FINANCIAL VIABILITY ANALYSIS OF DR. SOEJONO SELONG HOSPITAL IN INDONESIA, 2008

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การวิเคราะห์ความอยู่รอดทางการเงินของโรงพยาบาล นพ. ซูโจโน เซลอง ในประเทศอินโดนีเซีย ปี พ.ศ. 2551

นางลักษมี ซาฮาร่า

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
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Thesis Title	FINANCIAL VIABILITY ANALYSIS OF DR. SOEJONO SELONG HOSPITAL IN INDONESIA, 2008
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ลักษมี ชาฮาร่า: การวิเคราะห์ความอยู่รอดทางการเงินของโรงพยาบาล นพ. ซูโจโน เซลอง ในประเทศอินโดนีเซีย ปี พ.ศ. 2551. (FINANCIAL VIABILITY ANALYSIS OF DR. SOEJONO SELONG HOSPITAL IN INDONESIA, 2008) อ.ที่ปรึกษาวิทยานิพนธ์หลัก : รศ. ดร.ศิริเพ็ญ ศุภกาญจนกันติ อ.ที่ปรึกษาวิทยานิพนธ์ร่วม : นพ. พิรัส ประดิษฐวณิช, 80 หน้า.

วัตถุประสงค์ของการศึกษาคือวิเคราะห์ความอยู่รอดทางการเงินของโรงพยาบาล นพ. ซูโจโน เซลอง ในประเทศอินโดนีเซียปีงบประมาณพ.ศ.2551การศึกษาครั้งนี้เป็นการศึกษาย้อนหลังโดยใช้ข้อมูลต้นทุนจากมุมมองของผู้ให้บริการด้วยวิธีการวิเคราะห์แบบลำดับขั้น

ผลการศึกษาพบว่าต้นทุนทั้งหมดของโรงพยาบาล นพ. ซูโจโน เซลองคิดเป็น 20,852,759,000 รูปี สัดส่วนของต้นทุนค่าแรงงาน ต้นทุนค่าวัสดุอุปกรณ์ และต้นทุนค่าลงทุนคิดเป็น ร้อยละ 45.96 ร้อยละ 26.35 และร้อยละ 27.72 ตามลำดับ ต้นทุนต่อหน่วยของแผนกผู้ป่วยในคิดเป็น 295,960 รูปี ซึ่งเมื่อเปรียบเทียบกับต้นทุนต่อหน่วยของแผนกผู้ป่วยนอกที่คิดเป็น 109,105 รูปี ในขณะที่รายรับทั้งหมดของโรงพยาบาลคิดเป็น 26,902,360.57 รูปี โดยร้อยละ 67 เป็นรายรับจากการสนับสนุนของรัฐบาล ร้อยละ 5.1 เป็นรายรับจากโครงการการประกันสุขภาพของข้าราชการและพลเรือน ร้อยละ 11.7 เป็นรายรับจากโครงการประกันสุขภาพ และร้อยละ 16.3 เป็นรายรับจากผู้ป่วย ซึ่งรายรับรวมจากผู้ป่วยและจากโครงการประกันสุขภาพ (รายรับตั้งต้น) ร้อยละ 65 ต้องนำส่งเพื่อเป็นรายรับของรัฐบาลท้องถิ่น ในขณะที่เหลืออีกร้อยละ 35 เป็นรายรับที่โรงพยาบาลสามารถนำมาจัดสรรสำหรับผลประโยชน์ส่วนเพิ่มของบุคลากรและสำหรับการจัดซื้อเครื่องมือและอุปกรณ์ทางการแพทย์ ดังนั้นภายใต้เงื่อนไขดังกล่าวการคืนทุนของต้นทุนทั้งหมดเมื่อเปรียบเทียบกับรายรับแล้วคิดเป็น 0.96 ซึ่งไม่สามารถคลอบคลุมถึงต้นทุนทั้งหมดของโรงพยาบาลได้ อย่างไรก็ตาม เมื่อพิจารณารายรับตั้งต้นของโรงพยาบาลแล้ว การคืนทุนของต้นทุนทั้งหมดคิดเป็น 1.29 และการคืนทุนที่มิใช่งบประมาณคิดเป็นเพียง 0.43 รายรับจากผู้ป่วยเป็นรายได้หลักของแผนกผู้ป่วยในโดยมีอัตราคืนทุนสูงสุด 1.69 และต่ำสุด 0.34 ในขณะที่แผนกผู้ป่วยนอกคิดเป็น 0.34 ซึ่งมีค่าต่ำสุดเมื่อเปรียบเทียบกับโครงการประกันสุขภาพของข้าราชการและพลเรือน คือ 0.70

ต้นทุนต่อหน่วยของโรงพยาบาลจากการศึกษาค่อนข้างสูงเนื่องจากอัตราการใช้ทรัพยากรของโรงพยาบาลไม่เป็นไปตามหลักประสิทธิภาพสูงสุดและการจัดสรรทรัพยากรของโรงพยาบาลเป็นไปอย่างไม่มีประสิทธิภาพ ข้อเสนอแนะต่อผู้บริหารของโรงพยาบาลคือการพัฒนาระดับคุณภาพของการให้บริการและคงไว้ถึงอัตราส่วนของต้นทุนแรงงานและต้นทุนวัสดุอุปกรณ์ที่เหมาะสม

สาขาวิชา...เศรษฐศาสตร์สาธารณสุข... ลายมือชื่อนิสิต.....

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ลายมือชื่ออ.ที่ปรึกษาวิทยานิพนธ์ร่วม.....

5185707629 : MAJOR HEALTH ECONOMICS
KEY WORDS: FINANCIAL VIABILITY/COST RECOVERY/INDONESIA
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The objective of this study is to analyze the financial viability of the Dr.Soejono Selong Hospital in Indonesia in the fiscal year of 2008. This study is retrospective using cost data from providers' perspective with Step Down Method analysis.

It could be found that the total cost of the Dr. Soejono Selong Hospital was 20,852,759,000 rupiah. The proportion of labor cost, material cost and capital cost was 45.93%, 26.35%, and 27.72% respectively. The unit cost of Inpatient Department was 295,960 rupiah compared to the unit cost of Outpatient Department which was 109,105 rupiah. The total revenue was 26,902,360.57 rupiah, while 67% of the total revenue had been contributed from government budget support, and 5.1% of the total revenue was from the Civil Servant Insurance Scheme. Moreover, 11.7% of the total revenue was from the Health Assurance Scheme, and 16.3% of the total revenue was from out of pocket. The revenue from health assurance and out of pocket (initial revenue), about 65 %, had to be turned over to the local government, and only 35% of the revenue left to be managed by hospital and used to finance fringe benefit and medical device. Under this condition total cost recovery was 0.96 which means that the revenue could not cover the total cost. However, with the initial revenue, total hospital cost recovery was 1.29, and non-budget cost recovery was only 0.43. Out of pocket was the payment mechanism scheme provided maximum cost recovery for IPD (1.69) and the minimum was health assurance (0.34), while for OPD, the scheme provided maximum cost recovery was also out of pocket, and the minimum belonged to civil servant insurance (0.70).

The unit cost was relatively high due to the problem of not optimum of the utilization rate of hospital services, and the inefficiency in resource allocation and wastage in hospital. The recommendations to hospital administrator are to work on improving quality of services and containing the cost particularly for labor and material cost.

Field of Study Health Economics Student's Signature.....

Academic Year 2009 Advisor's Signature.....

Co-Advisor's Signature.....

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LIST OF ABBREVIATIONS

CC	Capital Cost
DC	Direct Cost
FY	Fiscal Year
IPD	Inpatient Department
LC	Labor Cost
MC	Material Cost
NRPCC	Non-revenue Producing Cost Center
MoH	Ministry of Health
OoP	Out of Pocket
OPD	Outpatient Department
PS	Patient Service
RPCC	Revenue Producing Center
RP	Rupiah
TDC	Total Direct Cost
USA	United State of America
WHO	World Health Organization

CHAPTER I
INTRODUCTION

1.1 Background and Rational

According to the Indonesian Basic Law in 1945 and the law no. 23/1992 statement, it can be summarized that the rights of all Indonesian citizens to get health care services are equal; therefore, the health of each individual, family and community should obviously be protected. The assurance and fulfillment of the healthy life as the rights of people are the task and responsibility of government directly and indirectly. In contrast, the ideal condition has not always been happened in the real situation, inequity on health care services both protective and curative services occur, particularly for the poor, to those who get difficulties to access it. Until the mid of 1990s, the low income family were behind other quintiles regarding prevalence of specific disease, nutrition, infant and child mortality rates, (Gwatkin, et al.2000). Saadah, et al (2000) mentioned that the poor much more relied on self-treatment, even though they have greater needs on the health treatment system. On the other hands, the health care public facilities on an inpatient basis and on an outpatient basis were three times more likely used by household in the top 20% of the expenditure distribution in 1995 than those in the bottom two deciles do.

After the mid of 1990s, it can be found that government of Indonesia improved the conditions mentioned above by developing health care system in order to provide health program and facilities and also to improve the equity. One of the efforts was an establishment of service delivery network which was jointly by Ministry of Health and Ministry of Home Affairs. This self-contained system consisted of 7,100 health centers (puskesmas) which provide primary health care through outpatient clinics and through roughly 23,000 sub-centers, over 4,000 mobile clinics and 19,000 village rooms (polindes). Health centers operated as referral points for 285 district hospital. (Lieberman and Marzoeki, 2000)

Another government program aimed to improve the equity is one of the health care in which it is initiative targeting on the poor and launched by the government in 2005. It is health assurance program namely Askeskin which changed into Jamkesmas

in 2008, and cover up to 76.4 million poor people. It also provides free service for the poor for primary health care and inpatient service in health center and the third class of the hospital.

In 2009, West Nusa Tenggara Province launched the local health assurance named Jamkesmas West Nusa Tenggara aims to cover the poor more in this province those who are not covered by national health assurance. As far as the attempt of the government to improve the health care system has been concerned, the government program particularly health assurance improve the equity of health care. In other words, this allows the poor to get more access to health services, which effects to significant increase in demand of health care, especially to hospital. It also effects to the health care seeking behavior of the people, in which they prefer to go directly to hospital not to health care center, i.e. for the primary health care. This situation leads to excess demand which becomes a burden of the hospital. Another reason of increasing demand of health care in Indonesia is as a consequence of demographic epidemiological, and nutritional transition. Education and better knowledge are also influence, in which people more aware of healthy life.

The similar phenomena was faced by Dr. Soejono Selong Hospital. It is a district hospital in West Nusa Tenggara province. It can be seen the continually increasing trend of hospital services demand in table 1 about the number of patients of Dr. Soejono Selong hospital in 2004-2008. The compound annual growth rate of patient for outpatient (OPD) is 12.30 %, where for inpatient (IPD) the compound annual growth rate was 11.28.

Table 1-1 Number of patients of Dr. Soejono Selong hospital for 5 years

Patient Service	2004	2005	2006	2007	2008
OPD	37,695	44,947	54,753	62,585	67,318
IPD	856	9,675	10,884	10,679	13,965
Total	**46,255**	**54,620**	**65,637**	**73,264**	**81,283**

Source: Annual report of Dr. Soejono Selong hospital in 2008

To reduce the burden of the hospital and bring health service to the community closer, government provide inpatient service in some health center with

bed. However, since the implementation of health assurance, referral cases from the health center increase including the unnecessary referral cases.

1.2 General Information of Dr. Soejono Selong Hospital

Dr. Soejono Selong is a district hospital with 163 beds located in East Lombok District, West Nusa Tenggara Province. The size of the hospital is small compared to the number of population, in which there are 60 beds over 350,000 population compared to average ratio of beds per population in Indonesia which is 60 beds over 100,000 population. This hospital is the only hospital in the district with population about 1.083 million.

Since the implementation of the health assurance, the hospital experience financial deficit, because they have to face the situation where the rising number of patients is faster than rising financial does. Another problem faced by hospital related to the health assurance program is the delay of hospital claim payment. The process from claiming until getting payment consume a lot of time. According to the table 1-2 about the number of patient based on the payment scheme it can be found that in year 2008 most of the patients of this hospital were under the health assurance scheme. The percentage of patient in OPD was 46.49 %, and in IPD was 58.93 %, while the percentage of patient using hospital service in OPD and IPD under out of pocket was 20.69 % and 16.47 % and under civil servant insurance was 31.83% and 11.79 % respectively.

Table 1-2 Number of patient of Dr. Soejono Selong Hospital based on payment scheme

Payment Scheme	Outpatient	%	Inpatient	%
Out of Pocket	13,931	20.69	2,300	16.47
Health Assurance	31,299	46.49	8,229	58.93
Civil Servant Assurance	21,424	31.83	1,647	11.79
Uninsured	664	0.99	1,789	12.81
Total	67,318	100	13,965	100

Source: Dr. Soejono Selong Hospital Annual Report 2008

Another issue affected to the hospital financial deficit is the poor people with poor card (uninsured), in which the percentage of them was 0.99 % in OPD and

12.81 %. This group of people is not covered by national health assurance as well as local assurance. They become the burden of hospital as the cost for their treatment cannot be charged to all payment schemes including health assurance scheme. There is no subsidy or support from government, and non government institution, which causes this hospital has to cover all the cost itself.

During the decentralization era, hospitals are also encouraged to be more financial independence. Based on the government regulation, in year 2011 the Dr. Soejono Selong Hospital will become an autonomous hospital. It means that the Hospital has an authority to manage its own sources, including control its total revenues that come from the fee it collects at the facilities. Hospital still gets support from local and central government, plus with cost recovery from their own revenue, however, the support from the government might be reduced. It has challenges to improve its resources, so it has to compete to potential clients to improve their revenue by improving service quality.

With the situation of budget limitation in which assigned to health care facilities as shown above, health planners and managers have to be able to account for the resources used in health facilities as well as used it efficiently (Conteh and Walker, 2004). This means that it is very essential for the hospital administrator to understand its financial situation through unit cost analysis. Properly use of unit cost can promote creative management, efficiency, and financial benchmarks, so it can be served as information for measuring the performance of organization, and provide a common framework to evaluate support activities. With all of these burden and pressure, hospital as a public facility should maintain its social task to provide affordable and quality service to the community. Therefore, financial sustainability is the most important issue for its survival.

Regards to the fulfillment of community needs on hospital health service in 2010, the government of East Lombok District will start to do planning regarding increasing the number of rooms and beds of the hospital. It is planned to change the type of hospital from type C hospital into type B. Going from type C to type B, the hospital needs more resources both human as well as financial resources. In order to manage the resources efficiently, the manager of hospital have to analyze the cost,

revenue and cost recovery, to get clear picture on the hospital situation in order to get data for planning, budgeting and decision making. Therefore, it is very important to analyze the financial viability of hospital to make a decision on how it should be or do especially in cases of Dr. Soejono Selong Hosptital in 2008.

1.3 Research Questions

Primary questions

What is the financial viability of the Dr. Soejono Selong Hosptital in fiscal year 2008?

Secondary questions

- What are the total indirect cost, total direct cost and total cost of patient service centers?
- What are the sources and level of hospital revenue?
- What are the cost recovery of hospital and patient service centers ?

1.4 Research Objectives

General Objective:

The general objective of this study is to analyze financial viability of the Dr. Soejono Selong Hospital.

Specific Objectives:

The specific objectives of this study are as following:

- to calculate indirect cost, direct cost and total cost of patient service centers.
- to analyze the sources and level of hospital revenue.
- to analyze unit cost of inpatient day and an admission per one outpatient visit.
- to analyze cost recovery of hospital and patient service centers.

1.5 Scope of Study

The scope of this study is to examine analysis of total cost, unit cost and revenue of Dr. Soejono Selong Hospital in fiscal year 2008, form provider perspective, and analyze the hospital financial viability which focus to the ability of hospital to cover its cost.

1.6 Possible Benefits of the Study

The result of the study provide information on cost and revenue of hospital which can help the hospital administrators and other beneficiaries in followings:

- The result of the study can be served by hospital administrators and policy makers as a guideline for budget allocation, cost containment , and other decision making particularly regarding hospital autonomy.
- The hospital administrators will able to use the result of the study as one of the basis for bargaining budget support from the government.
- The data and information provided by the study would be very useful for hospital administrators to monitor and identify the expenditure and how the hospital resources are being utilized, so that hospital will be able to reduce wastage and improve efficiency, quality of service and financial sustainability.
- The result of the study can be used for planning in-term of activity, financial and human resources.

CHAPTER II
LITERATUR REVIEW

2.1 Cost definition

Economist defines cost as the value of resources used to produce something including a specific health service or a set of service (as in health program) (*creese & Parker, 1994)*According to Adam and Evans (2006), cost is an essential ingredient for policy guidance and hospital management. It can be used for assessing various types of relative efficiency and various types of treatment compared to the prevention. It also identifies the resources for undertaking or sustaining the intervention.

Cost of goods and services is the value of resources spent for acquisition of those goods or services that may be expressed by monetary and non-monetary values (Mogyorosy and Smith, 2005). Carrin and Evlo (1995) also mentioned that cost is the value of resources spending for obtaining products and services by spending in monetary and non monetary form.

2.1.1 Classification of Cost

Creese & Parker (1994) classify cost by using input criteria as following:

Capital cost:

- Vehicles: bicycle, motorcycle, four-wheel-drive vehicles, trucks.
- Equipment: refrigerators, sterilizers, manufacturing machinery, scales, and other equipment with unit cost (price) of $100 or more.
- Building-Space: health centers, hospitals, training facilities, administrative office, storage facilities.
- Training-non recurrent: training activities for health personel that occur only once or rarely.
- Social mobilization-non recurrent: Social mobilization activities (e.g ; promotion, publicity campaign) that occur only once or rarely.

Recurrent cost or operating cost:

- Personnel (all type): supervisors, health workers, administrators, technicians, consultants, casual labors.

- Supplies: drugs, vaccines, syringes, small equipment (unit cost of less than $100).
- Vehicles, operation and maintenance: petrol diesel, lubricants, lyres, spare parts, registration, insurance.
- Building, operation and maintenance: electricity, water, heating, fuel, telephone, telex, insurance, cleaning, painting, repairs of electricity, plumbing, roofing and heating.
- Training, recurrent (e.g., short in service courses).
- Social mobilization: operating costs.
- Other operating costs not included above.

2.1.2 **Unit Cost analysis.**

There are some steps for the unit cost analysis. Shephard, Hodgkin, and Anthony (2000) used seven steps which adopted from Hanson and Gilson (1996) as following:

1. Define final product.
2. Define cost center.
3. Identify the full cost of each input.
4. Assign input to cost center.
5. Allocate all cost to final cost centers (compute total allocated cost).
6. Compute unit cost for each final cost center.
7. Report result.

2.1.3 **Cost center identification and grouping**.

According to Shephard, et al. (2000), cost center can be distinguished into the nature of their works such as patient care, intermediate clinical care and overhead centers.

- *Patient care*: This cost centers are responsible for the direct patient service such as wards, inpatient care unit as a whole, and the ambulatory care center.
- *Intermediate*: These cost centers provide ancillary service to support patient care units but organizing as separated departments such as laboratory, pharmacy and radiology.

- *Overhead*: These cost centers provide service to both patient care and intermediate cost centers. Examples of overhead departments are finance (accounts receivable, accounts payable, payroll, etc), dietetic and security.

Tisayaticom, K., Tangcharoensathien, V., & Patcharanrumol, W. (2007) mentioned that there are four categories of cost identification as following:

- Non Revenue Producing Post Center (NRPCC).
- Revenue Producing Cost Center (RPCC).
- Patient Service Cost Center (PS).
- Non Patient Service Cost Center (NPS).

2.2 Defining allocation criteria

Determination of allocation criteria is needed to allocate the costs of overhead and intermediate costs centers to patient service centers. According to Tisayaticom et al. (2007), allocation criteria should be developed based on what services are provided by overhead cost centers to the patient centers.

2.3 Full cost determination

Regarding with Drummond (2005), cost allocation method consists of four steps:

- Direct allocation (ignores interaction of overhead department).
- Step-down allocation (partial adjustment for interaction of overhead department).
- Step-down allocation with interactions/ double distribution method (full adjustment for interaction of overhead departments).
- Simultaneous equation technique allocation (full adjustment for interaction of overhead department).

2.4 Unit Cost.

Unit cost can be determined by dividing full cost by the number of patient visit in that department.

2.5 Related research studied on hospital costing.

2.5.1 Cost Recovery studies

Tungkasamesamran. K. (2000), studied on the unit cost and cost recovery analysis of community hospital in fiscal year 2000. This study was a case study in the Thongsaenkhan Hospital in Thailand using step down allocation method. It can be found that the total cost of hospital was 28,892,655 baht. The highest proportion of the budget consumed by capital cost, labor cost, and material cost were 38%, 37%, and 25% respectively. The cost for the hospital was mainly paid by the government budget about 67% while the rest was paid by non-government budget. Furthermore, for the curative care hospital, it could be found that it was spent 87% of the total cost, compared to the preventive care which was 13%. The unit cost of OPD was 266 baht, and dental clinic was 593 baht. The cost of health promotion clinic was 1,138 baht and IPD was 4,215 baht per visit/per inpatient day. The revenue of hospital was government budget in 69% and non-budget source from various health insurance/welfare schemes, user charges, donation and interest income (31%). Totally the revenue was 28,049,691 baht. Total cost recovery was 0.97 and non-budget cost recovery was 0.30. As far as the CSMBS Insurance Scheme had been concerned, it was the scheme that provided maximum cost recovery (1.37) while the minimum was belonged to underprivileged group (0.85).

It was also found from this study that with the newly proposed capitation budget Thongsaenkhan Hospital, it may not survive, as with the universal coverage policy, the hospital cost recovery will be lower than the situation in fiscal year 2000. Based on the break even analysis, the hospital will survive with the capitation of 1,373.23 bath per head which is higher than proposed rate. Therefore, as an alternative, the size of registered population must be at least 37,857 people which is larger than that Thongsaenkhan district.

Promjak. P. (2002) studied on cost recovery analysis of health service for foreign patient in Nan General Hospital, in three community hospitals, and in five health centers in Nan province. The three community hospitals were Pua Crown Prince hospital, Tungchang Hospital, and Songkwae Hospital. The health centers

were Pon, Hauysatang, Chondan, Ngob, and Numripattana health center. The study could be found that there were 3,233 foreign patients in 2001. The total cost of health care provision for outpatient and inpatient were higher than the user charge, except Pua Crown Prince Hospital and Chondan Health Center, which was equaled to the user charge. The average cost recovery ratio of out of patient was 0.54, compared to the inpatient which was 0.16. For health centers, the average cost recovery ratio was 0.30.

If public health facilities were operating as private health facilities, the average cost of health care services in hospital and health centers, which was based on market wage, would increase 32.2% and 6.8% respectively. The average cost recovery ratio of outpatient in hospital decrease to 0.42 or 22.2% while the average cost recovery ratio should reduce to 0.12 or 25.0%.

2.5.2 Unit Cost Studies

La Foucade, Scott, and Theodore (2009) studied on estimating the cost of hospital service in Milton Cato Memorial hospital in the St. Vincent and the Grenadines, using the step down accounting method. It can be found that the cost per patient per day spent on the Maternity Ward was 57.4% higher than for the Surgical Ward did. Even with the 1995 an increase in user fees, the levels of subsidization for inpatient services remained relatively high at 78% to 96% , and for the public patients were 43% to 72% for private patients. Ancillary services were found to have lower levels of subsidization and in most cases the full costs were recovered from private patients. Laboratory services were not subsidized.

Garattini, Giuliani, & Pagano (1999),who studied on a model for calculating cost of hospital ward in Italian, explained that at the time when the study had being conducted, Italian hospitals had no cost accounting or activity data collection systems, being formally required only to do financial book-keeping. Therefore, the cost analysis method presented in the study expected to be used to set up detailed and completed hospital cost accounting, which would permit a better understanding of patterns of resource distribution among departments, better opportunities for cost saving and cost control for hospital managers and health authorities. The study was done at one local hospital in Northern Italy by using a step down allocation method.

The study firstly identified a framework within to which assessed to the annual cost related to a hospital ward, then calculated the average bed day cost for each specialty. Cost data were collected over one year in 1996 from manually compiled records. Wards requiring a major amount of resources per day of stay were intensive cardio coronary unit (US$650.69), and ophthalmology (US$483.32). The less expensive ward was general medicine (US$148.64). The cost analysis method presented in this study might be used to set a detailed and completed hospital cost database, which was a necessary tool for hospital managers to realize cost control and cost recovery.

Another study on cost analysis done by Zamir. S. (1993), the study can be found and summarized in table 2.1 that it was the study on cost analysis for hospital care of Embaba Hospital Cairo in Egypt. The aim of this study was to help Embaba Hospital in Cairo to establish fees for services once it was converted to a cost recovery system. The main objectives were to estimate the actual cost of a service delivered by each medical department of the hospital, to develop a methodology of service cost calculation at the other hospitals that will be the target of the Cost Recovery for Health Project, and to create a solid base for a pricing system for medical services delivered by hospitals run by the Ministry of Health in general and by Embaba Hospital. The study examined five major categories of cost for estimating the total expenditure of the hospital: buildings andpermanent structures, equipment, personnel, utilities, materials and supplies. All costs of operating the hospitl were allocated to the departments, which were identified as either overhead, intermediate service, or final service departments. The study found that overhead, intermediate service, and final service departments account were 11, 41, and 48 percent, respectively, of total hospital-wide costs. The cost of materials and supplies consumed by the departments was found to be the prime determinant of the sharp variation in cost among departments. Personnel costs also were found to differ substantially across departments.

Table 2.1 Summary of unit cost analysis study of public hospitals (in rupiah)

Year	Researcher	Hospital	Allocation method	Unit Cost/visis	Unit Cost	LC:MC:CC
2007	Bola Kan	Phnom Phen H.C	Step down	482,670	2,865,330	27.2:27.3:45.5
2000	Cook, N	Prangklao	Step Down	75,300	493,800	51:21:28
1998	Thantaristri	Bangplee	Simultan. eq.	44,100	351,900	63:28:9
1997	Sorya, C	Nakloeung	Step Down	640,200	3,168,600	7:63:30

The cost of the studies mentioned in table 2.1 have been conversed into rupiah based on Indonesian Bank rate on the basis of the year when study was carried out.

CHAPTER III

METHODOLOGY

3.1 Research methodology

The research methodology is a retrospective descriptive study, focusing on provider perspective to analyze the cost, unit cost, and the financial viability Dr. Soejono Selong Hospital in term of its cost recovery. This study will use primary and secondary data of fiscal year 2008.

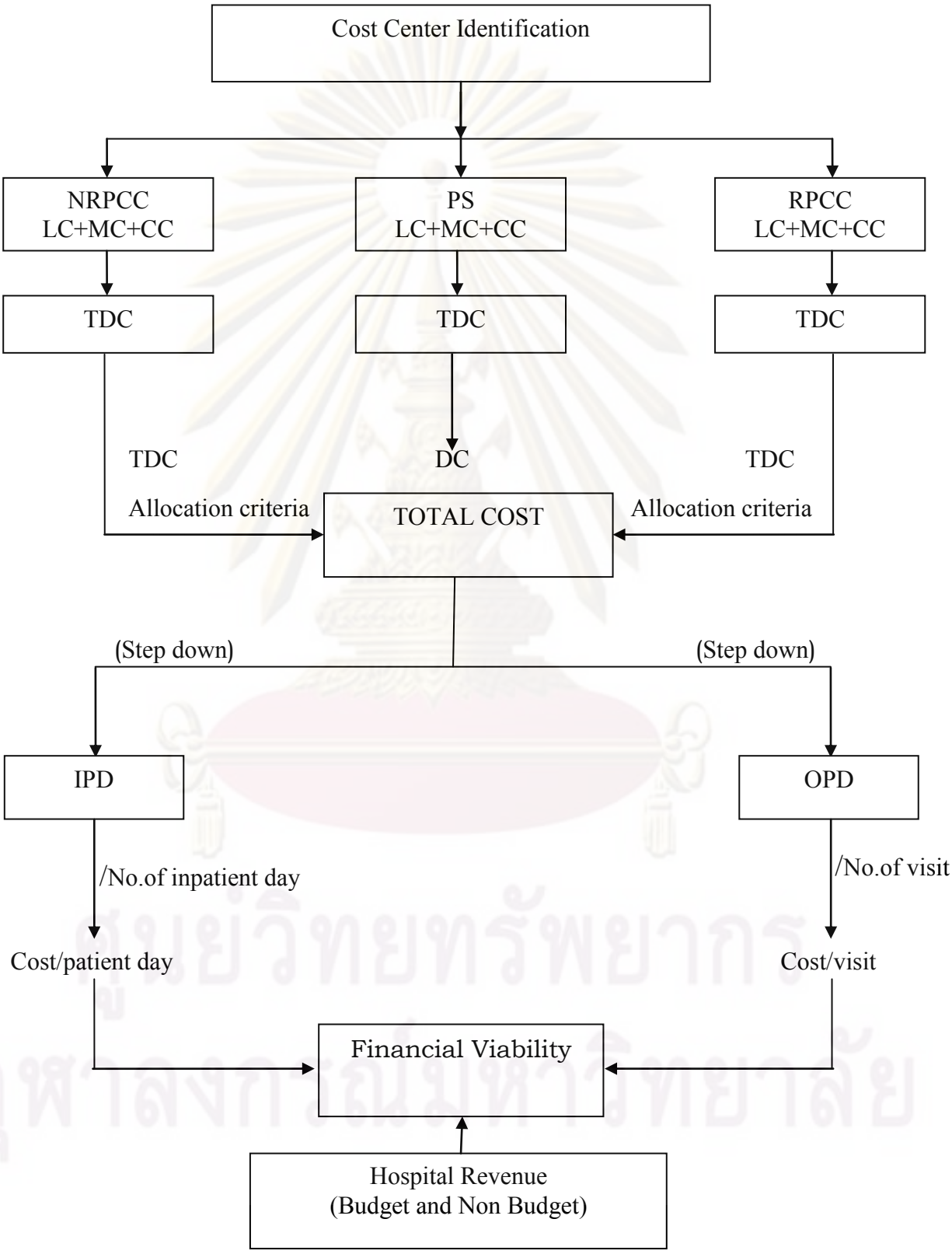
3.2 Conceptual Framework

The conceptual framework will use step down allocation method as shown in the figure 3-1. The conceptual framework of the study describes the component of hospital cost, and analyzes of unit cost, cost recovery, and hospital revenue. The detail of explanation conceptual framework can be summarized as follows:

First part of the figure 3-1 describes the cost and unit cost which is shown in the first line in the cost centers consist of labor, material and capital cost. Then follows by the total direct cost which is used by patient service cost center and indirect cost from NRPC and RPCC derived by allocation criteria. Then total cost of each cost center of patient service is determined. Unit cost of each patient service is obtained by dividing total cost with number of unit of services.

Second part of figure 3-1 describes the hospital revenue which consists of government and non-government budget. Government budget is the budget from government called as operation budget paid for labor (salary), material, and capital. Non-government budget is budget which is earned form out of pocket, health assurance and health insurance schemes.

Figure 3-1 Conceptual Framework



Third part of figure 3-1 describes the hospital financial viability in term of cost recovery which is a comparison between hospital revenue and cost. In this study the revenue will be :

- Total revenue sources.
- Non budget (out of pocket, health assurance and civil servant insurance)

Meanwhile, cost recovery will be identified by as follows :

- Total cost.
- Recurrent cost/operational cost
- Material cost.
- Payment mechanism schemes : Civil Servant Insurance, Health Assurance and Out of Pocket

3.3 Operational definition

- Capital cost: The costs of buildings, and equipment which have a life expectancy of 1 year or more which are used by health services.
- Labor cost: The cost of wages and salaries including fringe benefits such as hospitalization fees, child school fees, child benefit allowance.
- Material cost: The cost of resources that are purchased and used. within one year including electricity, mailing and telephone charges.
- Unit Cost: The cost per unit of health services.
- Cost recovery: The ratio of the revenue to the cost.
- Hospital budget revenue: The revenue supported from the government for Labor, material and capital cost.
- Hospital non-budget revenue: The revenue that the hospital get form direct payment and budget from health assurance and insurance schemes

3.4 Data collection

The data in this study is collected using two types of resources which are primary data and secondary data.

3.4.1 Primary data

The primary data are data of labor/personnel regarding time allocation, time used of equipment and materials etc. The data was collected from self record form and in-depth interview to get more detail/comprehensive information.

3.4.2 Secondary data

The secondary data are data regarding material cost, capital cost, labor cost, hospital charge, hospital revenue, and health service utilization. This data was obtained from such as patient record, inventory book, administrative books, office supply, and medical record.

3.5 Method of data collection

The methods of data collection can be shown in the table 3.1

Table 3-1 Methods of data collection

Objective	Variable	Unit/scale	Type of data	Source of data
Hospital Cost	Labor Cost - No. of staff - Salary - fringe benefit	Midpoint salary, Rupiah/year	- Primary data - Secondary data	- Self record form - Record form
	Material Cost - Medical material - Non medical material - Operational/maintenance	Rupiah/year	- Secondary data	- Record form - Inventory list
	Capital Cost - Equipment - Building - Land	Rupiah/month /year	- Primary data - Secondary data	- Record form - Inventory list.

Objective	Variable	Unit/scale	Type of data	Source of data
Unit of service	OPD	No. of patient visit	- Secondary data	- Record form
	IPD	No. of patient day	- Secondary data	- Record form
Objective	variable	Unit/scale	- Type of data	- Source of data
Patient characteristic	Payment mechanism	Types	- Secondary data	- Record form
	Number of patient with each payment mechanism scheme	- Case/year - Day/year	- Secondary data	
Hospital charge	Charge to patient	- Rupiah/year	- Secondary data	- Record form
Hospital revenue	Budget revenue	- Rupiah/year	- Secondary data	- Record form
	Non-budget revenue	- Rupiah/year	- Secondary data	- Record form

3.6 Data analysis

3.6.1 Unit cost analysis

Unit cost analysis can be done as follows:

1) Cost center identification and grouping

The cost center will be derived to non-revenue producing cost center (NRPCC), revenue producing cost center (RPCC) and patient services cost center (PS).

I Non-revenue producing cost center (NRPCC)

This cost center is the cost center that supports other cost centers to service patient. This cost center consists of:

1) Administration (A1)
2) Medical administration support (A2)
3) General supply administration (A3)
4) Cleaning service (A4)

5) Laundry (A5)

6) Kitchen (A6)

II Revenue Producing Cost Center (RPCC)

This cost center provides services to the patient and can produce revenue from its service to hospital. This cost center consists of:

1) Pharmacy (B1)

2) Laboratory (B2)

3) X-ray (B3)

4) Operating Theater (B4)

5) Emergency Unit (B5)

III Patient Service Cost Center (PS)

This cost center is the center which provides patient services. This cost center consists of:

1) Inpatient (C1)

2) Outpatient (C2)

2) Total Direct cost determination

There are three types of cost involved in the total direct cost of each cost center. There are labor cost, material cost and capital cost.

I. Labor Cost

Labor cost of this study is salary and benefit. The components of the benefit are social welfare benefit given for civil servant, and medical and service incentive. The data will be collected from hospital account, hospital financial report, and others.

II. Material Cost

Material Costs are the costs of resources which are purchased less than US$ 100, and used less than 1 year. Material costs will be medicine, medical device, laboratory device, food, vehicle maintenance, electricity, fuel, wages for some job.

Data will be collected from hospital inventory that includes all inventories of each department in hospital.

III. Capital Cost

Capital Cost is the cost of resources that have working years or useful life of 1 year or more. These including the cost of building, equipment and vehicles. The cost of land will be excluded. The price will be calculated from purchased price to be the price in year 2008.

The capital price in year 2008 is calculated using the formula as follows :

$$C_{2008} = C_t (1+r)^{2008-t}$$

where C_{2008} = The value of the capital in year 2008

C_t = The purchased value of making or buying the capital in year t

r = discount rate at specific period

t = the year that the capital bought or completed.

The discount rate will be 7.86% interest rate of Bank of Indonesia in fiscal year 2008.

Depreciation value of capital will be calculated by dividing value in year 2008 of the asset by annualization factor which can be taken from the table. The depreciation will be calculated using formula below:

Annual economic cost = Current value / Annualization factor

3) Allocation Criteria determination

Allocation criteria will be defined based on services and activities of non-revenue producing cost center (NRPCC) and revenue producing cost center (RPCC) which provides service to patient service cost center (PS). Total direct cost of NRPCC and RPCC is allocated to be indirect cost to patient service cost center. Therefore the cost center provides service to the highest number of cost center will become priority to be allocated as shown in table 3-2.

Table 3-2 Allocation criteria for cost allocation from NRPCC and RPCC

Cost Center	Allocation Criteria
NRPCC	
Administration	Number of staff in each cost center
Medical Supp Administration	Number of staff in each Patient Service
General supply	Proportion of relative weight of material supply
Cleaning service	Proportion of area
Laundry	Number of patient day of patient service (IPD only)
Kitchen	Number of patient day of patient service (IPD only)
RPCC	
Pharmacy	Proportion of one year charge of medicine of each PS
Laboratory	Proportion of one year charge of laboratory service to PS
X-Ray	Proportion of one year charge of X-ray to PS
Operating Theater	Proportion of one year charge of operating theater to PS
Emergency Unit	Number of patient in PS

4) Full cost determination

The total cost of each patient service cost center can be calculated by addition the total direct cost and total indirect cost as follows:

Total cost center = Total direct cost + Total indirect cost

5) Unit cost calculation

The unit cost will be calculated as total cost divided by number of patient visits/in patient day/in patient case as follows:

$$\text{Unit cost of OPD} = \frac{\text{Total cost of OPD}}{\text{No. of patient visit}}$$

$$\text{Unit cost of inpatient day of IPD} = \frac{\text{Total cost of IPD}}{\text{Total days of patient admitted}}$$

3.6.2 Hospital revenue analysis

Hospital revenue is collected from the sources of different payment mechanism as follows:

1) Budget : Revenue from government both local and central for capital cost, labor cost, material cost.

2) Non-Budget : Revenue from the Civil Servant Insurance Scheme, Assurance Scheme and out of pocket.

3.6.3 Cost recovery analysis

The analysis of cost recovery will be done using the following steps:

1) Cost determination

The cost will be determined in three levels:

1) Total hospital cost

2) Operating Cost (labor and material)

3) Material Cost

4) Cost by payment mechanism in each scheme: Civil Servant Insurance, Health assurance and Out of Pocket.

The cost of payment mechanism schemes will be calculated using the unit cost of inpatient and outpatient, because the standard of services for all patients is the same.

2) Hospital revenue identification

1) Hospital revenue identification as explained in hospital revenue analysis.

2) Determination of hospital revenue by payment scheme :

Determination of hospital revenue by payment will be identified as follows:

- Direct revenue :

Direct revenue is total revenue of hospital which earned by IPD and OPD from each payment scheme. However, the available data is only total hospital revenue, therefore it will be allocated to IPD and OPD using cost proportion of these two patient service centers as a criteria.

- Indirect revenue :

Indirect revenue is revenue from government which is allocated to each payment scheme both in IPD and OPD. As the data on government budget allocation to IPD and OPD is not available, proportion of the cost of these patient service centers will be used as a basis for allocation, then further allocation to payment scheme will use proportion of cost spent for treating patient under each schemes.

3) Cost recovery calculation

Cost recovery can be calculated by using the formula as follows:

Cost recovery = Revenue/Cost

Cost recovery will be identified in the forms as follows:

1) Hospital revenue from all sources (Budget and non budget)
2) Hospital revenue from non budget only

Cost recovery was analyzed as follows :

1) Total cost recovery = $\frac{\text{Revenue of hospital}}{\text{Total hospital cost}}$
2) Operating cost recovery = $\frac{\text{Revenue of hospital}}{\text{Labor and Material cost}}$
3) Material cost recovery = $\frac{\text{Revenue of hospital}}{\text{Material cost}}$
4) Payment mechanism schemes = $\frac{\text{Revenue from each schemes}}{\text{Cost of each schemes}}$

3.6.4 Sensitivity Analysis

Sensitivity analysis will be performed in some scenarios setting under the assumptions that the other factors remain fixed. The scenarios will be as follows:

1) Unit cost and cost recovery with changing in cost components

Unit cost of inpatient and outpatient and hospital cost recovery will be determined with the scenarios of changing in discount rate for capital, material cost and labor cost.

2) Hospital cost recovery with changing in hospital revenues

Hospital cost recovery will be analyzed if there are changes in hospital revenue components.

CHAPTER IV

RESULTS

4.1 General Data

The Dr. Soejono Selong Hospital is a district hospital with 162 beds, managed by 396 staffs, in which 27 were doctors, 170 were nurses, 49 were paramedics and 150 were administrative staff.

Table 4-1 Staff of Dr. Soejono Selong Hospital

Staff	Total	%
Doctors	27	6.82
Nurses	170	42.93
Paramedic	49	12.37
Administrative Staff	150	37.88
Total	396	100

Source: Dr. Soejono Selong Hospital Annual Report 2008

It can be shown from table 4.1 that the number of doctors was very low (6.82%) compared to other staffs, while nurses was the highest (49%) followed by administrative staff (37.88%).

In 2008, there were 67,318 outpatient and 13,965 inpatient with 52,744 number of inpatient days.. The total bed occupancy rate was 79.9%, and the average length of stay was 3.8. Referring to the occupancy rate, this hospital was not fully utilized. During this year, there were 649 caesarian, 1206 eye surgery, 577 other surgery, 8516 physiotherapy treatment, 13.876 X-rays and 193.060 laboratory investigation.

Payment mechanism system for health assurance and civil servant insurance scheme in hospital based on claim system, where health center payment mechanism for health assurance based on capitation.

The study also found, 664 outpatient and 1,789 inpatient were the patient those who were not covered by any payment scheme. Therefore, treatment cost for those patients could not be claimed and became a burden of hospital.

Referral cases from health center to hospital were 8,468 outpatient and 5,261 inpatient. It was indicated that not all referral cases are necessary to be referred to hospital. The exact number was not recorded, however, the doctors and other health staffs who were in charge in emergency unit, assumed that 15-20% of referral cases were unnecessary referred patient. Referring to the payment mechanism system in hospital and health center, it can be concluded that health center shift the cost/burden from health center to hospital.

The Cost in this study was calculated in Indonesian Rupiah (Rp). The exchange rate in 2008, which was 1 US Dollar was equal to 10,000- Rupiah.

4.2. Hospital Cost

4.2.1 Labor Cost

Total labor cost of the Dr. Soejono Selong Hospital can be summarized in table 4-2 that there was 9,578,392,063 rupiah, and 74% was used to pay salary and wages, and 26% for fringe benefit. Inpatient was the cost center with highest labor cost (37.6%) followed by outpatient (12.4%) and administration (10.7%), meanwhile laundry was the lowest (1.3%). High cost of labor for inpatient and outpatient as these cost centers was the centers provides services to the patient, while high cost of administration, because it supported all cost centers in hospital in term of administration matter. However, if we refer to table 4-1 which shows high number of administrative staff, high cost in this cost center might be due to over staffing.

Table 4-2 also presents that laundry; kitchen and X-ray were the cost centers with the lowest labor cost which was 1.3:1.9: 2.2 respectively.

Table 4-2 Labor cost of Dr. Soejono Selong Hospital

Cost Center	Salary and wages (Rp)	Fringe Benefit (Rp)	Total (Rp)	%
NRPCC				
Administration	757,116,400	264,817,435	1,021,933,835	10.7
Medical adm. support	580,041,200	151,217,017	731,258,217	7.6
General supply	316,423,900	87,671,009	404,094,909	4.2
Cleaning service	193,050,000	84,636,571	277,686,571	2.9
Laundry	94,430,600	32,301,967	126,732,567	1.3
Kitchen	131,856,400	48,747,735	180,604,135	1.9
RPCC				
Pharmacy	191,180,600	56,447,145	247,627,745	2.6
Laboratory	354,057,300	109,795,720	463,853,020	4.8
X-ray	164,657,300	45,778,380	210,435,680	2.2
Operating room	133,992,000	113,992,300	247,984,300	2.6
Emergency Unit	616,303,189	264,481,108	880,784,297	9.2
Patient Service				
Inpatient	2,579,558,683	1,020,740,138	3,600,298,821	37.6
Outpatient	898,456,350	286,641,616	1,185,097,966	12.4
Total	**7,011,123,922**	**2,567,268,141**	**9,578,392,063**	100.0

Source: Dr. Soejono Selong Hospital Annual Report 2008 and author's calculation

Table 4-3 represents the source of budget for the labor cost. It can be shown that 79.62% of budget supported by government, in this case was district government, and 13.09% was budget from health assurance (Jamkesmas), 2.09 from civil servant insurance and 5.20% was from out of pocket. From the data describes above, it can concluded that hospital in term of labor cost was highly depends to government budget.

Table 4-3 Source of budget paid for labor cost of Dr. Soejono Selong Hospital

Source of Budget	Salary and Wages (Rp)	Fringe Benefit		Total (Rp)	%
		Social Welfare (Rp)	Medical Service Incentive (Rp)		
Government	7,011,123,912	614,944,000	-	7,626,067,912	79.62
Health assurance	-	-	1,253,912,123	1,253,912.23	13.09
Civil servant insurance	-	-	199,913,775	199,913,775	2.09
Out of Pocket	-	-	498,498,243	498,498,243	5.20
Total	7,011,123,912	614,944,000	1,952,324,141	9,578,392,063	100.00

Source: Dr. Soejono Selong Hospital Annual Report 2008 and author's calculation

The components of Fringe and benefit were social benefit welfare given for civil servant based on the strata and working period, and medical service incentive for all staffs including those who are not civil servant. The source of social welfare benefit was from local government budget, where medical service incentive paid using the revenue from civil servant insurance, health assurance and out of pocket.

4.2.2 Material Cost

The total material cost of the Dr. Soejono Selong Hospital in 2008 was 5,493,971,959 rupiah. Furthermore, it can be summarized from the table 4-5 that 21.78% was a payment for medicine, 35.27% for medical device, laboratory material, oxygen, and others, and 42.95% for non medical material such as stationeries, cleaning material, food and other material.

Table 4-4 Material cost of Dr. Soejono Selong Hospital

Medicine	%	Medical & Lab Device	%	Non Med.Material	%	Total
(Rp)		(Rp)		(Rp)		(Rp)
1,196,488,272	21.78	1,937,605,067	35.27	2,359,878,620	42.95	5,493,971,959

Source: Dr. Soejono Selong Hospital Annual Report 2008 and author's calculation

Non medical material was the material with highest cost. This cost was not included cost for electricity, telephone and water, as the data was not available. If the cost of these three components was included, non medical material cost will be higher. 62.68% of non medical material cost was used to pay stationeries.

Medicine and non-medical material were paid using budget from local government, while medical device, laboratory material and others were financed by local government budget and revenue from Civil Servant Insurance Scheme, Health Assurance Scheme and out of pocket (non budget).

Table 4-5 Material cost of Dr. Soejono Selong Hospital to categories of cost centers

Cost Center	Drugs	%	Medical device	%	Non medical	%	Total	%
Administration	-	-	-	-	256,062,365	10.85	256,062,365	4.66
Medical Adm. support	-	-	-	-	31,859,780	1.35	31,859,780	0.58
General supply	-	-	-	-	25,277,134	1.07	25,277,134	0.46
Cleaning service	-	-	-	-	-	-	-	-
Laundry	-	-	-	-	16,646,745	0.71	16,646,745	0.30
Kitchen	-	-	-	-	726,228,513	30.77	726,228,513	13.22
Pharmacy	-	-	-	-	49,642,080	2.10	49,642,080	0.90
Laboratory	-	-	133.422.000	6.89	13,520,665	0.57	146,942,672	2.67
X-Ray	-	-	-	-	401,414,645	17.01	401,414,645	7.31
Operating Theater	95,719,062	8.00	187,823,600	9.69	5,834,657	0.25	289,377,337	5.27
Emergency Unit	162,722,405	13.60	243,173,185	12.55	729,153,635	30.90	1,135,049,251	20.66
Inpatient	698,749,151	58.40	1,015,605,655	52.42	72,458,700	3.07	1,786,813,506	32.52
Outpatient	239,297,654	20.00	357,580,627	18.45	31,779,701	1.35	628,657,982	11.44
Total	1,196,488,272	100	1,937,605,067	100	2,359,878,620	100.00	5,493,972,010	100.00

From table 4-5, we can see that inpatient was the cost center with highest material cost, then followed by emergency unit. It is understandable because these two cost centers provided 24 hours service to the patients. Kitchen had also high material cost, particularly to pay food for patients.

Material cost of patient service centers can be seen in table 4-6. It shows that, interna/general ward, surgery ward and pediatric ward, were the patient service units with highest material cost. The proportion was 21.94%,20.21% and 13.85% respectively. Patient service unit with lowest material cost were nutrition department (0.96%), physiotherapy (1.25%) and eye department (1.77%).

Table 4-6 Material cost of Dr. Soejono Selong Hospital to categories of patinet service center

Patient Sevice	Drugs	%	Medical device	%	Non medical	%	Total	%
Inpatient								
1. Maternity	57,431,437	6.12	85,825,830	6.25	20,098,181	19.28	163,355,480	6.76
2. Neurology	67,003,343	7.14	71,521,525	5.21	3,056,719	2.93	141,581,602	5.86
3. Interna/General	210,581,936	22.45	314,694,710	22.92	4,720,335	4.53	529,997,031	21.94
4. Pediatric	124,434,780	13.27	185,955,965	13.54	24,080,295	23.10	334,471,090	13.85
5. VIP	47,859,531	5.10	71,521,525	5.21	9,791,701	9.39	129,172,777	5.35
6. Surgery	191,438,124	20.41	286,086,100	20.83	10,711,469	10.28	488,235,745	20.21
Outpatient								
1. Surgery	47,859,531	5.10	71,521,525	5.21	4,227,986	4.06	123,609,056	5.12
2. Eye	14,357,859	1.53	21,456,458	1.56	6,819,350	6.54	42,633,677	1.77
3. Maternity	16,750,836	1.79	25,032,534	1.82	2,994,799	2.87	44,778,175	1.85
4. Interna/General	57,431,437	6.12	85,825,830	6.25	2,751,878	2.64	146,009,160	6.04
5. Pediatric	31,108,695	3.32	35,760,763	2.60	1,244,505	1.19	68,113,970	2.82
6. Dental	35,894,648	3.83	53,614,144	3.90	775,730	0.74	90,284,530	3.74
7. Ear, Nose, Throat	23,929,765	2.55	35,760,763	2.60	268,550	0.26	59,959,083	2.48
8. Nutrition	11,964,883	1.28	10,728,229	0.78	416,325	0.40	23,109,439	0.96
9. Physiotherapy.			17,880,381	1.30	12,280,578	11.78	30,160,972	1.25
Total	938,046,805	100	1,373,186,282	100	104,238,401	100	2,415,471,788	100

4.2.3 Capital Cost

The total capital cost of Dr. Soejono Selong Hospital from table 4-7 was 5,780,394,978 rupiah, and 78.30% was the cost for medical equipment, while 21.70% for non-medical equipment. Sources of budget for medical equipment was from central government, while for non-medical equipment was financed by local government.

Table 4-7 Capital cost of Dr. Soejono Selong Hospital

Source of Budget	Medical Equipment (Rp)	Non Medical Equipment (Rp)	Total (Rp)	%
Local Government		2,644,727,342	2,644,727,342	21.70
Central Government	3,135,667,636		3,135,667,636	78.30
Total	3,135,667,636	2,644,727,342	5,780,394,978	100.00

From the table above, we can see that the hospital totally depends on central government regarding medical equipment, as all of medical equipment financed by central government (MoH)

As far as the capital cost of the Dr. Soejono Selong Hospital has been concerned in table 4-8, it can be summarized that total capital cost was 5,780,394,978 rupiah, and the largest four proportions of each capital over total capital were Inpatient (29.05%), Operating Theater (17.71%), Administration (14.29%), and Outpatient (11.70%). The total capital cost can be categorized into medical cost of 3,135,667,636 rupiah (54.24 %) and non-medical cost of 2,644,727,342 rupiah (45.76%).

Table 4-8 Capital cost of the Dr. Soejono Selong Hospital to categories of cost Centers

Cost Center	Medical (Rp)	%	Non Medical (Rp)	%	Total Capital (Rp)	%
Administration	-	-	825,777,173	31.22	825,777,173	14.29
Medical						
Admin.supp	-	-	158,566,763	6.00	158,566,763	2.74
General supply	-	-	98,417,335	3.72	98,417,335	1.70
Cleaning service	-	-	889,366	0.03	889,366	0.02
Laundry		-	11,590,618	0.44	11,590,618	0.20
Kitchen	-	-	39,406,052	1.49	39,406,052	0.68
Pharmacy	-	-	39,211,768	1.48	39,211,768	0.68
Laboratory	144,980,047	4.62	69,085,829	2.61	214,065,876	3.70
X Ray	409,389,909	13.06	172,164,127	6.51	581,554,036	10.06
Operating						
Theater	912,299,720	29.09	111,633,025	4.22	1,023,932,746	17.71
Emergency Unit	222,139,493	7.08	209,411,621	7.92	431,551,114	7.47
Inpatient	1,055,793,065	33.67	623,522,390	23.58	1,679,315,456	29.05
Outpatient	391,065,401	12.47	285,051,273	10.78	676,116,674	11.70
TOTAL	3,135,667,636	100	2,644,727,342	100	5,780,394,978	100

Furthermore, the capital cost of Dr. Soejono Selong Hospital can also be allocated using categories of patient service criteria in the table 4-9, and can be summarized that the total capital cost was 2,355,432,130 rupiah. The table shows that pediatric ward was the cost center use the resources the most (26.37%), followed by maternity ward (14.20%) and VIP (10.23%), While the lowest capital cost was the

department in outpatient service center which were nutrition, maternity and interna/general with the proportion of 1.41%, 1.64% and 1.82% respectively.

Table 4-9 Capital cost of Dr. Soejono Selong Hospital to categories of patient service

Patient Service	Medical (Rp)	%	Non Medical (Rp)	%	Total Capital (Rp)	%
Inpatient						
1. Maternity	118,937,445	8.22	215,624,056	23.73	334,561,501	14.20
2. Neurology	67,161,745	4.64	69,793,830	7.68	136,955,576	5.81
3. Interna/general	114,837,832	7.94	83,589,645	9.20	198,427,477	8.42
4. Paediatrict	536,867,330	37.11	84,268,854	9.27	621,136,184	26.37
5. VIP	136,410,822	9.43	104,509,329	11.50	240,920,151	10.23
6. Surgery	81,577,892	5.64	65,736,675	7.24	147,314,567	6.25
Outpatient						
1. Surgery	68,436,862	4.73	37,330,841	4.11	105,767,704	4.49
2. Eye	57,446,651	3.97	34,664,036	3.82	92,110,687	3.91
3. Maternity	16,910,101	1.17	21,734,436	2.39	38,644,536	1.64
4. Interna/General	9,302,057	0.64	33,580,734	3.70	42,882,791	1.82
5. Pediatric	25,999,490	1.80	19,577,867	2.15	45,577,357	1.93
6. Dental	29,384,937	2.03	34,129,581	3.76	63,514,518	2.70
7. Ear, Nose, Throat	119,170,196	8.24	25,118,114	2.76	144,288,310	6.13
8. Nutrition			33,213,548	3.66	33,213,548	1.41
9. Physiotherapy	64,415,106	4.45	45,702,116	5.03	110,117,222	4.68
Total	1,446,858,467	100	908,573,663	100	2,355,432,130	100

4.2.4 Total Hospital Cost

4.2.4.1 Total Direct Cost

The total cost of the Dr. Soejono Selong Hospital in 2008 was 20,852,759,000 rupiah. From table 4-10, it can be found that 45.93% of budget was used to finance labor, 26.35% for material and 27.72% for capital.

Table 4-10 Total direct cost of Dr. Soejono Selong Hospital

Cost Categories	Amount (Rp)	%
Labor Cost	9,578,392,063	45.93
Material Cost	5,493,971,959	26.35
Capital Cost	5,780,394,978	27.72
Total	20,852,759,000	100.00

Furthermore, from table 4-11 can be shown that inpatient was the cost center used the resources most. It was followed by outpatient, emergency unit and administration. The proportion was 33.89%, 11.94%, 11.74% and 10.09% respectively. Emergency unit used high cost because the patients were examined and got first treatment in this unit before transferring to patient services. It was often that the hospital wards were full, so the patients were reminded treated in this unit until the ward would be available. High cost was also utilized by the medical support administration (4.42%). The least cost was utilized by cleaning service (1.34%).

Table 4-11 Total Direct Cost of Dr. Seojono Selong Hospital to categories of cost centers

Cost Center	Total Labor (Rp)	%	Total Material (Rp)	%	Total Capital (Rp)	%	Total (Rp)	%
Administration	1,021,933,835	10.67	256,062,365	4.66	825,777,173	14.29	2,103,773,373	10.09
Medical Admin.supp	731,258,217	7.63	31,859,780	0.58	158,566,763	2.74	921,684,760	4.42
General supply	404,094,909	4.22	25,277,134	0.46	98,417,335	1.70	527,789,378	2.53
Cleaning service	277,686,571	2.90		0.00	889,366	0.02	278,575,937	1.34
Laundry	126,732,567	1.32	16,646,745	0.30	11,590,618	0.20	154,969,930	0.74
Kitchen	180,604,135	1.89	726,228,513	13.22	39,406,052	0.68	946,238,700	4.54
Pharmacy	247,627,745	2.59	49,642,080	0.90	39,211,768	0.68	336,481,593	1.61
Laboratory	463,853,020	4.84	146,942,665	2.67	214,065,876	3.70	824,861,561	3.96
X Ray	210,435,680	2.20	401,414,645	7.31	581,554,036	10.06	1,193,404,361	5.72
Operating Theater	247,984,300	2.59	289,377,319	5.27	1,023,932,746	17.71	1,561,294,365	7.49
Emergency Unit	880,784,297	9.20	1,135,049,225	20.66	431,551,114	7.47	2,447,384,636	11.74
Inpatient	3,600,298,821	37.59	1,786,813,506	32.52	1,679,315,456	29.05	7,066,427,783	33.89
Outpatient	1,185,097,966	12.37	628,657,982	11.44	676,116,674	11.70	2,489,872,622	11.94
Total	9,578,392,063	100	5,493,971,959	100	5,780,394,978	100	20,852,759,000	100

Table 4-12 shows total direct cost of patient service center. The unit patient service with highest direct cost was pediatric ward (18.81%), maternity ward (13.94%) and interna/general ward (13.36), while the lowest was maternity department (1.94%), physiotherapy (1.98%) and pediatric (2.09%). It has to be noted, that maternity unit in inpatient was one of the unit with highest direct cost, while

maternity unit in outpatient was one of the unit patient service with lowest total cost. This is probably due to the habit of pregnant woman to do routine health control, either at village health clinic or in private practice.

Table 4-12 Direct cost of Dr. Soejono Selong Hospital to categories of patient service

Cost Center	Total Labor (Rp)	%	Total Material (Rp)	%	Total Capital (Rp)	%	Total (Rp)	%
Inpatient								
Maternity	834,701,199	17.44	163,355,448	6.76	334,561,501	14.20	1,332,618,148	13.94
Neurology	357,725,959	7.48	141,581,587	5.86	136,955,576	5.81	636,263,122	6.66
Internal/general	548,237,868	11.46	529,996,981	21.94	198,427,477	8.42	1,276,662,326	13.36
Pediatric	841,508,709	17.58	334,471,040	13.85	621,136,184	26.37	1,797,115,933	18.81
VIP	524,081,711	10.95	129,172,757	5.35	240,920,151	10.23	894,174,619	9.36
Surgery	494,043,375	10.32	488,235,693	20.21	147,314,567	6.25	1,129,593,635	11.82
Outpatient								
Surgery	164,161,450	3.43	123,609,042	5.12	105,767,704	4.49	393,538,196	4.12
Eye	128,697,975	2.69	42,633,667	1.77	92,110,687	3.91	263,442,329	2.76
Maternity	101,932,827	2.13	44,778,169	1.85	38,644,536	1.64	185,355,532	1.94
Internal/General	209,410,121	4.38	146,009,145	6.04	42,882,791	1.82	398,302,057	4.17
Pediatrics	86,382,045	1.81	68,113,963	2.82	45,577,357	1.93	200,073,365	2.09
Dental	150,610,028	3.15	90,284,522	3.74	63,514,518	2.70	304,409,068	3.19
Ear, Nose, Throat	80,076,522	1.67	59,959,078	2.48	144,288,310	6.13	284,323,910	2.98
Nutrition	215,004,322	4.49	23,109,437	0.96	33,213,548	1.41	271,327,307	2.84
Physiotherapy	48,822,676	1.02	30,160,959	1.25	110,117,222	4.68	189,100,857	1.98
Total	4,785,396,787	100	2,415,471,488	100	2,355,432,130	100	9,556,300,405	100

4.2.4.2 Total Indirect Cost

The total indirect cost of Dr. Seojono Selong Hospital is presented in the table 4-13. It can be summarized that when the total indirect cost of all unit of patient services both inpatient and outpatient was identified using step down analysis, the largest proportion of total cost was attributed to maternity ward (16.71%), followed by pediatric (15.32%) and surgery ward (13.69%). High proportion of hospital total

cost was also utilized by internal/general department of outpatient (7.94%), and the lowest was utilized by maternity department of outpatient (1.99%)

Table 4-13 Direct and indirect cost of each unit of patient service cost center

Unit of Patien Services	Direct Cost (Rp)	%	Indirect Cost (Rp)	%	Total Cost (Rp)	%
Inpatient						
Maternity	1,332,618,148	13.94	2,151,595,766	19.05	3,484,213,914	16.71
Neurology	636,263,122	6.66	426,654,582	3.78	1,062,917,704	5.10
Internal/general	1,276,662,326	13.36	1,205,609,308	10.67	2,482,271,635	11.90
Pediatric	1,797,115,933	18.81	1,398,537,455	12.38	3,195,653,388	15.32
VIP	894,174,619	9.36	709,640,579	6.28	1,603,815,198	7.69
Surgery	1,129,593,635	11.82	1,724,602,009	15.27	2,854,195,644	13.69
Total Inpatient	**7,066,427,783**		**7,616,639,699**		**14,683,067,482**	
Outpatient						
Surgery	393,538,196	4.12	526,936,805	4.66	920,475,001	4.41
Eye	263,442,329	2.76	597,538,873	5.29	860,981,202	4.13
Maternity	185,355,532	1.94	230,375,763	2.04	415,731,295	1.99
Internal/General	398,302,057	4.17	1,257,081,174	11.13	1,655,383,231	7.94
Pediatrics	200,073,365	2.09	221,744,219	1.96	421,817,584	2.02
Dental	304,409,068	3.19	158,111,005	1.40	462,520,073	2.22
Ear, Nose, Throat	284,323,910	2.98	196,047,264	1.74	480,371,174	2.30
Nutrition	271,327,307	2.84	153,601,345	1.36	424,928,652	2.04
Physiotherapy	189,100,857	1.98	338,382,449	3.00	527,483,307	2.53
Total Outpatient	**2,489,872,622**		**3,679,818,897**		**6,169,691,519**	
Total Patient Service	**9,556,300,405**	**100**	**11,296,458,595**	**100**	**20,852,759,000**	**100**

4.2.5 Unit Cost and Patient Utilization

The unit cost of hospital and each department of patient service can be presented in table 4-14. It shows that the unit cost of inpatient was 278,384 rupiah. Maternity ward was the department among inpatient cost center with highest unit cost (420,038 rupiah), followed by neurology (341,007 rupiah) and surgery ward (283, 379 rupiah), and the lowest unit cost was VIP ward (195,659 rupiah). The unit cost for outpatient was 91,650 rupiah, and among outpatient, nutrition was the department with highest unit cost, it was 348,874 rupiah, while eye was the lowest with 58,214 rupiah. Other department with low unit cost among outpatient cost center was internal/general with 72,484 rupiah.

Table 4-14 Patient utilization and unit cost of each unit of patient service

Unit of Patinet Service	Total Cost (Rp)	No.of Patient day/Visit	Unit Cost (Rp)
Inpatient			
Maternity	3,484,213,914	8,295	420.038
Neurology	1,062,917,704	3,117	341.007
Interna/general	2,482,271,635	9,292	267.141
Pediatric	3,195,653,388	13,771	232.057
VIP	1,603,815,198	8,197	195.659
Surgery	2,854,195,644	10,072	283.379
Total Inpatient	**14,683,067,482**	**52,744**	**278,384**
Outpatient			
Surgery	920,475,001	9,263	99.371
Eye	860,981,202	14,790	58.214
Maternity	415,731,295	3,248	127.996
Interna/General	1,655,383,231	22,838	72.484
Pediatrics	421,817,584	3,582	117.760
Dental	462,520,073	1,733	266.890
Ear, Nose, Throat	480,371,174	3,681	130.500
Nutrition	424,928,652	1,218	348.874
Physiotherapy	527,483,307	6,965	75.733
Total Outpatient	**6,169,691,519**	**67,318**	**91,650**

4.3 Hospital Revenue

The hospital revenue sources in table 4-15 were budget from local government and central government, and non-budget from civil servant insurance Scheme, health assurance scheme and out of pocket. Total revenue of Dr. Soejono Selong hospital was 26,902,360,574 rupiah. 55.76% was the revenue from local government, 11.15% was from central government, 5.10% was from civil servant insurance, 11.70% was from health assurance and 16.29% was the revenue from out of pocket. However, 65% of the revenue from health assurance and out of pocket should be turned over to the local government and only 35% of both revenue can be managed by hospital.

Table 4-15 Dr. Soejono Selong Hospital revenue, fiscal year 2008 (Initial revenue)

Source of revenue	Amount (Rp)	%
Local Government	15,000,000,000	55.76
Central Government	3,000,000,000	11.15
Civil Servant Insurance	1,372,360,574	5.10
Health Assurance	3,148,000,000	11.70
Out of Pocket	4,382,000,000	16.29
Total	26,902,360,574	100.0

Table 4-16 represents the revenue of hospital after 65% deduction of revenue from health assurance and out of pocket. It shows the total revenue remained and managed by hospital was 22,007,860,574 rupiah. The proportion of revenue change as describes in the table. Revenue from central government used only for financing building construction and medical equipment.

Table 4-16 Total revenue managed by Dr. Soejono Selong Hospital , fiscal year 2008

Source of revenue	Amount (Rp)	% from total revenue
Local Government	15,000,000,000	68.16
Central Government	3,000,000,000	13.63
Civil Servant Insurance	1,372,360,574	6.24
Health Assurance	1,101,800,000	5.01
Out of Pocket	1,533,700,000	6.97
Total	22,007,860,574	100.0

4.4 Hospital Cost Recovery

Hospital cost recoveries can be presented in table 4-17 that there was cost recoveries estimated using total revenue both form government and non government budget. It can also be seen that total cost recovery of hospital was 1.29. It means that hospital could cover their cost. However, using non budget revenue cost recovery was 0.43 only. So, it can be concluded that without government support, hospital could not cover the cost. Revenue from non budget can cover only material cost (1.62), while for operating cost, the cost recovery was 0.59.

Table 4-17 Hospital cost recovery with initial revenue

Cost Recovery	Total Cost Recovery	Non-budget revenue
Total Hospital cost	1.29	0.43
Operating Cost (LC+MC)	1.78	0.59
Material Cost	4.90	1.62

The table 4-18 represents about hospital cost recovery with budget managed by the hospital.

Table 4-18 Hospital Cost Recovery with Budget Managed by Hospital

Cost Recovery	Total Cost Recovery	Non-budget revenue
Total Hospital	0.96	0.19
Operating Cost (LC+MC)	1.46	0.27
Material Cost	4.01	0.73

As mentioned above, 65% of the revenue from health assurance and out of pocket should be turned over to local government, and only 35 % managed by hospital. With this situation, total hospital cost recovery was 0.96, means that hospital could not cover their cost, even though with government support. However, for operating and material, hospital could cover the cost by total hospital revenue. With non budget revenue only, total cost recovery was 0.19, operating cost recovery was 0.27 and material cost recovery was 0.73 respectively.

Table 4-19 Hospital Cost Recovery to Categories of IPD and OPD based on Revenue Resources (Direct Recovery)

Revenue Resources	Revenue (Rp)	Inpatient		Outpatient	
		Total Cost of IPD (Rp)	Cost Recovery (Rp)	Total Cost of OPD (Rp)	Cost Recovery (Rp)
Civil Servant Insurance	1,372,360,574	1,852,295,256	**0.74**	1,963,509,600	**0.70**
Health Assurance	3,148,000,000	9,254,728,392	**0.34**	2,868,553,350	**1.10**
Out of Pocket	4,382,000,000	2,586,690,400	**1.69**	1,276,776,150	**3.43**

Table 4-19 represents the cost recovery of inpatient and outpatient based on payment scheme. The revenue used to calculate cost recovery is the total revenue of hospital from each payment scheme. The table describes that total revenue from civil servant insurant could not cover total cost of inpatient as well as total cost of outpatient. The revenue from health assurance had very low cost recovery (0.34) for

total cost of inpatient, but could cover total cost of outpatient, while total revenue from out of pocket could cover total cost both inpatient and outpatient.

Table 4-20 Indirect hospital cost recovery to category of IPD based on payment scheme

	Civil Servant Insurance	Health Assurance	Out of Pocket	Uninsured
No. of Patient	1,647	8,229	2,300	1,789
Average Length of stay	3.8	3.8	3.8	3.8
No. of Patient day	6,259	31,270	8,740	6,475
Unit Cost/Inpatient day	295,960	295,960	295,960	295,960
Total Cost	1,852,295,256	9,254,728,392	2,586,690,400	1,916,341,000
Direct revenue	798,820,854	2,403,135,190	2,933,861,905	0.0
Indirect revenue	1,530,968,962	7,649,267,512	2,137,965,157	1,583,904,393
Total revenue	2,329,789,816	10,052,402,702	5,071,827,062	1,583,904,393
Gap between total cost and revenue	477,494,560	797,674,310	2,485,136,662	-332,436,607
Cost Recovery	**1.26**	**1.09**	**1.96**	**0.83**

Table 4-20 describes indirect hospital cost recovery to the category of IPD based on payment scheme. Indirect cost recovery means that revenue from government was distributed/allocated to each payment scheme as indirect revenue from the schemes. As the data on government budget allocation to each patient service center was not available, proportion of cost of each payment scheme used as a criteria for revenue allocation. This criteria was also implemented to allocate total revenue from each scheme to outpatient and inpatient (direct revenue), because there was also no information on the amount of total revenue from the payment scheme should be attributed to each patient service center. From the table, it can be seen that for inpatient, only uninsured scheme could not cover its cost (0.83) and referring to the gap between cost and revenue, hospital experienced deficit about 332,436,607 rupiah, while for civil servant insurance, health assurance and out of pocket the cost recovery were 1.26:1.09:1.96 respectively, and hospital experienced surplus with

477,494,560 rupiah: 797,674,310 rupiah:2,485,136,662 rupiah respectively. Furthermore, indirect cost recovery of outpatient represents in table 4-21. The table shows that uninsured scheme could not cover its cost and hospital experienced deficit about 10,238,926 rupiah. Meanwhile, other schemes could cover their cost and provide surplus for hospital which were 233,683,919 rupiah from civil servant insurance, 248,358,709 rupiah from health assurance, and 1,227,146,163 rupiah from out of pocket.

Table 4-21 Indirect cost recovery to category of OPD based on payment scheme

	Civil Servant Insurance	Health Assurance	Out of Pocket	Uninsured
No. of Patient	21,424	31,299	13,931	644
Unit Cost/visit	91,650	91,650	91,650	91,650
Total Cost	1,963,509,600	2,868,553,350	1,276,776,150	59,022,600
Direct revenue	573,539,720	744,864,810	1,448,138,095	0.0
Indirect revenue	1,623,653,799	2,372,047,249	1,055,784,218	48,806,621
Total revenue	2,197,193,519	3,116,912,059	2,503,922,313	48,806,621
Gap between total cost and revenue	233,683,919	248,358,709	1,227,146,163	-10,238,926
Cost Recovery	**1.12**	**1.09**	**1.96**	**0.83**

From the result above, it can be concluded that hospital administrator should work on finding solution regarding uninsured scheme.

4.5 Sensitivity Analysis

Sensitivity analysis is performed in a scenario setting under the assumption that other input parameters remain fixed.

4.5.1 Unit cost and cost recovery with the changes of cost components

Changing cost components is selected for this sensitivity analysis are as presents in Table 4.22

Scenario 1: changing in discount rate of capital cost from 7.86% to 10%

It can be seen from the table that the capital depreciation cost will go up if the discount rate increase from 7.86 % to 10 %. Unit cost of OPD per visit, and

unit cost of IPD will increase from 91,650 rupiah to 109,105 rupiah and 278,384 rupiah to 295,960 rupiah respectively, and cost recovery will change to 0.96. This means that hospital cannot recover its cost.

Table 4-22 Cost structure, unit cost and cost recovery with changing scenario

Scenario	Capital Cost (Rp.)	Material Cost (Rp.)	Labor Cost (Rp)	OPD/visit (Rp)	IPD/inpatient day (Rp)	Cost Recovery
Baseline	5,780,394,978	5,493,971,959	9,578,392,063	91,650	278,384	1.06
Scenario 1	7,882,471,424	5,493,971,959	9,578,392,063	109,105	295,960	0.96
Scenario 2	5,780,394,978	4,944,574,763	9,578,392,063	82,218	271,039	1.08
Scenario 3	5,780,394,978	5,493,971,959	10,536,231,269	96,018	292,098	1.01

Scenario 2: Material cost decrease 10%

As it can be seen from the table 4-22, in scenario 2 when there exist a reducing material cost 10%, the unit cost of OPD and IPD will decrease to 82,218 rupiah and 271,039 rupiah respectively, and cost recovery will change to 1.08. From this result, it can be concluded that material cost containment will improve hospital cost recovery.

Scenario 3: Labor cost increase 10%

If labor cost increase 10%, as shown in the table 4-22, the unit cost of IPD and OPD will increase to 96,018 and 292,018 respectively and cost recovery will change to 1.01. It is necessary to the hospital to give more attention on labor issue, as the salary and fringe benefit increase every year following the government regulation.

4.5.2 Hospital cost recovery with changes of the revenues

Due to the government regulation that Dr. Soejono Selong Hospital will become autonomous hospital in 2011, the revenue used to analyze sensitivity regarding hospital cost recovery is the initial revenue of hospital, which was 18,000,000,000 rupiah as the revenue from government (budget revenue) and 8,902,369,570 was revenue from payment schemes (non budget revenue). As known, under autonomous status the hospital can retain and manage all their revenue without turning over 65% of the revenue from health assurance and out of pocket to local government. It can be seen from the table 4-23 that an increase in hospital budget revenue 10% will improve hospital cost recovery to 1.38, while decrease in budget revenue 10% will decrease cost recovery to 0.93. Furthermore, if there exists an increase in non-budget revenue 10% and decrease in budget revenue 10%, cost

recovery will change from 1.33 and 1.25 respectively. From the result, it can be seen that decreasing 10% of government budget will lead the hospital cannot cover their cost. Compared to the decreasing of non-budget revenue, the hospital cost recovery will also decrease, but hospital still can cover their cost. So, hospital cost recovery more sensitive to budget revenue, as it is the most revenue of hospital, which is 66.91% from total revenue.

Table 4-23 Hospital cost Recovery with the changes of hospital revenue

Scenario		Amount of budget (Rp)	Cost recovery
Baseline		26,902,360,574	1.29
Scenario 1	Increase budget revenue 10 %	28,702,360,574	1.38
	Decrease budget revenue 10 %	25,102,360,574	0.93
Scenario 2	Increase non budget revenue 10 %	27,792,596,631	1.33
	Decrease non budget revenue 10 %	26,012,124,517	1.25

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion and Conclusion

The study intended to analyze the cost, unit cost and cost recovery of the Dr. Soejono Hospital in fiscal year 2008. This hospital is the public hospital providing primary and secondary health service. The study is retrospective study from providers' perspective. Data and information were collected from 13 cost centers namely Administration, Medical Support Administration, General Supply, Cleaning Service, Laundry, Kitchen, Pharmacy, laboratory, Radiology, X-ray, Operation Theater, Emergency Unit, Inpatient and Outpatient Department. These cost centers were identified into three groups based on the character of the service. The three groups were Non Revenue Producing Cost Center (RPCC), Revenue Producing Cost Center (RPCC) and Patient Service (PS). The main information was collected by this study was the total hospital cost composing of the total direct and indirect cost. The direct cost is composed of labor, material and capital cost. The indirect cost of NRPCC and RPCC were allocated to PS using step down method, based on each cost center's allocation criteria. Then unit cost of hospital and patient service centers were also determined, followed by hospital revenue, hospital cost recovery and sensitivity analysis. The main finding of this study can be categorized as follows:

5.1.1 Hospital Cost and Revenue

The study found that the total cost of Dr. Soejono Selong Hospital was 20,852,759,000 rupiah, and 45.93% of budget was labor cost compared with the statistics that 26.35% was material cost and 27.72% was capital cost Total revenue was 26,902,360,574 rupiah. The sources of revenue mainly come from local government which was about 55.76%, and central government 11.15%. Other sources were the revenue from patient of civil servant insurance, health assurance, and out of pocket, with the proportion were 5.10%, 11.70% and 16.29% respectively. The 65% of hospital revenue from health assurance and out of pocket had to turn over to local government, only the revenue from civil servant insurance can be retained all by hospital.

5.1.2 Unit Cost

The unit cost of inpatient was 278,384 rupiah. The highest unit cost of department within inpatient was maternity ward, it was 420,038 rupiah. This was because of its total direct cost that was high as well as total indirect cost from operational theater. The lowest unit cost among inpatient was VIP ward which was 195,659 rupiah. VIP is one of the wards with excess demand; therefore, hospital has to give more attention to this ward, as it is potential to become hospital revenue resources. However, the tariff for this ward needs to be reviewed followed by improve the quality of services, in order to secure potential clients to use the services. Under autonomous system hospital manager may set tariff for all charges except charge for beds for poor, while this should be approved by higher authorities.

The unit cost for outpatient was 91,650 rupiah. Among outpatient, the highest unit cost was nutrition with 348,874 rupiah, as the utilization of the service was the lowest. The unit cost of dental was also high (266,890 rupiah). The reason was that dental services used costly sophisticated machineries equipment. Eye was outpatient department with the lowest unit cost which was 58,214 rupiah. The number of patients visited to this department was high as there was program collaborated with donor. Other department with low unit cost was internally general with Rp.72,484 rupiah, as this department services was utilized the most.

The unit cost of hospital actually can be reduced as referring to the occupancy rate which was 79.9 %, (less than 85 %), it can be found that hospital resources was not fully utilized. Moreover, this hospital is the only hospital in the district with 1,083,000,000 populations. It means that hospital had wide market; therefore, hospital administrator should work on how to increase the utilization of hospital by improving the quality of services.

5.1.3 Hospital Cost Recovery

The total hospital cost recovery using initial revenue, where all non-budget revenue can be retained and managed by hospital, was 1.29 means that hospital could cover their cost. However, using non-budget revenue cost recovery was only 0.43. Without government supports hospital could not cover the cost. Revenue from non-budget can cover only material cost (1.62), while for operating cost , the cost recovery was 0.59. Direct cost recoveries of hospital with total revenue from civil servant

insurance scheme, health assurance scheme and out of pocket for inpatient were 0.74, 0.34 and 1.69 respectively. Hospital can only cover the cost of out of pocket patient, where health assurance was the scheme with lowest cost recovery. It means that total revenue both of inpatient and outpatient from civil servant insurance and health assurance could not cover the treatment cost of patient under these schemes in inpatient department. For outpatient, using total revenue from all payment scheme, the cost recovery was 0.70 for civil servant insurance Scheme, 1.10 for health assurance scheme and 3.43 for out of pocket. From the result mention above, it has to be noted that hospital cannot cover the treatment cost of patient under civil servant insurance scheme with the total revenue from the scheme, both for inpatient and outpatient.

Indirect cost recovery of hospital for IPD from civil servant insurance scheme, health assurance scheme, out of pocket and uninsured were 1.26:1.09:1.96:0.83 respectively, and hospital experienced surplus with 477,494,560 rupiah : 797,674,310 rupiah:2,485,136,662 rupiah respectively. And indirect cost recovery of hospital for outpatient was 1.12:1.09:1.96 and 0.83 respectively.

With the situation described above, in 2011, when the Dr. Soejono Selong Hospital become a autonomous hospital, it can be predicted that hospital will be able to cover its cost, under the assumption that supports from government will not be reduced. The cost recovery can be improved, if the hospital can increase its revenue, by negotiating the charges of health service for all mechanism schemes, and increasing budget allocation for health assurance scheme. Under the autonomous system, this hospital is allowed to manage all its revenues without turning over to local government. The hospital can use these funds for salary incentives, operation and hiring contract personnel. However, the revenue is not allowed to finance equipment and contractor, it is allowed to finance contract service such as food service and laundry.

5.2 Recommendation

5.2.1 Policy Implication

Within Hospital: the hospital administrators should set up the policy within hospital regarding:

1) Cost containment on labor Cost

Based on the results of study, the biggest proportion of total hospital cost was labor cost (47.7%). It means that hospital spent nearly 50 % for the labor. The number of staff was high. There were 27 doctors, 170 nurses, 49 paramedics and 150 non-medical staff. Referring to government regulation of Ministry of Health, No.202, in 1998 regarding to the ratio of medical and non-medical staff for type C hospital as follows in table 5.1:

Table 5.1 Staff allocation standard for hospital type C

Staff Allocation	Doctor / Bed	Nurse/Bed	Paramedic/Bed	Non-medic/Bed
Regulation Standard	1 / 9	1 / 1	1 / 5	3 / 4
Dr. Seojono Hospital	1 / 6	1 / 0.96	1 / 3.3	3 /3

Source: Dr. Soejono Selong Hospital Annual report 2009

From the table above, it can be shown that number of staff was much higher than the needs of hospital. Particularly for nurse, if we used the standard 1 nurse/5 patient visit compare to the condition in hospital, where 1 nurse/1.1 patient visit, it can be concluded that hospital was overstaff. Therefore, the hospital managers should allocate staff properly, and use available resources more efficiently. Hospital should also consider about the personnel recruitment. Good human resource planning is very needed to be developed by involving the unit in local government, which in charge on staff recruitment.

2) Material cost

The highest allocation for material cost was for non medical material (43%), while the lowest was for medicine (22%) followed by medical device/consumable (35%). Non-medical material cost will be much higher if the cost of telephone, electricity and water was included in this study. It was excluded, due to unavailability of data. Refers to the experience at the end of fiscal year 2008, where hospital lacked of medicine and consumable, hospital administrators have to give more attention on this problem because it influenced to every patient services. Good planning should be

done, and efficiency should also be implemented, particularly for non-medical material such as stationeries, by introducing bidding system or quotation system.

3) Capital Cost

All of the costs for capital were from government, both local and central government. For medical capital cost of the Dr. Seojono Selong Hospital was fully depended on the central government. Most of the equipments were purchased by Ministry of Health (MoH), without involving with hospital. In order to get equipments which are really needed and necessary for hospital, closed to coordination and cooperation with MoH are needed

Outside Hospital :

1) Results of the study can be used as one of the basis for hospital autonomous preparation, and it is also beneficial for hospital planning development and basis for ad-vocation to the local parliament.

2) Results of the study can be used as one of basis for development of referral system together with health stakeholders or development in common understanding and commitment with district health office and health center regarding referral patient, in order to avoid unnecessary referral cases and improve referral system.

5.3 Limitation of study

1) Since the study was done under timeframe constraint and the hospital record system was not appropriated, some data and information were not able to be collected, such as cost for each payment mechanism, cost for disease treatment, complete data on drugs and consumables, cost of electricity, telephone, and water.

2) This study is a retrospective study; therefore, many data were not recorded, and the filling system of hospital was not properly done.

3) There is no information on hospital costing study which similar with this study; therefore, it is difficult to compare the result of this study.

5.4 Suggestions to further study

1) Conduct further costing study including comparison cost of patient treatment in hospital and health centers.

2) Conduct similar study based on prospective approach in order to get comprehensive information.
3) Undertake study on cost, unit cost and cost recovery in all hospital in the province.

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APPENDICES

Appendix A1: Record form for alary and Fringe Benefit
Working Unit : Month :

Staff Name	Salary	Professional Allowance	Long term Allowance	Medical Service Incentive	Overtime	Total Income	Remarks
Total							

Appendix A2: Record form for time allocation of staff (who serves more than one cost center)
Month :

Working Unit	Name of staff	Proportion of time spent in cost center (hrs/week)				Total percentage of time in each cost center/week	Total Salary	% of labor cost/center
Total								

Appendix A3: Record form for medical material (drug, medical device, lab device, consumable, etc)
Cost Center/Working unit : Month:

Name of material	Cost of material	Total	Remark
Total			

Appendix A4: Record form for non medical material
Cost Center/Working unit : Month:

Name of material	Cost of material	Total	Remark
Total			

Appendix A5: Record form for office supply
Cost Center/Working unit : Month:

Name of material	Cost of material	Total	Remark
Total			

Appendix A6: Record form for office supply
Cost Center/Working unit : Month:

Name of material	Cost of material	Total	Remark
Total			

Appendix A7: Record form for public utilities
Cost Center/Working unit : Month:

Electricity	Water supply	Telephone	Other utilities	Total	Remarks
					,
Total					

Appendix A8: Record form for Major Equipment (Capital)
Cost Center/Working unit :

Name of capital	Date of purchase	Purchasing price	Useful life years	Depreciated value

Appendix B

Appendix B1: Depreciatory of building per year 2008

	M^2	Price	Year of purchase	Useful life	Discount rate	Value of 2008	Economic cost
Administration	920	1,699,999,920	2004	20	7.86	3,665,199,	373,314,303
Medical admin supp.	137	253,152,162	2004	20	7.86	545,796,06	55,591,369
General supply	173	319,673,898	2004	20	7.86	689,216,92	70,199,320
Cleaning service	45	2,700,000	1999	20	7.86	8,731,800,	889,366
Laundry	45	2,700,000	1999	20	7.86	8,731,800,	889,366
Kitchen	420	17,000,000	2004	20	7.86	36,652,000	3,733,143
Pharmacy	60	28,000,000	1995	20	7.86	108,829,95	11,084,738
Laboratorioum	150	348,912,300	2006	20	7.86	531,924,55	54,178,504
Radiology	420	976,954,440	2006	20	7.86	1,489,388,	151,699,812
Operating room	150	277,173,900	2006	20	7.86	422,557,76	43,039,088
5. IGD	510	942,391,260	2005	20	7.86	1,759,586,	179,220,469
Patient Service							
Inpatient							
1.Maternity	640	640,000,000	2000	20	7.86	1,951,388,	198,756,207
2. Anatara	420	162,960,000	1995	20	7.86	633,390,36	64,513,176
	M^2	Price	Year of purchase	Useful life	Discount rate	Value of 2008	Economic cost
4. Pediatric	510	197,880,000	1995	20	7.86	769,116,87	78,337,428
5. VIP	350	135,800,000	1996	20	7.86	507,118,14	51,651,879
6. surgery	420	162.960.000	1996	20	7.86	608,541,77	61,982,255

Appendix B1(Cont.): Depreciatory of building per year 2008

	M^2	Price	Year of purchased	Useful life	Discount rate	Value of 2008	Economic cost
Outpatient							
1. Surgery	640	121.956.516	2004	20	7.86	262,938,248	26,781,243
2. Eye	420	92.391.300	2004	20	7.86	199,195,642	20,288,821
3. Maternity	420	92.391.300	2004	20	7.86	199,195,642	20,288,821
4. Interna /general	510	140.434.776	2004	20	7.86	302,777,377	30,839,008
5. Pediatric	350	83.152.170	2004	20	7.86	179,276,078	18,259,939
6. Dental	420	142.282.602	2004	20	7.86	306,761,289	31,244,784
7. Ear, nose, troath	45	83.152.170	2004	20	7.86	179,276,078	18,259,939
8. Nutrition	77	142.282.602	2004	20	7.86	306,761,289	31,244,784
9. Physiotherapy	90	166.304.340	2004	20	7.86	358,552,157	36,519,877

Appendix B 2: Depreciatory of medical equipment in operating theater

No	Medical Equipment	Purchase	Price	Useful life	Discount rate	Value in 2008	Economic value
1	Laparoscop Unit	2003	150,000,000	10	1.0786	361,773,438	58872813
3	Sterilisator	2002	1,960,000	7	1.0786	5,178,358	994,690
4	Pulse Oxymeter	2005	60,585,000	7	1.0786	113,184,291	21,741,124
5	Defribilitor	2003	117,364,600	10	1.0786	283,062,632	42,185,191
6	E S U	2003	45,000,000	10	1.0786	108,532,031	16,174,669
7	E S U	2002	35,000,000	10	1.0786	92,470,687	13,781,026
8	Suction Pump	2002	4,500,000	10	1.0786	11,889,088	1,771,846
9	Suction Pump	2005	38,474,000	10	1.0786	71,876,742	10,711,884
10	Suction Pump	2005	38,474,000	10	1.0786	71,876,742	10,711,884
11	Suction Pump	2005	38,474,000	10	1.0786	71,876,742	10,711,884
12	Suction Pump	2005	38,474,000	10	1.0786	71,876,742	10,711,884
13	Spygmomanometer Stand	2003	2,425,000	10	1.0786	5,848,671	871,635
14	Spygmomanometer Stand	2003	2,425,000	10	1.0786	5,848,671	871,635
15	Meja Operasi	2003	42,000,000	15	1.0786	101,296,563	11,835,093
16	Meja Operasi	2003	42,000,000	15	1.0786	101,296,563	11,835,093
17	Meja Operasi	2005	42,000,000	15	1.0786	78,463,980	9,167,424
18	Laringoscope	2002	5,800,000	3	1.0786	15,323,714	5,992,849
19	Weighing Scale	2005	917,000	10	1.0786	1,713,130	255,310
20	Infant Care	1993	27,000,000	10	1.0786	105,001,585	15,648,522
21	Instrument Trolley	2006	4,000,000	10	1.0786	6,101,483	909,312
22	Medicine Troelly	2004	4,017,000	15	1.0786	8,665,472	1,012,440
23	Wheel Chair	2005	2,311,000	5	1.0786	4,317,387	1,081,239
24	Instrument Cabinet 1 pintu	5006	6,287,000	15	1.0786	9,590,006	1,120,459

Appendix B 2(Cont.) : Depreciatory of medical equipment in operating theater

No	Medical Equipment	Purchase	Price	Useful life	Discount rate	Value in 2008	Economic value
25	Pulse Oxymeter	2004	51,256,000	7	1.0786	110,569,443	21.238.848
26	Pulse Oxymeter	2004	51,526,000	7	1.0786	111,151,887	21.350.727
27	Suction Irigator	2004	6,480,000	10	1.0786	13,978,656	2.083.257
28	Tensi Meter Digital	2005	875,000	5	1.0786	1,634,666	409.383
29	Tensi Meter Digital	2005	875,000	5	1.0786	1,634,666	409.383
30	Lampu tindakan	2005	4,000,000	10	1.0786	7,472,760	1.113.675
31	X-ray film viewer	2005	1,605,000	8	1.0786	2,998,445	521.741
32	Lampu operasi	2005	73,600,000	10	1.0786	137,498,784	20.491.622
33	Anesthesi Machine	2005	90,000,000	7	1.0786	168,137,100	32.296.792
34	Anesthesi Ventilator	2005	208,369,000	7	1.0786	389,272,882	74.773.892
35	Instrument Cabinet	2005	6,287,050	15	1.0786	11,745,404	1.372.287
36	Anaesthesi Mach. + Vent.	2005	398,369,000	7	1.0786	744,228,983	142.956.009
37	E S U	2006	222,549,800	10	1.0786	339,470,955	50.591.797
38	Anaesthesy Machine with Ventilator 950	2006	619,880,000	7	1.0786	945,546,820	181.626.358
39	Operating Mikroscope	2006	27,500,000	10	1.0786	41,947,696	6.251.519
40	Micro Surgical Drill	2006	84,400,000	10	1.0786	128,741,291	19.186.482
41	THT Instrument Set	2006	42,000,000	10	1.0786	64,065,571	9.547.775
42	Meja Operasi	2006	93,159,000	15	1.0786	142,102,014	21.177.647
43	Suction Pump	2007	32,249,000	10	1.0786	34,783,771	5.183.871
44	Suction Pump	2007	32,249,000	10	1.0786	34,783,771	5.183.871
45	Infan Warmer	2007	557,080,000	10	1.0786	600,866,488	89.547.912
46	Instrumen tindakan OK mata	2007	30,407,000	10	1.0786	32,796,990	4.887.778
	Total					**5,772,493,764**	**912,299,720**

Appendix B 3: Depreciatory of medical equipment in laboratory

No	Equipment	Purchase year	Price	Useful life	Discount rate	Value in 2008	Annualization factor	Economic value
1	Microscope Binoculer	2003	39,500,000	7	7.86	95,267,005	5.206	18,299,463
2	Microscope	1995	220,000	7	7.86	411,001	5.206	78,948
3	Microscope	1997	230,000	7	7.86	248,078	5.206	47,652
4	Spectrophotometer	2005	196,997,000	8	7.86	368,027,825	5.747	64,038,251
5	Spectrophotometer	1994	37,000,000	8	7.86	79,816,400	5.747	13,888,359
6	Spectrophotometer	1998	73,000,000	8	7.86	248,990,785	5.747	43,325,350
7	Timbangan Digital	2000	18,232,500	10	7.86	55,622,644	6,710	8,290
8	Urine Analyzer	2002	3,900,000	10	7.86	10,303,876	6,710	1,536
9	Mikro centrifuge	2000	2,340,000	7	7.86	7,138,735	5.206	1,371,251
10	Centrifuge	2006	4,100,000	7	7.86	6,254,020	5.206	1,201,310
11	Centrifuge	2006	2,124,000	7	7.86	3,239,887	5.206	622,337
12	Centrifuge	2008	3,124,100	7		-		446,300
13	Incubator kuman	2008	16,510,000	10		-		1,651,000
		Total				**875,320,260**		**144,980,047**

Appendix B 4: Depreciatory of medical equipment in emergency unit

No	Medical Equipment	Purchse year	Price	Useful life	Discount rate	Value in 2008	Annualization factor	Annual economic cost
1	Wheel Chair	2002	7,200,000	5	1.0786	19,022,541	3.993	4,763,972
2	Wheel Chair	2005	2,311,000	5	1.0786	4,317,387	3.993	1,081,239
3	Timbangan badan dewasa	2001	700,000	10	1.0786	1,997,595	6.710	297,704
4	UV Room Sterilisator	2006	8,910,000	7	1.0786	13,591,053	5.206	2,610,652
5	Ultrasonic Nebulizer	2004	7,975,000	10	1.0786	17,203,670	6.710	2,563,885
6	Defibrilator	2008	117,346,000	5	1.0786			23,469,200
7	Suction Pump	2008	98,040,000	10	1.0786			9,804,000
		Total				56,132,246		44,590,652

Appendix B 5: Depreciatory of medical equipment in maternity ward

No	Medical Equipment	Purchase year	Price	Useful life	Discount rate	Value in year 2008	Annualization factor	Annual economic cost
1	Spigmomanometer Raksa	2004	18,000,000	10	7.86	38,829,600	6.710	5,786,826
2	Stetoscope	2005	700,000	5	7.86	1,307,733	3.993	327,506
3	Lampu Tindakan	2006	4,000,000	10	7.86	6,101,483	6.710	909,312
4	Weighing scale	2005	917,000	10	7.86	1,713,130	6.710	255,310
5	Timbangan Dewasa	2001	700,000	10	7.86	1,997,595	6.710	297,704
6	Meja Ginocology	2006	15,000,000	15	7.86	22,880,561	8.559	2,673,275
7	Medicine Trolley	2004	4,017,000	15	7.86	8,665,472	8.559	1,012,440
8	Wheel chair	2005	2,311,000	5	7.86	4,317,387	3.993	1,081,239
9	Set perawatan	2002	11,400,000	15	7.86	30,119,024	8.559	3,518,989
10	Doppler	2008	2,107,500	5	7.86	421,500	3.993	421,500
11	Lampu Tindakan	2008	6,260,000	10	7.86	626,000	6.710	626,000
Total						115,931,986		16,910,101

Appendix C

Appendix C1 : Allocated from space related cost to center to all cost centers

Code	Cost Center	Total Direct Cost (TDC)	Unit of Measure men (sqm2)	Cost allocate	Total
	Space related Cost Center	1,697,320,818			
A1	Administration	1,730,459,070	920	373,314,303	2,103,773,373
A2	Medical Administration supporrt	866,093,391	137	55,591,369	921,684,760
A3	General supply	457,590,058	173	70,199,320	527,789,378
A4	Cleaning service	277,686,571	45	889,366	278,575,937
A5	Laundry	154,080,564	45	889,366	154,969,930
A6	Kitchen	942,505,557	420	3,733,143	946,238,700
B1	Pharmacy	325,396,855	60	11,084,738	336,481,593
B2	Laboratory	770,683,057	150	54,178,504	824,861,561
B3	X-ray	1,041,704,549	420	151,699,812	1,193,404,361
B4	Operating Theater	1,518,255,276	150	43,039,088	1,561,294,365
B5	Emergency Unit	2,268,164,167	510	179,220,469	2,447,384,636
C1	**Inpatient**				
	1. Maternity	1,133,861,941	640	198,756,207	1,332,618,148
	2. Neurology	571,749,945	420	64,513,176	636,263,122
	3. Interna	1,212,149,150	420	64,513,176	1,276,662,326
	4. Pediatric	1,718,778,505	510	78,337,428	1,797,115,933
	5. VIP	842,522,740	350	51,651,879	894,174,619
	6. Surgery	1,067,611,380	420	61,982,255	1,129,593,635
C2	**Outpatient**				
	1. Surgery	366,756,952	640	26,781,243	393,538,196
	2. Eye	243,153,508	420	20,288,821	263,442,329
	3. Maternity	165,066,712	420	20,288,821	185,355,532
	4. Interna/General	367,463,049	510	30,839,008	398,302,057
	5. Paediatrict	181,813,426	350	18,259,939	200,073,365
	6. Dental	273,164,284	420	31,244,784	304,409,068
	7. Ear, Nose, Throuth	266,063,971	45	18,259,939	284,323,910
	8. Nutrition	240,082,523	77	31,244,784	271,327,307
	9. Fisiotheraphy.	152,580,980	90	36,519,877	189,100,857
	Total	20,852,759,000		1,697,320,818	20,852,759,000

Appendix C 2 :Allocated from Administration office to other Cost Centers

Code	**Cost Center**	Total Direct Cost (TDC)	Unit of Measure. # of personnel	Cost allocate	Total
A2	Administration	2,103,773,373			
A3	Medical Administration support	921,684,760	28	162,722,802	1,084,407,562
A4	General supply	527,789,378	17	98,795,987	626,585,365
A5	Cleaning service	278,575,937	33	191,780,446	470,356,383
A6	Laundry	154,969,930	8	46,492,229	201,462,160
B1	Kitchen	946,238,700	13	75,549,873	1,021,788,573
B2	Pharmacy	336,481,593	13	75,549,873	412,031,466
B3	Laboratory	824,861,561	21	122,042,102	946,903,663
B4	X-ray	1,193,404,361	9	52,303,758	1,245,708,119
B5	Operating Theater	1,561,294,365	18	104,607,516	1,665,901,880
C1	Emergency Unit	2,447,384,636	39	226,649,618	2,674,034,254
	Inpatient				
	1. Maternity	1,332,618,148	21	122,042,102	1,454,660,250
	2. Neurology	636,263,122	13	75,549,873	711,812,994
	3. Interna	1,276,662,326	12	69,738,344	1,346,400,670
	4. Pediatric	1,797,115,933	33	191,780,446	1,988,896,379
	5. VIP	894,174,619	21	122,042,102	1,016,216,721
C2	6. Surgery	1,129,593,635	21	122,042,102	1,251,635,736
	Outpatient				
	1. Surgery	393,538,196	5	29,057,643	422,595,839
	2. Eye	263,442,329	4	23,246,115	286,688,444
	3. Maternity	185,355,532	3	17,434,586	202,790,118
	4. Interna/General	398,302,057	6	34,869,172	433,171,229
	5. Pediatric	200,073,365	3	17,434,586	217,507,951
	6. Dental	304,409,068	6	34,869,172	339,278,240
	7. Ear, Nose, Throat	284,323,910	3	17,434,586	301,758,496
	8. Nutrition	271,327,307	8	46,492,229	317,819,536
	9. Physiotherapy.	189,100,857	4	23,246,115	212,346,972
	Total	20,852,759,000	362	2,103,773,373	18,118,802,175

Appendix C3 :Allocated from Medical administration Support to other Cost Centers

Code		Total Direct Cost (TDC)	Unit of Measure. # of personnel in PS	Cost Allocate	Total
A2	Medical Administration support	1,084,407,562			
A3	General supply	626,585,365			626,585,365
A4	Cleaning service	470,356,383			470,356,383
A5	Laundry	201,462,160			201,462,160
A6	Kitchen	1,021,788,573			1,021,788,573
B1	Pharmacy	412,031,466			412,031,466
B2	Laboratory	946,903,663			946,903,663
B3	X-ray	1,245,708,119			1,245,708,119
B4	Operating Theater	1,665,901,880			1,665,901,880
B5	Emergency Unit	2,674,034,254			2,674,034,254
C1	**Inpatient**				
	1. Maternity	1,454,660,250	21	139,708,950	1,594,369,199
	2. Neurology	711,812,994	13	86,486,493	798,299,487
	3. Interna	1,346,400,670	12	79,833,686	1,426,234,356
	4. Pediatric	1,988,896,379	33	219,542,635	2,208,439,014
	5. VIP	1,016,216,721	21	139,708,950	1,155,925,670
	6. Surgery	1,251,635,736	21	139,708,950	1,391,344,686
C2	**Outpatient**				
	1. Surgery	422,595,839	5	33,264,036	455,859,875
	2. Eye	286,688,444	4	26,611,229	313,299,672
	3. Maternity	202,790,118	3	19,958,421	222,748,540
	4. Interna/General	433,171,229	6	39,916,843	473,088,071
	5. Paediatrict	217,507,951	3	19,958,421	237,466,372
	6. Dental	339,278,240	6	39,916,843	379,195,083
	7. Ear, Nose, Throuth	301,758,496	3	19,958,421	321,716,917
	8. Nutrition	317,819,536	8	53,222,457	371,041,993
	9. Fisiotheraphy.	212,346,972	4	26,611,229	238,958,201
	Total	20,852,759,000	163	1,084,407,562	20,852,759,000

Appendix C 4 : Allocated from general supply to other Cost Centers

Code		Total Direct Cost (TDC)	Unit of Measure, Prop of relative weight of material supply (%)	Cost Allocate	Total
A3	General supply	626,585,365			
A4	Cleaning service	470,356,383		0,0	470,356,383
A5	Laundry	201,462,160	4.4	27,646,199	229,108,358
A6	Kitchen	1,021,788,573	0.9	5614289,6	1,027,402,862
B1	Pharmacy	412,031,466	0.4	2,332,926	414,364,392
B2	Laboratory	946,903,663	4.3	26,714,415	973,618,077
B3	X-ray	1,245,708,119	16.673	104,470,976	1,350,179,095
B4	Operating Theater	1,665,901,880	24.5	153,251,626	1,819,153,506
B5	Emergency Unit	2,674,034,254	5.8	36,347,107	2,710,381,361
C1	**Inpatient**				
	1, Maternity	1,594,369,199	2.9	18,434,894	1,612,804,094
	2, Neurology	798,299,487	1.6	10,088,418	808,387,905
	3, Interna	1,426,234,356	2.8	17,515,381	1,443,749,737
	4, Pediatric	2,208,439,014	13.9	87,016,244	2,295,455,258
	5, VIP	1,155,925,670	4.7	29,296,117	1,185,221,787
	6, Surgery	1,391,344,686	2.2	13,706,528	1,405,051,214
C2	**Outpatient**				
	1, Surgery	455,859,875	1.9	12,033,828	467,893,703
	2, Eye	313,299,672	1.6	10,093,714	323,393,386
	3, Maternity	222,748,540	0.5	2,891,028	225,639,568
	4, Interna/General	473,088,071	0.3	1,635,581	474,723,652
	5, Pediatric	237,466,372	0.7	4,411,575	241,877,948
	6, Dental	379,195,083	0.8	5,179,585	384,374,668
	7, Ear, Nose, Throat	321,716,917	3.1	19,575,071	341,291,988
	8, Nutrition	371,041,993	0.0	234,004	371,275,998
	9, Physiotherapy,	238,958,201	6.1	38,095,859	277,054,059
	Total	20,852,759,000	100.0	626,585,365	20,852,759,000

Appendix C 5 : Allocated from cleaning service to other Cost Centers

Code		Total Direct Cost (TDC)	Unit of Measure, prop of areas (%)	Cost Allocate	Total
A4	Cleaning service	470,356,383			
A5	Laundry	229,108,358	45	4,157,540	233,265,898
A6	Kitchen	1,027,402,862	420	38,803,709	1,066,206,571
B1	Pharmacy	414,364,392	60	5,543,387	419,907,779
B2	Laboratory	973,618,077	150	13,858,467,4	987,476,545
B3	X-ray	1,350,179,095	420	38,803,709	1,388,982,804
B4	Operating Theater	1,819,153,506	150	13,858,467	1,833,011,974
B5	Emergency Unit	2,710,381,361	510	47,118,789	2,757,500,150
C1	**Inpatient**				
	1, Maternity	1,612,804,094	640	59,129,461	1,671,933,555
	2, Neurology	808,387,905	420	38,803,709	847,191,614
	3, Interna	1,443,749,737	420	38,803,709	1,482,553,445
	4, Pediatric	2,295,455,258	510	47,118,789	2,342,574,047
	5, VIP	1,185,221,787	350	32,336,424	1,217,558,211
	6, Surgery	1,405,051,214	420	38,803,709	1,443,854,923
C2	**Outpatient**				
	1, Surgery	467,893,703	66	6,097,726	473,991,429
	2, Eye	323,393,386	50	4,619,489	328,012,875
	3, Maternity	225,639,568	50	4,619,489	230,259,057
	4, Interna/General	474,723,652	76	7,021,623	481,745,276
	5, Pediatric	241,877,948	45	4,157,540	246,035,488
	6, Dental	384,374,668	77	7,114,013	391,488,681
	7, Ear, Nose, Throat	341,291,988	45	4,157,540	345,449,529
	8, Nutrition	371,275,998	77	7,114,013	378,390,011
	9, Physiotherapy,	277,054,059	90	8,315,080	285,369,140
	Total	20,852,759,000	5091,0	470,356,383	20,852,759,000

Appendix C6 : Allocated from laundry to other Cost Centers

Code	Cost Centers	Total Direct Cost (TDC)	Unit of Measure, # inpatient day	Cost Allocate	Total
A5	Laundry	233,265,898			
A6	Kitchen	1,066,206,571		0,0	1,066,206,571
B1	Pharmacy	419,907,779		0,0	419,907,779
B2	Laboratory	987,476,545		0,0	987,476,545
B3	X-ray	1,388,982,804		0,0	1,388,982,804
B4	Operating Theater	1,833,011,974		0,0	1,833,011,974
B5	Emergency Unit	2,757,500,150		0,0	2,757,500,150
C1	**Inpatient**				
	1, Maternity	1,671,933,555	23	53,528,157	1,725,461,712
	2, Neurology	847,191,614	5	12,588,495	859,780,109
	3, Interna	1,482,553,445	18	42,598,891	1,525,152,336
	4, Pediatric	2,342,574,047	30	70,264,724	2,412,838,771
	5, VIP	1,217,558,211	10	24,347,376	1,241,905,587
	6, Surgery	1,443,854,923	13	29,938,255	1,473,793,178
C2	**Outpatient**				
	1, Surgery	473,991,429		0,0	473,991,429
	2, Eye	328,012,875		0,0	328,012,875
	3, Maternity	230,259,057		0,0	230,259,057
	4, Interna/General	481,745,276		0,0	481,745,276
	5, Pediatric	246,035,488		0,0	246,035,488
	6, Dental	391,488,681		0,0	391,488,681
	7, Ear, Nose, Throat	345,449,529		0,0	345,449,529
	8, Nutrition	378,390,011		0,0	378,390,011
	9, Physiotherapy,	285,369,140		0,0	285,369,140
	Total	20,852,759,000		233,265,898	20,852,759,000

Appendix C 7: Allocated from kitchen to other Cost Centers

Code	Cost Centers	Total Direct Cost (TDC)	Unit of Measure, # inpatient day (%)	Cost Allocate	Total
A6	Kitchen	1,066,206,571			
B1	Pharmacy	419,907,779			419,907,779
B2	Laboratory	987,476,545			987,476,545
B3	X-ray	1,388,982,804			1,388,982,804
B4	Operating Theater	1,833,011,974			1,833,011,974
B5	Emergency Unit	2,757,500,150			2,757,500,150
C1	**Inpatient**				
	1, Maternity	1,725,461,712	23	244,665,309	1,970,127,021
	2, Neurology	859,780,109	5	57,539,213	917,319,322
	3, Interna	1,525,152,336	18	194,710,060	1,719,862,396
	4, Pediatric	2,412,838,771	30	321,164,435	2,734,003,206
	5, VIP	1,241,905,587	10	111,286,444	1,353,192,032
	6, Surgery	1,473,793,178	13	136,841,109	1,610,634,288
C2	**Outpatient**				
	1, Surgery	473,991,429			473,991,429
	2, Eye	328,012,875			328,012,875
	3, Maternity	230,259,057			230,259,057
	4, Interna/General	481,745,276			481,745,276
	5, Pediatric	246,035,488			246,035,488
	6, Dental	391,488,681			391,488,681
	7, Ear, Nose, Throat	345,449,529			345,449,529
	8, Nutrition	378,390,011			378,390,011
	9, Physiotherapy,	285,369,140			285,369,140
	Total	20,852,759,000	100	1,066,206,571	20,852,759,000

Appendix C 8: Allocated from Pharmacy to other Cost Centers

Code	Cost Center	Total Direct Cost (TDC)	Unit of Measure, prop of drug charge	Cost Allocate	Total
B1	Pharmacy	419,907,779			
B2	Laboratory	987,476,545			987,476,545
B3	X-ray	1,388,982,804			1,388,982,804
B4	Operating Theater	1,833,011,974	8.00	33,592,622	1,866,604,596
B5	Emergency Unit	2,757,500,150	13.60	57,107,458	2,814,607,608
C1	**Inpatient**				
	1, Maternity	1,970,127,021	4.80	20,155,573	1,990,282,594
	2, Neurology	917,319,322	5.60	23,514,836	940,834,158
	3, Interna	1,719,862,396	17.60	73,903,769	1,793,766,165
	4, Pediatric	2,734,003,206	10.40	43,670,409	2,777,673,614
	5, VIP	1,353,192,032	4.00	16,796,311	1,369,988,343
	6, Surgery	1,610,634,288	16.00	67,185,245	1,677,819,532
C2	**Outpatient**				
	1, Surgery	473,991,429	4.00	16,796,311	490,787,740
	2, Eye	328,012,875	1.20	5,038,893	333,051,768
	3, Maternity	230,259,057	1.40	5,878,709	236,137,766
	4, Interna/General	481,745,276	4.80	20,155,573	501,900,849
	5, Pediatric	246,035,488	2.60	10,917,602	256,953,090
	6, Dental	391,488,681	3.00	12,597,233	404,085,915
	7, Ear, Nose, Throat	345,449,529	2.00	8,398,155	353,847,684
	8, Nutrition	378,390,011	1.00	4,199,078	382,589,089
	9, Physiotherapy,	285,369,140			285,369,140
	Total	20,852,759,000	100	419,907,779	20,852,759,000

Appendix C 9 : Allocated from Laboratory to other Cost Centers

Code	Cost Centers	Total Direct Cost (TDC)	Unit of Measure, prop of charge to PS	Cost Allocate	Total
B2	Laboratory	987,476,545			
B3	Radiology	1,388,982,804			1,388,982,804
B4	Operating Theater	1,866,604,596			1,866,604,596
B5	Emergency Unit	2,814,607,608			2,814,607,608
C1	**Inpatient**				
	1, Maternity	1,990,282,594	15	149,686,408	2,139,969,002
	2, Neurology	940,834,158	3	28,370,846	969,205,004
	3, Interna	1,793,766,165	15	148,034,373	1,941,800,538
	4, Pediatric	2,777,673,614	9	90,688,704	2,868,362,319
	5, VIP	1,369,988,343	5	51,233,312	1,421,221,655
	6, Surgery	1,677,819,532	9	90,334,980	1,768,154,512
C2	**Outpatient**				
	1, Surgery	490,787,740	4	40,049,522	530,837,262
	2, Eye	333,051,768	1	13,806,170	346,857,938
	3, Maternity	236,137,766	7	68,495,628	304,633,394
	4, Interna/General	501,900,849	30	292,026,180	793,927,029
	5, Pediatric	256,953,090	1	14,376,581	271,329,671
	6, Dental	404,085,915		0,0	404,085,915
	7, Ear, Nose, Throat	353,847,684		373,841	354,221,525
	8, Nutrition	382,589,089		0,0	382,589,089
	9, Physiotherapy,	285,369,140		0,0	285,369,140
	Total	20,852,759,000	100	987,476,545	20,852,759,000

Appendix C 10 : Allocated from X-ray to other Cost Centers

Code	Cost Centers	Total Direct Cost (TDC)	Unit of Measure, prop of charge to PS (%)	Cost Allocate	Total
	X-ray	1,388,982,804			
B4	Operating Theater	1,866,604,596		0,0	1,866,604,596
B5	Emergency Unit	2,814,607,608		0,0	2,814,607,608
C1	**Inpatient**				
	1, Maternity	2,139,969,002	2	27,779,656	2,167,748,658
	2, Neurology	969,205,004	5	69,449,140	1,038,654,145
	3, Interna	1,941,800,538	33	458,364,325	2,400,164,863
	4, Pediatric	2,868,362,319	11	152,788,108	3,021,150,427
	5, VIP	1,421,221,655	10	138,898,280	1,560,119,935
	6, Surgery	1,768,154,512	27	375,025,357	2,143,179,869
C2	**Outpatient**				
	1, Surgery	530,837,262	5	69,449,140	600,286,402
	2, Eye	346,857,938			346,857,938
	3, Maternity	304,633,394			304,633,394
	4, Interna/General	793,927,029	5	69,449,140	863,376,170
	5, Pediatric	271,329,671	2	27,779,656	299,109,327
	6, Dental	404,085,915			404,085,915
	7, Ear, Nose, Throat	354,221,525			354,221,525
	8, Nutrition	382,589,089			382,589,089
	9, Physiotherapy,	285,369,140			285,369,140
	Total	20,852,759,000	100	1,388,982,804	20,852,759,000

Appendix C 11 : Allocated from operating theater to other Cost Centers

Code	Cost Centers	Total Direct Cost (TDC)	Unit of Measure, prop of charge to PS (%)	Cost Allocate	Total
B4	Operating Theater	1,866,604,596			
B5	Emergency Unit	2,814,607,608			2,814,607,608
C1	**Inpatient**				
	1, Maternity	2,167,748,658	65	1,213,292,987	3,381,041,645
	2, Neurology	1,038,654,145			1,038,654,145
	3, Interna	2,400,164,863			2,400,164,863
	4, Pediatric	3,021,150,427			3,021,150,427
	5, VIP	1,560,119,935			1,560,119,935
	6, Surgery	2,143,179,869	35	653,311,609	2,796,491,478
	Outpatient				
C2	1, Surgery	600,286,402			600,286,402
	2, Eye	346,857,938			346,857,938
	3, Maternity	304,633,394			304,633,394
	4, Interna/General	863,376,170			863,376,170
	5, Pediatric	299,109,327			299,109,327
	6, Dental	404,085,915			404,085,915
	7, Ear, Nose, Throat	354,221,525			354,221,525
	8, Nutrition	382,589,089			382,589,089
	9, Physiotherapy,	285,369,140			285,369,140
	Total	20,852,759,000	100	1,866,604,596	20,852,759,000

Appendix C 12 : Allocated from emergency unit to other Cost Centers

Code		Total Direct Cost (TDC)	Unit of Measure, # of patient in cc	Cost Allocate	Total
B5	Emergency Unit	2,814,607,608			
C1	**Inpatient**				
	1, Maternity	3,381,041,645	2,968	103,172,268	3,484,216,882
	2, Neurology	1,038,654,145	698	24,263,559	1,062,918,402
	3, Interna	2,400,164,863	2,362	82,106,771	2,482,273,997
	4, Pediatric	3,021,150,427	5,020	174,502,960	3,195,658,408
	5, VIP	1,560,119,935	1,257	43,695,263	1,603,816,455
	6, Surgery	2,796,491,478	1,660	57,704,166	2,854,197,304
C2	**Outpatient**				
	1, Surgery	600,286,402	9,211	320,188,599	920,484,212
	2, Eye	346,857,938	14,790	514,123,264	860,995,992
	3, Maternity	304,633,394	3,196	111,097,901	415,734,491
	4, Interna/General	863,376,170	22,784	792,007,061	1,655,406,015
	5, Pediatric	299,109,327	3,530	122,708,257	421,821,114
	6, Dental	404,085,915	1,681	58,434,159	462,521,754
	7, Ear, Nose, Throat	354,221,525	3,629	126,149,650	480,374,803
	8, Nutrition	382,589,089	1,218	42,339,563	424,929,870
	9, Physiotherapy,	285,369,140	6,965	242,114,167	527,490,272
	Total	20,852,759,000	80,969	2,814,607,608	20,852,839,969

VITAE

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