

COST ANALYSIS OF HEART TRANSPLANTATION
AT CHULALONGKORN HOSPITAL
IN THAILAND

Ms. Survimon Panananunt

A Thesis Submitted in Partial Fulfillment of the Requirement

For the Degree of Master of Science

Department of Economics

Graduate School

Chulalongkorn University

1995

ISBN 974-632-153-6

Thesis title : COST ANALYSIS OF HEART TRANSPLANTATION AT CHULALONGKORN HOSPITAL IN THAILAND

Graduate : Suvimon Pavananunt

Department : Economics.

Advisor : Asst. Prof. Dr. Sothitorn Mallikamas

Co-advisor : Professor Dr. Pirom Kamolratanakul

Accepted by the graduate school, Chulalongkorn University in partial fulfillment of the requirements for a degree of Master of Science in Health Economics.

Santi Thoongsuwan

..... Dean of
(Assoc. Prof. Dr. Santi Thoongsuwan) Graduate School

Thesis Committee:

Siripen

..... Chairman
(Asst. Prof. Dr. Siripen Supakankunti)

Sothitorn Mallikamas

..... Advisor
(Asst. Prof. Dr. Sothitorn Mallikamas)

P. Kamolratanakul

..... Co-advisor
(Prof. Dr. Pirom Kamolratanakul)

Somkid Keawsonthi

..... Member
(Prof. Somkid Keawsonthi)

C760771 . MAJOR Health Economics

KEY WORD: : COST ANALYSIS / HEART TRANSPLANTATION / CHULALONGKORN HOSPITAL

SUVIMON PAVANANUNT : COST ANALYSIS OF HEART TRANSPLANTATION AT CHULALONGKORN HOSPITAL, THAILAND. THESIS ADVISOR : SOTHITORN MALLIKAMAS, Ph.D., 71 pp. ISBN 974-632-153-6

The objective of this study are to examine the cost of heart transplantation from the day of surgery to the day of discharge and to establish the methods of costing for heart transplantation procedure.

In the study, costing principles have been reviewed; cost models were developed for the retrospective determination of direct cost for heart transplantation through the individual consumable of cost categories and the apportionment of resource area costs. The costs were calculated per patient related to individual treatment of patients with respect to volume and unit costs. Using the theoretical framework, an empirical analysis of the cost data of 12 patients was undertaken from the relevant departments in Chulalongkorn Hospital. The total provider cost for the operation was calculated. In this study, the total provider cost of heart transplantation from the day of operation to the day of discharge is averaged to be Bt288,262 in 1994's price. The costs are classified by input, of which 91% of the total cost is recurrent cost and only 9% is capital cost. Among the recurrent cost components, the personnel cost is 46%, which is the highest category. The second comes the drug cost which is 20% and the third is supply cost, which accounts for 16% of the recurrent cost. The important implication from this study is that the hospital incur most of the cost for heart transplantation, while cost recovery is a minor part of the total.

ภาควิชา...Economics.....

ลายมือชื่อนิสิต *Suvimon Pavananunt*

สาขาวิชา...Health...Economics.....

ลายมือชื่ออาจารย์ที่ปรึกษา *Sothitorn Mallikamas*

ปีการศึกษา...1994.....

ลายมือชื่อคณาจารย์ที่ปรึกษาร่วม *P. Kimlathorn*

ACKNOWLEDGEMENT

I would like to express my gratitude to my thesis advisor, Dr Sorthitorn Mallikamas, my thesis co-advisor, Prof. Dr Pirom Kamolratanakul, and the thesis committee members, Prof. Somkid Kaewsonthi and Dr. Siripen Supakankunti for their critical reviewed of my thesis and suggestion for improvement.

Completion of my thesis would not have been achieved but for the kind co-operation of the personnels working in Chulalongkorn Hospital in the Department of Pharmacy, Department of Statistic, Surgical ward, Intensive Care Unit, and Operating Room. I am gratefully acknowledge their help.

Special thanks are due to Miss Watana Numpet for sharing her valuable time in helping retrieval of records from Intensive Care Unit. The suggestions and views of Mrs. Penchun Sanprasarn are also gratefully acknowledged.

Lastly, I must acknowledge my beloved mother, my sisters and all my family members for their constant support both morally and materially.

Suvimon Pavananunt

May, 1995

CONTENTS

	Page
Abstracts	iii
Acknowledgement	iv
Contents	v
List of Tables	viii
List of Figures	ix
Chapters	
1. Introduction	1
Background	1
Cardiac transplantation at Chulalongkorn Hospital	2
1. Recipient Selection Criteria	3
2. Donor Population	3
3. Donor Selection Criteria	3
4. Heart Transplantation Process	4
5. Post Operative Management	4
Rationale	8
Benefit of the study	8
Research questions	9
Research objectives	9
2. Conceptual framework and literature review	10
Definition of Costing	10
Cost Classification	11
Costing Concerns	14
Theoretical Basis for Estimating Cost	16
Costing Procedure	16
Measuring and Valuing Capital Costs	17
Measuring And Valuing Recurrent Costs	18
Donated Inputs	19
Conceptual Framework	19
Literature review	22
1. Heart transplantation procedure	22
2. Recipient selection	22
3. Donor procurement	23
4. Patient management	23
5. Management of rejection	23

6. Cost of heart transplantation	23
3. Research method	26
Scope of study	26
Key words definition	26
Research design	27
Population	27
Data compilation	27
Costing Assumptions	27
Costing methods	28
1. Identification of activities for heart transplantation	28
2. Identification of input resources	29
3. Determination of measure input	32
4. Estimation of unit cost of items	33
5. Cost allocation criteria	33
6. Valuation every input into money term	35
7. Calculation of cost incurred	35
Cost models for heart transplantation	35
1. Model for costing heart transplantation program	36
2. Model for calculate total provider cost	37
3. Model for calculating personnel cost	38
4. Model for calculating equipment cost	38
5. Model for calculating medication and supplies cost	39
6. Model for calculating the laboratory and diagnostic radiology cost	39
7. Model for calculating building cost	39
Data analysis	40
4. Results and analysis	41
General characteristics of the subjects	41
Average costs	42
1. The comparability of the costs	42
2. The average cost	42
3. Cost by components	43
4. Cost by resource area service of activitues	46
Factors relating to cost	46
Effect of reduction in length of stay in ICU and ward on total cost.....	47
5. Discussion, Implication, and Conclusion	50
Discussion	50
Policy implication	53
Limitations of the study	54

Recommendation of future studies	54
Conclusions	55
Reference	57
Appendix	60
Biography	61

LIST OF TABLES

Table	Page
1.1 Characteristics of 30 patients transplanted at Chulalongkorn Hospital.....	2
1.2 Typical post-operative orders for cardiac transplantation patients.....	6
2.1 The difference between financial and economic cost.....	10
2.2 Calculation of the annual value of capital items	18
2.3 Calculation of recurrent items	19
3.1 Identification of capital costs for heart transplantation	30
3.2 Identification of recurrent costs for heart transplantation	31
3.3 Measure unit of the cost items	32
4.1 Characteristics of the 12 patients in the study	41
4.2 Average costs and length of stay of the studied patients.....	43
4.3 The average cost by type of inputs.....	43
4.4 Capital costs by components	44
4.5 Recurrent costs by components	45
4.6 Cost by resource-area service of activities for heart transplantation	46
4.7 Result of multiple regression of cost with other related factors	47
4.8 Effect of reducing the length of stay in ward on total cost	48
4.9 Effect of reducing the length of stay in ICU on total cost	49

5.1	Type of payment for medical bill of the 30 patients transplanted in 1987-1994.....	51
5.2	Type of payment for medical bill of the 12 studied patients.....	52
5.3	Estimation of costs of Heart Transplantation for the 12 studied patients that incurred by the Hospital	52

FIGURES

Figure	Page
1.1 Heart transplant program in Chulalongkorn Hospital	7
2.1 Classification of costs	14
2.2 Costing framework for heart transplantation procedure.....	21
4.1 Percentage of capital and recurrent cost	44
4.2 Recurrent cost by components	46
4.3 Effect of reduction of LOS in ward on total cost	48
4.4 Effect of reduction of LOS in ICU on total cost	49