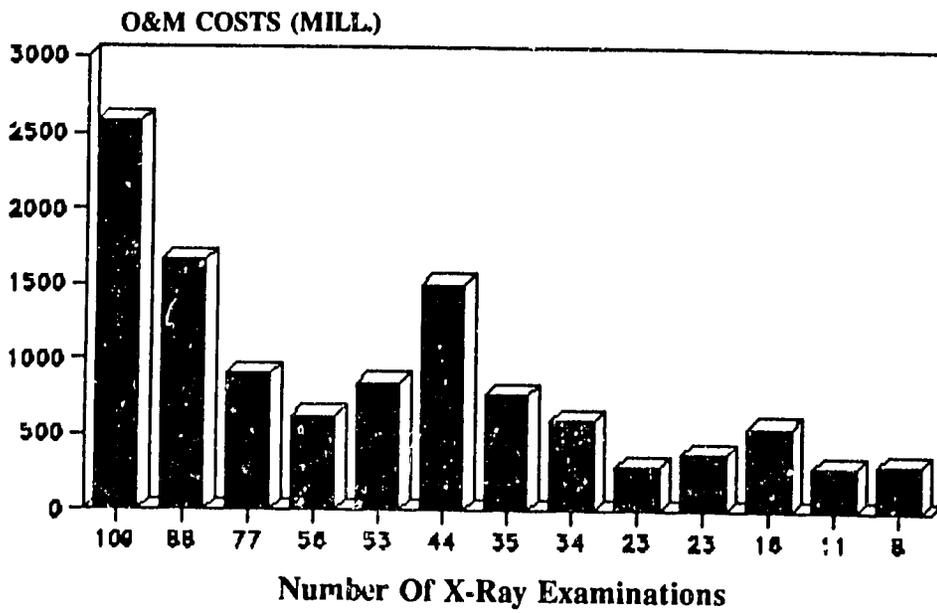
**CHART 4. O&M COSTS AND SPECIALIST OUTPATIENT TREATMENT**



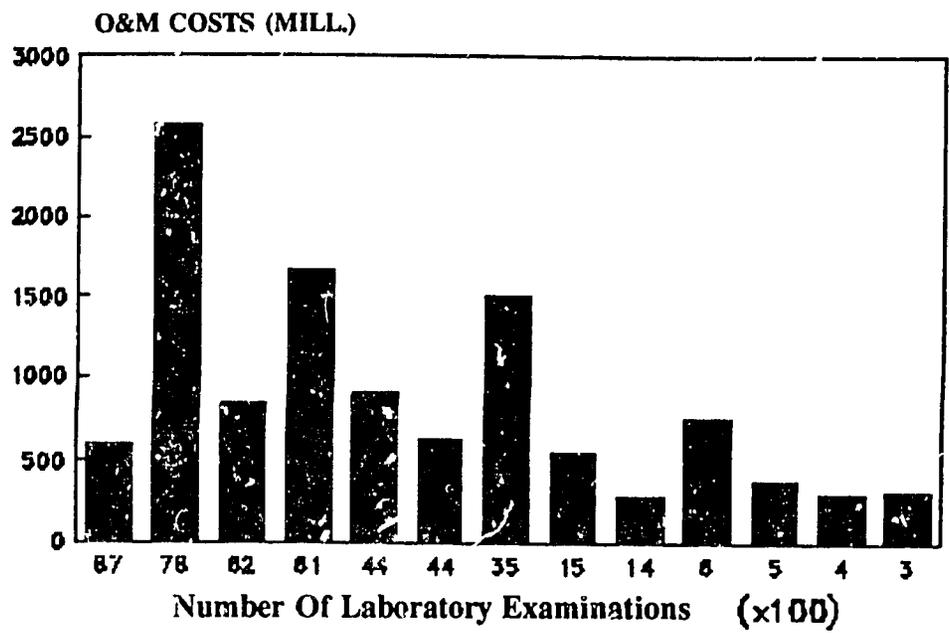
**CHART 5. O&M COSTS AND SURGERY ACTIONS**



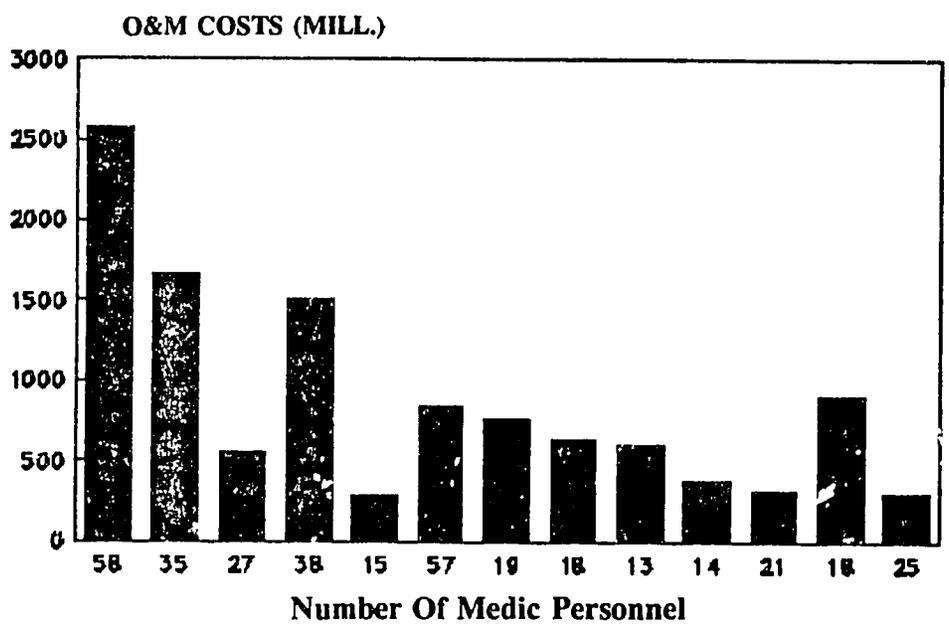
**CHART 6. O&M COSTS AND X-RAY EXAMS.**



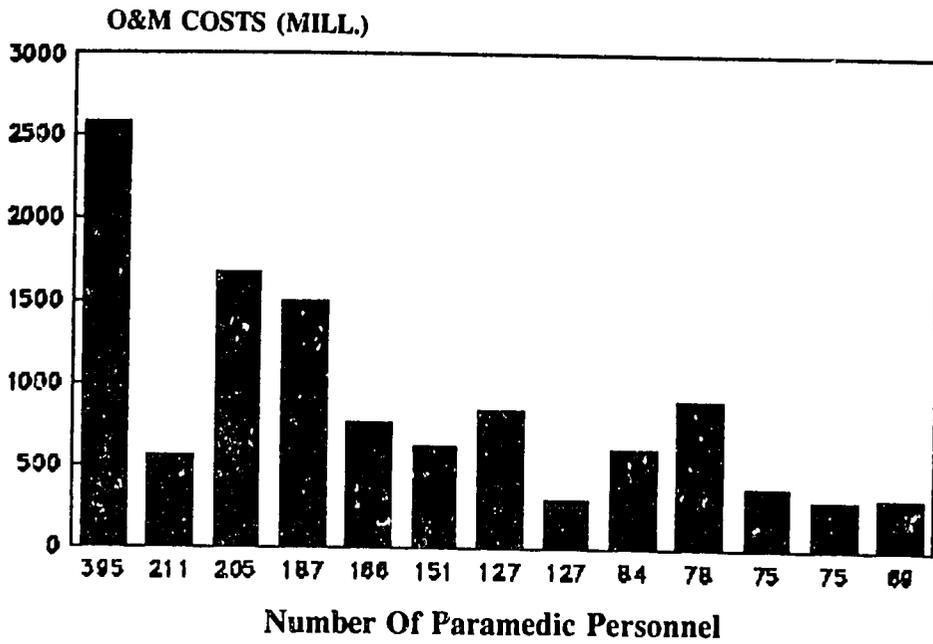
**CHART 7. O&M COSTS AND LABORATORY EXAMS.**



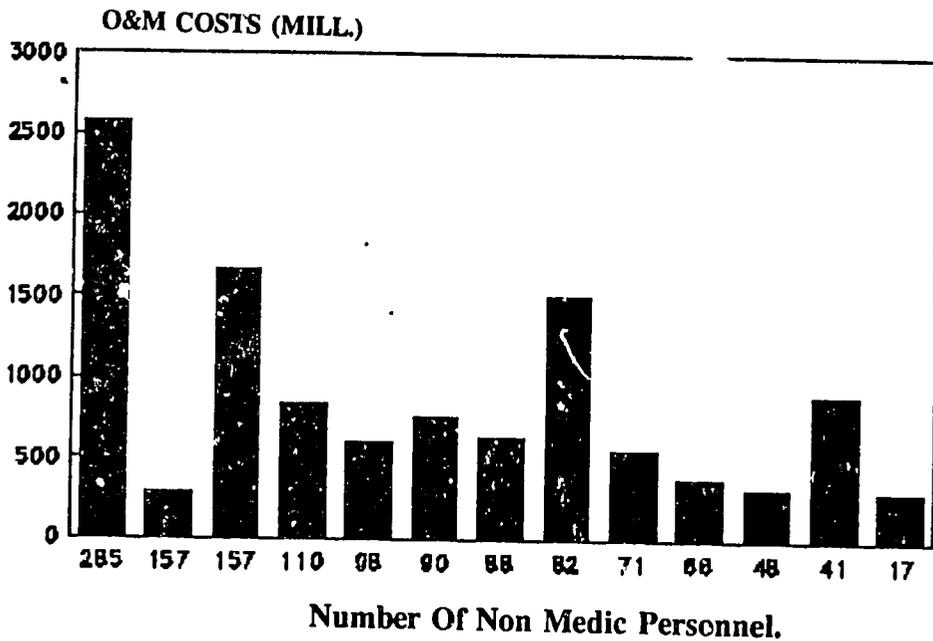
**CHART 8. O&M COSTS AND MEDIC PERSONNEL**



**CHART 9. O&M COSTS AND PARAMEDIC PERSONNEL**



**CHART 10. O&M COSTS AND NON MEDIC PERSONNEL**



To find out how the above mentioned variables contributed to the variation in the total amount of O&M costs, a stepwise regression analysis was undertaken.

The stepwise regression analysis executed included 14 hospitals. Total O&M costs were treated as the dependent variable, and various other variables characterizing the hospitals were used as the independent variables as shown in the Table III.2 below. Note that Table show the regression coefficient and its related "t-value" for each independent variable and a prediction of total O&M costs. The "R-2" and the overall "F level" of significance of the estimating equation all is presented in the last row of the Table.

**TABLE III.02 DEPENDENT VARIABLE : TOTAL O&M.**

Independent variable	Regression coefficient	Sig. T
Total bed days	19.261	.0000
Number of bed	0.452	.1872
Outpatient (GP) visits	- 0.024	.7928
Outpatient (Specialist)visits	0.171	.2912
Surgical procedures	0.051	.7089
X-ray exams	0.060	.7709
Lab-exam	-0.144	.2676
Total personnel	0.169	.3357
Medical personnel	-0.085	.5754
Paramedical personnel	0.183	.2674
Admin. personnel	0.098	.4843
Building size	0.080	.7562
Constant : intercept	-344.459	
R-square = .91 and Significance F = 0.0000		

As indicated in the table, the total number of bed days turns out to be a strong determinant of hospital total O&M cost, with a significancy level of 0.0000. A similar analysis conducted for only hospital class C and D (excluding the two class-B hospitals) yield the same result, i.e. a strong role of the number of total bed days.

It should be bore in mind that the number of hospital included in the two regression analysis is very limited, i.e. only 14 and 12 hospitals respectively. Therefore, the validity of the result are questionable. However, such an anlysis help explain the bardigram presented in this chapter.

## B. THE O&M FINANCE BY THE SOURCE

There were 10 types of sources of the O&M finance for hospitals including funds from the Central administration, the Provincial level, the District level, the PHB, etc. Sources of finance are shown in the Table below.

**TABLE III.03 SOURCES OF O&M FINANCE FOR GOVERNMENT HOSPITALS.**

<b>CENTRAL LEVEL</b>	1.DIP 2.INPRES 3.SBBO 4.DIK
<b>PROVINCE/DATI.I</b>	1.DIP 2.DIK
<b>DISTRICT/DATI.II</b>	1.DIP 2.DIK
<b>PHB</b>	
<b>OTHERS</b>	

Source : HEPA Unit (Unit AKEK).

Table III-04 shows the percentage of the total O&M costs collected from the secondary data available at each hospital. The breakdown of the percentages in rupiah is shown in the attached Table. As will be further explained, it turned out that in a number of hospitals the amount of the O&M salary and drug was smaller when compared with the data obtained from the survey. It was also evident that a considerable number of hospitals had, indeed, not had complete data on both the salaries of the employees and the cost of drugs used. In general, the data on both these items were very weak in a number of hospitals. This, for instance, was discovered in the RS Sumedang, RS Bodjonegoro, RS Wlingi, RS Lubuk Linggau, RS Palopo, RS Batang, and RS Batu Raja.

For B-class RSU like the RS Mataram and the A.Moeloek, the finance of the Dati I played a very dominant role, i.e. 84% for the RSU Mataram and 95% for the RS A.Moeloek. For C-class hospital, it was the finance from the Dati II that had been playing a major role i.e 71% - 89%. For D-class hospital, no clear pattern was visible. There were some hospitals that had been relying heavily on the Dati I sources, e.g. the RS Palopo, RS Batang, and RS Palangkaraya. Some others had been depending on the Dati II and the Central level sources for their finance, e.g. the RS Baturaja, or only on the Dati II sources, e.g. the RS Boyolali.

The role of the SBBO in the central budget was very outstanding. In general the proportion was more than 50% of the central budget.

It was also discovered in this study that a number of hospitals had other sources of finance for O&M. An example was the RS Bojonegoro, which had been able to use part of its income. The funds from this income had been used for a number of things such as the honoraria of the medical and the non-medical personnel(including drivers, security guards, etc), vehicle maintenance, and purchase of non-medical supplies. A similar condition was encountered in the RS Sumedang. Direct use of the income would be formally accounted for in the Dipda Tkt.II.

**TABLE III.04 PERCENTAGE OF O&M COST BY THE SOURCE.**

<b>HOSPITAL</b>	<b>SOURCE OF FINANCE</b>			
	<b>CENTRAL</b>	<b>PROVINCE</b>	<b>DISTRICT</b>	<b>PHB</b>
<b>B-Class</b>				
1. Mataram	2%	84%	8%	7%
2. A.Moeloek	2%	95%	-	3%
<b>C-Class</b>				
1. Soewondo	6%	7%	83%	4%
2. Sumedang	16%	-	83%	1%
3. Bojonegoro	10%	17%	71%	71%
4. Wlingi	9%	-	89%	2%
5. L.Linggau	18%	-	80%	2%
<b>D-Class</b>				
1. Palopo	21%	67%	-	12%
2. Batang	6%	93%	-	1%
3. Baturaja	44%	-	56%	-
4. Boyolali	6%	15%	75%	4%
<b>Controll</b>				
1. Tegalyoso	99%	-	-	1%
3. Pandeglang	24%	-	82%	14%

### **C. O&M COSTS BY COST ITEMS**

An attempt also was made to trace the cost items of the secondary cost data gathered from hospitals in this analysis, so that they could be classified into the various O&M cost components, i.e. salaries/wages, drugs, food, warehouse maintenance, etc.

It is necessary to confirm here that the data on salaries /wages used in this study were the data on salaries/wages obtained from a survey made by collecting the data on salaries/ wages/incentives and other earnings of each hospital employee. In a case of a large number of the hospital studied it was discovered that the total amount of salaries/wages based on the survey exceeded the total amount of salaries/wages in the secondary data. This was a result of the fact that not all data on the salaries/wages of the hospitals' employees were available in the hospitals, because some of them received their pay at either the Dinas Dt-1 or the Dinas Dt-II. For this study it was decided to the data on salaries/wages from the survey, because they were more complete.

The drug data cost are known to be of low validity. First, from the data collected it was evident that the difference in the cost of drugs was very great between two hospitals which ought to display little difference in drug costs. The cost of drugs in the RS Mataram, for instance, was only 1/3 of the cost of drugs in the RS A.Moeloek, even though both these hospitals belonged to the same class, i.e. B-class, and even though there was not much difference in the number of beds and the BOR between them. This was perhaps a result of the incompleteness of the data available in the hospitals. Second, there were hospitals that gave drug prescriptions to their patients. Therefore the data collected did not reflect the actual total amount of drug costs in these instances. In this study no further attempt was made to trace the cost of drugs expended through the prescriptions, due to the complexity of the method required for that purpose and other constraints. Consequently, the calculation of cost, as will be described later in Chapter V, was done in two ways. First, the calculation was done by including the data collected on the drug cost; and second, the calculation was done without the inclusion of the drug cost.

In the classification of the types of the O&M costs, it turned out that there were many types of costs that had to be grouped under the category of "others", because the variations of the items among the hospitals were so great. Costs classified as others, for instance, were as follows:

Electricity, gas, water, telephone,  
cost of travel, cost of supplies, cost of Maintaining  
Hospital Equipments, cost of training.

Table III-05 below shows the percentage of each type of O&M cost for each hospital. It is obvious that in total the cost of salaries/wages absorbed approximately 50 - 60% of O&M costs. A fairly great variation, however, is seen in the percentages of the cost of drugs. As already explained above, this could possibly be a result of the variation in the completeness of the data on the cost of drugs, and the variation in the quantities of drugs given through prescriptions. On the average, B-class hospitals spent 12.5%, C-class 26.4%, and D- class 9.3% on drugs. The cost of food was on the average between 8 - 12%, and the cost of the maintenance of the building was on the average between 2.3 - 3.8%; while other cost of others was on the average between 12 - 18%.

**TABLE III.05 PERCENTAGE OF THE TYPE OF O&M COSTS.**

Name of Hospital	Type of Costs				
	Salaries	Drugs	Foods	Build. Maint	Others
<b>B-Class</b>					
1 Mataram	59%	9%	6%	3%	23%
2 A Moeleok	52%	16%	18%	4%	10%
<b>Average</b>	55.5%	12.5%	12.0%	3.5%	16.5%
<b>C-Class</b>					
1 Soewondo	48%	29%	7%	5%	11%
2 Sumedang	48%	19%	11%	3%	18%
3 Bojonegoro	18%	65%	5%	1%	10%
4 Wlengi	59%	14%	14%	4%	9%
5. Lubuk Linggau	63%	5%	12%	6%	14%
<b>Average</b>	47.5%	26.4%	9.8%	3.8%	12.4%
<b>D-Class *</b>					
1. Palopo	69%	4%	13%	3%	11%
2 Batang	61%	11%	12%	2%	14%
3 Baturaja	63%	3%	4%	2%	28%
4 Palangkaraya	53%	19%	2%	2%	18%
<b>Average</b>	61.5%	9.3%	7.8%	2.3%	17.8%
<b>Controll</b>					
1. Tegalyoso	40%	45%	8%	4%	4%
2 Pandeglang	56%	32%	5%	4%	3%
<b>Average</b>	48%	38.5%	6.5%	4%	3.5%

(\*) Boyolali Hospitals is not included here because the validity of its data leaves much room to doubt

## CHAPTER IV RESULTS:

### THE CALCULATION OF UNIT COSTS

As already explained in the chapter on the Methodology, the method applied for calculating unit costs of hospital outputs is the "double distribution" method. The application of this method made it possible to trace all cost components comprising unit cost thus making it possible to know how much the costs of salaries, drugs, and others were in terms of the unit cost of certain outputs.

Four types of unit cost calculation are presented here. **First** is the total unit costs, which contains all O&M cost elements. The total unit cost may be somewhat biased due to the incompleteness of the data on drugs. **Second** is the calculation of the unit costs without drugs. In view of quality of the non-drugs data collected, it can be said that the unit costs without drugs is fairly reliable. **Third**, a calculation was also made of the unit costs without salaries and without drugs. These unit costs included the cost of maintenance, the cost of electricity, water, and telephone. **Fourth**, a special calculation was also made of the cost of food.

The purpose of calculating the four types of unit costs was to determine to what extent the current price tariff covers O&M costs expended. A comparison of the tariff with unit costs establishes the "cost recovery rate" of the tariffs of hospitals, which is expected to serve as inputs for the Hospital Financing Policy. This will be discussed further in Chapter V.

The determination of a large number of types of hospital outputs as a basis for calculating unit costs is rather complete. This report will, for this purpose, narrate the following unit costs of the group of outputs:

1. The unit cost of outpatient treatment: general and specialized.
2. The unit cost of the Emergency Unit.
3. The unit cost of inpatient treatment.
4. The unit cost of actions comprising :
  - surgery
  - radiology
  - clinic laboratory

Actually the outputs of both general and specialized outpatient treatment appear in different types or cost categories, depending on the branch of specialization of the concerned hospitals. A detailed calculation for the unit costs of the various outputs is shown in the "spread sheets" attached to this document.

For the unit cost of inpatient treatment, it is clear that a distinction should be made as far as possible between the different classes of inpatient wards. However, sometimes difficulties do occur in the separation of the inputs for each of these classes. The second- and the third-class wards of inpatients treatment, for example, employed the same personnel and it was very difficult to estimate the amount of time personnel spent in each ward/section. In the calculation some notes will be made in cases where such circumstances were encountered.

Mention needs to be made here once again that the total amount of unit cost was determined by the total cost and quantity of the outputs. In hospitals that were not efficient, the total cost would swell, thus making the unit cost high. Similarly, a high unit cost will also be encountered in hospitals with a low degree of use.

## **A. TOTAL UNIT COSTS**

### **1. Unit Costs of General Outpatient Services**

Out of the 12 hospitals analyzed, only 10 hospitals permitted the calculation of their unit costs for their general outpatient treatment. These hospitals consisted of 5 C- class hospitals, and 5 D-class hospitals. There were hospitals that did not provide general outpatient treatment; RS Tegalyoso was an example.

In Table IV.01 it could be seen that the average unit cost of outpatient treatment for C-class hospital was Rp. 2,470, ranging between Rp. 888 and Rp. 2522. The five hospitals were RS.Soewondo, RS.Sumedang, RS.Bojonegoro, RS.Wlingi, and RS.Lubuk Linggau. The lowest cost was found in RS Wlingi, Rp.888. The other three hospitals, i.e. RS.Soewondo, RS.Sumedang, and RS.Bojonegoro, had an almost similar unit costs, approximately Rp. 2,400. The RS Lubuk Linggau, Rp.1,972, was mid-way between the lowest and the highest unit costs.

Further the table also shows that the average unit cost of outpatient treatment in D-class hospitals was Rp.2.936. This figure was obtained from the calculation made of 3 hospitals, namely Palopo, Batang, Baturaja, and Palangkaraya. The lowest unit cost was found in the RS Baturaja(Rp. 1,040) and the highest in the RS Batang(Rp.5,558).

A comparison made showed that unit costs of general outpatient services D-class hospitals was approximately 20 % higher than that of C-class hospitals, i.e. Rp.2.930 as against Rp.2.470. This is because the number of outpatients, was higher in C-class hospitals than in D-class hospitals. On the average the number of outpatient visits in C-class hospitals was 55 persons/day; in D-class hospital the number of visits was only 45 persons/day. Such a comparison proves, as has all this time been generally assumed, that D-class hospitals indeed, have not yet been operating efficiently when compared with C-class hospitals.

**TABLE IV-01 UNIT COSTS OF GENERAL OUTPATIENT TREATMENT**

Hospital	Total	without drugs	without salary	Drugs	Salary	Others
<b>C-Class</b>						
1.Soewondo	2522	2005	688	517	1834	171
2.Sumedang	2349	1118	1507	1231	842	276
3.Bojonegoro	2502	577	2172	1925	330	247
4.Wlingi	888	864	97	24	791	73
5.Lbk.I inggau	1972	1914	272	58	1700	214
6.Plk.raya	4589	3426	2286	1163	2303	1123
<b>Average</b>	2470	1651	1170	820	1300	351
				33%	53%	14%
<b>D-Class</b>						
1.Palopo	2211	2102	251	109	1960	142
2.Batang	5558	3623	2525	1935	3033	590
3.Baturaja	1040	982	731	58	309	673
<b>Average</b>				701	1767	468
				24%	60%	16%
<b>Controll</b>						
1.Tegalyoso	3561	2528	1282	1033	2279	249
				29%	64%	7%
2.Pandeglang	3390	898	2719	2492	671	227
					20%	7%

## 2. Unit costs of specialist outpatient service.

Unit costs for specialist outpatient service were calculated for each type of specialist services provided in the hospitals studied. This section presented calculation of the average unit cost for all hospital as well as for each hospital, by type of the specialist outpatient service.

As depicted in Table IV.02, the average unit cost of specialist outpatient services in C Class hospital do not differ very much from that in D Class hospital. The higher unit costs in D Class hospital may be due lower number of visit as compared to that in C Class hospital.

**TABLE IV.02 UNIT COST OF SPECIALIZED OUTPATIENT TREATMENT**

Hospitals	Unit Costs	Without Salaries
<b>C-Class</b>		
Soewondo	8400	3036
Sumedang	3192	496
Bojonegoro	8562	7607
Wlingi	1223	171
Lbk.Linggau	9174	1106
Plk.raya	5128	2345
Average	5946	2460
<b>D-Class</b>		
Baturaja	6238	826
Average	6238	826
<b>Controll</b>		
Tegalyoso	3561	1252
Pandeglang	11352	5132
Average	7546	3192

Source : HEPA Unit (Unit AKEK).

Table IV.03 and Table IV.04 present the unit cost of various specialist outpatients services in each hospital. There are several specialist outpatient departments which already have a high utilization, and therefore have a low unit cost. For example, the ophthalmology outpatient clinic in Soewondo hospital served 9,332 patients a year and the unit cost is only Rp. 145,-

The OBGYN outpatient treatment unit in the hospital only had 1,163 patients, which as a result made unit costs to be as high as Rp. 17,566.

Further, from Table above it can be seen that certain units had fairly high unit costs, i.e. the OBGYN Unit, the Pediatric and Dental/Oral Unit at RS. Soewondo, the Internal Medicine and Surgery Unit at RS. Bojonegoro, and the Internal Medicine Unit at RS. Lubuk Linggau.

Calculation of unit costs of D-class hospitals could be done rather completely only in the cases of RS Baturaja and the RS Palangkaraya. In the RS Palopo and the RS Batang no specialized outpatient treatment facilities, except dental/oral services.

The unit costs of Internal Medicine outpatient treatment was very high in RS. Baturaja, i.e. Rp. 19,899. The reason for this was that the number of patients seeking treatment was small, only 1,111. By comparison, the number of patients of the pediatric polyclinic of the hospital reached as high as 22,907 which brought the unit cost down to Rp. 1,317.

In RS Palangkaraya, with the number of patients reaching 1,618, the unit cost was Rp. 8,584. The utilization of the Internal Medicine polyclinic was fairly high, i.e. 3,967 patients, such that the unit costs were less than that of the RS Baturaja, Rp. 2,884.

The services of the specialized polyclinic of the RS Tegalyoso, however, seemed to have a uniform unit cost. The number of the patients was indeed large. Besides the Skin/Venereal and Neurology polyclinic, other special polyclinics treated more than 2,000 patients per year--ranging from 2,500 to 7,000 people.

What is most striking is the Surgery outpatient treatment of RS. Pandeglang where unit costs amounted to Rp. 53,290. The polyclinic treated only 815 patients in the year of this study.

**TABLE IV.03 UNIT COSTS OF SPECIALIZED OUTPATIENT TREATMENT  
AT C-CLASS AND CONTROL HOSPITAL(Tegalyoso)**

Specialty	A.Moe- loek	Soe- wondo	Sume- dang	Bojo- negoro	Wlingi	Lb.ling- gau	Tgl. yoso
Surgery	3129		1703	8642	452	1389	3891
Internal medic.	5155			17779	962	43348	2744
OBGYN	3598	17566	4057	6403	1922	1132	3475
Pediatry	1183	8900	3446	3034	1021	964	2192
Ophthalmology	2155	145	1747			5963	2778
E.N.T	953	7661	3523		1760		2008
Dentis./Oral	258	7726	1796	6954			4494
Neurology	7027						5744
Veneral/Der- matology	506		3271				4722

**TABLE IV.04 UNIT COSTS OF SPECIALIZED OUTPATIENT TREATMENT  
AT D-CLASS HOSPITALS AND CONTROL HOSPITALS (RS. Pandeglang)**

Specialty	Batang	Bt.raja	Pandeglang
Surgery		5810	53290
Internal Medicin		19899	1803
OBGYN		2050	1464
Pediatry		1317	3908
Ophthalmology			
E.N.T.			
Dentistry/Oral	1387	1685	4254

### **3. Unit Costs of the Emergency Unit**

On the average the unit costs of the Emergency Unit were Rp.11,234 in C-Class Hospitals, and Rp. 7,749 in D-Class Hospitals. These costs were higher than the average unit cost of the general and the specialized outpatient treatment (Table IV.05).

There is a large variation of the unit costs of the Emergency Units among the hospitals. Among C-class hospitals, the highest unit cost was found in the RS Wlingi, Rp.26,534.

Among D-class hospitals, the unit cost of the RS.Palangkaraya, Rp.23,022 was the highest.

The RS Pandeglang as the control hospital had the highest unit cost for emergency treatment, i.e. Rp. 53,290. The number of patients of the Emergency Unit here was indeed very small, only 815 people a year. In the RS Tegalyoso the unit cost of the Emergency Unit was quite low, Rp. 6,786. The figure was even lower than the average unit cost of C-class hospitals. The number of patients of the Emergency Unit of this hospital totalled 7.408 people, which was indeed larger than the number treated at other C-class hospitals.

### **4. Unit Costs of Inpatient Treatment**

Table IV.06 shows the unit costs of the various inpatient treatment facilities. Since our efforts to estimate the unit costs of the 1st Class and the VIP inpatient treatment facilities was not successful, the discussions that follows concerns mainly the unit costs of the 3rd Class inpatient treatment in four major sections, namely : Surgery, Internal Medicine, Pediatric, and OBGYN.

In general the average unit cost of inpatient treatment of C-class hospitals was smaller than those of D-class hospitals. For the four types of inpatient treatment mentioned above, the unit cost of C-class hospitals was Rp.8,967, while the unit cost of D-class hospitals was Rp.18,065, or approximately twice of that of the former. Again these figures show that D-class hospitals had been less efficient compared with C-class ones.

However, if compared with the two control hospitals, it is evident that the unit costs of the sample hospitals of the study were more efficient. For RS.Tegalyoso, for instance, the average cost of the inpatient treatment was Rp.13.837, while for RS.Pandeglang it was Rp.9.6106.

**TABEL IV/5 UNIT COSTS OF THE EMERGENCY TREATMENT UNIT.**

Hospitals	Total	Without Drugs	Without Salaries	Drugs	Salaries	Others
<b>B-Class</b>						
A Moeleok	5022	4202	1622	820	3400	802
<b>C-Class</b>						
Soewondo	6679	3982	3351	2697	3328	654
Sumedang	7921	5674	3813	2247	4108	1566
Bj negro	12474	3285	9952	9189	2522	763
Wings	26548	26548	3017	0	23531	3017
L.Linggau	2555	2554	537	1	2018	536
Plk Raya	23022	23022	6391	0	16631	6391
Average	13,200	10,844	4,510	2,356(18%)	8,690(66%)	2,155(14%)
<b>D-Class</b>						
Palopo						
Batang	2164	1898	434	266	1730	168
Baturaja	5810	5682	1135	128	4575	1007
Average	3987	3790	785	197	3,203	588
<b>Control</b>						
Tgl Yoso	6694	5079	2501	1615(24%)	4193(65%)	886(13%)
Pandeglang	53290	24333	33326	28957	19964	4369

**TABEL IV.06 UNIT COSTS OF 3RD CLASS- GENERAL INPATIENT TREATMENT**

Hospital	Total	Without Drugs	Without Salaries	Drugs	Salaries	Others
<b>B-Class</b>						
A Moeleok						
<b>C-Class</b>						
Soewondo	51,922	34,641	30,855	17,281	21,067	13,574
Sumedang	25,837	21,294	17,079	4,543	8,758	12,536
Bj negro	31,959	9,593	22,664	22,366	9,295	298
Wings	48,924	40,882	22,692	8,042	26,232	14,650
L.Linggau	12,007	11,203	5,540	804	6,467	4,736
Plk Raya	30,167	24,679	23,467	5,488	6,700	17,979
Average	33,469	23,715	20,383	9,754 (29%)	13,086 (39%)	10,6292 (32%)
<b>D-Class</b>						
Palopo	18,736	8,343	13,455	10,394	5,281	3,062
Batang						
Baturaja	9,677	9,217	2,253	480	7,444	1,773
Average	14,217	8,780	7,854	5,437 (38%)	6,353 (45%)	2,417 (17%)
<b>Control</b>						
Tgl Yoso	138,007	132,380	19,832	5627	118175	14205
				4%	86%	10%
Pandeglang	96,106	77,756	28,715	18350	67391	10365
				19%	70%	11%

## **5. The Unit Cost of Medical/Diagnostic procedures.**

In this study it was discovered that a considerable number of health care units also conduct various kinds of medical or diagnostic procedures. These, for instance, included procedures such as surgery, obgyn, radiology, laboratory, and the ophthalmology section, the ear-nose-throat section, the dental/oral section.

As already described in the chapter on the Methodology, for practical reasons all types of procedures will be divided into three categories, i.e. 1).small/simple, 2).medium, and 3). major procedures. An attempt was then made to calculate the cost of manpower and the cost of drugs/materials per procedures for each category. These data were used for calculating weights appropriate for the calculation of the unit cost of each category.

Because there were so many data to be collected, and due to the complexity of the process of the collection of data on the manpower and the drugs/material inputs, it was decided that only three types of procedures would be subjected to analysis, i.e. Surgery, Radiology, and Laboratory. Each type of procedure was then divided again into small/simple, medium, and big/sophisticated. The division was based on the classification of procedures issued by the Directorate General of Medical Services, Ministry of Health of Republic of Indonesia.

### **a. Unit Costs of Surgery Actions**

A summary of unit costs of surgery actions is presented in Table IV.07. For C-class hospitals, the average units costs for small, medium, and major surgery procedures were Rp.7.123,50, Rp.25.106, Rp.118.599,50 respectively.

For D class hospitals the costs were by far higher for medium and major surgery Rp.6.408,50(twice of that of C-class hospitals) and Rp.146.472,50 (twice of that of C-class hospitals) respectively. The calculation at RS.Tegalyoso, the control hospital for C-class hospitals, showed a striking difference for medium and major surgery procedures. But the cost of small surgery was by far smaller in this hospital, i.e. less than half of those of other C-class hospitals.

**TABLE IV.07 UNIT COSTS OF SURGERY ACTION.**

<b>Hospital</b>	<b>Small</b>	<b>Medium</b>	<b>Major</b>
<b>C-Class</b>			
RS Soewondo	1,750	21,706	66,484
RS. Sumedang	22,615	17,966	138,402
RS. Bj.negoro	2,580	9,996	52,284
RS. Wlingi	3,417	12,199	98,818
RS. Lb.linggau	925	24,760	89,263
RS. Plk.raya	11,454	64,009	266,346
Average	7,123.50	25,106.00	118,599.50
<b>D-Class</b>			
RS.Palopo	1,825	12,817	72,794
RS. Baturaja	1,053	18,207	220,151
Average	1,439.00	6,408.50	146,472.50
<b>Control</b>			
RS. Tegalyoso	2,556	12,728	82,262

Source : HEPA Unit (Unit AKEK).

### **b. Unit costs of clinical examination.**

Unit costs of laboratory examination were presented in Table IV.08. As explained earlier, the laboratory procedures were categorized into simple, medium and sophisticated examination. The simple examination include for example routine blood test for haemoglobine, leucocyte count and differentiation, urine and faeces examination, etc. The medium ones are SGOT, SGPT, Widal test, HDL Cholesterol, LDL Cholesterol, pregnancy test, etc. Examples of sophisticated examinations are various serological tests, microbial cultures, etc.

In Moeloek class B hospital, the unit cost of laboratory examinations is Rp.640, Rp.762 and Rp.1.428 for the simple, medium and sophisticated examinations respectively. The unit costs for simple examinations in Moeloek is lower than those in class C hospitals (with an average of Rp.1.019) and class D hospital (with an average of Rp.2.281). The unit costs at the control hospital (Tegalyoso, Palangkaraya and Pandeglang) is Rp.3.476, which much higher than the "efficient" hospitals in the sample.

For the medium type of laboratory examination, the unit cost in class B hospitals is Rp.762, in class C hospitals is Rp.663 and in class D hospitals is Rp.5127. It should be recalled, however, that the average unit costs are derived from a small sample of hospitals. Thus caution should be excercised in generalizing these findings.

### **c. Unit costs of X-ray examination**

Table IV.09 depicts the unit costs of various category of X-ray examinations. Belong to simple x-ray examinations are diagnostic x-ray for the chest, abdomen, extremetis, vertebrae, etc. Example of medium examinations are pelvimetry, mammography, tomography, ultrasonography, etc. Sophisticated examinations consist of various x-rays using contrast, and all examination using radioactive materials.

In Moeloek hospital unit costs are Rp.1.904, Rp.3.164 and Rp.6.568 for simple, medium and sophisticated procedures respectively. In class C hospital, the unit cost are Rp.5.888, Rp.7.449 and Rp.14.719 respectively. In class D hospital, only simple x-ray data were available, and the unit cost is Rp.3.220.

The average unit cost in the control hospitals are Rp.7882, Rp.17293 and Rp.21749 respectively. These figures are higher than those in the efficient hospitals.

TABLE IV.08 UNIT COSTS OF CLINICAL EXAMINATION

Hospitals	Category/type of examination		
	Simple	Medium	Sophisticated
<b>B-Class</b>			
Moclock	640,88	762,75	1.428,78
<b>C-Class</b>			
Soewondo	273,68	313,82	587,85
Sumedang	875,10	1.415,51	
Bojonegoro	775,15	910,65	
Wlingi	126,73	188,87	728,43
Lhinggau	2.868,14		
<b>Average</b>	<b>850</b>	<b>664</b>	<b>653</b>
<b>D-Class</b>			
Palopo	1.445,49	-	-
Barang	1.071,56		-
Bt raja	1.377,93	5.127,12	9.604,13
Plk raja	1.833,22		
<b>Average</b>	<b>2.170</b>	<b>5.127,12</b>	<b>9.604,13</b>
<b>CONTROL</b>			
Tgl yoso	4.754,84	5.659,02	-
Pandeglang	3.840,34	4.570,62	-
<b>Average</b>	<b>4.298</b>	<b>5.115</b>	

TABLE IV.09 UNIT COSTS OF X-RAY EXAMINATION.

Hospitals	Category/type of actions		
	Simple	Medium	Sophisticated
<b>B-Class</b>			
Moclock	1.944,91	3.164,85	6.669,68
<b>C-Class</b>			
Soewondo	7.452,19		25.700,92
Sumedang	868,40		2.994,95
Bojonegoro	11.888,99	-	-
Wlingi	4.483,36	7.448,73	15.462,30
Luhuk Linggau	4.748,00		-
Palangkaraya	2.829,61		-
<b>Average</b>	<b>5.376</b>	<b>7.448,73</b>	<b>15.562,30</b>
<b>D-Class</b>			
Palopo	1.540,81		-
Barang	4.899,55		-
Haturaja			
<b>Average</b>	<b>3.220,15</b>		
<b>CONTROL</b>			
Tegaloyo	6.306,35	10.477,48	21.749,46
Pandeglang	14.512,08	24.110,61	-
<b>Average</b>	<b>10.407,7</b>	<b>12.579</b>	<b>21.749,46</b>

## B. UNIT COSTS WITHOUT DRUGS

A problem encountered in the collection of data was the failure to record all drugs costs. Quite a considerable number of patients had been purchasing drugs in dispensaries, either in the hospitals' dispensaries or outside dispensaries, using the prescriptions given to them by hospitals' personnel. There is a possibility that the variation in unit costs among hospitals as described in section A above was the result of the variation in the policy on drug dispensing among the hospitals. This could lead to the conclusion that the comparison of unit costs among the hospitals included in the study does not illustrate the actual condition.

To eliminate all influences of the variation in drug prescribing, a calculation of unit costs was made without the inclusion of the drug costs. A comparison of unit costs without drugs would at least show the degree of efficiency in the use of funds used for salaries and maintenance. The results shown in Tables IV.01, IV.02, IV.05, and IV.06 are synthesized in Table IV.10 below.

**TABLE IV.10 UNIT COSTS WITHOUT DRUGS.**

	C-Class Hospital	D-Class Hospital	Tegal-yoso	Pand e-glang
General Outpatient Treatment	949	2092	-	3390
Specialist Outpatient Treatment	4121	5025	2528	2114
Emergency Action Unit	8406	9514	5073	1438 8
General Inpatient Treatment 3rd Class	7047	16299	8417	1946 1

Source : HEPA Unit (Unit AKEK).

For the general outpatient treatment, again it was also seen that unit costs of C-class hospitals were fairly small when compared with those of D-class hospitals. Similarly, unit costs of D-class hospitals were much smaller than that of the RS Pandeglang, the control hospital. The figures conformed with the estimation of the gradation of the level of efficiency between C-, D-, and the control hospitals in this study.

Such, however, was not the case with unit costs of the specialized outpatient treatment C-class hospitals, indeed, were more efficient than B-class ones. But the unit costs of these two types of hospitals turned out to be far higher than those of the control hospital. An explanation to this is that even in one hospital there can be variations in the levels of efficiency of the production units. This means that (see example above) the specialized outpatient treatment units of RS.Tegalyoso and RS.Pandeglang had treated a fairly large number of patients. Such a condition could also be seen by comparing the unit costs of the Emergency Units.

For inpatient treatment it was also seen that unit costs (without drugs) of C-class hospitals reached Rp.7.047, while those of D-class hospitals were twice as much, i.e. Rp.16.299. Here it was also found that the third class inpatient treatment of RS.Tegalyoso had already had unit costs that were almost equal to those of other C-class hospitals.

All in all it could be said that the direction of the comparison of the values of the unit costs was consistent enough with the direction of the comparison of the unit costs with drugs, meaning that even if there were doubts as to the completeness of the data on drug costs, it could still be made a basis for the formulation of conclusions.

### **C. UNIT COSTS WITHOUT SALARIES**

As was the case with the unit costs without drugs, a calculation had been made of the unit costs without salaries. The calculation of this is very important, especially in relationship with the policy on tariffs. For hospitals, unit costs without salaries are in principle the same as marginal costs (MC). It is common knowledge that a marginal cost is the additional cost required to produce one more unit of

output. In such a case as this the MC is a variable cost highly influenced by the volume of production.

Since the amounts of salaries remain unchanged (fixed), especially if production in the hospital has not reached full capacity, any increase in the outputs of the hospital will not lead to the increase in salaries. In such a case as this salaries are a "fixed cost", which in the short term will remain unchanged-quite often salaries are also referred to as a "semi- variable cost" (as noted in Chapter I). Thus, if the salaries are taken away from the unit cost, what remains will be a variable cost that is marginal in nature. The remainder(without salaries) consists of drug cost and other costs (materials, food, maintenance, and other operational costs).

The result of the calculation of unit costs without salaries is shown in Table IV.11. The figures in the Table show that there had been a consistency of unit costs between C- class and D-class hospitals, particularly for the general and the specialized outpatient treatment. Unit costs of inpatient treatment, however, was an exception, C-class hospitals were by far more efficient.

**TABEL IV.11 UNIT COSTS WITHOUT SALARIES**

	C-Class Hospital	D-Class Hospital	Tegalyoso Hospital	<u>Pandeglang Hospital</u>
General Outpatient Treatment	1321	1414	-	2644
Specialist Outpatient Treatment	2362	2135	1282	914
Emergency Action Unit	4134	2834	2608	41566
General Inpatient Treatment	5015	9008	8009	8890

**CHAPTER V**  
**VARIATION IN UNIT COSTS**  
**AND ITS COMPARISON WITH TARIFFS**

**A. VARIATION IN UNIT COSTS**

Analysis of variance is important for the purpose of identifying factors related to the variation in the values of a variable. For example, in the case of cost analysis, it is possible to identify factors related to the variation of a unit cost. This, however, is difficult, if the number included in a sample is small, as is the case in this study. Nevertheless, an attempt was made to study the relationship of the variation in unit costs in relation to a number of characteristics of the concerned hospitals, i.e. using the cross-tabulation technique. The characteristics chosen were the number of beds, the number of x-ray examinations conducted, the number of operation, the number of doctors, paramedics, and non- medical personnel.

A differentiation was made of both C and D-class hospitals, i.e. those with high unit costs, and those with low unit costs. A limited analysis was made of only the unit costs of inpatient treatment. The results are presented in Table V.01.

The C-class hospitals classified as those having high unit costs of inpatient treatment (Rp. 9.628 or more) were RS.Tegalyoso, RS.Wlingi, and RS.Soewondo, while those with low unit costs (Rp.8.514 or less) were RS.Lubuk Linggau, RS.Bojonegoro, and RS.Sumedang. Similarly, for D-class hospitals those with low unit costs (Rp.24.072 or less) were RS.Pandeglang, RS.Batang, and RS.Palangkaraya; while those with high unit costs (Rp. 9.697 or more) were RS.Palopo and RS.Baturaja.

Of all the characteristics observed it turned out that the number of beds and the number of non-medical personnel were the variables that exhibiting differences that corresponded to the levels of unit costs. This means that in both C and D-class hospitals with a considerable number of beds, unit costs were high. Similarly, hospitals with a large number of non-medical personnel proved to have high unit costs.

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## B. VARIATION IN UNIT COSTS OF FOOD

The unit costs of food was one of O&M cost components of which the data were relatively accurate such that the values of the unit costs calculated may be considered as reliable. The level of unit costs of food, therefore, were further analyzed, particularly for the purpose of seeing whether there were any "economies of scale", i.e. the relationship between the portions produced and the amount of the unit cost.

For this purpose, a regression analysis was made in which unit cost was treated as a dependent variable, while the Length of Stay (LOS) was treated as the independent variable. The result illustrating the pattern of the relationship is presented in the following formula:

$$UC = 4236 - 0.88 OPT + 0.0000638 OPTSQ$$

in this case :

UC = Unit Cost

OPT = Output(Length of Stay)

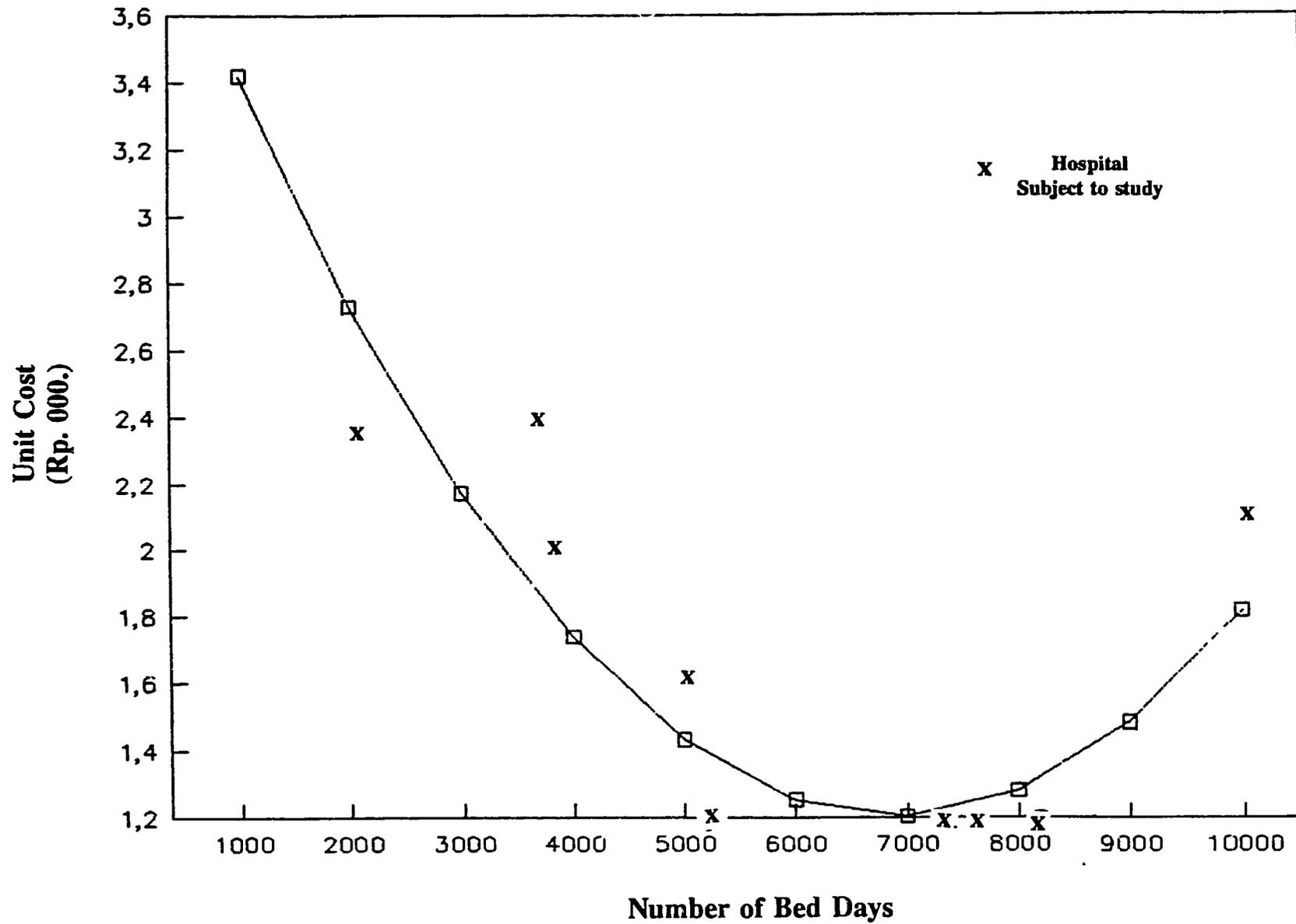
OPTSQ = OPT squared

The above equation explains 65% variation in the unit cost of food ( $R^2 = 0.655\%$ ) with significant of  $P < 0.04$  (for the total equation),  $P < 0.01$  for the OPT, and  $P < 0.02$  (for the OPTSQ)

For example, if a ward produces 3500 LOS in a year, then the unit cost of food is estimated to be  $(4236 - (0.88 \times 3500) + (0.0000638 \times 3500 \times 3500)) = \text{Rp. } 1.938$ .

Using the formula it was possible to analyze the "economies of scale", i.e. making a curve of the unit costs at the various levels of outputs (length of stay). The result is shown in the curve below. The curve shows the presence of the "economies of scale" in the production of the portions of food, meaning that the unit cost will become lower, if the LOS is increased to a certain point; and if that point is surpassed, the unit cost will rise. As it turned out, the optimal level of production (LOS) that had offered the lowest unit cost was 7,000 bed day/year. At this point, the unit cost of food was Rp.1.200,-

## Economies Of Scale Food Costs



Using the curve line mentioned above, an attempt was made to calculate the extent to which unit costs of each hospitals deviates from the curve line. The results are presented in Table V.02 below. There were indeed a number of hospitals that had surpassed the limits of efficiency; these were RS.Soewondo, RS.Bojonegoro, RS.Baturaja, and RS.Pandeglang. In the meantime, those that had not reached an optimal degree of efficiency were RS. Sumedang, RS.Wlingi, RS.Tegalyoso, RS.Lubuk Linggau, and RS.Palangkaraya.

**TABEL V.02 THE DEGREE OF EFFICIENCY OF THE UNIT COST OF FOOD.**

HOSPITALS	LENGTH OF STAY	AVERAGE UC	EFFICIENT UC	DIFFERENCE
RS SOEWONDO	8155	984	1303	319
RS SUMEDANG	7421	1661	1219	-442
RS BJ NEGORO	7543	1019	1228	209
RS WLINGI	10361	2253	1967	-286
RSTGL YOSO	5022	1718	1426	-292
RS LB LINGGAU	3822	2148	1804	-344
RS PLK RAYA	3538	2489	1921	-568
RS BATURAJA	5346	945	1355	410
RS PANDEGLANG	1817	2345	2848	490

UC = Unit Cost

It should be noted that these results should be interpreted with care, since unit costs of food are just a component of overall unit costs of inpatient services. Thus the number of bed days that is optimal for food service may be above or below the number of days that optimize unit costs overall

## **B. COST RECOVERY RATE**

In this section a presentation is made of the comparison between O&M unit costs and tariffs in effect in each hospital. It needs to be mentioned here that the comparison is by no means an illustration of the complete degree of "cost recovery", because O&M unit costs does not include investment costs.

The purpose of the presentation is to determine the extent to which certain tariffs now in effect can cover O&M cost or certain O&M cost elements. The results of calculation for general outpatient treatment, specialized outpatient treatment, and inpatient treatment respectively are shown in Tables V.03, V.04, and V.05.

### **1. Cost Recovery as compare to Total Unit Costs**

#### **a.General Outpatient Treatment**

For general outpatient treatment(Table V.03), neither one of the hospitals studied had a tariff that would cover 50% of total O&M unit costs (see Cost Recovery I column of the Tables). For C-class hospitals, O&M costs covered by the current tariffs (which ranged from 12% in RS.Soewondo to 34% in RS.Wlingi hospital) was on the average 14%. The tariff of the general outpatient treatment of a number of the hospitals was Rp.300.

Conditions in D-class hospitals did not differ much. With the tariff of outpatient treatment also Rp.300 on the average, O&M costs covered (which ranged from 5% in the RS Batang to 29% in RS.Bturaja) was averagely around 29%.

#### **b.Specialized Outpatient Treatment**

The average tariff of specialized outpatient treatment in C- class hospitals was Rp.5.949 This tariff covered only approximately 20% of O&M costs (Table V.04). This cost recovery rate is a bit higher when compared to that of the general

outpatient treatment. In fact, in RS.Wlingi and RS.Sumedang the rates were quite high, 82% and 47% respectively. In D-class hospitals, with the tariff of specialized outpatient treatment Rp.1.000, the cost recovery rate reached 18%.

### **c. Inpatient Treatment**

The average tariff of inpatient treatment in C-class hospitals was Rp.2.320. With O&M unit cost at Rp. 8.967, the tariff was able to cover only about 27% of the unit cost. For D-class hospitals the cost recovery rate reached 13.5% (Table V.05). The cost recovery rate of RS. Palangkaraya was, however, the lowest with only 6%.

For the control hospitals, the cost recovery rates were by far lower: the RS Tegalyoso achieved only 9%, while the RS Pandeglang only 6%.

## **2. Cost Recovery Compared to Unit Costs without Salaries**

In the short term the operational "sustainability" of a production process such as in a hospital, is determined by whether or not the effective tariff is able to cover marginal costs (for further discussions on this, see Chapter VI).

As was stated earlier O&M unit costs less salaries is basically a marginal cost. The difference between marginal cost and the tariff is, therefore, an indicator of whether the pricing policy of the hospitals under study is one that is healthy or not, viewed from the standpoint of corporate economy. The difference or distance is shown in the column of Cost Recovery II shown in Tables V.03, V.04, and V.05.

### **a. General Outpatient Treatment**

On average, C-class hospitals had covered approximately 45.5% of their marginal costs not including salaries. The RS Lubuk Linggau had, in fact, even exceeded the marginal cost, i.e. 110%, though the difference between the tariff and the marginal cost was only Rp.28.-

For D-class hospitals, the conditions were highly varied. The RS Palopo had covered 280% of the general outpatient treatment marginal cost (without salaries) with a (tariff - cost) difference of Rp.193. The other three hospitals, however, were on the average able to cover only 22% of their marginal costs less salaries.

#### **b.Specialized Outpatient Treatment**

The cost recovery rate of the marginal cost for specialized outpatient treatment appears to be better improving when compared with that of the general outpatient treatment. This appears to be the case in both C- and D-class hospitals. A number of the C-class hospitals were able to cover unit costs without salaries for specialized outpatient treatment, e.g. the RS Sumedang, Wlingi, and Lubuk Linggau respectively 384%, 540% and 118%. In D-class hospitals the tariffs of specialized outpatient treatment so far has been able to cover only 50% of their marginal costs less salaries.

#### **c.Inpatient Treatment**

The tariffs of inpatient treatment in C-class hospitals, which on the average was Rp.2.320.-, were still far below their marginal costs less salaries. This was particularly true of the RS Soewondo, RS Wlingi, and RS Bojonegoro where "cost recovery" covered less than 25% of the cost. The RS Sumedang and RS Lubuk Linggau, however, covered approximately 85% - 90% of these costs. The tariffs of D-class hospitals also do not contribute greatly to covering their costs. Only the RS Palopo had been able to cover 75% of the cost, while the others only covered less than 45%. The achievement of the RS Palangkaraya was even smaller, only 9%.

**TABLE V.03. UNIT COSTS AND TARIFFS RATIO OF GENERAL OUTPATIENT TREATMENT.**

Hospital	Total	Without Salaries	Tariffs	Cost Rec. I	Cost Rec.II.
<b>C-Class</b>					
RS Soewondo	2522	688	300	12%	27%
RS Sumedang	2349	1517	300	13%	65%
RS Bj negoro	2502	2117		0%	85%
RS Wlingi	888	97	300	34%	11%
RS L.Linggau	1972	272	300	15%	14%
RS Palangkaraya	2349	2286	300	13%	97%
<b>Average</b>	<b>2,097</b>	<b>1,163</b>	<b>250</b>	<b>14%</b>	<b>50%</b>
<b>D-Class</b>					
RS Palopo	2211	251			
RS Batang	5558	2525			
RS Baturaja	1040	731	300	29%	70%
<b>Average</b>	<b>2 936</b>	<b>1,169</b>	<b>300</b>	<b>29%</b>	<b>70%</b>
<b>Controll</b>					
Pandeglang	3 390	2,633	300	9%	78%

**TABLE V.04 UNIT COSTS AND TARIFFS RATIO SPECIALISED OUTPATIENT TREATMENT**

Hospitals	Without Salaries	Tariffs	Cost Rec. I	Cost Rec.II.
<b>C-Class</b>				
RS Soewondo	3036	1,000	12%	33%
RS Sumedang	496	1,500	47%	307%
RS Bj negoro	7607	1,000	12%	13%
RS Wlingi	171	,000	82%	583%
RS L.Linggau	1106	1,500	96%	136%
RS Palangka raya	2345	1,000	20%	43%
<b>Average</b>	<b>2460</b>	<b>1 167</b>	<b>20%</b>	<b>47%</b>
<b>D-Class</b>				
RS Baturaja	826	1,000	13%	16%
<b>Average</b>	<b>826</b>	<b>1,000</b>	<b>13%</b>	<b>16%</b>
<b>Controll</b>				
RS Tgl Yoso	1252	1,000	35%	28%
RS Pandeglang	5132	1.150	45%	10%
<b>Average</b>	<b>3192</b>	<b>1075</b>	<b>43%</b>	<b>14%</b>

**TABLE V.05 COST RECOVERY OF GENERAL INPATIENT TREATMENT-3RD CLASS**

Hospitals	Unit Costs	Without Salaries	Tariff	Cost Rec.I. (%)	Cost Rec.II. (%)
<b>C-Class</b>					
RS Soewondo	9628	5295	1250	13	24
RS Sumedang	6471	4141	3500	54	85
RS Bj.Negoro	7990	5753	1250	16	22
RS Wlingi	12231	5626	1000	8	18
RS Lb Lingsgau	8514	4257	3800	45	89
RS Plk Raya	30167	21117	2000	7	9
<b>Average</b>	12500	7698	2133	24	41
<b>D-Class</b>					
RS Palopo	7601	2660	2000	26	75
RS Batang	24794	9928	3000	12	30
RS.Baturaja	9697	2327	1000	10	43
<b>Average</b>	14031	4972	2000	16	49
<b>Control</b>					
RS Tgl Yoso	13575	8009	1250	9	16
RS Pandeglang	24027	8890	1500	6	17
<b>Average</b>	18801	8450	1375	8	17

**TABLE V.06 UNIT COSTS AND TARIFFS RATIO OF INTENSIVE CARE UNIT.**

Hospitals	Total	Without Drugs	Without Salaries	Drugs	Salaries	Others
<b>C-Class</b>						
Soewondo	6679	3982	3351	2697	3328	654
Sumedang	7921	5674	3813	2247	4108	1566
Bj negoro	12474	3285	9952	91	2522	763
Wlingi	26548	26548	3017	0	23531	3017
L.Lingsgau	2555	2554	537	1	2018	536
Plk Raya	23022	23022	6391	0	16631	6391
<b>Average</b>	13,200	10,844	4,510	2,356	8,690	2,155
				18%	66%	16%
<b>D-Class</b>						
Batang	2164	1898	434	266	1730	168
Baturaja	5810	5682	1135	128	4675	1007
<b>Average</b>	3987	3790	785	197	3,203	588
<b>Control</b>						
Tgl Yoso	6694	5079	2501	1615	4193	886
				24%	63%	13%
Pandeglang	53290	24333	33326	28957	19964	4369
				54%	37%	8%

**CHAPTER VI**  
**DISCUSSIONS AND CONCLUSIONS:**  
**OPERATIONAL AND STRATEGIC POLICY IMPLICATIONS**

The analyses of the sources of finance, the uses of finance, and the calculation of O&M unit cost have been presented in the preceding chapters. Much has been done to present these results as objectively as possible.

This final chapter presents the various discussions and the conclusions drawn from the findings and what their implications are as far as the operational functions and policies of a hospital are concerned. It is believed that an operational function that can be further developed is the planning of O&M budget and the system of accounting of hospitals. As concerns strategic policies, emphasis is focused on pricing policy and cost containment policies.

While this chapter will feature numerous interpretations and opinions, which are somewhat subjective, as they are based on objective data and information gathered.

**A. THE PLANNING OF THE O&M BUDGET**

**Technical Issues of O&M Budget Planning**

A budget plan can usually be developed on by using one of two approaches. The first approach is the "incremental increase approach". The basis of this approach is the experiences of the previous years which gives the budget planner a "feeling" of the the upward trend of costs from year to year. If, for instance, it is estimated that average cost needs will always increase by 10% of the previous year's, then the budget for the forthcoming year is estimated to be the same as that of the current year plus 10%.

In this approach the O&M budget plan is directly arranged by the O&M items, e.g. drugs, supplies goods, maintenance, travels, water supply, telephone and energy, etc.

The advantage of this method is that it is easy to do. The disadvantage lies in the assumptions used, i.e. an equal percentage of increase is set for all cost items: drugs, materials, maintenance, and even salaries. In reality, the inflation rates of the costs of the items are not the same. Besides, this approach is not based on the estimation of the forthcoming year's outputs which may involve cases in which the volumes of the activities increase or decrease. If that is the case, the budget plan may no longer conform with the actual needs.

In practice, however, what has been often used as the basis of budgeting is "how large approximately will the approved budget be?", instead of "how large approximately is the increase in the finance needed?" This actually is a result of the fact that the many sources of funds for hospitals have each been coming to the hospitals as packages of budgets of which the allocation and the procedure have been standardized. It quite often happens that coordination, let alone consolidation, of the budgets from the various sources is difficult.

The second approach employs the production target and unit costs as the basis of budgeting. Thus it can also be referred to as the target and unit cost approach. The advantage of using this approach is that it is more realistic, and is based on the volumes of outputs projected. This method indeed requires that the managers of hospitals work on their own projection of outputs for the forthcoming year.

The weakness of the second approach lies in the difficulty it offers when it comes to the quantitative determination of the volumes of services targeted for the forthcoming year. For example it is perhaps relatively easy to determine the target for outpatient treatment (both general and specialized) and the length of stay, but it is not so easy to translate what the number of visits and treatment implies in terms of the number and types of diagnostic examinations to be performed.

Another weakness is the incompleteness of the data on unit costs. The O&M budget plan is usually prepared on the basis of the O&M items themselves: salaries/wages, medical supplies, non-medical supplies, food, maintenance of the medical facilities, maintenance of the support medical facilities, and maintenance of non-medical facilities. The use of unit costs that are not specified by the items will

only complicate the preparation of a specified O&M budget plan. Unfortunately the available information on a number of unit costs of outpatient is usually general in nature. No attempt is made to break the costs down into portions of each component. Thus, in this study an attempt has been made to overcome most of these problems, though (as can be seen above) not all of them had been successfully resolved.

Further, the many types of services produced by a hospital also contributes to the difficulty in using unit costs. A target needs to be set for each type of service. This is difficult, particularly for those production units that produce "mixed services", e.g. The Clinical Laboratory, the Radiological Section, the operation room, etc. That is why the use of the information on the unit costs resulting from this study is limited in nature. The use of unit costs as the basis of working on the overall O&M budget plan will be possible, only if a calculation is made of unit costs of all the types of outputs of the hospital.

For the time being it is suggested here that hospitals make use of both approaches simultaneously. For units of which the products are of similar types (general and specialized outpatient treatment, inpatient treatment), it will be possible to use the target and unit cost approach. For units of which the outputs are of different types, the first approach as described above should be used, since no specific data on the unit costs are likely to be available.

### **The Use of the Unit Costs in the O&M Budget Planning**

As described earlier, complete calculation O&M finance needs based on unit costs will only be possible, if the unit costs of all types of outputs of a hospital are known and a projection is made of the output "production" targets to be achieved in the forthcoming year.

The study has not managed to produce the unit costs of all types of hospital outputs. If a certain hospital intends to use the "unit cost" approach, the hospital will then need to calculate all unit costs. If this can be accomplished, then subsequent calculation of O&M finance needs would be relatively simple. The steps in such a process are briefly described immediately below.

First, the concerned hospital must determine its projection of outputs for the forthcoming year. This, for instance, could be done by looking at upward or downward trends of previous and current years. Second, the projected target must be multiplied by the unit cost of each output.

Both the first and the second planning approaches to financial operational needs can be taken by using Table VI.01 and Table VI.02. In this report, for instance, the tables were used for estimating the O&M finance needs for the RS Sumedang. In such a case as this, the unit costs for the laboratorial actions and the Rontgen were quoted from the results of the study made by Dr. Asiah Suroto, who also conducted a comprehensive cost analysis at the RS Sumedang(The Cost Analysis of the RS Sumedang 1988/1989, Thesis, Faculty of Public Health-University of Indonesia, 1990).

As can be seen, the above simulation of the calculation has managed to produce the total O&M finance needs, without salaries, only drugs, only food, and only others(maintenance, electricity, water, telephone, etc.) This is obtained from Table VI.01.

Further, by using Table VI.02, the needs can be analyzed by their sources. The basis of this is the amount of finance from the various sources being realized in the current year. Then, by "judgement", an estimate is made as to whether it will be possible to obtain an increase(or decrease) from the sources.

Again, the weakness of this method is the incompleteness of the data on the unit costs for all the outputs of the hospital. It is, therefore, necessary to compare the results of the calculation with the results of the conventional estimation(the budget of the current year plus a certain percent of increase estimated for the forthcoming year).

PROJECTION OF O & M BUDGET NEEDS  
OF THE RSU SUMEDANG  
BUDGET YEAR 1990/1991

**Table VI.01**  
SIMULATION  
Target . approx 7.5%  
Higher than that of 89/90

PRODUCTION TARGET		UNIT COSTS					BUDGET PLAN				
		Total Rph. Mill.	(-) Salaries	D r u g s	F o o d s	O t h e r s	Total Rph. Mill	(-) Salaries	D r u g s	F o o d s	O t h e r s
<b>Outpatient Treatment:</b>											
General	20 000	2047				40 9					
Specialist	20 000	6030				120 6					
Emergency	7 000	11243				78 7					
<b>Inpatient Treatment</b>											
3rd class	35 000	8967				314 0					
2nd class	1 900	8969				17 03					
1st class	2 000	10606				21.2					
V.I.P											
<b>Surgery:</b>											
Small	560	6258				3.5					
Medium	1.100	17325				19 05					
Big	280	89050				24.93					
<b>Radiology:</b>											
Small	6 000	4205				25 2					
Medium											
Big											
Special											
<b>Laboratory:</b>											
Small	45 000	556				25 02					
Medium											
Big											
Special											
<b>TOTAL 90/91</b>						690 1					
<b>TOTAL 89/90</b>						624 4					

**TABLE VI.02**  
**O&M BUDGET PLANNING OF RSU.SUMEDANG**  
**BUDGET YEAR : 1989/1990**

**SIMULATION.**

SOURCE	TOTAL	SALARIES	DRUGS/MATERIALS	FOOD	NON-MED MATERIAL	BLD MAINTENANCE	MED INSTRUM MAINTENANCE	NON-MED INSTRUM MAINTENANCE	ELECTR WATER PHONE	OTHERS
<b>CENTRAL</b> 1 DIP 2 DIK 3 SBBO 4 INPRES 5 BLN										
<b>PROVINCE</b> 1. DIP 2 DIK										
<b>DISTRICT</b> 1 DIP 2. DIK										
<b>PHB</b>										
<b>CTHERS</b>										
<b>TOTAL</b>	690 13 Mill	302 6 *)	166 7	75 9		20 7				

\*) Assumption Salaries remain unchanged

124 2

Allocation of Total O&M Costs by cost items based on percentage of allocation as last year

- Salaries 43 8% (stable)
- Drugs 24 1% (increased by 5%)
- Foods 11% (stable)
- Building 3% (stable)
- Others 18% (stable)

## **B. THE DEVELOPMENT OF THE HOSPITAL ACCOUNTING SYSTEM**

### **The System of Accounting and Self-Financing**

Recently there have been statements of intention to provide broader autonomy to Government hospitals. This includes more autonomy in the management of the finance and in the direct use of the revenue of hospitals. One of the objectives of such thinking is to promote the self-reliance of the hospitals, by which it is also expected that improvements will take place in the quality of services.

Financial self-reliance can, among others, be achieved by adjusting the price and containing the utilization of resources available for the concerned hospitals. This will obviously require professional financial management to assure that budget planning is accurate, budgetary control is functioning, and the system of accounting is good.

In other words, in a self-financing system in which financial decisions are taken by the management of the hospital, a good system of accounting is indispensable. However, as was encountered in this study, weaknesses still prevail in the practice of the principles of accounting in the hospitals studied. This was particularly true when it came to managerial accounting.

### **The Issues of the System of Financial Accounting of Hospitals**

#### **a. Accounting Information**

A major difficulty encountered in the cost analysis conducted during the course of study was the weakness of the system of accounting in a significant number of the sample hospitals. The accounting Systems and Procedures, which had been orientated more towards financial accounting, can not support managerial accounting needs.

As generally known, financial accounting is orientated more towards the effort to account for the finance received and spent. The records and reports concern

income and expenditure such as in form of a balance sheet; and this is usually general in nature for each cost item (drugs, salaries, materials, travels, etc.). Expenses are not yet related to the outputs and the performance of hospitals.

Managerial accounting provides information on the relationship between inputs and outputs, e.g. information on unit costs, trends in the use of finance or cost items in the various units of hospitals, etc. This information is needed by the management of hospitals for making decisions such as on price setting, commitment in the use of finance, and the determination of the volume of outputs, etc.

For managerial accounting, in addition to the data on incomes and expenditure, other data are also needed, e.g. data on the use of drugs by production units, which are very often found to be incomplete. All that is available is the overall expenditure of finance on drugs by the hospital. Where the drugs have been used and how much of them have been used have never been properly recorded, despite the fact that data on the expenditure on drugs are very vital for the cost analysis of hospitals. This especially is important because the drug component is quite large in the O&M cost of hospitals. There are hospitals that do not have any processed data on their outputs, e.g. on the numbers of the various types of laboratorial examinations or surgery actions performed during the year.

Managerial accounting also requires that such data be collected at each cost centre, be it productive or supportive in nature. This is particularly important in cases where it is necessary to see how the various types of O&M cost components are used in each of the cost centres at a certain time, and the trends in a certain period of time. The data are also needed to calculate the unit costs of each productive cost centre.

The results of the managerial accounting of hospital finance are mainly used in the planning and control of budget and the determination of the prices. In the planning of budget, managerial accounting provides information on the unit cost, and the need of the various units of hospitals for the various types of cost items that it is possible to assess whether any unusual increase or decrease has occurred or not-and if it has, the necessary corrective measures will have to be

taken. For pricing policy the unit costs resulting from the managerial accounting are useful in the purpose of assessing the extent to which a hospital maintains its operations deficit or making profit.

Again, those information on those matters described above will only be available if the managerial accounting function appropriately.

#### **b. Cash basis and accrual basis accounting.**

Other major pitfall in the cost data is the fact that hospital studied practice a cash basis accounting system. However, since the data used were those of 1987/1988, and were collected in 1989, it is assumed that all financial transactions which took place during 1987/1988 were completed.

Nevertheless, for a regular and accurate accounting, an accrual basis accounting need to be developed in each hospital.

#### **Developmental Measures**

There are a number of basic measures that need to be taken for the establishment of the hospital's accounting, particularly the managerial accounting. The measures are 1/. the clarification of the units of the hospital that serve as cost centres; 2/. the standardization of items of information to be collected; 3/. the standardization of the use of drugs and materials for various services; 4/. the assignment of certain officer to fill in the forms in each cost centre; 5/. the presence of a centre of data storage and processing, and analysis standard and its outputs, 6/. the dissemination of the results(information) to the management of the hospital, and 7/. the application of the information in the planning and control of costs or the regulation of the price.

#### **a. The Identification of the Hospital's Units: Support and Productive Cost Centres**

The first step in developing the managerial accounting is to decide the focal point where information has to be gathered. The focal point is basically the

functional units of the concerned hospital. In the system of accounting the focal point is the "cost centre".

The productive unit is differentiated from the support units. A productive unit is one that produces the hospital's products, i.e. general and specialized outpatient treatment, inpatient treatment, laboratorial examination, diagnostic examination, radiological examination and therapy, operation actions, etc. A support unit is one that supports the productive unit, e.g. the administrative unit, the kitchen, the laundry, the maintenance units, etc.

Experiences have shown us that not all of these units can be seen in the hospital's organogram. Thus, every hospital needs to clarify this; this can be done by the concerned hospitals themselves.

In the determination of these cost centres, all physical facilities need to be included into certain cost centres. The open hall and connecting corridor, for instance, has to be completely split up among the relevant cost centres (e.g. cost centres that are close to it). This is necessary for such purpose as allocating the cost of the maintenance of the building. The same is true in the case with the parking lot, and the grounds and the garden. These can be included as part of the "General Administration" or the "Maintenance" cost centre.

What needs to be clearly defined in the determination of these cost centres is that as cost centres they represent a complete unity comprising facilities (buildings, equipment, etc.) and manpower as well as clearly-defined functions. The common problem, however, concerns manpower. It very often happens that a staff is assigned to more than one cost centre, e.g. a director (of the Administrative Cost Centre--as the support centre) is concurrently a surgeon in the surgery (productive) cost centre. Similarly, there are nurses who are concurrently assigned to the 1st class and the VIP-class of the inpatient treatment units.

In cases where such a situation is encountered, it will be necessary to have a knowledge of the time allocated or the percentage of the time the staff spends in each of these cost centres. It is enough to do this only once, through a survey, and should changes occur later on, the data should be "updated".

**b. The Standardization of the Items of the Accounting Report.**

For the managerial accounting, particularly if related with the O&M cost, it is necessary to determine the data items to be collected in accordance with the needs. Every cost centre needs to make a record of items relevant to the activities of the concerned cost centre.

The data to be collected by each cost centre will minimally be as are shown in Table VI.03 below :

**TABLE VI.03  
DATA TO BE RECORDED BY HOSPITAL COST CENTRES  
IN THE MANAGERIAL SYSTEM OF ACCOUNTING**

Type of Data	Periodicity
<b>O&amp;M Items</b>  1. Drug use 2. Use of materials 3. Use of energy, water 4. Non-medical exhaustible materials 5 Salaries 6. Maintenance of medical instruments 7. Maintenance of non-medical facilities	  monthly monthly monthly monthly  monthly monthly  monthly
<b>Output (of productive units)</b>  1 (Gen./spec.) outpatient treatment 2. Inpatient treatment (gen, 3rd, 2nd, 1st, VIP, Special, etc) 3. Actions (small, medium, big, spec etc.) 4. Radiology 5. Clinical laboratory. ----- <b>Non Financial Data</b>  1. Area of Floor 2. Inventory of medical instrument, medical and non medical support materials	  monthly          -----  annually
<b>Others</b> 1. Drug use/materials per output 2. The use of time of the staff per output	survey ( 1x )

### **c. Standards for Drugs/Materials and the Calculation of the Cost for Multiple Products**

For calculating the unit cost of a cost centre which produces more than one type of products, it is necessary to find the basis on which the weights are to be set. It is, however, common practice to use the time consumed by the staff/officers (e.g. how long does it take a surgeon to perform appendectomy), and the drugs/materials consumed (e.g. the types and quantities of drugs and materials used for appendectomy).

It is also advisable that efforts be made to gradually standardize the use of drugs and materials for each type of service, especially in productive units that produce a variety of services. This can, for instance, be done through a special survey of the Clinical Laboratory, the Radiology/Rontgen section, and the Surgery section.

### **d. The Outputs of the System of Managerial Accounting**

The system of managerial accounting can produce information on unit costs. These data should be produced every year in order to enable the managers of the hospital to see the trend (whether or not inflation has occurred). If unit costs are broken down by their components (drugs, materials, etc.), then it also will be possible to know which of the cost components is experiencing the largest inflation.

In addition to this, the system of managerial accounting can also produce information on the pattern of expenditure of each cost centre. Knowledge can, for instance, be attained as to which of the cost centres absorbs the largest cost of drugs, cost of materials, cost of maintenance. If such information can be produced every month, it will then be possible to see the trends.

Efforts need to be made to trace the causes, should there be any striking changes. If inefficiency in the use of resources turns out to be the cause, corrective actions have to be taken.

#### **e. The Processing Centre**

The accounting data that have been collected need to be processed by a special unit, e.g. in the data and information centre of the concerned hospital. In view of the magnitude of the data to be stored and analyzed, it is necessary to have a computerized unit or center.

#### **f. The Skills of the Personnel**

Formats of the managerial accounting report (and also the formats of the financial accounting report) in particular must be understood by the officers in charge of the data and information centre. Because the endeavour includes the production of the calculation of the allocation of finance and the unit costs, the officers will have to have at least a mastery of one of the techniques of calculating the unit costs.

It is recommended here that the "double distribution" technique be applied. Once the format of the analysis is prepared (spread-sheets for "double distribution"), it can be used for a lifetime, unless, of course, changes occur in the structure of the organization and the cost centres of the concerned hospital.

### **C. STRATEGIC PRICING POLICY**

The pricing policy in Government facilities is usually viewed in terms of two aspects simultaneously, i.e. the aspect of cost in production of certain commodity (usually social services), and the aspect of equity in terms of accessibility to services. By looking into the unit costs and their components, it will be possible to calculate the various alternatives to the price on the basis of a number of assumptions concerning the extent to which the Government should provide subsidies. This will be discussed in point a. below.

Further, the implication of the price as concerns equity of social services, such as hospital services, can be analyzed from the perspective of "the ability and willingness" of the consumers to pay. This will be discussed in point b. below.

As will be seen later, as in the case of, the RSU Sumedang, it turned out that the ability of the public to pay was by far below the calculated unit costs. One of the solutions to this is to develop a health insurance scheme, by which it is believed that the public's ability will be stepped up. This will be discussed in point c.

#### **a. Alternatives to the price**

By comparing the unit costs with the effective price in each of the hospitals, the possibility is offered to make an estimate of how large should the government subsidize the consumers of the services of hospitals. This has been described in Chapter V. On the average the tariffs in effect for general outpatient treatment could cover only 16% of the total O&M cost, or approximately 22% of the O&M cost without salaries. For specialized outpatient treatment, the "cost recovery" was already quite good, i.e. 18% - 35% of the total O&M cost and 48% - 220% of the O&M cost without salaries. For inpatient treatment, the "cost recovery" was only 14% - 27% of the total O&M cost and 39%- 47% of the O&M cost without salaries.

This means that the Government has been subsidizing the consumers of hospital services; and in such a condition as described above the amount of subsidies will continue to rise, if the utilization of the hospital services rise. It needs to be noted here that the subsidies are not confined to only the O&M cost, because the investment cost is not included in the unit cost.

The question is : Will the Government keep on providing such subsidies? This will, however, depend on the financial capacity of the Government. If the capacity is limited, it will then be necessary to review the current price in effect. In fact, there are a number of alternative prices that can be put into effect.

The first alternative is to cover all unit costs plus profit. Here, the O&M unit cost is added to the unit cost of investment (separately calculated), plus profit. For the RSU Sumedang, for example, the unit cost of the OBGYN polyclinic is Rp. 3,347 (Asiah Suroto : Cost Analysis of the RS Sumedang 1988/89) comprising the cost of depreciation of investment of Rp.230, and the O&M cost of Rp.3,117. If the hospital is to make a profit of 10%, then the price applied should be Rp.3,400 or

approximately Rp. 3,500.(Note : the current price is Rp.3,700, which means that the RS Sumedang has been making a profit of Rp. 300 from the OBGYN outpatient polyclinic).

Secondly, subsidies are provided, but these are not to pose a burden to the operational cost, meaning that the hospital will be able to continue production for as long as the investment facilities are in good working order. For this, the price to be imposed will be as large as the marginal cost(Price = Marginal Cost or MC). By definition, the MC is the amount of cost needed to increase the production of a unit. In other words, the MC is actually an operational unit cost.

In the case of government facilities, since salaries are in general relatively stable and not affected by the volume of production (at least, if the hospital has not been operating to full capacity), they can actually be classified as fixed cost so long as no contract "sessional" fees are included. As such the actual marginal cost is O&M costs minus salaries. Theoretically speaking, fulfilment of this marginal cost will enable the hospital to continue its operation in the same manner it has been operating all this time.

In relation with the concept of hospital self-financing (swadana), the hospital would still belong to the government, but it would have to be financially self-reliant. Therefore, it is recommended that the government must still be the one to finance the investment cost, while the hospital itself must make every effort to fulfil its need for the operational finance. In other words, if the hospital relies on the fees of the patients as its sources of revenue, then the short term target to be achieved will be the adjustment of the price in such a way so as to equal marginal cost.

Tables V.03, V.04, and V.05(Chapter V) show the amount of the O&M cost without salaries respectively for outpatient treatment, specialized outpatient treatment, and 3rd class inpatient treatment. If the "Price = Marginal Cost" principle is adopted as a yardstick by which hospital will be able to maintain its operations, then the adjustment of tariffs required will be as shown in Table VI.04 below.

**TABLE VI.04**  
**TARIFFS ADJUSTMENT BY MARGINAL COST.**

Hospital	3rd Class Inpatient Treatment		Specialist Outpatient Treatment		General Outpatient Treatment	
	Present tariff	New tariff	Present tariff	New tariff	Present tariff	New tariff
<b>C-Class</b>						
Soewondo	1250	5295	1000	2520	300	1778
Sumedang	3500	4141	1500	391	300	1517
Bojonegoro	1250	5753	1000	7449	300	2172
Wlingi	1000	5626	1000	184	300	864
L.Linggau	3800	4257	1500	1266	300	272
Plk.raya	2000	21117	1000	1128	300	2295
<b>D-Class</b>						
Palopo	2000	2660			300	107
Batang	3000	9928			300	2526
Baturaja	1000	2327	1000	187	300	728
<b>Control</b>						
Tegalyoso	1250	8009	1000	1282		
Pandeglang	1500	8890	1150	914	300	2644

Note: The specialized outpatient treatment MC's of RS.Soewondo, RS.Wlingi, and RS.Baturaja were so small, because costs of drugs were very small (prescription were given to the patients).

## **b. The Aspect of Equity**

The issues of the adjustment of the price based on the results of the analysis of unit costs have been discussed above. In the discussion, particular attention has been given to the use of the marginal cost as the basis. The approach, however, is partial in nature, i.e. the issues are viewed only from the production or "supply" standpoint.

Because hospitals, especially those belonging to the Government, have had some social function to perform, it is also necessary to consider things from another standpoint, which is the impact of the adjustment of price on equity. In other words, it is also necessary to view matters from the standpoint of the public's ability to pay.

One way to do this is to make a study of the public's "ability to pay"(ATP) and their "willingness to pay"(WTP). Information on the ATP and the WTP is still scarce in developing countries, including Indonesia. The adjustment of the price without taking the ATP and the WTP into consideration may only adversely lead to inequity in the consumption of health services.

So far, a study that has been conducted in detail concerns the ability to pay for the premium of health insurance scheme in East Nusa Tenggara(NTT), and in Kelurahan Jati Petamburan(Jakarta), and the ability of the public to pay the price of the RSUD Sumedang.

A calculation has been made of the ATP and the WTP of the patients of the RSUD Sumedang. This calculation may contain a biased sampling, because there is no assurance that the picture of the general public can possibly be the same as that of the patients of the hospital. However, if it is assumed that the segment of the public seeking treatment at the hospital is socially and economically better than the general public, it can also be assumed that the ATP and the WTP of the public in general are lower than the ATP and the WTP studied.

The ATP in this study is defined as the "amount of money that the patient is able to pay for the health service he/she enjoys in the RSU Sumedang". This was measured by calculating the total income of the respondent and then subtracting the costs of food and non-food from it. The WTP is defined as the amount of money that the patient is willing to pay for the health service he/she enjoys. This was measured by asking the patient how much he/she was willing to pay for the health service (prior detailed explanation about the issue in question was, of course, given to him).

In this study an attempt has been made to quote the ATP tables for specialized outpatient treatment and 3rd-class inpatient treatment produced by the study of the RSU Sumedang. The ATP of specialized outpatient treatment was obtained from the survey of the patients of specialized outpatient treatment, while the ATP of 3rd-class inpatient treatment was obtained from the survey of the patients being treated in Class III. The ATP was later compared with the marginal cost (the O&M unit cost without salaries); the comparison was confined to only the cost of specialized outpatient treatment and 3rd class inpatient treatment.

It perhaps is necessary to mention here that the WTP of the respondents turned out to be lower than their ATP. For the purpose of the discussion on price, an attempt is made to use the ATP as the basis. The underlying assumption here is that the ATP can still be mobilized, e.g. by disseminating information or conducting a "social marketing" of hospital services, or through the health insurance scheme (program JPKM).

Figure VI.01 shows the ATP scale of the patients of the RSU Sumedang for specialized outpatient treatment. The average marginal cost for specialized outpatient treatment in the RSU Sumedang was quite low, i.e. only about Rp.400 (the reason for this is, among others, that the drugs were given through prescriptions). This means that actually the marginal cost was within the reach of all the patients interviewed. This further means that the "consumers surplus" (the total number of ATP was above the MC) was quite large that it would be possible to set the price by far above the MC.

It turned out that the price of the specialized outpatient treatment was on the average Rp. 3,990.- or approximately 10 times as much as the MC. Actually, with such a price (according to the ATP data) 66% of the patients were discovered to be less able to pay; so, those really able to pay totalled only 34%. If it is considered that what is desirable is that at least 75% of the patients should be able to pay, then it will be necessary to lower the tariff to Rp.1,500--this, in fact, is still three times as much as the marginal cost required.

For 3rd class inpatient treatment a very different picture was obtained of the ATP of the patients; the ATP was by far below the ATP for specialized outpatient treatment. This could possibly be due to the fact that the patients took into account their length of stay during treatment in the hospital. A picture of the ATP can be seen in Fig.VI.02.

According to this cost analysis, the marginal cost of inpatient treatment in the 3rd class of the RSU Sumedang was Rp.4100/day. Only about 12% of the patients could afford to pay for this. The price in effect was Rp.9,300, or twice as much as the marginal cost. These figures show that the RSU Sumedang has had problems concerning its inpatient treatment facility. The ability of the people to pay was far below the price in affect. The cost of materials also was far below the marginal cost, which also was below the tariff. A seperate calculation for class II and class I inpatient treatment also produces ATP's that are lower than the tariffs.

An alternative for the RSU Sumedang is to catch the potency of the ATP for outpatient treatment such that there occurs a cross subsidy between outpatient treatment and inpatient treatment.

Another approach is to deliver information on the results of this unit cost analysis to the PHB with the hope that the tariff for the PHB can at least cover the marginal cost of inpatient treatment. In addition, the RSU Sumedang can also persuade relevant parties to organize a JPKM system(health insurance scheme) in order to promote the ATP of the peoples-because there is a "pooling of risk".

The examples of RSU Sumedang show that it is not enough to use only the information on the unit cost to decided the policy on the price. Other hospitals can actually do the same; the staff of the concerned hospital themselves can be assigned to do the job.