

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Study Design

Study design of this research is cross-sectional descriptive study that calculate unit cost of each activity in Outpatient department services in Manorum district hospital during May – September in 2003 Fiscal Year.

3.2 Study Population

Health personal who actually work in OPD in Manorum district hospital during May – September in 2003 Fiscal Year including physicians, nurses, pharmacist, radiation technician, laboratory technician, pharmacy technician, all type of health employec.

3.3 Operational Definition

- **Labor cost:** The cost of wages and salaries including fringe benefits such as hospitalization fees, child benefit allowance, non-private practice incentives, etc.

- **Material cost:** The cost of resources that are purchased and used within May – September in 2003 Fiscal Year including drug cost, non-drug medical material cost, diagnostic substance cost, non-medical material cost and utilities cost.

- **Capital Cost:** The costs of OPD building and OPD medical equipment which have a life expectancy of one year or more (or follow The Comptroller General's Department Declaration)

- **Unit Cost:** Cost per unit of activity (or activity driver)

- **Activities:** The work performed in the organization, such as performing X-rays, administering medication, reviewing test results, and taking patient information.

- **Resources:** the financial and operational inputs required to perform activities. Resources coincide with traditional cost pools, such as salaries, medical supplies, and depreciation and portions of these various resources are consumed by each activity.

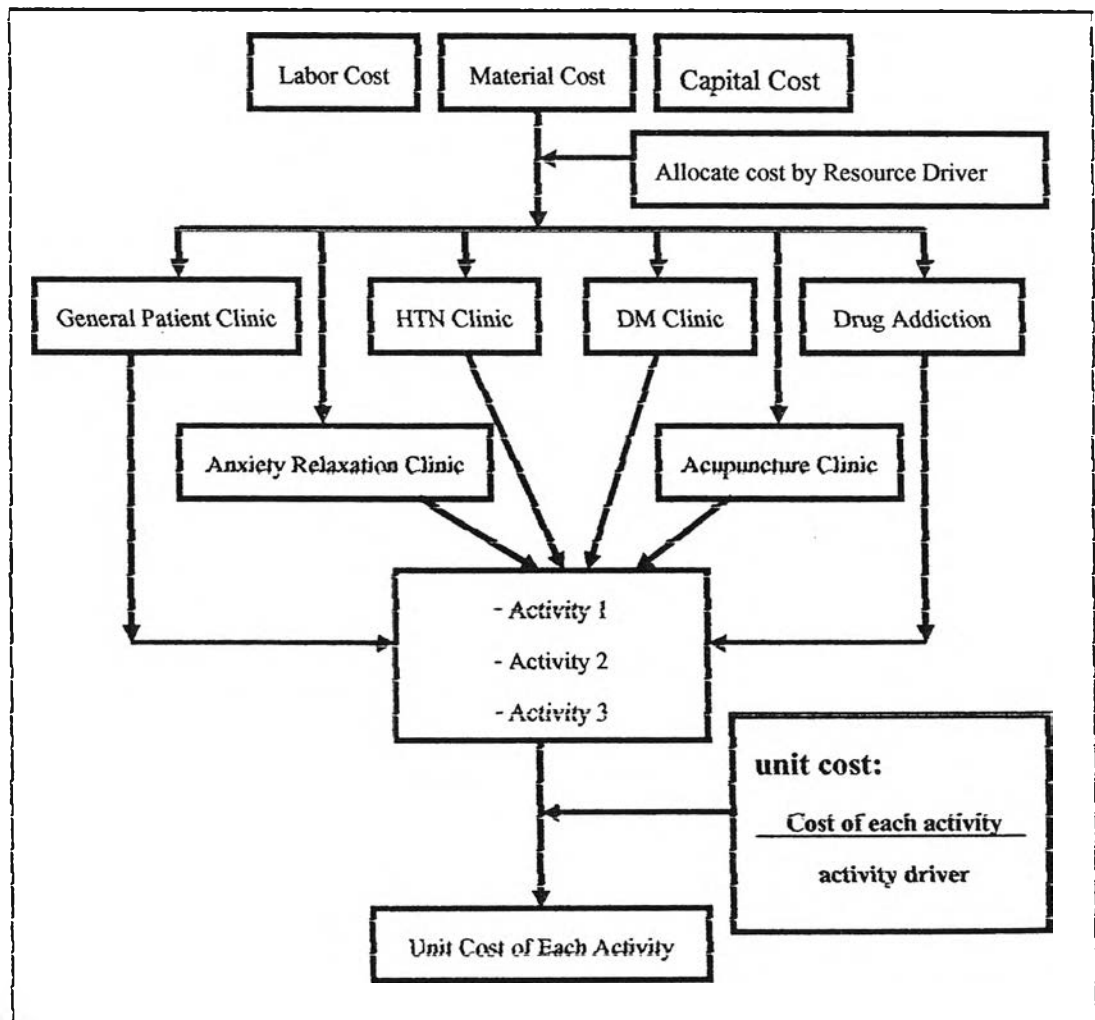
- **Resource drivers:** measures of the quantity of resources consumed in performing each activity.

- **Activity drivers:** measures of the frequency and intensity of the demand placed on an activity by a cost object i.e. number of service in Acupuncture clinic.

3.4 Conceptual Framework

This research describes the component of hospital cost and measures unit cost of each activity as shown in figure....

Figure 11: Conceptual Framework



3.5 Data Gathering

3.5.1 Data Gathering Form (see appendix 1)

Form 1: Data gathering form of activities in General Patient Clinic, Hypertension Patient Clinic, Diabetes Mellitus Patient Clinic, Drug Addiction Patient Clinic, Anxiety Relaxation Clinic and Acupuncture Patient Clinic including products or services of OPD and main activities.

Form 2: Data gathering form of detailed activity in each main activity in services of OPD

Form 3: Dictionary of activity including General Patient Clinic, Hypertension Patient Clinic, Diabetes Mellitus Patient Clinic, Drug Addiction Patient Clinic, Anxiety Relaxation Clinic and Acupuncture Clinic including services of OPD, main activities, detailed activities and activities description.

Form 4: Data gathering form of detailed activity or proportion of time that OPD' member use for each detailed activity in each main activity in OPD services

Form 5: Data gathering form of activity driver

Form 6: Data gathering form of labor cost including person code, salary, overtime allowance, out of workplace activity allowance, civil servant medical benefit scheme (hospital fee), child benefit allowance, position benefit allowance, non-private practice incentive, home rental benefit allowance, electric benefit allowance and other fringe benefits.

Form 7: Data gathering form of medical material cost including drug and medical supplies list, unit, used quantity, price/unit and total expenditure.

Form 8: Data gathering form of non medical material cost including non medical material list, unit, used quantity, price/unit and total expenditure.

Form 9: Data gathering form of utilities cost: water supply cost, electricity cost, and other utilities cost.

Form 10: Data gathering form of capital cost including code of medical equipment, equipment list, unit, price/unit and depreciation

Form 11: Data gathering form of capital cost including code of OPD building, OPD building list, price/unit and depreciation

3.5.2 Test of Data Gathering Form

- **Content validity**: Researcher give the forms of data gathering to five experts who have the knowledge about activity-based costing technique and activity of Outpatient Department, consider content validity of these forms. Calculate content validity index(CVI) as follow: (Boonjai Srisatitnarakoon, 2001 quoting Davis, 1992)

$CVI = \frac{\text{number of form that expert give the level of content validity in 3}^{rd} \text{ and 4}^{th}}{\text{Number of all form}}$

Number of all form

Criteria for judge the content validity of these forms is CVI should not less than 0.8

(Boonjai Srisatitnarakoon, 2001 quoting Davis, 1992)

- **Reliability test**: Researcher and assistant test reliability of dictionary of activity in OPD by Observation. Calculate reliability as follow:

$$P = \frac{Po}{(Po+Pe)}$$

P = reliability

Po = number of consistent observation

Pe = number of observation that not consistency

reliability should not less than 0.8 (Pipat Intang 2002 quoting Boonjai Srisatitnarakoon 2001, 205)

3.5.3 Data gathering method (Pipat Intang 2002)

Preparation phase

- 1) Review literature about Activity-Based Costing technique.
- 2) Demonstrate objective and benefit of Activity-Based Costing technique to Manorum district hospital director
- 3) Demonstrate objective, benefit and data gathering method of Activity-Based Costing technique to head of Outpatient department.
- 4) Select research assistant

5) Demonstrate objective, benefit and data gathering method of Activity-Based Costing technique to research assistant.

Operation phase

1) Construct data gathering form (appendix 1) by studying activity-based costing textbook, related research and theses.

2) Define products/ services of Outpatient department by studying work structure of Outpatient department.

3) Identify main activities, detailed activities by studying work structure, job description and interview members of Outpatient department.

4) Fill dictionary of activities.

5) Identify resource and activity driver.

6) Test content validity and reliability.

7) Collect time that OPD' personal spend on each activity (Pipat Intang 2002 quoting Urden J. D and Roode J. L 1997, 35; Songsri Kittiraktrakul 2000, 74)

8) Collect labor cost including salary and fringe benefit from database of general administrative department.

9) Collect material cost including drug, medical supplies, non medical supplies, utilities from database of general administrative department, nursing department, pharmacy department.

10) Calculate capital cost including depreciation of equipment and OPD building, using straight line depreciation method and to calculate present value as follows:

$$\text{Depreciation (\$)} = \frac{\text{asset value}}{\text{Given number of building or equipment years}}$$

$$C_{2003} = C_t (1+r)^{2003-t}$$

Where; C_{2003} = the value of the capital in year 2003

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

r = discount rate, use interest rate per year = 0.75 %

t = the year that the capital was bought or completed

3.6 Data Analysis

3.6.1 Data Analysis Method (see appendix 2)

This research use Microsoft Excel 2002 to analyze unit cost of Outpatient department services in Manorom District Hospital using Activity-Based Costing Technique. Data analysis step as follows:

1) Fill the proportion of spent time in each detailed activity at zone5 that obtained from data gathering form 4, classified by level of each health personal (zone1).

2) Calculate total time of each activity (zone7) and sum up all of detailed activity to zone 8.

3) Calculate percentage of each detailed activity using formula; zone 9= (zone 7*100)/ zone 8, to fill those percentage to zone 9 and sum all of percentage to zone 10 in final. Using labor cost from recording form 6 fill in zone2 and sum up to zone 4.

4) Allocate labor cost to each detailed activity and fill in zone 14, using formula; zone 11 = (zone5 *zone 2)/zone 6

Zone 1 = number of health personal classified by level of health personal in OPD during May to September 2003

Zone 2 = salary and fringe benefit of health personal classified by level of health personal in OPD during May-September 2003

Zone 3 = total number of health personal

Zone 4 = total salary and fringe benefit of health personal

Zone 5 = the proportion of spent time in each detailed activity

Zone 6 = total of spent time in each detailed activity classified by level of health personal

Zone 7 = total of spent time in each detailed activity

Zone 8 = total of time in OPD services

Zone 9 = percentage of time in each activity

Zone 10 = total percentage of time in OPD services

5) Allocate direct cost, material cost and capital cost to zone12 - zone16 whereas indirect cost that cannot directly allocate to each activity. Then, we have to fill those indirect cost to zone 20 and allocate those indirect cost to each detailed activity based on allocation criteria or percentage of time that each activity use for operation.

In this research, researcher use allocation criteria as follows:

5.1) Drug and medical supplies that collected by data gathering form 7, will directly allocate to each activity, whereas, if there are indirect drug and medical supplies cost then will allocate those cost based on percentage of time that each activity use for operation.

5.2) Non medical supplies that collected by data gathering form 8, will allocate based on actually used in each activity, whereas, if there are indirect non medical supplies cost then will allocate those cost based on percentage of time that each activity use for operation..

5.3) Utilities costs that collected by data gathering form 9, will allocate based on percentage of time that each activity use for operation.

5.4) Depreciation of equipment that collected by data gathering form 10, will directly allocate to each activity, whereas, if there are depreciation of equipment then will allocate those cost based on spent time on each activity.

5.5) Depreciation of OPD building that collected by data gathering form 11, will allocate based on area of each activity occupy, if cannot separately define then will allocate based on percentage of time that each activity use for operation.

Zone 18 = volume of service or activity during May – September in 2003 Fiscal Year.

Zone 20 = total expenditure of Manorom district hospital during May – September in 2003 Fiscal Year.

Zone 21 = other cost and indirect cost

Zone 22 = total expenditure (direct cost)

6) Calculate total of expenditure from zone 11 -16 and fill in zone 17.

7) Collect volume of each service in each activity from recording form 5 and fill in zone 18.

8) Calculate unit cost of each activity using formula

$$\text{Unit Cost} = \frac{\text{Cost of each activity}}{\text{Activity driver}}$$

9) Conclusion and suggestion

3.6.2 Statistic

Descriptive Statistics: number, percentage, average