

CHAPTER 2

REVIEW OF LITERATURE

This study divided literature review into two parts:

1. Unit cost analysis
2. Diagnosis Related Groups

2.1 Unit Cost Analysis

There are four studies of the unit cost analysis into four hospitals in Thailand. The details different in unit costs in various departments.

Tanamun and others (1990) studied the unit cost of the new outpatient of Chulalongkorn hospital, Bangkok at the tertiary care level hospital from providers' perspective. All sections of OPD were classified into three cost centers categorized as follows:

1. Non – revenue producing cost center.
2. Revenue producing cost center.
3. Patient services.

The total costs were calculated from capital cost, material cost and labour cost in each cost center by the simultaneous equation method using appropriate allocation criteria.

The study found that the unit cost of OPD was 241.73 baht per visit. The unit cost of general medicine clinic, surgical clinic were 253 baht and 255 baht respectively. The unit cost/visit of obstetric and gynecological clinic were 247 baht and 228 baht respectively. The unit cost of pediatric, ophthalmic and dental clinic were 333 baht, 173 baht and 263 bahts per visit respectively. The unit cost of orthopedic, ENT, psychiatric and forensic medicine clinic were 223

baht, 202 baht, 398 baht and 96 baht per visit respectively. And the unit cost of parasitological and preventive clinic were 409 baht and 146 baht per visit respectively.

Ngmsiriudom and others (1994) studied the unit cost and cost recovery of maternal and child hospital in Chiang Mai, Chiang Mai at the secondary care level hospital.

In this study all units in the hospital and administrative sections of the health promotion center were classified into three categories of cost centers as follows:

1. Non - revenue producing cost center.
2. Revenue - producing cost center.
3. Patient services.

The total cost in each cost center consisted of labour cost, material cost and capital depreciation cost. This study used the simultaneous equation method using appropriate cost allocation criteria.

It was found that the total direct cost of the hospital itself was 36,915,876.90 bahts. The ratio of labour, material and depreciation cost equaled 63: 27:10. The unit cost of outpatient of pediatrics, adult patient and gynecology were 147.05 baht, 244.31 baht and 127.49 baht per visit respectively. The unit cost of family planning and dental clinics were 215.45 baht and 140.76 baht per visit respectively.

The inpatient unit cost of pediatrics and obstetric - gynecology were 1,991.81 bahts and 5,169.82 bahts respectively. The cost per hospital day of pediatrics and obstetric – gynecology were 486.24 bahts and 1,419.51 bahts respectively.

Sridaeng (1997) studied cost and unit cost analysis of Thoen hospital, Lamphang at the secondary care level hospital.

All units in the hospital and administrative sections of the health promotion center were classified into three categories of cost centers as follows:

1. Non - revenue producing cost center.
2. Revenue - producing cost center.
3. Patient services.

This study used the simultaneous equation method. It was found that the proportion of labour costs, material costs and capital costs were 54:30:16 respectively. The unit cost per outpatient visit was 201 baht and the unit cost per inpatient case was 2,939 baht that based on average stay 3.11 days that the cost was 945 baht per hospital day. The unit cost per dental visit was 380 baht.

Thantaristri (1998) studied unit cost analysis of Bangplee hospital, Samutprakan this hospital is a secondary care level hospital . All units in the hospital were classified into three cost centers of categories as follows:

1. Non - revenue producing cost center.
2. Revenue - producing cost center.
3. Patient services.

The total cost in each cost center consisted of labour cost, material cost and capital depreciation cost. This study used the simultaneous equation method using appropriate cost allocation criteria. It was found that the total costs of its hospital was 37,951,398 baht. Ratio of labour cost, material cost and capital cost equaled 7: 3: 1 respectively. This study found that the average cost for OPD was 147 baht per visit and inpatient was 1,173 baht per day respectively.

This study is similar to those studies to analyze the unit cost that classifies the cost centers into three categories: non-revenue producing cost

center, revenue producing cost center and patient services. This study also will determine the total cost components for material, labor and capital cost. But the cost allocation method is different from those studies as this study uses the step down allocation method by using appropriate cost allocation bases. In addition to finding the unit cost, this study will also estimate DRGs cost for 5 common diseases. In the next page shows the summary the unit cost analysis studies in the table 2.1.



Table 2.1 : Summary the unit cost analysis studies

Year	Researcher	Hospital	Location, type of hospital	Allocation method	Unit Cost/OPD visit	Unit Cost/ IPD	LC : MC : CC
1990	Tanamun and others	Chulalongkorn	BKK, Tertiary care level	Simultaneous eq.	OPD = 241.73	-	27 : 55 : 18
1994	Ngmsiriudom and others	Maternal and Child	Chiang Mai, Secondary care level	Simultaneous eq.	OPD = 152.77 OPD Ped = 147 OPD Ob-Gyn = 128	IPD = 3,570 IPD Ped = 1,992 IPD Ob-Gyn = 5,170	63 : 27 : 10
1997	Sridaeng	Thoen	Lampang, Secondary care level	Simultaneous eq.	OPD = 201 OPD dental = 380	IPD = 2,939	54 : 30 : 16
1998	Thantarisiri	Bangplee	Samutprakan, Secondary care level	Simultaneous eq.	OPD = 147	IPD = 1,173	63 : 28 : 9

2.2 Diagnosis Related Groups

An increase in the hospital expenditure resulted from expensive new medical equipment and an aging population. In the USA, such concerns led to introduce a fixed price, prospective payment system based on the classification of patients into Diagnosis Related Groups (DRGs).

The original DRGs were developed in the USA for assurance programs. The same DRG consumes similar amounts of resources, DRGs are used to standardize for differences in the case mix for hospitals and compare the hospital efficiency. In the mid 1980s, the US federal government introduced the fixed price Prospective Payment System (PPS) for reimbursed a standard rate per DRG for treating Medicare patients who are elderly and disabled. It was the first time that hospital payment was based on a case mix classification system. Since then , there have been case mix classifications developed in the United Kingdom, Belgium, Spain, Portugal, Norway, Sweden, Australia, France and Australia.

Essentially the PPS involves a plan of paying hospitals fixed sums for each patient treated with the particular amount dependent upon the patient's DRG. Assignment of DRG is based on the patient's primary and secondary diagnoses at the time of discharge and the surgical and medical procedures performed. A DRG weight is gotten by processing the patient's diagnoses and treatment from computer program. "The weight represents an estimate of the average cost of caring for all patients with the particular diagnostic and procedural characteristics in all hospitals as a ratio of the average cost of caring for all patients in the same hospitals. The Medicare payment which the

hospital receives equals the weight times the average patient cost ". (Cheah, 1999)

Patient Classification

The purpose of the DRGs is to relate a hospital's case mix to its resource consumption. It was necessary to determine the types of patients treated and resources are consumed. "The DRGs were developed as a patient classification scheme consisting of classes of patients who were similar clinically and in their consumption of hospital resources ".(Fetter,1991)

Basic Characteristics of the DRG Patient Classification Scheme

The DRG patient classification scheme to be practical it should include the following characteristics:

1. Patient characteristics

The patient information includes age, sex, principal diagnosis, secondary diagnoses, and the surgical procedures performed.

2. Number of DRGs

The number of DRGs should be limited to control numbers that is hundreds of patient classes rather than thousands.

3. Resource intensity

The resource intensity of the patients in each DRG have to be similar in order to set up a relationship between the hospital case mix and the resources it consumed.

4. Clinical coherence

Each DRG should contain patients who are similar from a clinical perspective. The clinical coherence requires that the patient characteristics

included each DRG relate to a common organ system. For example patients who are admitted for a dilatation or a tonsillectomy should be similar in terms of most measures of resource intensity, such as length of stay, preoperative stay, operating room time, and use of ancillary services. However different organ systems and different medical specialties are involved. Thus the requirement that the DRGs be clinically coherent precludes the possibility of these types of patients being in the same DRG.

A common organ system and a common clinical specialty are necessary but not sufficient conditions for a DRG to be clinically coherent. In addition all available patient characteristics that medically would be expected to affect resource intensity and should be included in the definition of the DRG. Furthermore, a DRG should be not based on patient characteristics that medically would not be expected to consistently affect resource intensity. For example, patients with appendicitis may or may not have peritonitis. Although these patients are the same an organ-system, etiology and medical-specialist perspective that the DRG definitions must form separate patient classes, since peritonitis would increase the resource intensity for appendicitis patients.

Prospective Payment System Monitoring DRG analysis

The table 2.2 shows the 25 most frequently occurring DRGs in fiscal year 1985 that are relative cost weights, average length of stay and fiscal year 1984 ranks. (Spiegle, 1986)

Table 2.2 : Payment system of DRGs

FY1985 Rank	FY1984 Rank	DRG No.	Description	RW cost weight	Average los
1	1	127	Heart failure and shock	1.0300	7.6
2	6	089	Simple pneumonia and pleurisy	1.0914	8.4
3	5	140	Angina pectoris	0.7470	4.9
4	2	182	Esophagitis, gastroenteritis and misc.digestive disorders	0.6121	5.5
5	4	014	Specialcerebrovascular disorders	1.3386	9.6
6	8	138	Cardiac arrhythmia & conduction	0.9200	5.5
7	10	296	Nutrition & Misc.metabolic disorders	0.0886	7.0
8	12	096	Bronchitis & asthma	0.7913	6.7
9	7	243	Medical back problems	0.7473	6.8
10	9	088	Chronic obstructive pulmonary disease	1.0340	7.5
11	11	015	Transient ischemic attacks	0.6604	5.1
12	14	209	Major joint procedures	2.2674	13.7
13	13	336	Transurethral prostatectomy	0.9974	6.8
14	15	174	Gastrointestinal hemorrhage	0.9185	6.5
15	3	039	Lens procedures	0.4958	2.0
16	10	122	Circulatory disorders with acute myocardial infarction	1.3509	8.9
17	17	320	Kidney & urinary tract infections	0.8039	7.3
18	19	468	Unrelated O.R. procedure	2.0818	12.9
19	20	210	Hip & femur procedures	2.0617	13.9
20	22	121	Circulatory disorders with acute myocardial infarction & cardiovascular complications	1.8454	11.2
21	18	294	Diabetes	0.8003	7.2
22	24	087	Pulmonary edema & respiratory failure	1.5368	9.1
23	23	148	Major small & large bowel procedures	2.5228	15.8
24	29	410	Chemotherapy	0.3490	3.1
25	21	082	Respiratory neoplasms	1.1282	8.6