UNIT COST OF PRIMARY HEALTH CARE SERVICE IN A SELECTIVE CONTRACTING PRIVATE CLINIC UNDER NATIONAL HEALTH INSURANCE SCHEME IN BANGKOK

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Thesis
Entitled

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Nattayanee seingnoo

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UNIT COST OF PRIMARY HEALTH CARE SERVICES IN A SELECTIVE CONTRACTING PRIVATE CLINIC UNDER NATIONAL HEALTH INSURANCE SCHEME IN BANGKOK

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ABSTRACT

The purpose of this descriptive research was to analyse the unit cost of primary health care services in a selective contracting private clinic (clinic A) under the national health insurance scheme in Bangkok, fiscal year 2004. This analysis was conducted from the provider's perspective and was a cross-sectional study. The data were collected from the 1 April 2004 to 30 June 2004. All related units in clinic A were classified into five categories of the main service activities: (1) health prevention and promotion (P&P), (2) treatment, (3) other activities, (4) administration, and (5) supportive service. The total direct cost was calculated from labour, material and capital cost of each the activity. Appropriate allocation criteria were used to allocate total cost from indirect activity for service to direct activity by the direct distribution method. Currency units were presented in Thai Baht.

The study revealed that the total direct cost was 811,130.81 baht. The percentages of labour cost, material cost and capital cost were 39.89%, 49.07%, 11.04% respectively. The results showed that the unit cost at clinic A was as follows: 160.65 baht per visit (88.88 baht for fixed cost and 71.77 baht for variable cost) or (14.58 for capital cost and 146.07 for operating cost) for treatment, 133.64 baht per visit (86.18 baht for fixed cost and 47.46 baht for variable cost) or (11.88 baht for capital cost and 121.75 baht for operating cost) for health prevention and promotion (P&P), 90.02 baht per visit (84.94 baht for fixed cost and 5.08 baht for variable cost) or (10.64 baht for capital cost and 79.38 baht for operating cost) for other activities respectively.

From the study results and experiences obtained during the study, it is recommended that the results from this study could be used as a referance to plan the appropriate budget allocation as well as the capitation, by considering the number of activities. The unit cost is a tool for checking the resource utilisation of the resources, budget and management strategies in order to forecast the trend of budget implementation. Finally, it is also recommended that records of those materials and equipments could be regularly maintained for the on-going process conducted annually.

KEY WORDS: UNIT COST / PRIVATE CLINIC /
HEALTH INSURANCE SCHEME BANGKOK

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การวิเคราะห์ต้นทุนต่อหน่วยกิจกรรมในคลินิกเอกชนซึ่งอยู่ภายใต้โครงการหลักประกันสุขภาพถ้วนหน้าในเขตกรุงเทพมหานคร (UNIT COST OF PRIMARY HEALTH CARE SERVICE IN A SELECTIVE CONTRACTING PRIVATE CLINIC UNDER NATIONAL HEALTH INSURANCE SCHEME IN BANGKOK)

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คณะกรรมการควบคุมวิทยานิพนธ์: สุคนธา คงศีล Ph.D. (Lond.), สุพัตรา ศรีวณิชชากร MD., M.P.H.

บทคัดย่อ

การศึกษาเชิงพรรณนานี้ มีวัตถุประสงค์เพื่อวิเคราะห์ต้นทุนต่อหน่วยต้นทุนกิจกรรมในคลินิกเอกชนแห่งหนึ่ง (คลินิก A) ซึ่งอยู่ภายใต้โครงการหลักประกันสุขภาพถ้วนหน้าในเขตกรุงเทพมหานคร ในการศึกษาครั้งนี้ วิเคราะห์ในมุมมองของผู้ให้บริการ เป็นการวิจัยแบบ cross-sectional โดยทำการศึกษาข้อมูลตั้งแต่ 1 เมษายน 2547 - 30 มิถุนายน 2547 การจัดกลุ่มกิจกรรมของคลินิก A แบ่งเป็น 5 กลุ่มกิจกรรม ได้แก่ (1) กิจกรรมส่งเสริมป้องกันสุขภาพ (2) กิจกรรมรักษาพยาบาล (3) งานอื่น ๆ เกี่ยวกับการบริการในคลินิก (4) กิจกรรมการบริหาร (5) กิจกรรมสนับสนุนการบริการ ต้นทุนรวมทางตรงประกอบด้วย ต้นทุนค่าแรง, ต้นทุนค่าวัสดุและต้นทุน ค่าลงทุน ต้นทุนรวมทางตรงของกิจกรรมที่ให้บริการผู้ป่วยทางอ้อม จะถูกกระจายไปยังกิจกรรมที่ให้บริการผู้ป่วยโดยตรง ตามเกณฑ์การกระจายที่เหมาะสมโดยใช้วิธีการกระจายแบบ direct distribution method

ผลการวิจัยพบว่า คลินิก A มีต้นทุนรวมทั้งสิ้น 811,130.81 บาท ร้อยละของต้นทุนค่าแรง, ค่าวัสดุและค่าลงทุน เท่ากับ 39.89 : 49.07 : 11.04 ตามลำดับ ต้นทุนต่อหน่วยบริการของคลินิกมีต้นทุนต่อหน่วยบริการเฉลี่ยดังนี้งานรักษาพยาบาล เท่ากับ 160.65 บาทต่อครั้ง (ต้นทุนคงที่ 88.88 บาท ต้นทุนแปรผัน 71.77 บาท) เท่ากับ (ต้นทุนค่าลงทุน 14.58 บาท ต้นทุนค่าดำเนินการ 146.07 บาท) งานส่งเสริมป้องกันสุขภาพ เท่ากับ 133.64 บาทต่อครั้ง (ต้นทุนคงที่ 86.18 บาท ต้นทุนแปรผัน 47.46 บาท) เท่ากับ (ต้นทุนค่าลงทุน 11.88 บาท และต้นทุนค่าดำเนินการ 121.75 บาท) งานอื่น ๆ เกี่ยวกับการบริการในคลินิก 90.02 บาท (ต้นทุนคงที่ 84.94 บาท และเป็นต้นทุนแปรผัน 5.08 บาท) หรือ (ต้นทุนค่าลงทุน 10.64 บาท และต้นทุนค่าดำเนินการ 79.38 บาท)

จากผลการศึกษาและประสบการณ์ที่ได้จากการศึกษา ผู้วิจัยมีข้อเสนอแนะว่าผลของการศึกษาครั้งนี้สามารถนำไปวางแผนการใช้ทรัพยากรอย่างเหมาะสม โดยพิจารณาจากกิจกรรมทั้งหมด และการตั้งเป้าหมายที่ชัดเจน การวิเคราะห์ต้นทุนจัดเป็นเครื่องมือตรวจสอบการใช้ทรัพยากร งบประมาณ และการใช้แผนกลยุทธ์ ทำให้มองเห็นแนวโน้มและสามารถทำนายการใช้ทรัพยากรให้เกิดประโยชน์อย่างเหมาะสม หน่วยงานจึงควรจัดทำและเก็บทะเบียนพัสดุ-ครุภัณฑ์ควรทำต่อเนื่องเป็นปัจจุบัน และศึกษาต้นทุนอย่างต่อเนื่องทุก ๆ ปี

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CHAPTER 1
INTRODUCTION

Rationale

Section 52 of the Constitution (1997) states that "All Thai people have an equal right to access the quality health care services…" was agreeable with the concept, objective and goal of the 9th National Economic and Social Development Plan (2002 – 2006) to that an achievement to develop policy and standard, monitoring, support, and co-operation for efficient health care system to lead to social health (Office of health insurance, 2005: 73).

Thai economy was facing the financial problems from the Asian economic crisis that happened from mid 1997 to 2001. At the same time, Thai government could not adjust to both domestic and international changes. As a result, the cabinet approved to establish "the state administrative system reform plan" following the proposal of the civil service revolution committee (The civil service revolution committee, 2001: 1). This plan includes 5 issues of administrative systems: 1) to revise the roles and administrative method of government sector; 2) to change the financial system from the resource usage to be organizational performance to determine the financial allocation; 3) to develop the human resource management; 4) to revise some laws; 5) to improve the organizational cultures and norms of government sector.

Quality assurance is an important mechanism to achieve the specified goal of good health at reasonable cost (Sanguan Nitayarumphong and Supasit Pannarunothai, 1998: 275). On the 26th February 2001, the Thai government set up the main policy on universal coverage under project of "30 baht for curing every illness". The first phase was established in six pilot provinces - Nakhonsawan,

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Phayao, Patum Thanee, Samut Sakhon, Yasothron and Yala - on 1st April 2001 (Office of health insurance, 2005: 73). This project aims to thoroughly provide the health care service assurance to people, to reform the financial management to be able to gain more effectiveness and efficiency, and to improve the standard of health care service (The organizers of the properly developing in resources management of hospitals, 2001: 1-2).

At the same time, the public sector was on the government agenda and health sector reform, major changes in structure and budgetary system to result-based budgeting management. Financial sustainability closed end and related to organizational performance (The Health Assurance Department, 2002: 74). Financing health care changing to capitation payment. The government approved the budget for health in FY 2003 at 1,202 baht per capita per year and in FY 2004, 1,308 baht per capita per year for each hospital that Ministry of Public Health had proposed a budget (Office of Health insurance, 2004: 43).

In 2003, Thailand had 3 public health insurance schemes: Social Security Scheme (SSS), Civil Servant Medical Benefit Scheme (CSMBS), and Thirty Baht Universal Health Care scheme (Asia-Pacific Health Economics Network, 2001) and government's policy to expand health benefit coverage due to decrease population were not covered by any health benefit scheme. In the year 2001, 20 percent of the population were not covered by any health benefit scheme until the year 2003, the population were covered up to 96.6 percent (Office of statistic, 2003) then, primary health care system is important to the success of the policy.

From Sanguan Nitayarumphong and Mingkhun Suphunpong's study on the situation analysis of private clinics in Thailand, and their functions as primary care, as initiated with the objective to identify the characteristic of private clinics in terms of its capacity, workload, and personnel, as well as the feasibility and favorable factors to involve them in the primary care network of the government. Since there are more than 6,500 private clinics in Thailand, in the part, these private clinics were not taken as a part in the health planning of the country although experiences learned from

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many countries, such as; Social Security Scheme, have shown that it is possible to include private clinics to be a part of health service system to provide primary care for the people (Sanguan Nitayarumphong and Mingkhun Suphunpong: Abstract).

Then, the office of National Health Care Reform studied project to develop private clinics under national health insurance scheme in Bangkok and set goals for the study to develop alternatives, controlling, monitoring quality and impact for clinics or network clinics which co-operating in primary care unit under project "Ob-Aun clinic". A part of project is to study the cost of clinic A, which cooperated with Thirty Baht Universal Health Care scheme, because it receives the budget in the form of capitation payment. It needs the effective method to control budgeting. It is very important for an organization to make a calculation of the production cost before entering into the performance based budgeting system (Chaisit Chalermmeeprasert, 2001).

From literature review, no study had been done on the cost and unit cost analysis of health services at private clinics. The study of cost and unit cost of health service at clinic A should not be complicated and the data collection should be accurate. The implication from these findings will be benefitial to the director of clinic A and his administrative team to use as a guideline for appropriate clinic cost management, including clinic accounting and financial system, due to question in this research that how much the cost and unit cost of Thirty Baht Universal Health Care scheme of a private clinic from the provider perspective.

The proper system will lead to effective budget control and optimum use of health service resources to serve needs of people in the catchment area of clinic A. Finally, the fruitful information from this study will be used as a guideline how to plan a performance-based management especially through a pilot project of health insurance system and in the near future.

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Research Objectives

General objective:

To analyze cost and unit cost of clinic A which was under national health insurance scheme during the fiscal year 2004 in Bangkok.

Specific objectives:

This study intends to analyze:

1. Total direct cost of the clinic A in the fiscal year 2004 (1 April-30 June 2004), which consists of labour cost, capital cost and material cost by main activities.
2. The total indirect cost of patient service.
3. Full cost of patient service.
4. Unit cost of patient service.

Scope of the Research

1. This research is an analysis of cost and unit cost by means of provider's perspective during 1 April 2004-30 June 2004.
2. This research is performing only one private clinic.

Limitation of the Study

1. This study was conducted at clinic A in Bangkok. The result of study might not represent other private clinics in Bangkok, which has a different operation.
2. The accounting records of the clinic A were not collected. The other data was collected from various sources of secondary data and interviewing staff of the clinic. Some data, wage per month and prices of medicines, could not be disclosed. Then, the researcher calculates labour cost by wage per hour.

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3. The price of the medicine and equipment was not truly priced because the staff denies to give out the data. Then, the researcher estimates medicine cost by the standard price.

4. Other expense gathered by interviewing administrator and staff in-charge without evidence or receipt.

Assumptions of the Study

1. This study is an accounting cost analysis.
2. This study calculated cost per activity that was an average cost.
3. The capital cost was specifically studied on durable good, which excluded the land and building.
4. The labour cost was specifically studied on wage, the compensation from overtime-working hours and other welfare were excluded.
5. Working hours of health officers were accounted for eight hours per day and twelve hours on Sunday.
6. The time proportion was weighted by the researcher
7. This research studied only 30 baht registration cost.

Definition of Terms

Cost is defined as value of resource or explicit cost spending to obtain products or services and enable the measuring in the form of money.

Capital cost (CC) is defined as depreciation cost of buildings and durable goods. The depreciation cost calculation is the straight-line method and the formula to calculate depreciation cost of the capital cost is:

$$\text{Depreciation cost in a year} = \frac{\text{Capital cost}}{\text{Useful Life}}$$

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The calculation was based on the assumptions as follows:

-All durable goods have 5 years useful life. Durable articles are office supplies, medical equipment and scientific supplies include vehicles.

Material cost (MC) is defined as all material costs of each service center obtained from the administrative and the pharmacy sections, which are the main cost allocation centers to distribute cost of all material cost to other sections of clinic A such as household materials, construction equipment, computer hardware, medical science materials, medicines and medical equipment, family planning materials, vaccines, utilities, maintenance, and other expenses.

Labour cost (LC) is defined as all expenses and fringe benefits paid for staff as wages, rewards and welfare and other fringe benefits for their work in monetary term such as monthly salary, professional rewards, over time payment, allowance, child education fee, children assistance, and health care fee. In this study, the labour cost is only calculated the sum of wage staff (doctor, nurse and cleaning personnel) expense paid in the period of study.

Total direct cost (TDC) is defined as the sum of labour cost, material cost, and capital cost which occur in one activity.

Total indirect cost (IDC) is defined as the total cost that is coming from the administration and the supportive services, which were indirect activities. It must be allocated by following the criteria that was set in the proportion of number of clients. The direct distribution method was used to distribute cost in this process.

Full cost (FC) is obtained from summation of total direct cost and total indirect cost or the costs that are obtained from all direct expenses of patient service and indirect patient service where obtained from cost sharing.

Activity is defined as the condition of being active to change resources to service of a clinic A as the following detail:

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- **Promotion and Prevention health care (P&P)** is defined as the service covering ANC, FP, Immunization and advice for client that was ANC (only urine-test, physical check-up, and tetanus vaccination), FP (oral contraceptive, injectable contraception). Immunization refers to vaccination service for children under 5 years old and common people, i.e. Bacillus Calmette Guenrin Vaccine (BCG), Diptheria Tetanus Pertussis Vaccine (DTP), Oral Poliomyelitis Vaccine (OPV) Hepatitis B Vaccine (HBV), Japanese Encephalitis Vaccine (JE), Measles Mump and Rubella Vaccine (MMR), Tetanus Toxoid Vaccination (TT).

- **Treatment** is defined as the service including all cares (URI, DM, HT, pain cause, diarrhea, rash on skin and etc, except the dental care).

- **Others** is defined as the services for the client aside from the treatment, and the health promotion and prevention i.e. the dental health care that was checking and advising services for the basic mouth care and search the problem of the client for the referral to network clinic in the upper tier health care facilities, and considered in the complexity which was beyond the capacity of clinic A.

- **Administration** is defined as the activity of providing equipment, drug and other components to service the client.

- **Supportive service** was the activity, which was helping the clients to be comfortable when they came to the clinic and support the main service of clinic A. In this study, supportive service was cleaning activity.

Fixed costs is defined as unchangeable total costs no matter how activities levels or quantity of services are changed such as land, building, machine, etc. This fixed costs includes the capital cost, rent and labour cost.

Variable costs is defined as changeable cost that is variant to quantity of activities such as material cost etc.

Recurrent cost is defined as the sum of labour cost and operating cost, including medical supplies cost that have a life span less than one year and the price is less than US$100.

Recurrent cost = Labour cost + Operating cost

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Operating cost is defined as the cost that is calculated from the sum of office supplies, drugs, vaccines, electricity and telephone. The office supplies include materials that are equal or less than US$100.

Direct distribution method is defined as all total direct cost of the activities that do not directly service the clients and is allocated to the total activity that service the client directly by using proportion of service. There is no cost allocation among indirect service activities. After allocated to direct service activities, the indirect service activity is no longer the cost.

Cost allocation is defined as the cost distribution of the indirect service activities to the direct service activities by using the suitable allocation criteria.

Table 1 Cost Allocation Criteria

Item	Criteria allocation		
	Labour cost	**Material cost**	**Capital cost**
Administration	Number of staff	Number of clients	Number of clients
Support service	Number of staff	Responsible area	Responsible area

Cost of UC is defined as cost that occurs from Thirty Baht Universal Health Care Coverage Scheme client group.

Unit cost per activity is defined as cost that occurs in one activity per a number of clients of that activity.

$$Unit \quad \cos t \quad = \frac{Total \quad \cos t}{Quantity}, \quad or \quad \frac{TC}{Q}$$

The meanings in this study were:

- Unit cost per health promotion and prevention was the average cost that one person receiving health promotion and prevention service in one visit.

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- Unit cost per treatment was the average cost of one person receiving treatment service in one visit.

Client is defined as the person who receives the service from clinic A.

Visit is defined as a number of times that the client contacts the clinic in each activity

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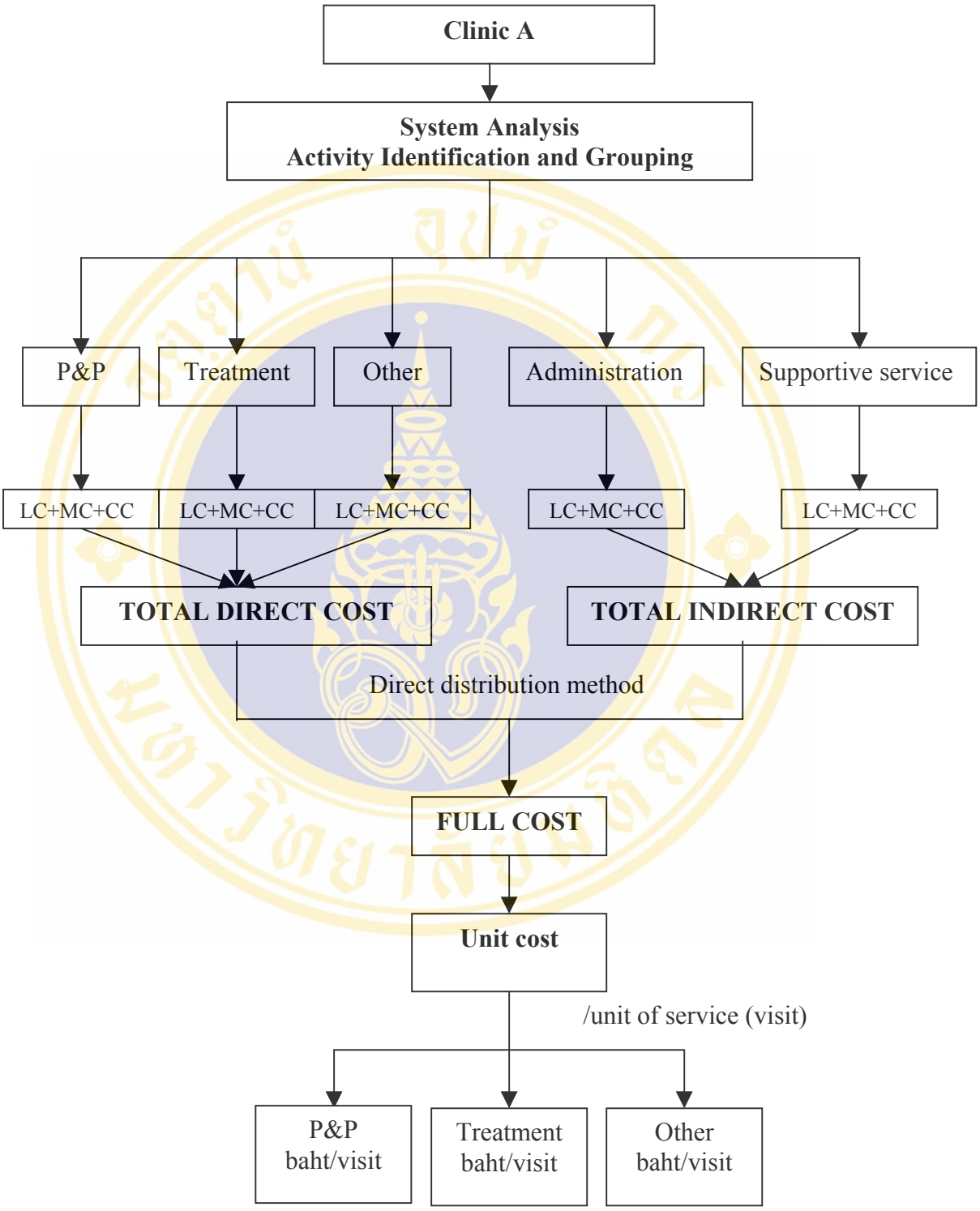

Figure 1 Conceptual framework of cost and unit cost analysis of clinic A under national health insurance scheme during the fiscal year 2004 in Bangkok.

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CHAPTER 2
LITERATURE REVIEW

The literature review in this study was divided into 4 parts as follows:

1. Health insurances in Thailand
2. The structure of Health Service System in the clinic A
3. Cost and cost theory
4. Previous studies on cost analysis

1. Health insurances in Thailand

The reform of the government official's welfare system

In 2001, there were several health insurance/welfare schemes in Thailand, for example, Voluntary Healthcare Card Scheme, Civil Servants Medical Benefit/Welfare Scheme (CSMBS), Social Security Scheme (SSS; compulsory scheme for formal sector) and Health Welfare for the low income group, the elderly, children under 12 and other underprivileged groups but have not yet covered 100% of the total 60 million Thai population. Besides, it was found that there were still some weaknesses in terms of efficiency and equity (Supasit Pannarunothai, 2000).

The problem of the government official's welfare system was the rapid increasing of expenses. This problem was caused from the mechanism of the payment to the medical premises that existed in various types of activities. To solve the problem, the Advisory Committee of the Ministry of Treasury proposed the guidance for the distortion as follows:

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Short-term period (2001-2003): Build up 1) The database of the payments of the inpatient that was used for paying money to governmental medical premises, 2) The database of the persons having the right of treatment for setting up the register and capitation system, and 3) The database of the drug usage for implementing in the long term period.

Long-term period (from 2004): 1) Start the system for selecting the governmental medical premises and private clinics which joined the network of services, 2) Register the persons having the right of treatment and servicing them during one year of the registration, 3) Apply the capitation system (excluding the drug cost) to the mechanism of the payment of the outpatients, 4) Apply the risk-adjusted capitation rates to the mechanism of the payment of the inpatients, and 5) the drug system as the list of essential drugs was changed as follows (Supasit Pannarunothai, 2000):

1. Change the previous drug list without specifying the cost of drug to the new drug list with specifying the cost of drug, so the patients had to pay for the excess cost in case the cost exceeds the specified standard cost.
2. Separate the drug cost from the capitation rates of the outpatients.
3. Control the drug cost in the list of essential drugs.

In 2003, there were three major forms of health insurance covering personal medical care in Thailand. Each program had its own beneficiaries, benefit coverage, amount of government subsidy, provider payment mechanism, utilization rates, and costs of care. The three major forms were:

1. Civil Servant Medical Benefit Scheme
2. Social Security Scheme
3. Thirty Baht Universal Health Care Coverage Scheme (UC)

1. Civil Servant Medical Benefit Scheme

In 1980, Royal Decree on CSMBS was established. The CSMBS referred to the health benefit program provided by the government for civil

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servants, both in-service and retired, and their immediate family members including a spouse, parents and off-spring (not more than three children less than 20 years of age).

The reform aims at improvement of efficiency and to contain the cost - currently 14% increase in real terms per annum. Reformers propose transformation from fee for service reimbursement model towards capitation and global budget for ambulatory and inpatient care contract model. It was a long way to go in this reform. (Supasit Pannarunothai, 2000)

2. Social Security Scheme

Thailand developed Social Security Scheme in early 1990s. We gained a good experience on capitation payment system (on cost containment and quality of care and cost-quality trade off) and contract model to public and private providers by the Social Security Office. Lessons were drawn from this scheme. There were weak points under the capitation payment. The Social Security Office developed a sub-system of payment to tackle those weak points at the beginning. They were:

1) Fee-for service reimbursement for emergency and/or injury from accident. This method of payment was the means to cope with a situation that insured the urgent need for treatment when those patients were not able to go to registered hospitals

2) Lump Sum Additional Payment for high cost medical service: There was a tendency for registered hospitals to avoid treating the insured person if he or she needed advanced technology or high cost procedures. SSS introduced this extra payment to reduce concern from providers.

3) Additional payment according to the utilization rate: After four years of scheme implementation, some hospitals complained that they were in deficit but many others were not. Instead of raising the capitation rate, SSS would pay according to the ranking of the utilization rate.

3. Thirty Baht Universal Health Care Coverage Scheme (UC)

On 26th February 2001, the government launched the 30 Baht health policy. The first phase was established in six pilot provinces - Nakhonsawan, Phayao, Patum Thanee, Samut Sakhon, Yasothron and Yala - on 1st April 2001.

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(Office of Health Insurance, 2005: 73). The insured were all of the people who were not in any health scheme and whose names were in the house registrations in those provinces. These people would receive the universal health card or the gold card. This card must show consistency with the individual's identification card every time they accessed the health services, which were the government health services or the private sector health services registered with this project.

The Asia-Pacific Health Economics Network (APHEN) mentioned that the main objectives for universal coverage were as follows:

Equity: An equal sharing of health care expenditure and equity of access to the same quality of health services.

Efficiency: Efficient use of resources by good administrative and management practices.

Choice: People have the right to choose their health services in order to reduce the problem of an imperfectly competitive market.

Good health for all: Universal healthcare coverage aims not only to provide curative care but also to provide disease prevention and health promotion where appropriate

The accessing health service had to follow the referral system from the primary health center or the nearby hospital, which were registered under the project. For emergencies and accidents, the insured could access any government health services. To access needy health services, the insured must contribute a co-pay of 30 Baht per episode.

Under this 30 Baht Universal Coverage Policy, the insured would receive the same quality health services as offered by other health schemes. At present, the service package includes most health services except cosmetic care, obstetric delivery beyond two pregnancies, drug addiction treatment, hemodialysis, organ transplantation, infertility treatment, and other high cost interventions. However, with more resources and disease priorities, the inclusion could expand further over time.

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From the government side, the funding of the system was paid by capitation. The total payment per capita paid from tax revenue, parts of which were paid to the health care facilities, according to the number of local residents who were registered with them, hence to be served. The budget allocation at 1,204 baht in FY 2002, but in reality this was not enough according to the population structural change. The estimate IPD in 1996 was used to calculate the capitation payment in FY 2002. The budget allocation per capita in FY 2004 was 1,308.50 baht (National Health Security Office, 2004). This capitation included the costs for the curative, preventive, promotional care as well as the administration. Detail of budgeting per capita was as follows:

Table 2 Comparison of budgeting per capita for FY 2003 and FY 2004 in Thailand.

Service type	Fiscal Year 2003	Fiscal Year 2004
1. Outpatient care	574	488.2
2. Inpatient care	303	418.3
3. Prevention and control of diseases	175	206
4. High cost care	32	66.3 (OP=4.2, IP=55.1 instruments =7.0)
5. Emergency and accident care	25	19.7 (OP=0.4, IP=19.3)
6. Structural investment	83.4	85
7. Central and regional administration		10% of total package
8. Contingency funds.		10% of OP+IP
9. Total budgeting per capita	1,202.4	1,308.5

Source: National Health Security Office, Thailand 2004

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The MoPH's allowed Bangkok residents who moved in from other provinces to choose a new clinic or hospital under the 30 Baht Universal Health Care Scheme had met with overwhelming response. If people held a gold card under the scheme they could choose a clinic or hospital closer to where they lived or worked. For those with home registration in Bangkok but who did not yet have a card, they could get one, which specified a clinic or hospital in Bangkok of their choice.

Service system under National Health Care Insurance

Primary health care Unit or primary health care network must be service of health promotion and prevention, treatment, rehabilitation, inpatient care and outpatient care service. Moreover it had at least one doctor and other staff for service. The private clinics had to pass the clinic audit and characteristics according to the set up criteria. The doctor has to work full time. Health care services that the population selects to registration have to the community hospital, health center, hospital and private clinic, which doctor has to work full time. Moreover, The private clinics had to pass the clinic audit and characteristics according to the set up criteria.

Decentralization of public service to the Local Administrative Organization was only one part of the legislation, but the more important component in the legislation was the goal to increase the proportion of revenue of the local administration from the present level of 9% of total public revenue to 20% in 2001, and 35% in 2006. Such redistribution would enable the local administration to take up active roles in providing various social services under their responsibility as mandated in the Act. The MoPH had proposed to create the new decentralized health system with 4 important features.

1. Establishment of the Area Health Board (AHB). The AHB would be responsible for health development activities in their respective local area. Such a unit would need to have legal status in order to make decisions, not only taking up an advisory role.

2. Combination of health facilities at various levels within the same AHB to form a single unit of service providers. Under this new structure, the

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district hospitals and health centers within the same aggregation would take role in the overall planning and management of the new organization, while sharing financial and human resources to maximize the people's benefits.

3. Allocation of a sector block grant from the central ministry to the AHB. The central government had a supportive role in allocation of health financing while the entire decision was made by the local organization. The central government might set the criteria for allocating health budget as a health sector block grant, which would be a mix of the central government block grant with a matching grant from AHB.

4. The relationship between the AHB and the services facilities. The service aggregation should be flexibly managed and should not be required to follow all the rules and regulations of the local administration. Financial resource should be allocated to them based on the expected results and performances.

The implementation of decentralization needs to support and to improve through Research and Development that was focused on the issues of the AHB, capacity building, development of monitoring and support at the central level.

Fee for service 30 Baht (co-payment)

Health promotion and prevention care without pay for the service.

Primary health care network

The services emphasized on the good health promotion more than the curative system by non inpatient service and using the general medicine.

Qualifications of clinics

Clinics must be registered with the National health care system and pass the clinic audition following the standard.

Duration to co-operate

Duration apply for admission was continued to FY 2004.

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Locations and population

The locations were easy to communicate and located in the community area about 30 minutes by automobile. Furthermore this clinic was responded to not exceeding 10,000 registered population per clinic.

Competency of work

The services are health promotion and prevention, treatment, rehabilitation and efficiency referral (according to standard criteria).

Manpower

- Ratio of nurses or paramedics at least 1 : 1,250 people, nurses at least 1 : 5000 people, and work full time at least 75%
- Ratio of doctors at least 1 : 10,000 people. In the locations that were short of doctors, the nurses who were advanced practitioners nurses or appropriate nurses could be set up.
- Ratio of dentists at least 1 : 20,000 people. In the locations that did not have enough dentists dental care staff could be set up instead. The ratio of dental care staffs at least 1 : 20,000 people including [non-over]? 1: 40,000 people.
- Ratio of pharmacists at least 1 : 15,000 people for drug administration in primary health care unit at least 3 hours per week.

Characteristics of private clinics studied by Doctor Sa-Nguang Nittayarumpong are as follows:

Location

More than two thirds of private clinics (77.1%) delivering general care were situated in the municipal area and almost all of those delivery specific cares were in metropolitan area.

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Time of service

About 34.8%of them had been delivering their services less than 5 years.

Working time

Open sometimes or irregularly (83.7%)

Capability of personnel

The ratio of physicians for specific filed was more than general ones (55.7/44.3). About 62.6 % of them worked as a part time. Most nurses also worked as part time (60.40) whereas the nurse assistant worked full time (51.7%) and all personnel were the government officials.

Capability on treatment and diagnosis

More than half of them (54.8%) were able to perform minor surgery and about 18.4% of them can provide labour/delivery and half of them can diagnose pregnancy condition and a few of them can diagnose other diseases.

Syndrome of disease for service

The most diseases in many areas were similar which includes respiratory disease syndrome, gastrointestinal disease skin disease, hypertension and stress or psychosis.

Cost per one time of service

The cost or expense per one time of treatment of out-patients in private clinics showed the lowest rate at 139 baht/time and the highest rate at 187 baht/time.

Cost of referral

Most clinics had no suggestions or did not fill the referral forms. It was found that clinics in Bangkok and new economic area had the lowest referral rate. Most referrals were performed among government hospitals in that province whereas

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referrals to private hospital were slightly found. The reasons for referral was most upon capability of each clinic, and about 14.2% of these clinics followed up their cases, 54% sometimes followed the cases and 31.8% had never followed the referred cases. The feedback of health facility, where patients were referred to, was at a low level and the process of returning patients to the original health facility or clinic was to continue treatment and care.

Data and statistical collection & Evaluation of service

Most clinics rarely performed data and statistical collection. However, there were only slight data on common drug use, finance, patient and epidemics.

Decision making to join the network of healthcare

Most clinics agreed to join the healthcare network and would mainly like to cooperate for general care and treatment.

Factors influencing decision making

Factors influencing most clinics to join the network were (1) to support government policy, followed by (2) to easily manage documents and finance, (3) good reimbursement with only a few changes.

When classified by the owner, there were two types of clinics: individual and network clinics of private hospitals. Therefore, those clinics that joined the project could more flexibly adjust themselves to a set standard.

The characteristics of CUP

1. More new constructed place.
2. Providing physicians and nurse to take turn for services.
3. Good location and treatment room.
4. Working time started from 08.00 to 18.00.
5. A total of 383-10,560 people were registered.
6. The average of individual clinics was 3,510 cases.
7. The average of hospital network was 5,121 cases.

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The comparison between individual clinics and network clinics.

1. Individual clinics had a weak point about lacking medical personnel but the main point was most personnel had been working there for a long time.
2. The capability regarding finance management in the individual clinics was more limited.
3. Individual clinics had marketing limits and low competition.
4. Individual clinics difficultly adapt to the change of NHSO
5. The capability of proactive work is limited in the individual clinics.

2. The structure of Health Service System in clinic A

The private clinics could be classified in different management forms as follows:

1. Network clinics: The clinics that were in a network of private hospitals
2. Solo clinics were clinics of which the clinic owners administered and managed by themselves. It can be divided to:
   - 2.1 Minor clinics were clinics with one doctor owner.
   - 2.2 Group practice clinic
   - 2.3 Solo practice

Clinic A was established in 1999. It was a private clinic, which was administered by network clinic. There was one doctor, one nurse and one cleaning worker, opened on Monday to Friday from 6.45 am to 11.00 am and 4.30 pm to 9.00 pm. Every evening one more nurse was added to the teamwork. On Sunday it opened from 7.45 am to 9.00 pm and there were 4 staff working like weekday evening. From the census on 31 December 2003, there were 2,754 people in catchment area. It provided services on health promotion, prevention, treatment, and others (dental and referral).

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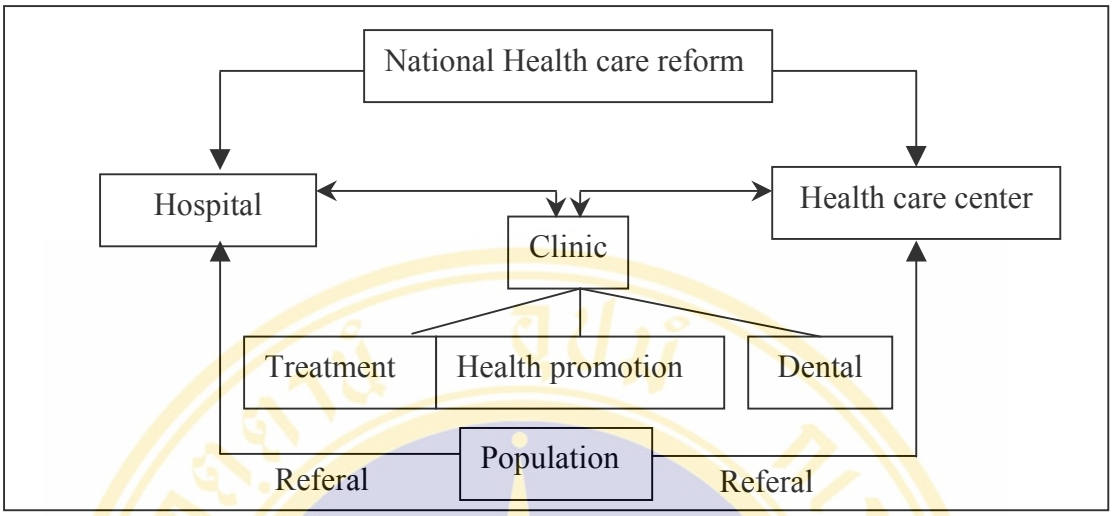

Figure 2 Form of health care service system in Bangkok

Source: National Health Care Reform, Thailand 2004

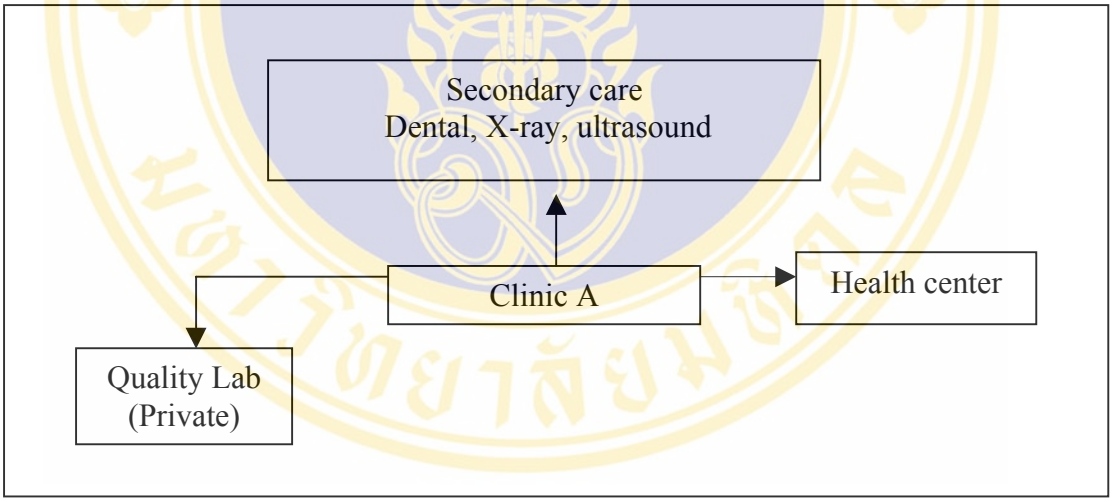

Figure 3 Administration network

Source: National Health Care Reform, Thailand 2004

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3. Cost and cost theories

Definition of cost

Cost has very wide meaning and can be explained in many situations as follows:

Cost is the value of resources used to produce something, including a specific health service or a set of service (as in a health program). (Creese and Parker, 1994: 7)

Costs mean sum of money that pays for products of health and sanitary service management providing to service users. (Sukanlaya Kongsawat, 1997: 5)

Cost means losing resources may be at the value of benefit or the value of money to obtain something needed. (The value of resource is used in producing process.) (Arthon Riwpaiboon, 2001: 2)

Cost means calculable money paid with cash, property, asset or services. (Wijitra Poonpirmsap, 1997: 6)

Then, the researcher defined the cost as value of resource or explicit cost spending to obtain products or services and enable the measuring form of money.

Hospital Cost

Viroj Tangchareinsatien (1998: Transparencies) said that the hospital cost means the standard cost for health care services to variety of deserved patients. These costs need to be defined in advance because they are useful for the hospital management to know how much they have to pay directly and indirectly for a unit cost per patient and bring to decision making planning. Moreover, the hospital management can control the administration more efficiently.

Kanongyuth Kanchanakul (1996: 304) said that hospital cost means the expenses of hospital that provide for service processes to variety of patients. Besides, it also means total expenses of all units that are related to health care service

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management. These expenses are noted in the cost accounting of the hospital with the setting method. Generally, all units within the hospital have related working characteristics. Then, the hospital cost calculation method is different from business cost calculation method.

Activity based costing

There are many concept of cost including original and modern cost concept. In this study, the researcher reviewed the literature, which was new model cost concept that was agreeable with the present time.

Worasak Thummanon mentioned that Activity based costing is a technique to quantitatively measure cost and performance of activities, resources and cost objects, including, when appropriate, overhead.

Sheri A Martin mentioned that Activity based costing is an accounting technique that allows an organization to determine the actual cost associated with each product and service produced by the organization without regard to the organization structure.

Carole Keeton Strayhorn mentioned that Activity based costing is a methodology that measures the full cost and performance of activities, resources and cost objects. Resources are assigned to activities, and activities are assigned to cost objects based on their purpose.

The American Institute of Certified Public Accountants (AICPA) (2003) mentioned that Activity Based Costing (ABC) is traditional cost accounting techniques that allocate costs to products based on attributes of a single unit

DoD mentioned that ABC is a technique to quantitatively measure the cost and performance of activities, resources and cost objects, including, when appropriate, overhead.

Then the researcher defined the Activity based costing (ABC) as an accounting technique that permits clinic A to determine the actual cost associated with each product (health care service) and service produced by the clinic A without regard to the clinic structure.

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Cost

Cost was divided into 2 types as follows:

1. Economic costs
2. Cost accounting

Economic costs

Creese & Parker (1994: 54) said that cost in view of economic is more than expenses for resources because some resources can be obtained with least or without cost such as donated medical supplies, volunteers, etc. If resources are used for one activity it may not be used in other such as the work of health volunteers.

Pirom Kamonratana (1994: 3-4) said that economic costs mean opportunity cost of product that is equal to the output that is produced by other activities. Then, the expenses, that are not related to the social resources, are not included in economic costs such as depreciation of assets, tax, interests, and sunk cost (the past expenses for continuous project to present).

Cost accounting

Wijitra Poonpermsap (1998: 28) said that cost accounting means defining, collecting, and explaining the output data for:

1. Planning and controlling
2. Decision making of managers
3. Finding out the costs of products.

Cost accounting emphasizes on planning, controlling, and decision making rather than finding out the costs of products.

Accountant's and economist's attitude toward cost was different regarding cost of account which was real expense of those activities and able to record. Hence cost value of account was lower than economic cost. (Oranai Wannasukam, 1993)

In this research, the researcher used service provider's economic cost evaluation that did not account for other expenses from client (out of pocket money) or compensations that were lost from sickness.

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Cost evaluator's perspectives

There are 3 groups of cost evaluator's perspective:

1. In service provider's perspectives: costs mean all occurred expenses paid for patient services such as labour cost, material cost, and capital cost. Thus, these costs are not equal to service price.
2. Inpatient's perspectives: costs mean all occurred expenses that patients need to pay for services as well as loss of opportunity cost from sickness.
3. In society's perspectives: costs mean the sum of total costs such as environmental damage, severe transacted diseases, and job missing.

In this research, the researcher used service provider's perspectives cost evaluation that occurred expenses paid for client services such as labour cost, material cost, and capital cost.

Cost Allocation Method

There are many cost allocation methods to be used, depending on which method is faster, accurate, credible, and the objective of data analysis. Then, the output of credible cost of hospital that matches with the status of hospital depends on the procedure of cost allocation method.

Broyles, 1982 divided the cost allocation methods into 3 types:

1. Direct Apportionment method
2. Step Down method
3. Double Distribution method

Among all three methods, the Double Distribution method is more accurate than Direct Apportionment and Step Down methods because this method takes into consideration the expenses that distribute in the related proportion between health service center and supporting center. However, Step Down method is better than Direct Apportionment method.

Kennamer (1986) also proposed other methods such as:

1. Multiple Distribution Method followed by step down method and direct apportionment.

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2. Simultaneous Equation Method: Using straight-line equation and the relationship of each other.

The general commitment represented the priority of the accurate method from the best to worse.

1. Simultaneous Equation Method
2. Double Distribution Method
3. Step Down method
4. Direct Apportionment method

(Berman, H.J. and Weeks, 1976:110; Meeting D.T., 1979:38-39; Sukanya Kongsawat, 1995: 28)

Anuwat Supachutikul (1996: 27-28) divided cost allocation method into 2 types:

1. One-sided cost allocation: This method is used for transient cost center that will distribute all its cost to other cost centers. There are many methods as the following:

1.1 Direct Distribution Method: It consists of transient cost and absorbing cost. The transient cost will be directly distributed to be absorbing cost but it will not be distributed within the same group such as administration department will not distribute the cost to laundry department or pharmacy department, pharmacy department will not distribute its cost to operating room or X-ray department. All transient costs will be directly distributed to in and outpatients department.

1.2 Step-Down Method: This method is the arrangement of the unit center to support other center down the step. The upper cost center distributes more to other cost centers than the ones down the step. This method is more accurate than direct distribution method.

2. Distribution and receiving cost: This method takes into consideration the real situation while one center supports other centers. It at the same time receives supports from others as well. However, this method will infinitively cause the problem because the costs of transient cost center are not finished, it will stop to distribute with the proper methods as mentioned below.

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2.1 Double Distribution Method: While allocating the first cost, cost center, which allocated cost, still absorb cost from other center. Therefore, some arrange the center that has direct total cost lower than itself manage the cost of transient cost center received from this allocation by using direct allocation or precedence allocation method.

2.2 Multiple Distribution Method: This method is similar to Double Distribution Method but the number of distribution times is more than two. The costs are worked out until they become the least, and then it will be closed by direct distribution method or step down method

2.3 Simultaneous Equation Method: There are many distribution times of the costs until that costs are finished in transient cost. Linear equation is used. This method achieves greater accuracy than other method because it recognizes reciprocity between cost centers.

This research uses "Direct Distribution Method" because it is the appropriate method for clinic, which was no complicated management.

The Classification of Costs

The costs have different forms and natures. The classification of cost had many approaches depending on the objective of application.

Pirom Kamonratanakul (1991: 769-774) classifies the cost of activities into 3 types:

1. Direct cost is the direct expenses of services such as capital cost expenses, operational expenses, and patients' expenses. There are 2 types of direct cost of hospital:

1.1 Medical service direct costs that are occurred from direct health care services such as medicines, laboratory, and medical staff wages.

1.2 Non-medical service direct costs that are not occurred from direct health care services. The patients have to pay for these expenses to go to hospital caused from their sickness, such as meals, transportation, and childcare.

2. Indirect costs are not occurred from direct health care service.

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2.1 Leaving work caused by sickness. Patients might lose opportunity if they are unable to work or their capabilities to handle routine work decreased.

2.2 Death caused by whether or not the hospital gives services but the patients die before proper age. That means society would lose productivity in his/her remaining life. Then it is difficult to accurately and credibly evaluate value of life.

3. Intangible costs are costs that the hospital, whether or not the hospital gives services to patients, causes the patients painful, sad, scared, or lonely. Such things are difficult to evaluate in term of amount of money.

Anuwat Supachutikul (1996: 3-6) stated that the separation of costs into several categories depends on objective led to the use of each of the separation, which shall contain particular hidden concept. One kind of cost can be used with job in one feature but cannot be used with another nature. The cost used in accounting may not be used to make a decision such as the standard cost of goods in accounting system always changes because of the change of raw material but cannot be used with standard cost as mentioned to determine pricing. The cost estimation without rectification of cost type or the inappropriate from method of cost estimation can be variance for framework analysis.

The factors of cost can be classified into many methods. The suitable classification should be in accordance with the situation or objective of application without overlapping and should cover every type and nature of cost to get the most satisfaction.

1. Cost classification on input characteristics is the basic cost classification. There are 2 main groups of costs:

1.1 Capital costs are the assets that have useful life more than 1 year such as buildings, equipment, and long-term training (human capital development).

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1.2 Operating costs or recurrent costs or running costs are the costs of all resources that need to be continuously added such as labour, materials, maintenance, facilities, and short-term training costs. (Creese & Parker, 1994)

2. Cost classification aspects for objective of public health analyzing projects are as the following:

2.1 Classified based on activity such as training, supervising, administrative management, following up and evaluation, and supporting/ transporting.

2.2 Classified based on used level such as nation, border, province and district.

2.3 Classified based on resource such as Ministry of Public Health, other Ministries, and international organizations.

It should be noted that the researcher does not have many classifications at the same time because it will be complicated to decide the cost groups.

3. Classification for analyzed production and financial report

3.1 Direct cost and Indirect cost

Direct cost includes material cost and labour cost that are related to product or direct service, which can be specified whether it is product or service. This cost will be cancelled when business is closed.

Indirect cost includes the cost, which cannot be specified whether it is product or service such as utilized public depreciation, and office rental or material.

3.2 Product Cost and Period Expense

Product Cost is the cost related to the products. This cost is comprised of direct material cost, direct labour cost and overhead cost. This cost is collected in storage. It becomes cost of goods sold when it is sold. In the income statement it can be found to be property and it would become expense during selling that goods.

3.3 Period expense is the expense, which is unable to be specified and is reported as period expense at that time such as sale promotion and service expenses.

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4. Classification of Cost for Cost Control

To understand cost control, it is necessary to understand the concept of responsibility center, which refers to implementation and is controlled by human. Hence, to control cost, it is necessary to formulate responsibility center of each center, seek causes of deviation and resolve them. Classifications of cost for cost control are as follows:

4.1 Traceable cost is the cost clearly specified what it relates to.

4.2 Non-traceable cost is the cost that cannot be traced what it relates to. It is distributed to several centers such as quantity of production, area and number of professionals. The responsibility units are unable to control this cost. The administrator of unit center would only be responsible for traceable cost. Non-traceable cost would be the responsibility of other centers.

4.3 Controllable Costs

4.4 Non-controllable Costs

Managers classify Controllable Costs and Non-controllable Costs for considering the variance of Controllable Costs from projected budgeting.

4.5 Fixed costs are unchangeable total costs no matter how activities levels or quantity of services are changed.

4.6 Variable costs are changeable cost that is variant to quantity of activities.

The classification of fixed costs and variable costs are considered on formulating time and certain scope. In long term, fixed costs may become variable cost such as selling unused instruments or reducing employees due to decrease of number of jobs.

5. Cost Classification for Planning

Planning is defined for operation in the future. In business sector, the main target of planning is incomes, expenses and profits. The assessment of these figures will help service providers to compare and forecast the matters more accurately. The estimation process and the analysis of income, expense and profit

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sharing is called budgeting. Budgeting plan may cover each unit's budget plan, and estimate debit-credit account and balance sheet.

Expense estimation will use fixed estimated costs or standard costs from analyzing actual cost in the past systematically by considering wages, material cost and other costs to get unit cost. When calculation is taken place, plus the number of produced or estimated service, the total expense shall be estimated.

6. Cost Classification for Alternative Decision Making

To make decision on non-routine job one needs to consider the following costs:

6.1 Differential Cost: If some costs are similar, managers can compare only some costs that are different.

6.2 Sunk Costs: Sunk Costs are cash outlays that have already been made (i.e. past outlays) and therefore have no effect on cash flows relevant to the current decision. The instrument that was already purchased is sunk cost. Depreciation of the instrument is still taken into consideration for the project.

6.3 Opportunity Costs are cash flow that could be realized from the best alternative use of owned asset. They therefore represent cash flow that will not be realized as a result of employing that asset in the proposed project.

Arthon Riewapiboon (2001: 3) mentioned that costs can be classified in term of activity types as the following:

1. Functions or activities
2. Resource inputs:
   2.1 Capital Costs
      - Capital goods: inputs that last for more than one year
      - Vehicles
      - Equipment (others with price of $100 or more)
      - Buildings
      - Training: occurred only once or rarely
      - Social mobilization: promotion and campaign occurred
   2.2 Operating cost:
      2.2.1 Labour cost

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2.2.2 Material cost

- Used up in the course of a year and are usually purchased regularly

- Personnel

- Supplies

- Operation/maintenance of vehicles, buildings, equipment, social mobilization

- Training: Short in service courses

3. Medical relationships

3.1 Medical costs

3.2 Non medical costs

4. Cost objective and cost product

4.1 Direct cost

4.2 Indirect costs

5. Payment characteristic

5.1 Tangible cost is actual costs plus opportunity cost.

5.2 Intangible cost is invaluable costs as price or amount of money. It is collected from subjective evaluation.

6. Produced relationships in short term

6.1 Fixed cost is unchangeable to quantity of production such as land, building, machine, etc.

6.2 Semi fixed cost

6.3 Variable cost is unchangeable to quantity of production such as labour cost, material cost etc.

As there are several concepts of cost classification, this research will use the method of input production classification as follows:

1. Total direct costs consist of:

1.1 Capital costs: Depreciation of equipment and buildings

1.2 Operating cost:

- Labour costs

- Material costs

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2. Indirect costs are the costs from related organizations.

The steps to calculate of activity - based Costing (ABC)

The above article is similar to Worasak Thummanon's (2004) that studied Activity base costing and wrote 7 steps of process as follows:

1. Identify the activity outputs of organization.

2. Analyze activity to identify the necessary of activity for output.

3. Identify cost drivers or activity output measure, which cost of product occurs.

4. Estimate cost and activity item by item using direct cost tracing and indirect cost allocation.

5. Define links between activities and outputs for subsequent assessment of activity / output ratios and analysis of activity output patterns.

6. Identify cost drivers, which are short and long term aim, and Critical Success Factor.

7. Administration and control activity, which has the effect to output including evaluate of efficiency and effectiveness activity

Sheri A. Martin mention 5 steps to Analyze cost of activity as follows:

1. Analyze Activities

The depth and detail of analysis will be determined by activity decomposition, since activity decomposition is complete when one common or homogeneous primary output per activity is reached

Step 1 Identifying and grouping cost center of hospital

Anuwat Supachutikul (1997: 12) states that the standards to determine cost are:

Clear responsibility: Some unit cost may not have clear structure but it should have clear responsibility such as office or staff to collect cost data from and should have clear output such as outpatient service, or social assurance patient service.

Having resource utilities data of cost unit clearly and the level cost is high enough. The resource utilities data of cost unit include a number

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of staffs, record of cost unit consumption etc. The more bodies are distributed, the higher the accuracy of calculated cost, Thus, collaboration of bodies, which are similar nature, and each of cost unit is not so high, will be easily calculated for example merging task of general executive into the same cost unit.

The result of cost center can be measured. This result can bring to calculate final unit cost or cost distribution. It shall be required by administrators and without making trouble in collecting data.

Step 2 The classification of cost centers of the hospital

Cost centers of hospital have to cooperate and support each other. The production of a cost center may be transferred to be the input of other cost centers. Then, cost centers are identified by responsibility and supports (Mehta & Maher, 1997: 8) as the following centers:

1.1 Non-Revenue Producing Cost Centers (NRPCC): It is supporting works of various departments in hospital with non-performing revenue such as general executive registration of medical activity and statistics, central supplies etc.

1.2 Revenue Producing Cost Centers (RPCC): It is a group of service providing to patients and revenue producing from those services for example the operating room, pharmacy division, clinical laboratory etc.

1.3 Direct Patient Services (PS): It is a group of outpatient and internal patient servicing activity.

In this research, cost centers are classified as follows:

1. Direct activities service: It is Administration and supportive treatment.

2. Indirect activities service: It is a group of internal patient servicing activity (Treatment, other service and health promotion and prevention).

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2. Gather Costs

In this step costs are gathered for the activity producing the products or services provided as the outcome. These costs can be salaries, expenditures for research.

This step emphasizes on defining labour cost, material cost, and capital cost of each cost center.

Labour cost

Labour is an important resource for service. It consists of 2 main types: direct service labour and indirect service labour.

Sukanya Kongsawat (1995: 10) said the labour cost should be analyzed and categorized as follows:

1. Time keeping: Collect working time of permanent and temporary staff that work in many centers for example a doctor can work in many functions such as examining inpatients, examining outpatients, examining child health, and managing the hospital. Collecting time of each staff can be conducted in many ways e.g. per week or per month etc.

2 To calculate and analyze whether each staff works directly or indirectly for the centers and which periods he/she does not.

3 The labour costs used for calculation are costs before deducting income tax at general payment workplace, including other deducted items.

Labour Cost in cost calculation means wages and hiring expenses in budgeted and supporting fund. The hiring payment can be made daily or hourly or per piece of product, whereas wages or salaries are paid monthly. In practice, permanent staff will be paid by budgeted money and supporting budget will pay temporary staff. Beyond wage and hiring, there is welfare e.g. vacation days, meals, sport, health care service, training, children assistance cost, education fee, and house rental expense.

Anuwat Supachutikul (1996: 200) mentioned that labour cost is staff expenses for their work (salary, hiring, over time payment, welfare that is paid in cash.)

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Arthon Rewpaiboon (2001: 16) said that labour cost is all the benefits of the workers received from the organization such as daily or monthly payment, over time, training, special bonus, health care cost, house rental, and children assistance cost. When all labour cost of each person is totaled, the cost of each person will be defined as cost center. If one person worked for more than one center, the cost distribution will be considered. The popular method is that each person has to estimate the proportion of hours each staff works for each cost center and calculate labour cost by using that proportion. Then, all labour costs are summed up in each cost center.

The meaning of labour cost in this research is all expenses and fringe benefits paid for staff. It was only wages because the private clinic no other welfare and the hourly payment.

Material Costs

The material cost is the main factor for providing medical care services to patients because it has rather high value.

Sukanya Kongsawat (1995: 11) classified the materials as:
Direct material is the material that is used for health care service such as medicines, drugs, equipment, food, and family planning materials.
Indirect material is the material used to support the health care service such as stationeries, facilities, and fuel.

Anuwat Supachutikul (1997: 22) said that material cost means all kinds of consumed supplies that each unit cost drew from discharging section during the term of study (Major discharging section of hospital were such as pharmacy section and materials center), including maintenance, repair and utility expenses. In accounting concept, durable articles with low cost (less than 1,000 baht), were implied as material cost. Therefore, accounting principles shall be used as basis in hospital cost analysis. Anyhow, one should be careful not to mix-up between material cost and capital cost. For any costs that are considered material costs, depreciation will not be taken into account though that particular items are used for more that one year.

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Some public health service project/plan receives the materials from government center whereas the operation workers never know that detail. If the organization does not take all costs into account, the cost will appear to be lower than the reality. Then, the organization needs to find the cost of those materials including transportation cost and depreciation cost during transfer and use such as vaccines, and family planning materials.

Material costs are calculated as the purchased price shown in the list of price items. In case the purchased prices are not shown, the market price will be used in the calculation.

Kanjana Tisayaticom, Walaiporn Patchara and Wiroj Tancharernsatien (2001: 8) stated that material costs are wasted materials such as office supplies, household materials, medicines, science materials, fuel, utilities, maintenance, and medical equipment.

Material costs of the hospital consist of 3 main material costs:

1. Materials obtained from distribution center such as office supplies, construction and maintenance materials.
2. Medicines and medical equipment from pharmacy section such as medical science equipment of X-ray section and lab section.
3. Utilities such as electricity, water, post, telephone, and fax including the materials that the cost center uses directly and does not share with other centers such as family planning materials, dental materials, medical science equipment for lab section and X-ray section.

The meaning of material cost of this research is all material costs of each activities service obtained from the administration, the treatment, health promotion and prevention, the supportive treatment are the main cost allocation activities to distribute cost of all material cost to other section of clinic A such as household materials, construction equipment, computer hardware, medical science materials, medicines and medical equipment, family planning materials, vaccines, utilities, and other expenses such as rent.

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Capital Cost

Anuwat Supachutikul (1997: 45) said that the capital cost refers to the annual depreciation cost of durable articles for housing structures including the expense for training affecting in the long term and not frequently occur.

Capital costs consist of:

1. Land cost
2. Equipment cost and construction cost that is calculated from its depreciation. (Sukanya Kongsawat, 1995: 17)

Depreciation Cost

Jinda Khanthong (Mor.Por.Por.104) mentions that the depreciation cost means the division of immovable property cost that have the limited durable work age for expense of each installment utilized by that property, or caused revenue through the term of property consumption such as equipment, buildings, machines etc. In another meaning, the depreciation cost means the value of reduced property or devaluated even though its marketing price may be higher and rise.

Berman and Weeks (1984: 89) referred that the depreciation cost of houses, structures and durable articles involve three items as follows:

The useful life of assets to be calculated

1. Salvage or residual value
2. The method of depreciation.

1. The useful life of assets to be calculated

There are many studies of hospital cost and the researches about the expenses that determine the useful life as the followings:

Viroj Tangchareinstein, et al. (1988: 71) has determined the useful life by referring to the Office of Budget. The Office of Budget determines 5 and 20 years as useful lives of articles and buildings respectively.

Suwit Wiboonponprasert (1989: 18) has determined the useful life by referring to the American Hospital Association (1988) that consider 5 years as useful life of durable articles and 20 years for buildings.

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Kanchana Ditsayathikom et al. (1999: 8) stated that the useful life of equipment in Thailand has been collected but has not been widely published. At present, the American Hospital Association (1988) is popular to be referred to. Mostly, Thai community hospitals use 5 years as useful life of equipment on average and 20 years on average for buildings.

In this research capital cost is depreciation cost of buildings and durable goods:

1. All durable goods have 5 years useful life (include vehicles).
2. Buildings have 20 years useful life.
3. Buildings that use the land with other centers need to calculate the usage area of each center for identifying depreciation cost of centers.

Land is not taken into account of the capital cost because the evaluated price of land or rental cost has different price based on the market price, that lead some difficulty to make a comparison.

2. Salvage or residual value

In this research, the salvage values of buildings and durable articles are determined to be 1 baht after their useful lives.

3. The method of depreciation calculation

Sukanya Kongsawat (1995: 21-24) gave 6 examples of depreciation calculation methods:

1. Straight-Line Method: It is the simplest and the most widely used method. It results in an equal amount of depreciation allocated to each year of the asset whose services are expected to be uniformly consumed. The formula for calculation of annual depreciation under the straight-line method is:

$$\text{Depreciation cost in a year} = \frac{\text{Capital cost} - \text{Salvage cost}}{\text{Useful life (years)}}$$

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2. Diminishing or declining or reducing balance method: That is to deduct as the percentage determination of remaining money of asset's price that are transferred from the beginning of that year (after deducting last year depreciation).

The important point of method is to calculate as the percentage. The formula for the calculation the percentage is:

$$r = 1-\sqrt[n]{S/C}$$

Whereas:

S = Salvage value or the amount of money earned after selling the asset at the end of useful life

C = Cost of an asset

n = The number of years the asset is used.

r = Rate of depreciation

3. Service Hour Method calculates the depreciation by assuming the cost of the asset equals to the cost of the direct purchased services. That means if the center does not buy that asset, it has to hire other organization to provide the services. Then, the depreciation cost is calculated as hours of the asset used. The formula is:

$$\text{Depreciation cost (per hours)} = \frac{\text{Capital cost} - \text{Salvage cost}}{\text{Useful Life (hours)}}$$

4. Units-of-Production Method: In this method, a fixed amount of depreciation is assigned to each unit of output, or service, produced by the plant asset. Depreciation cost is divided by useful life, in units of production, to determine this amount. This per-unit depreciation expense is then multiplied by the number of units produced each period to compute depreciation for the period.

The formula is:

$$\text{Depreciation cost (per one product)} = \frac{\text{Capital cost} - \text{Salvage cost}}{\text{Useful life, in units of production}}$$

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5. Sum of the years' digits method is the depreciation cost calculation method that uses the number of years of the asset as the main idea. Depreciation of first year is higher than the following years.

6. Revaluation method: In this method, depreciation is calculated at the end of each accounting cycle. The estimated value of the asset purchased at the present time minus that of last year is depreciation. If the new price of the asset is more than the occurred price in the account, which means the profits of that asset are added in profit and loss account. This method is always used with the asset that cannot be calculated with other methods such as transportation, animals, container, instrument, trademark, and copyright.

Arthon Riewpaiboon (2001: 5) stated that buildings and equipment have the limited useful life. They gradually deteriorate. The method that the Section of Public Health uses is straight-line method or average annual cost as the formula showing below:

$$\text{Average Annual Cost} = \frac{\text{Cost of Purchase}}{\text{Useful life}}$$

The working life can be referred from the decree vol. no. 145, 1984 and vol. no. 359, 1999.

In this research, the straight line method has been used by the researcher in calculating the depreciation value. This method is the easiest, most convenient, accurate and reliable methodology. The formula is:

$$\text{Depreciation cost in a year} = \frac{\text{Capital cost} - \text{Salvage cost}}{\text{Useful life (years)}}$$

3. Trace Costs to Activities

Results of analyzing activities and the gathered organizational inputs and costs are brought together, which produces the total input cost for each activity machinery, office furniture, etc.

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Total Direct Costs = Labour Costs + Material Costs +
Capital Costs

4. Establish Output Measures

Activity unit cost is calculated by dividing the total input cost, including assigned costs from secondary activities, by the primary activity output volume. From this, a bill of activities can then be calculated which contains or lists a set of activities and the amount of each activity consumed. The amount of each activity consumed is extended by the activity unit cost and is added up as a total cost for the bill of activity.

5. Analyze Costs

The calculated activity unit costs and bills of activity are used to identify candidates for improving the business processes.

Renu Sukkharom and Kanongyut Kanchanakun, (1987: 68) gave the meaning of the Unit Cost or Average Cost that it is the analysis of occurred expenses of a service center when it produces one service product. For the unit cost analysis “unit” was various measurements, which depends upon the studied objective. Whereas, in the analysis of the hospital’s cost it is found that unit cost analyzed on cost per clients in each section or type of disease such as how much one outpatient’s cost is, or how much the appendix surgery of one patient is.

Kanongyut Kanchanakun, (1996: 311) Unit cost or average cost means the average of all cost per product or 1 unit of health service such as number of visits, admitted days, and number of patients. In the calculation, all costs are divided by the number of activities of the patients. For indirect responsibility of health care service center or non-revenue center, its average cost means the average of total costs divided by the number of its output.

Arthon Rewpaiboon (2001: 2) Unit cost means the cost of one product. To calculate this, total costs are divided by the number of all products.

This research assumes unit cost as the comparison of the quantity of resources that used for the output. When we get full cost of indirect cost service, and then divide it by the number of service units, a cost unit will be obtained:

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$$\text{Unit Cost} = \frac{\text{Full cost}}{\text{Number of services}}$$

Consequently, the unit cost of patient services is calculated as the following:

$$\text{Unit cost of Treatment} = \frac{\text{Full cost of treatment}}{\text{The number of visits of treatment}}$$

$$\text{Unit cost of health promotion and prevention} = \frac{\text{Full cost of health promotion and prevention}}{\text{The number of visits of health promotion and prevention}}$$

$$\text{Unit cost of other service} = \frac{\text{Full cost of other service}}{\text{The number of visits of other service}}$$

4. Previous study on cost analysis

From literature review, there were not unit cost of private clinic. It was conducted prior to the study, to provide background for the study and guide the selection of research methodology, and data collection techniques. So the literature reviewed in this studies referred to unit cost in primary health care instead. The operating form was similar to private clinic. Then the researcher selected the literature from Journals and electronic databases, using term: health center, unit cost analysis, primary health care etc. Detail of previous study on cost analysis are as follows:

Kongsawat, S. (1999: abstract) studied the unit cost of health care settings under the health system reform project of Ministry of public health in 5 provinces during the fiscal year 1997. (Presented in Table 2)

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Palakorn Parkpoom (2000: abstract) studied unit cost analysis of health centers in Amphur Muang Kamphengphet province for fiscal year 1998. (Presented in Table 2)

Pkawadee Laoukriattinun (2000: abstract) studied unit cost analyzed per activity of health centers in Bangsaotong sub-district, Samutprakan province for the fiscal year 1998. (Presented to Table 2)

Sangdeun Deepiew studied unit cost analysis of health centers in Muang district, Lopburi Province for fiscal year 2000. (Presented in Table 2)

Ausanee Suknit (2003: abstract) studied unit cost analysis of health center in Muangdistrict, Surin province for fiscal year 2001(Presented in Table 2)

Sok Kong studied (2003: abstract) studied unit cost analysis of health centers in Wathsuwan health center Nakhonpathom province, Thailand, for fiscal year 2002. (Presented in Table 2)

Costs in all studies were allocated by using direct distribution method. For the result of most researches in the beginning of the study, the proportion between labour cost and material costs was different. The labour cost was higher. Later in 2000 to present, it was found that the material costs are higher than labour and capital costs.

In the mean time, the proportion of labour cost decreased. The total cost depend on labour cost and material costs more than capital cost (27.70-55.00 %, 33.45-52.89% and 5-35.08%, respectively). It shows that there might be the missing of material resource management in development and maintaining of material resource efficiency. Furthermore, the process of curing and using material was important. The potential strategy is that controlling the cost of the hospital becomes nearer to the reality of work in the hospital.

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Table 3 Review literatures

Author (FY)	Treatment	Maternal and child health care	FP	Immunization	Dental health care	Total cost		
						LC	MC	CC
Yimyam, P (1998)								
- Big health centers	73.00	938.00	110	105		44.02	27.60	28.38
- General health center	89.00	737.00	108	95	-	47.67	17.25	35.08
Kongsawat, S (1999)	66.00	225.00	109.00	99.00	-	55.00	39.00	5.00
Parkpoom, P (2000)								
- Big health center	66.00	76.00	54.00	116.00	-	46.67	34.18	18.85
- General health center	62.00	102.00	61.00	124.00	-	52.98	33.45	13.56
Laoukriattinun,P(2000)	149.83	228.97	101.97	69.79	97.41	33.55	51.15	15.3
Deepiew, S (2000)	72.00	116.00	95.00	92.00	271.00	27.70	52.89	19.40
Suknit, A(2001)								
- Big health center	62.00	208.00	172.00	151.00	222.00	32.51	35.01	32.48
- General health center	59.00	142.00	148.00	149.00	184.00	42.15	41.61	16.24
Sok Kong (2002)	107.85	-	-	-	-	3.08	1	1.46

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CHAPTER 3
MATERIALS AND METHODS

Research Design

This research was a cross-sectional descriptive study to analyze unit cost of primary health care service in a selective contracting private clinic under National health insurance scheme in Bangkok. The data were prospectively collected from record forms. This study took place between April 2004 - June 2004.

The Study Place

The research was conducted at the clinic A, which was collaboration and had the criteria followed the Health System Reform Office. The location was easy for the communication, and the catchment area was not so crowded.

Population

The studied population were 5 activity services under clinic A as follows:

1. Health promotion and prevention
2. Treatment
3. Others (dental and referral)
4. Administration
5. Supportive treatment

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Research Tools

The researcher created the following forms to collected data based on documents, theories, and related researches, and was adjusted to suit the studied area. Record forms are comprised of 2 parts as follows:

Part 1 General record form is comprised of:

Record form code Gen-1: General record of the clinic A

Record form code Gen-2: Performance record of the clinic A

Part 2 Total Direct Cost Record Form is composed of:

Record Form code LC-1: Labour cost record

Record Form code MC-1: Material cost record (for medicine)

Record Form code MC-2: Material cost (Public utility cost)

Record Form code MC-3: Material cost (Rent)

Record Form code MC-4: Area in the clinic A

Record Form code CC-1: Capital cost for durable good

Microcomputer

Using computer program to compile, calculate, analyze and present the data

Data Collection

1. Preparation

A letter from the Head of the Public Health Administration Department, the form of Public Health Administration, Mahidol University was requested and sent to the chairman of Ob-Aun clinic project, requesting for the cooperation of clinic A and to contact its administration for data collecting.

2. Implementation

The studied period was between 1 April 2004 - 31 June 2004, it was a descriptive research and focused on the activities based costing of the clinic A.

The study procedure consisted of 6 steps as the following approach:

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Step 1 study organization structure and administrative system

The collected data in this study were as follows:

1) Primary data

Data collected by a self-administered questionnaire, interviews and observes from staff of clinic.

2) Secondary data

The research tools were to collect data of the materials, equipment, rent, vaccines, drugs, furniture, and supplies by document record of clinic and requested some data about clients from the Office of Health Reform System, which were collected by staff of clinic and sent to the chairman of "Ob-Aun clinic" project.

The researcher surveyed the general information such as the general operating systems, administration, and information technology for record performance data. Furthermore, the researcher observed the whole process activity and output of the clinic A. The detail of data was recorded in record form code GEN1.

Table 4 Sources of data collection.

Descriptions	Staff of clinic	Researcher	National health care insurance
Primary data (self-administered questionnaires)			
Staff's working time spent at clinic A		X	
Secondary data (Financial records)			
Capital cost – Equipment	X		
Capital cost – Furniture	X		
Labour cost – wage	X		
Material cost – Medical supplies and drug Material cost-rent	X		X
Total cost of drug cost per month	X		
No. Patient visit at clinic A	X		X

Source: Clinic A, 2004

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Table 5 The type of data allocated according to the source of information.

Source	Type of Data
1. Inventory list	**Capital cost** 1. Equipment of which the price is equal or more than US$100 2. Furniture of which the price is equal or more than US$100 **Recurrent cost** 3. Medical equipment of which the price is less than US$.100 4. Office supplies of which the price?
2. Drug consumption list	**Recurrent cost in the line of Operating cost** 1. Drug costs 2. Medical supplies costs
3. Salary record	**Recurrent cost in the line of Labour cost** Salary of health personnel and all fringe benefits
4. Reimbursement record for treatment record	**Recurrent cost** Visit of client
5. Reimbursement record for health promotion and prevention record	**Recurrent cost** Visit of client
6. Absent record	Working time of health personnel per annum
7. Geographic data of clinic A Report (census)	Visit of client
Source	Type of Data
8. Client record	Number of visits at clinic A
9. Expenditure financial record	Recurrent cost in the line of Operating cost 1. Office supplies 2. Utilities, telephone charge, electricity fee, water supply fee, and rent

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The figure 3 shows the calculation of the unit cost and total cost. The three principles: activity analysis, activity costing, and performance measures were applied as follows:

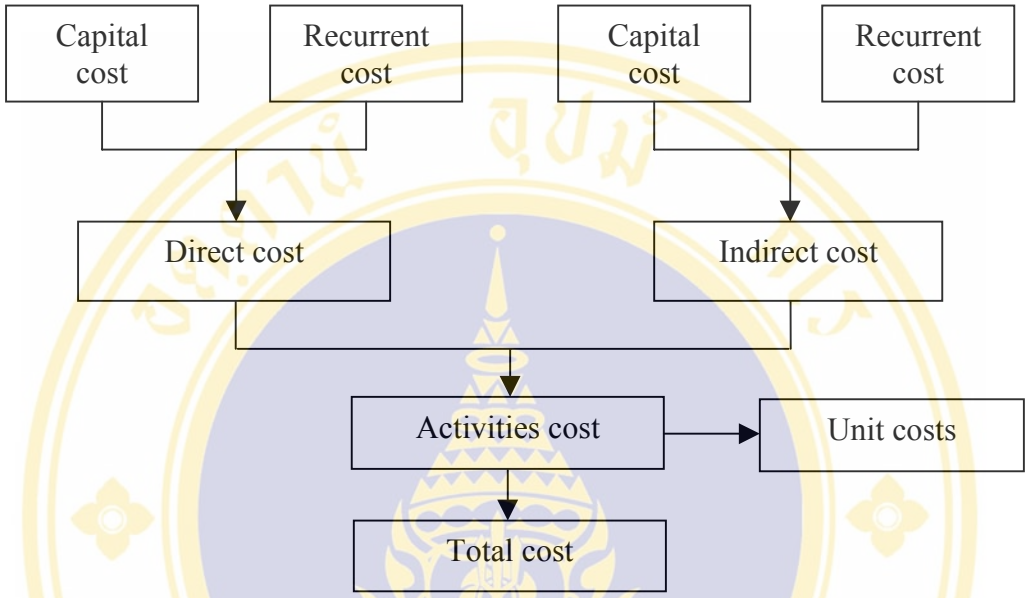

Figure 4 The structure of calculation of unit cost and total cost.

In the ABC system, activity centers have been determined and the direct costs have been assigned to the activity centers.

Step 2 Define activities

The researcher defined the activities. Therefore, the whole activities of the clinic A were defined to 5 main activities, of which 3 direct cost activities were 1) health promotion and prevention, 2) treatment, and 3) other activities, and 2 indirect cost activities were 1) administration, and 2) supportive activities. The detail of data was recorded in the record form code GEN-2.

Step 3 Identify resources into cost type

After having defined activities, the next step was to calculate the activity cost by allocating expenses including:

1. General ledger to each responsible center.

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2. Responsible centers to each activity.
3. Activities to products.

In this step costs were gathered for the activity producing the products or services provided as the output costing.

The capital cost and recurrent cost by activities were calculated first and then the total cost was calculated by activities.

Capital Costs

Capital costs was calculated from the equipment and furniture line items that had life span of more than one year and costed US$100 or more. In this study, the life span of those materials were determined as follows: Equipment and Furniture were categorized by observation depends on type and use. The life span used was 5 years.

The steps of collection data were as follows:

1. The researcher obtained the data from documents that were taken by the staff of clinic.
2. Calculated depreciation, in this study the life span of the equipment was determined as follows:

2.1 Furniture and equipment were categorized by observation depends on type and use. Additional information was obtained from interviewing and observing the persons who used the equipment. For some equipment that the cost was shared, the cost was allocated by using proportion in each activity. The life span used was 5 years (details of data record in record form code CC-1).

The depreciation costs of durable good were calculated by straight-line method, taking equal amounts in each year of useful life.

$$\text{Depreciation cost in a year} = \frac{\text{Capital cost}}{\text{Useful life (years)}}$$

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Recurrent Cost

Recurrent cost is the cost for running the health care activities during a year. The line items under recurrent cost of this study are labour cost and operating cost.

Labour Costs

Labour cost was the most significant expense of the clinic. The collected steps were as follows:

1. The researcher collected all expenses of the labour cost that was wage (wage/hour) only. The wage of the doctor and the nurse was wage per hour. While the cleaning personnel's wage was salary.
2. Change the wage (per hour) to wage per month by calculating and analyzing the working time of staff: How long they consumed the time for both direct and indirect costs (calculated by sharing the cost according to the proportion of working time in the respective activity).
3. Collect sum of the direct and indirect labour costs.

3.1 The detail of data record in record form code LC-1 (Labour cost and weight of time spent by activity) was calculated as the Labour cost recorded in record form code LC-2 (Proportion of work of respective staff according to the main activities and labour cost calculation).

3.2 After that, the labour cost of the respective staff needs to be calculated by sharing the cost according to the proportion of work in the respective activity

Operating Cost

Operating costs consist of office supplies, electricity fee, water fee, telephone charge, maintenance and repair for the equipment or furniture of which the price is less than US$100.

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Medical supplies consisted of rent, utility, drugs, vaccines, medical consumables, medical equipment where the price was less than US$100. This line item was found from the drug consumption list and expenditure record. The medical supplies in stock were not included in the list of calculation. Material cost was collected from the report of clinic, of which receipts were not available. Those were drug price, public utilities cost, rent, and vaccination cost and rent of building. The steps of collection data were as follows:

Material cost collection

Medication

1. Collect the quantity of drug and vaccination in the period of study.
2. The researcher searches the standard prices of medicines.
3. Take the standard prices of medicines and the quantity of drugs
4. After that the researcher got the total price of medicines (the medicines which were used in various activities must be allocated followed proportion of clients in each activities). The detail of data was recorded in record form code MC-1.

Public Utilities Collection

Public utility costs were collected from report of clinic, which was told by administrator and there was not receipt available. Next, sum up the public utilities and average to become the expense per month. The detail of data was recorded in record form code MC-2.

Rent of Building

1. The information of rent was told by the staff.

2. The researcher measured the area and divided the area according to useful purpose. It was divided into 5 zones as follows:

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Zone 1: register and check a compliance, record weigh and height, record vital signs, wait doctor, expend the medicines and payment

Zone 2: investigate, body check up, advice

Zone 3: dressing, vaccination, laboratory, minor treatment

Zone 4: restroom

Zone 5: a waiting room

The detail of data were recorded in record form MC-3

Table 6 Component of cost and criteria on cost allocation

Input	Dimension determining cost
Capital cost	
- Furniture	Proportion usage for each activity
Material cost	
- Material	Real amount of usage for each activity
- Rent	Real payment of building for clinic in each month
Labour cost	
- Labour payment	Proportion of usage time in each activity
1. Doctor	Working Time
2. Nursing staff	Working Time
3. Cleaning personnel	Working Time

Step 4 summing the cost for all activities for each item

1. Sum the total direct cost was LC+MC+CC
2. Sum the total indirect cost was LC+MC+CC
3. Allocated the total indirect cost to direct activities which was given direct client service, following the criteria in each activities

Step 5 total cost analysis

The total cost = Sum of the total direct cost + the total indirect cost

The total cost = Capital cost + Recurrent cost

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Step 6 average cost calculation

This was a kind of unit financial costs and it is expressed in terms of financial outlays. The purpose of this calculation was to find out the cost per capita in the catchment area. The basic calculation of unit cost was presented as

$$Average\cos t = \frac{Total\ \cos t}{Quantity}, or \frac{TC}{Q}$$

TC = Total cost

Q = Quantity (The total number of clients in each activity in this study

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CHAPTER 4
RESULTS

This study analyzed the unit costs of a private clinic under national health insurance scheme in Bangkok during the fiscal year 2004 (between 1 April – 30 June). The objective of this study was to find out unit costs of the following components of cost, which were capital, labour and material costs.

The results of study are presented into in five parts as follows:

Part 1 General information of the clinic A

1.1 Demographic data of the clients by number and percentage

1.2 Demographic data of the caregivers by number

Part 2 Data of costs in the clinic A

Part 1 General information of the clinic A

1.1 Demographic data of the clients by number and percentage

Clinic A was established in 1999. It was a private clinic, administered by clinic network under national health insurance scheme and under “Ob-Aun clinic” project. The total operating area was approximately 76.74 square meters. The operation functions were divided into three main functions: 1) management function, 2) service function, and 3) nursing function. The services were divided into 5 activities: 1) treatment, 2) health prevention and promotion, 3) other services (dental and referral), 4) administration, and 5) supportive service. Two emphasized activities at the clinic were treatment, and health prevention and promotion. It was providing its services on part-time basis (on Monday to Friday from 6.45 to 11.00 and 16.30 to 21.00, on Sunday from 7.45 to 21.00). Services provided were general services and it was located at the community area.

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At the present time, the clinic had serviced about 2,754 clients who were registered under the national health insurance scheme (From the census on 31 December 2003). In the time of study, there were 5,271 visits of outpatients, the average was 66 visits per day.

Table 7 shows characteristic data of the clients: Overall, 38.92 % were male and 61.08 % were female. 44.05 percent of the subjects were 0-15 years of age. Most of the subjects (56.57 %) have had healthcare right under Thirty Baht Universal Health Care Coverage Scheme.

Table 7 Characteristic data of the clients by number and percentage.

Characteristics	N	Percentage
Sex (Only UC group)		
Male	1,115	38.92
Female	1,750	61.08
Total	2,865	100
Age group (Years) (Only UC group)		
0-15	1,232	44.05
16-45	701	25.06
46-60	483	17.27
> 60	379	13.55
Total	2,795	100
Remedy right		
UC	2,982	56.57
SSS	1,272	24.13
Self-payment	1,017	19.29
Total	5,271	100

* SSS: Social Security Scheme

* UC: Thirty Baht Universal Health Care Coverage Scheme

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Table 8 showed the data of age group and the gender which found that 0-15-year-old age group was the majority of clients and over 60-year-old age group was the minority of clients (44.05% and 13.55%, respectively).

When considering the relationship between age and gender, the female were served at the clinic more than the male in every age group.

Table 8 The detail of clients distributed by age group and sex.

Age group (Years)	Sex		Total	%
	Male	Female		
0-15	552	680	1,232	44.05
16-45	152	549	701	25.06
46-60	139	344	483	17.27
> 60	115	264	379	13.55
Total	958	1,837	2,795	100

1.2 Characteristic data of the staff by number

Total number of staff at clinic A was 15, consisting of 5 doctors, 9 nurses and 1 cleaning person. Details were as show in table 9.

Table 9 Staffs in the fiscal year 2004, clinic A.

Type of staff	Number of staffs (N=15)
Doctors	5
Nurses	9
Cleaning person	1

When considering Table 10, the researcher compared the actual data (actual client service) with record data (the data which was recorded by the clinic and sent to the national health care reform), it was found that 42.82 percent of the record

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of diseases or symptoms was not complete, and 3.92 percent of the other data (sex, age and name of clients) was not complete.

Table 10 The record data form of Ob-Aun clinic project concluded the result as follows:

Item	Actual data (Visits)	Number of records (Visits)	No record (Visits)	Percentage of no record
Amount of client	2,982	2,865	117	3.92
Sex	2,865	2,861	4	0.14
Age	2,865	2,795	70	2.44
Diseases/Symptoms	2,865	1,638	1,227	42.82

From the table 11, in the period of study, it can be seen that the majority of the clients came to the clinic only one time (31.97 percent). After reviewing the data, the number of clients coming back to the clinic, 1-3 visits was 78.13 %, while 17-36 visits was only 0.78-1.67 %.

Table 11 The number of clients coming back to clinic A in 3-month cycle.

Returning Visits to clinic (Visits)	Visits/cycle	Number of visits	Percentage
1	694	694	31.97
2	258	516	23.77
3	162	486	22.39
4	92	368	16.95
5	34	170	7.83
6	24	144	6.63
7	26	182	8.38
8	8	64	2.94
9	5	45	2.07

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Table 11 The number of clients coming back to clinic A in 3-month cycle. (Cont.).

Returning Visits to clinic (Visits)	Visits/cycle	Number of visits	Percentage
10	8	80	3.68
11	1	22	1.01
12	1	12	0.55
17	1	17	0.78
29	1	29	1.34
36	1	34	1.67
Total		2,865	100

From table 12, it can be summarized that in total 1,638 visits of clients, URI was the majority of the clients (32.35%), followed by dressing (11.27%), and chronic diseases (hypertension and diabetic mellitus) 9.74% and 8.15% respectively. The other was not much different.

Table 12 Top-ten diseases or symptoms in the order of clients that caused the clients coming back to clinic A.

Disease or symptom	Number of Visits	Percent (%)
Upper respiratory tract infection	528	32.35
Dressing	184	11.27
Hypertension	159	9.74
Diabetic Mellitus	133	8.15
Vaccination	115	7.05
Pain	84	5.15
Refer	57	3.49
Antenatal Nursing Care (ANC)	56	3.43
Rach	45	2.76
Diarrhea/Nausea vomiting	42	2.57
Record data	**1,638**	**57.18**
No data	**1,227**	**42.82**
Total	**2,865**	**100.00**

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According to Table 13, the treatment was the service, which the clients selected to use most (81.75%). The next was health promotion and prevention (14.04%), and the least was the others (4.22%).

Table 13 Visits and percentage of clients classified by activity.

Activities	Number of visits	Percentage (%)
PP*	230	14.04
Treatment	1,339	81.75
Other	69	4.22
Total	1,638	100.00
No record	1,227	42.83

* PP = health promotion and prevention

Part 2 Data of costs in the clinic A

Labour Cost

From the study, it was found that total labour cost was 316,620.00 baht. Treatment section accounted for the highest value at 218,233.41 baht (65.81 percent) of all labour costs. The second highest was administration at 41,040.00 baht (12.38 percent), and the lowest was the other services at 11,238.69 baht (3.39 percent). Details were as shown in Table 14.

Total labour cost classified by staff is shown in Table 14. It was found that doctor fee was accounted for the highest at 218,400.00 baht (65.86 percent) of total labour cost. The second highest was the nurse, 90,720.00 baht (27.36 percent), and the cost for cleaning lady was the lowest at 22,500.00 baht (6.78 percent).

Labour cost of groups of the activity was shown in Table 15. It was found that the highest cost was accounted in the direct activity service at 266,952.19

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baht (80.50 percent) of total labour costs. The second was the indirect activity service at 64,667.81 baht (19.50 percent).

Table 14 Staffs of clinic A in the fiscal year 2004.

Activity	Labour cost (baht)			Total	Percentage
	Doctor	Nurse	Cleaning personnel		
Treatment	147,640.50	70,190.55	402.36	218,233.41	65.81
Health promotion	25,356.24	12,054.74	69.10	37,480.09	11.30
Other	7,603.26	3,614.71	20.72	11,238.69	3.39
Administration	37,800.00	3,240.00	0.00	41,040.00	12.38
Supportive service	0.00	1,620.00	22,007.81	23,627.81	7.12
Total	218,400.00	90,720.00	22,500.00	331,620.00	100.00
Percentage	65.86	27.36	6.78	100.00	
Total LC staff		331,620.00			

Table 15 Labour costs of each group of the activity in the fiscal year 2004 at clinic A.

Groups of activity	Labour cost (wage)	
	Baht	Percentage
Indirect activity service - Administration - Supportive service	64,667.81	19.50
Direct activity service - Treatment - P&P - Others	266,952.19	80.50
Total	331,620.00	100.00

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Material Costs

When considering material costs of each activity it was indicated that the cost of the treatment was the highest or equal to 352,589.51 baht (86.95 percent) of total material costs. Among the material cost, the highest cost was accounted on medicine cost (318,759.41 baht). The second highest material cost was found to be the health promotion and prevention 42,561.81 baht (10.50 percent). Most of the material cost found in this section was spent on medicines (31,363.50 baht). The supportive service was the lowest on material cost or only 1,000.00 baht.

Material cost of groups of the activity is shown in Table 16. It was found that the direct activity service was accounted for the highest cost or equal to 398,510.81 baht (98.27 percent of total material costs). The second highest cost was the indirect activity service or accounted at 7,000 baht (1.73 percent). Details were as shown in Table 16.

Table 16 Material costs of groups of the cost center at clinic A in the fiscal year 2004.

Group of activity	Material cost	
	Baht	Percentage
Indirect activity service		
Administration	6,000.00	
Supportive treatment	1,000.00	
Total (1)	7,000.00	1.73
Direct activity service		
Treatment	352,589.51	
Health promotion and prevention	42,561.81	
Other service	3,359.49	
Total (2)	398,510.81	98.27
Total (1+2)	405,510.81	100.00

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Table 17 The material costs were classified by types of materials. Details of the material cost indicated that the highest cost was spent on drugs, which was equal to 318,759.41baht (78.61 percent of total material costs). The second highest was the cost spent on materials from rent, 60,000 baht (14.80 percent), and other material was the lowest materiel cost at 7,000 baht (1.73 percent).

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Table 17 Material costs of each activity in the fiscal year 2004, clinic A.

Activity	Drug	Rent	Utility	Other	Total	%
Treatment	287,395.90	49,047.62	16,145.99	-	352,589.51	86.95
P&P	31,363.50	8,424.91	2,773.40	-	42,561.81	10.50
Other	0	2,527.47	832.02	-	3,359.49	0.83
Administration	0			6,000.00	6,000.00	1.48
Supportive service	0			1,000.00	1,000.00	0.25
Amount	318,759.41	60,000.00	19,751.40	7,000.00	405,510.81	100.00
%	78.61	14.80	4.87	1.73	100.00	

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Capital Costs

The capital costs of each activity indicated that the treatment was accounted for the highest cost or equal to 62844.94 baht (84.93 percent of total capital costs). The second highest was health promotion and prevention or accounted at 8,794.10 baht (11.88 percent), while the lowest cost was found in the other service or equal to 2,360.97 baht (3.19 percent). Details were as shown in Table 18.

Table 18 Capital costs of each activity at clinic A in the fiscal year 2004.

Activity	Depreciation of Durable Goods (baht)	%
Treatment	62,844.94	84.93
P&P	8,794.10	11.88
Other	2,360.97	3.19
Administration	-	-
Supportive service	-	-
Total	74,000.00	100

Capital cost of groups of the activity indicated that direct activity cost were accounted for the highest cost or equal to 74,000 baht (100.00 percent of total capital costs). Details are as shown in Table 19.

Table 20 represents the capital cost classified by types. It is indicated that capital cost was spent on durable goods or equal to 74,000.00 baht (100.00 percent).

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Table 19 Capital costs of groups of activity at clinic A in the fiscal year 2004.

Groups of activity	Capital cost	
	Baht	Percentage
Indirect activity service		
- Administration	-	-
- Supportive service		
Total (1)	-	-
Direct activity service		
- Treatment	62,844.94	
- P&P	8,794.10	100.00
- Other	2,360.97	
Total (2)	74,000	100.00

Table 20 Capital costs classified by types at clinic A in the fiscal year 2004.

Types of Capital cost	Capital costs	
	Baht	Percentage
Buildings	-	-
Durable Goods	74,000.00	100.00
Total	74,000.00	100.00

Total direct costs of clinic

Total direct costs of clinic A in the fiscal year 2004 were equal to 739,462.99 baht. It was comprised of labour cost, material cost and capital cost. The material cost accounted for the highest cost at 398,510.81 baht (49.07 percent of total direct costs), followed by the labour costs at 266,952.19 baht (39.89 percent). The capital cost accounted for the lowest direct cost at 74,000.00 baht (11.04 percent). Details are as shown in Table 21.

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Labour costs: The labour costs were allocated into 3 activities. The treatment section accounted for the highest labour cost at 218,233.41 baht (81.75 percent of total labour costs), followed by the health promotion and prevention at 37,480.09 baht (14.04 percent), and the others accounted as the lowest at 11,238.19 baht (4.21 percent).

Material costs: The material costs were allocated into 3 activities. The material cost spent on the treatment activity was the highest at 352,589.51 baht (88.48 percent of total material costs). The health promotion and prevention cost was 42561.81 baht (10.68 percent), while the other activity was 3,359.49 baht (0.84 percent).

Capital costs: The capital cost were allocated into 3 activities, The treatment activity accounted for the highest capital cost at 62,844.94 baht (85.69 percent of total capital costs). The health promotion and prevention was 8,794.10 baht (11.88 percent), while the other activity was the lowest capital cost at 2,360.97 baht (3.19 percent).

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Table 21 Labour costs, material costs, capital costs and total direct cost of each activity in the fiscal year 2004, clinic A

Activity	Labor cost		Material cost		Capital cost		Total direct cost	
	Baht	%	Baht	%	Baht	%	Baht	%
Treatment	218,233.41	81.75	352,589.51	88.48	62,844.94	84.93	633,667.86	85.69
P&P	37,480.09	14.04	42,561.81	10.68	8,794.10	11.88	88,835.99	12.01
Other	11,238.69	4.21	3,359.49	0.84	2,360.97	3.19	16,959.15	2.29
Total	266,952.19	100.00	398,510.81	100.00	74,000.00	100.00	739,462.99	100.00

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Total Direct and Indirect Costs of Clinic A

Total Direct Costs: The treatment activity accounted for the highest total direct cost at 633,667.86 baht (85.69 percent of total direct costs). The health promotion and prevention was 88,835.99 baht (12.01 percent), while the other activity was the lowest total direct cost at 16,959.15 baht (2.29 percent). Details are as shown in Table 22.

Table 22 Total direct costs of direct activity and indirect activity services at clinic A in the fiscal year 2004.

Activity	Total direct cost	
	Baht	**Percentage**
Direct activity service		
- Treatment	633,667.86	85.69
- P&P	88,835.99	12.01
- Other	16,959.15	2.29
Indirect activity service		
-Administration	-	-
-Supportive service	-	-
Total	739,462.99	100.00

Total Indirect Costs: Total indirect cost allocated from indirect activity services shown in Table 23 indicated that total indirect cost of clinic A in the fiscal year 2004 was 71,667.81 baht. The indirect cost of the administration accounted for the highest at 47,040.00 baht (65.64 percent of total indirect costs), and the supportive service cost was the lowest at 24,627.81 baht (34.36 percent).

The treatment received the highest allocated indirect cost from indirect activity service or 58,588.44 baht (81.75 percent), followed by the health promotion and prevention at 10,062.16 baht (14.04 percent), and the other activity received the lowest allocated indirect cost at 3,017.21 baht (4.21 percent).

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Table 23 Indirect cost allocated from indirect activity services.

Activity	Allocate		Indirect Cost	
	Baht	%	Baht	%
Treatment	58,588.44	81.75	58,588.44	81.75
P&P	10,062.16	14.04	10,062.16	14.04
Other	3,017.21	4.21	3,017.21	4.21
Administration	47,040.00*	65.64	47,040.00*	65.64
Supportive service	24,627.81*	34.36	24,627.81*	34.36
Total	71,667.81*	100.00	71,667.81*	100.00

* Allocate to client activity services

Full Costs

Full costs incurred from the activities were 811,130.81 baht. The highest cost was form the treatment, which was 692,256.30 baht (85.34 percent of the full costs). The full cost of the health promotion was 98,898.15 baht (12.19 percent), while the full cost incurred from the other services was the lowest or at 19,976.36 baht (2.46 percent). Details are as shown in Table 24.

Table 24 Full costs of activity services at Clinic A in the fiscal year 2004.

Activity	TDC		IDC		Full Cost	
	Baht	%	Baht	%	Baht	%
Treatment	633,667.86	85.69	58,588.44	81.75	692,256.30	85.34
Health promotion	88,835.99	12.01	10,062.16	14.04	98,898.15	12.19
Other	16,959.15	2.29	3,017.21	4.21	19,976.36	2.46
Administration			47,040.00	Allocate		
Supportive service			24,627.81			
Total	811,130.81	100.00	71,667.81	100.00	811,130.81	100.00

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Unit Cost of Activity

Capital cost and operating/recurrent cost

Table 25 indicated the operating cost, capital cost and the full cost of clinic A in the fiscal year 2004.

The highest operating cost was incurred from the treatment, which was 515,344.40 baht (69.01 percent of total operating cost). The second highest operating cost was from the health promotion and prevention, which was equal to 68,800.62 baht (9.21 percent), while the other service was found the lowest or equal to 11,245.24 baht (1.21 percent).

Regarding the capital cost, it was indicated that the treatment was accounted for the highest at 62,844.94 baht (84.93 percent of capital cost). The second highest was from the health promotion and prevention which was equal to 8,794.10 baht (11.88 percent), while the other service was accounted for the lowest at 2,360.97 baht (3.19 percent) and the administration and supportive did not incur any capital cost.

Table 26 shows the capital cost and operating/recurrent cost of the treatment of 9.08 percent and 90.92 percent respectively. The capital cost and operating/recurrent costs of the health promotion and prevention were accounted for 8.89 percent and 91.11 percent respectively. The capital cost and operating/recurrent cost incurred from the other service were 11.82 percent and 88.18 percent respectively.

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Table 25 Operating/Recurrent cost and capital cost of activity services in at clinic A the fiscal year 2004.

Activity	Capital cost		Operating/Recurrent cost	
	Baht	%	Baht	%
Treatment	62,844.94	84.93	515,344.40	69.01
P&P	8,794.10	11.88	68,800.62	9.21
Other	2,360.97	3.19	11,245.24	1.51
Administration	0.00		126,791.40	16.98
Supportive service	0.00		24,627.81	3.30
Total	74,000.00	100.00	746,809.48	100.00

Table 26 Operating/Recurrent cost and capital cost of cost of activity at Clinic A in the fiscal year 2004

Activity	Capital cost	Operating/Recurrent cost
Treatment	9.08	90.92
P&P	8.89	91.11
Other	11.82	88.18

Unit Cost of activity

The unit cost of activity was calculated by dividing total costs by number of visits. The unit cost of treatment was 160.65 baht per visit, which was composed of capital cost of 14.58 baht and operating/recurrent cost of 146.07 baht. The unit cost of health promotion and prevention was 133.64 baht per visit, which was composed of capital cost of 11.88 baht and operating/recurrent of 121.75 baht. The unit cost of other service activity was 90.02 baht per visit. It was capital cost of 10.64 baht and operating/recurrent of 79.38 baht. Details are as shown in Table 27.

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Table 27 Unit cost per activity at clinic A in the fiscal year 2004.

Activity	Unit cost per activity		Cost/visit
	Capital cost (baht/visit)	Operating/Recurrent (baht/visit)	
Treatment	14.58	146.07	160.65
P&P	11.88	121.75	133.64
Others	10.64	79.38	90.02

Table 28 indicated the fixed cost, variable cost and the full cost at clinic A in the fiscal year 2004.

The highest variable cost was incurred from the treatment, which was equal to 309,264.39 baht (89.51 percent of total variable cost). The second highest variable cost was from the health promotion and prevention, which was equal to 35,119.70 baht (10.16 percent), while the other service was found the lowest or equal to 1,126.72 baht (0.33 percent).

Regarding the fixed cost, it was indicated that the treatment was accounted for the highest or equal to 382,991.91 baht (82.25 percent of capital cost). The second highest was from the health promotion and prevention, which was equal to 63,778.45 baht (13.70 percent), while the other service was accounted for the lowest or equal to 18,849.64 baht (4.05 percent) and the administration and supportive did not incur any capital cost.

Table 28 Fixed cost and variable cost of activity services at Clinic A in the fiscal year 2004.

Activity	Fixed cost		Variable cost	
	Baht	%	Baht	%
Treatment	382,991.91	82.25	309,264.39	89.51
P&P	63,778.45	13.70	35,119.70	10.16
Other	18,849.64	4.05	1,126.72	0.33
Total	74,000.00	100.00	746,809.48	100.00

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Table 29 indicated that the fixed cost and variable cost of the treatment were equal to 55.33 percent and 44.67 percent respectively. The fixed cost and variable costs of the health promotion and prevention were accounted for 64.49 percent and 35.51 percent respectively. The fixed cost and variable cost incurred from the other service were equal to 94.36 percent and 5.64 percent respectively.

Table 29 Fixed cost and variable cost of cost of activity at Clinic A in the fiscal year 2004.

Activity	Fixed cost (%)	Variable cost (%)
Treatment	55.33	44.67
P&P	64.49	35.51
Other	94.36	5.64

Unit Cost of activity

The unit cost of activity was calculated by dividing total costs by number of visits. The unit cost of treatment was 160.65 baht per visit, which was composed of fixed cost of 88.88 baht and variable cost of 71.77 baht. The unit cost of health promotion and prevention was 133.64 baht per visit, which was composed of fixed cost of 86.18 baht and variable cost of 47.46 baht. The unit cost of other service activity was 90.02 baht per visit. It was fixed cost of 84.94 baht and variable cost of 5.08 baht. Details are as shown in Table 30.

Table 30 Unit cost per activity at clinic A in the fiscal year 2004.

Activity	Unit cost per activity		Cost/visit
	Fixed cost (baht/visit)	Variable cost (baht/visit)	
Treatment	88.88	71.77	160.65
P&P	86.18	47.46	133.64
Other	84.94	5.08	90.02

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CHAPTER 5
DISCUSSION

There were a few studies related to the cost, especially the cost of the private clinics, in Thailand. Almost all of them became the cost studies in the governmental hospitals. This research was a pioneer study on the cost in the private clinic during the period of three months. In the study, costs such as costs of equipment, buildings, or wage were identified for their utilization in various activities, their actual useful lives, the depreciation, and the cost of actual used area.

This research used data that were involved with all activities in clinic A. Most data were collected by staff but some data were from the interviewing and observing. There might be some errors in the data for example: data of labour, drug, and equipment, which were incomplete and sensitive.

The discussion of results was shown in six parts:

1. Total direct cost of clinic A
2. Full cost of patient services
3. Unit cost of patient services at clinic A
4. The strength of the study
5. The weakness of the study
6. The problems and obstacles

1. Total Direct Costs of clinic A

Total direct cost of clinic A was 739,462.99 baht comprising of material costs 398,510.81 baht, labour costs 266,952.19 baht, and capital costs 74,000.00 baht, which was calculated in percentage at 49.07: 39.89: 11.04 respectively. This

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coincided with the studies of Bangsaotong health center (Pkawadee Laoukriattinun, 2000), Bangplee Hospital (Sangdeun Deepiew, 2000), and Muang district, Surin (Ausanee Suknit, 2001), that showed the percentage of material costs: labour costs: and capital costs of 51.15: 33.55: 15.30, and 52.89: 27.70: 19.40, 35.01: 32.51: 32.48, respectively. The ratio indicated the large portion was material costs and labour costs. Material costs were a little higher than labour costs and capital costs were the smallest portion. It was similar to clinic A in fiscal year 2004. The total number of staffs was 15 persons. All staffs worked here as a part-time job, and there was no extra payment received.

1.1 Component Parts of Total Direct Cost

1.1.1 Labour cost: Total labour cost was 266,952.19 baht (39.89 percent) of total direct cost in clinic A and that the labour cost for treatment was the highest at 218,233.41 baht (81.75 percent) of all labour cost of total labour cost. Considering labour cost, it was lower than material cost. Because clinic A was a small clinic, only a few staffs were required for operation and the employment in the private clinic was the part-time job based on the working periods, normally counting from working hours. It was found that the labour cost in the clinic A was lower than those from the other previous studies. The personnel working at this private clinic on part-time basis, were government officials who came to work their extra-job during off office hours. Because the staffs were using most of the time for treatment activity in clinic A, so the labour cost was much higher than other activities.

This was different from other studies such as Kongsawat, S. (1999), Palakorn Parkpoom, (1998), Sok Kong (2002) and other studies. They found that the labour cost was quite high because the staffs in the government sector get their wages as the salaries. Furthermore, they have been working at the health center for more than 5 years so that the wages were much higher than staffs that work at this studied clinic. This factor was scaling up the labour costs and fluctuated according to the experience of the staff. The government salaries were higher than the clinic's. Moreover, the salaries, and extra and overtime pays were the major factors influencing the labour cost as it was higher than those in this study. Though the wage

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could not be controlled, but the administrator could manage the utilization of staff to achieve the highest efficiency to control cost, continuously retain the old clients and find the new clients.

1.1.2 Material cost: The total material cost was 398,510.81 baht (49.07 percent of total direct cost). For the direct activity cost, the treatment had the highest material costs at 352,589.51 baht (86.95 percent). The indirect activity cost, the administrative section also had the highest material costs at 6,000 baht. The treatment played a major role in services. The drugs and supplies were provided for the treatment. The clinic emphasized on the treatment services more than any other activities. From these activities, the drugs were dispensed to the clients for their self-drug usages after the patients went back home. Moreover, the top ten diseases of clinic, which were respiration tract infection, disease of gastrointestinal tract, pain cause, and various chronic illnesses such as hypertension, diabetes mellitus, dispensed most drugs to the clients. Although the patients with chronic diseases were not principal group of clients, a lot of drugs were dispensed. All of these activities needed a great deal of support materials. Furthermore, in this study, the prices of drugs were the standard prices, which might be higher than the actual prices. This was the reason why the material costs were so high. The material costs fluctuated depending on the number of people visiting the clinic and number of services. Moreover, the monthly rent was high. These caused the material cost so high.

The material costs were the highest in the administrative section of indirect activity cost because it had supported all other sections in clinic A. However, all of material costs in the administrative section showed that the document cost was the highest at 6,000 baht (85.71 percent). This was because clinic A used documents to transfer clients, record data such as OPD cards, order medicines, etc.

The result also coincided with studies of Sangdeun Deepiew (2000), Pkawadee Laoukriattinun (2000), and Ausanee Suknit (2003), which revealed that direct activity service cost, and material costs were the highest (52.89 : 51.15 : 35.01 percent of total material costs) in the health care centers. Pkawadee Laoukriattinun (2000) revealed that at 4 health care centers, the material costs were the highest costs. The higher the traffic of services, the more the utilization of the

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materials. The government gave 150,000 baht budget to support the respective health care centers due to the high cost of the material. Sangdeun Deepiew (2000) and Ausanee Suknit revealed that the activity service emphasized on treatment activity and effect to cost.

The study was different from the study of Palakorn Parkpoom (1998: Abstract), and Kongsawat, S. (1999: abstract), which studied the unit cost analysis of health centers. They found that the government health care centers and public health centers emphasized more on the health promotion and prevention than the curing. Furthermore, the drugs did not vary, which was different from the clinic A. This fact led to the lower material cost, which was different from this study. Moreover, the area was included in the capital cost and there was no rent as building expense.

However, the material cost could be controlled. The staff administrator would be able to manage the rental cost by utilization of area to achieve the highest efficiency to control cost of the clinic.

1.1.3 Capital Costs: The capital cost was classified by types. It was indicated that capital cost was spent on durable goods and equal to 74,000.00 baht (100.00 percent). The highest capital costs were found in treatment at 62,844.94 baht (84.93 percent of capital costs). That included depreciation of all related items. In this study, they were furniture, the office supplies, medical equipment and scientific supplies that were lower than other studies. Compared with other studies, the capital costs were higher than those in this study because they had many components of costs such as building, land, household articles, electronic and radio supplies, media articles, and vehicles in the calculation. That was why it was higher than Clinic A. Furthermore, the previous study found that the capital cost, fluctuated according to the size of area. The operating area of Clinic A was approximately 76.74 square meters. The capital cost was the lowest cost of all cost components. These were similar to Sangdeun Deepiew (2000) but the reason was different. The capital cost was low because both health care centers were built a long time ago and there was no budget for the new construction.

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2. Full cost of patient services

From the study result of direct cost of many divisions in the clinic, it was shown that the treatment, health promotion and prevention, and other services had higher direct costs than indirect costs. The direct cost of the treatment was 633,667.86 baht and the indirect cost was 58,588.44 baht. The direct cost of health promotion and prevention was 88,835.99 baht and the indirect cost was 10,062.16 baht. The direct cost of other services was 25,758 baht and the indirect cost was 4,844 baht. This was similar to the study of Sangdeun Deepiew (2000) that the direct cost of the treatment was 413,997 baht, and the indirect cost was 85,792 baht. Furthermore, this also coincided with the study of Pkawadee Laoukriattinun (2000), the direct cost of treatment was 3,829,901.00 baht and the indirect cost was 1,238,332.00 baht.

According to the conventional costing theory, costs occurred from services have to take indirect costs allocated from other supporting sections, although it may vary from each section it was related to. This was why the treatment activity, health promotion and prevention, and other service activities received a large portion of allocated indirect costs from administration and supportive service. At clinic A, these activities were the services to the clients, therefore, almost all of total costs from the administration and supportive service were allocated to the direct service activities.

For the treatment activities, the direct costs were higher than the indirect costs because the services were provided directly and completely for the clients, and only small amount of indirect costs were allocated from administration and supportive service.

Treatment received allocated indirect costs from the administration and supportive service as much as 58,588.44 baht (81.75 percent of the total indirect costs). This was because the role of administration was to serve and manage clinic staffs.

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Health promotion and prevention received allocated indirect costs from the administration and supportive service at 10,062.16 baht (14.04 percent of the total indirect costs). This activity received less allocated indirect cost than treatment activity since most of the clients came for the treatments. The allocation, then, was proportional to number of clients.

Other service activities received allocated indirect costs from the administration and supportive service at 3,017.21 baht (4.21 percent of the total indirect costs). This part of the activities was only the fundamental of the treatment, so, the proportion of staff workload and cost allocation was low as well.

3. Unit cost of patient services at clinic A

Full costs of the treatment was 692,256.30 baht (85.34 percent of total full costs) or 160.65 baht on average per visit, which was higher than the previous study, Yimyam P, (1998), which was 73 baht, at large health centers, and 89 baht at general health center. According to Kongsawat, S. (1999), the average full cost per visit was 66 baht, Palakorn Parkpoom (2000), 66 baht at large health centers and 62 baht at general health center. Pkawadee Laoukriattinun's study (2000) showed the average full cost per visit of 149.83 baht, Sangdeun Deepiew (2000), 72 baht, and Ausanee Suknit (2003), 62 baht at large health centers, and 59 baht at general health center.

The unit cost of treatment was composed of capital cost of 14.58 baht, and recurrent cost of 146.07 baht (9.08 : 90.92 percent respectively). It was shown that the recurrent cost was higher than the capital cost because the material cost (including the wage, the material cost, and the rental cost) was recurrent cost. Moreover, the high cost of the treatment was medicine cost. It was fluctuating according to the number of people visiting the clinic and number of services. Furthermore, clinic A emphasized on the treatment activities more than the health promotion and prevention, so, the cost of this activity was high. Clinic A had the little furniture that was capital cost, and had low depreciation, so that the capital cost was low.

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Full cost of the health promotion and prevention was 98,898.15 baht (12.19 percent of total full costs - on average 133.64 baht per visit, which was different from the previous studies). As the respective activity had similar procedure and each had few clients, therefore the researcher had combined the similar services together. This was different from the previous studies, which were separate, such as maternal and child health care, family planning and immunization. The cost per visit in respective activity, then could not be compared. And some activities that were not the same as in the previous studies could not also be compared. As the Clinic had few staff and it operated during off hours, quite a number of the clients had to wait for the service. Furthermore, the high expenses for example, traveling, fuel, staff and time, were the limitation of the Clinic.

The unit cost of health promotion and prevention was comprised of capital cost of 11.88 baht, and recurrent cost of 121.75 baht (8.89 : 91.11 percent respectively). It showed that the recurrent cost was higher than the fixed cost. This indicated that drugs and supplies, especially vaccines were expensive when comparing with other drugs. Furthermore, as an off-hour clinic, clinic A was famous for curing children and people trusted it until now, so the major client group was children. Moreover, this clinic had added more days for giving the vaccination. The high cost in the health promotion and prevention was due to the material cost. It provided ANC, vaccination and family planning, of which the medicine cost was despite of using only a few medicines.

Full cost of the other activities was 19,976.36 baht (2.46 percent of total full costs) or 90.02 baht per visit on average, which was lower than that of the previous studies. According to Pkawadee Laoukriattinun's study (2000), this full costs were 97.41 baht, Sangdeun Deepiew's (2000), 271 baht, and Ausanee Suknit's (2003), 222 baht at a large health centers, and 184 baht at a general health center.

In this study these meant dental health care and referral. Dental health care was only fundamental check up such as advice, tooth health check up and when finding problem, refer to dental health care center network. It was the lowest cost and

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the result was similar to the study of Sangdeun Deepiew (2000), (271 baht for dental) and the labour cost was high also. Furthermore, it was derived from increasing services that it was necessary to use more materials. These caused the high unit cost. The study of Ausanee Suknit (2002), 222 baht for big health centers, 184 baht for general health center. The study showed that small proportion of time was spent on dental health care activity because either there was no dentist working at the health centers, or the health officers lacked both the necessary equipment and knowledge or expertise to use it. Most equipment received was not fully functional.

Most referral activities in this study was about writing referral document because the clients who had more serious diseases or symptoms were passed on to the hospitals and came back to clinic for only to request for the referral documents. So, it was the responsibility of staff who needed to devote time for this part of activity. This cost was the lowest because this activity does not require any material and much weighted time of staff.

The unit cost of other activities (dental and referral) was composed of capital cost of 10.64 baht, and recurrent cost of 79.38 baht (11.82: 88.18 percent respectively). It was shown that the recurrent cost was higher than the capital cost because the material cost (including the wage, the material cost, and the rental cost) was also recurrent cost. Moreover, the high cost of the other activities item came from document cost. It was fluctuating according to the number of people visiting the clinic and number of services. Furthermore, the job often was writing referral documents.

4. The strength of the study

4.1 This research received good cooperation from the administration of clinic A. Then, some the data was received by the staff of the clinic.

4.2 This research was supported by the national health care insurance, and some data used were from the national health care insurance, e.g. the general data of clients etc., which the clinic recorded and sent to the national health care reform every month.

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4.3 The computer programs were used to record details of the data, so it was effective and had less error in the data.

4.4 The researcher was finding the top-ten diseases. The data could be utilized in the future to, for example, calculate cost of diseases, set up guideline for curing, and set up the project, which was supporting health promotion and prevention in the clinic.

5. The weakness of the study

5.1 The database was not efficient, no system and not complete such as material cost, labour cost, equipment cost.

The labour costs allocated in many activities were not accurate because the researcher recorded the working hours by observing.

The material costs of the clinic should be lower than figures shown in this study. It was not accurate because the researcher used the standard price to calculate the medicine cost and used estimated price given by the staff to calculate the equipment cost.

The capital costs or durable goods were not recorded or inventoried accurately. It was estimated by the staff.

5.2 The range of study was only 3 months. The data did not cover all the seasons. It might have had some errors because the prevalence of diseases in each the season was different and the curing was also different too. Then, the cost in each period of time should have been different.

5.3 The collecting information in the private clinic was difficult and hard for contracting. Moreover, the finance was a sensitive issue; it was not easy for the researcher who worked outside the clinic to collect data related to the activities dictionary

5.4 This research studied one place, so it could not be compared with other researches.

5.5 The staff did not spent time for record the data (weighting time), so the data were not the actual data.

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6. The problems and obstacles

The data were sensitive, and it was difficult for the outsiders to study and collect the cost data. The collaboration was important for collecting data in this research. It was found that the staff spent little time to give information about other data. Furthermore, the data was sensitive, especially the private clinic was operated for profit. The clinic limited number of staff, time and equipment, and emphasized only on treatment, so it was found that the majority of the workload was curing. It was different from the health centers. The health centers had many other activities of health promotion and prevention such as school healthcare, maternal and child health care, and family planning and immunization. It included all activities because it had a few clients. Then the activity in this research was not clear. In this study, the activities at Clinic A were not clearly classified since there were not many clients compared with the Primary Care Unit, that was why the cost of each activity could not be clearly pictured.

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CHAPTER 6
CONCLUSION AND RECOMMENDATIONS

This research was a descriptive study aimed to analyze cost and unit cost of service activity at clinic A in the fiscal year 2004. The data were collected from statistical records from April 1, 2004 to June 30, 2004. This research was studied by means of provider's perspective. The population of this study included all 5 activities of clinic A. The activities were specified into 2 types according to service structure of the clinic A: 1) direct service activity and 2) indirect service activity. Data were obtained by using recording forms. Details of collected data were composed of labour costs, material costs, capital costs and the clinic performance. All data were compiled to analyze in order to identify total direct cost of each activity and total direct cost of indirect service activity that allocated to the direct service activity. The capital cost allocation was conducted by using direct distribution method. Data were analyzed and recorded using Excel and Access programs for Windows.

Conclusion of the Study

Clinic A served patients mostly on treatment activities, so this was not followed the MoPH policy which emphasized on health promotion and prevention rather than treatment. The result of the study showed that cost on treatment (160.65 baht/visit) was the highest proportion of the total cost. The unit cost per visit of health promotion and prevention was 133.64 baht/visit and other activity was 90.02 baht/visit respectively.

Total cost in the fiscal year 2004 of clinic A was equal to 811,130.81 baht. The percentage of material costs, labour costs and capital cost were 49.07 : 39.89 : 11.04, respectively. Among the material cost, which was almost half of the total cost,

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the cost of medicines was the highest component (78.61 percent) of total material costs. Furthermore, the results showed characteristic of the client as well as the major causes of diseases were similar to those found in the O.P.D. of a government hospital in primary health care i.e. diseases of respiratory tract, skin diseases and chronic diseases etc. It was explained by total cost of clinic like clinic A and the decrease of unit cost, so the administration on materials would have to be controlled.

For the medicine, it should be recorded using computer program. Moreover, the administrator of clinic, himself/herself, should review the management process of drugs and supplies system in their clinics to control cost spent on drugs and supplies properly. The amount of materials should be recorded in types on weekly basis and the total cost should be calculated twice a year to enable the clinic to stock only necessary drugs and circulate them regularly. Furthermore, the client's information should be recorded completely and systematically, especially age, types of services, types of diseases, and medicines using computer program. These could be used to forecast and plan the utilization of medicines so that the clinic could plan the ordering of the medicines.

The study found that there was an area without any activity. To utilize that area efficiently, the empty area should be used by increasing activities on that area such as activities on health promotion and prevention.

For utility, the clinic should set up the strategies to try to save money such as use electricity and water only when necessary for example, turn off the air conditioner 15-30 minutes before closing the clinic.

Budgeting Management

In managing budget of any unit, clinic A should provide sufficient information in order to calculate the cost of each activity. The actual calculation will be used as a guideline to allocate budget to each activity. Furthermore, fixed costs and variable costs are necessary for the National health care insurance to monitor the

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performance-based budgeting system properly. It was the guideline to set up a service charge based on a true fixed cost and variable cost. In this study the result showed that the fixed cost was higher than variable cost, then if the clinic could control the staff wage and rent, it also could manage the budget. For example, the empty area should be used by increasing activities on that area such as activities on health promotion and prevention. And if the Clinic had more active services, the utilization of the human resource would have been more effective and the saving time could be used to give information to the clients.

The National health care insurance was the main group to control and monitor the private clinics. It was the important organization that managed the implementation of the unit cost analysis of private clinics. When implementing it, the staff's workload would increase. Therefore, it is recommended to hire extra staff for the data collection and administration work, and also to help finding the support factors for more active health promotion such as playing the health promotion video while the clients were waiting for the services. Furthermore, the Clinic should actively publicize health and emphasize on giving the clients information to encourage them to take better care of their health. Health promotion video could be played while the clients were waiting for the general health check-up. This would effectively reduce the utilization of medicines, which was the cause of high cost. Besides, the Clinic would be named the achiever of the active health promotion.

Recommendation from Findings:

The clinic should emphasize on the financial management, especially the material payment by checking the resource utilization.

The main weight to calculate the cost in the respective activities is the material cost. So, further research should focus on material such as medicines. The procedures of unit cost analysis were very detailed so the staff of the clinic needed to be trained on collecting data frequently and recording these data systematically.

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Recommendation for Further Study

To collect the information in a private clinic was a difficult task and needed many procedures such as contacting the clinic, asking for permission to collect data etc. So the researcher should provide time to conduct the study and create good relationship with staff of the clinic and if it is possible the staff should be invited to join the research team. Moreover, the study method should not be an observing study because the staff would feel uneasy like they were being watched and their behavior might have not been natural. Moreover the process of interview should be very carefully performed and it is essential to ask for permission from the staff in every visit.

It is recommended that further studies be performed in many private clinics in Bangkok or in other provinces to find more information and expand more knowledge in this area.

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APPENDIX

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DOCUMENT OF ETHICAL CLEARANCE

NO. 50/2004

Documentary Proof of Ethical Clearance
The Committee on Human Rights Related to Human Experimentation
Mahidol University, Bangkok

.....

Title of Project: **Activity-Based Costing of Primary Health Care Services in Selective Contracting Private Clinics Under National Health Insurance Scheme in Bangkok**

Principle Investigator: **Miss Nattayanee Seingnoo**

Name of Institution: **Faculty of Public Health**

Approved by the Committee on Human Rights Related to Human Experimentation

Signature of Chairman: _____
(Professor Dr. Srisin Khusmith)

Signature of Head of Institute: _____
(Professor Dr. Pornchai Matangkasombut)

Date of Approval: 19 MAY 2004

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Data collecting form in this study

Part	From Code	Objective of Record Form
1	GEN-1	General record of the clinic A
2	GEN-2	Performance record of the clinic A
4	MC-1	Material cost record (for medicine)
5	LC-1	Labour cost record
6	MC-1	Material cost record (for medicine)
7	MC-2	Material cost record (Public utility cost)
8	MC-3	Material cost record (Rent)
9	MC-4	Area in the clinic A
10	CC-1	Capital cost for durable good
11	-	Record form for general information of the clinic A

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GEN-1 General record of the Clinic A

1. Name of clinic……
2. Location……..……
3. Open time service Date/Month/year……..…….
4. Duration of operating…….year.
5. Type of clinic
   - ☐ Solo clinic
   - ☐ Network hospital (identified…….)
6. Duration time service……
7. Type of service (answer more than 1 choice)
   - ☐ Health promotion and prevention
   - ☐ Treatment
   - ☐ Dental health care
   - ☐ Rehabilitation
   - ☐ Other……..
8. Time work of staff

   Full time Doctor……

   Nurse……

   Other……

   Part time Doctor……

   Nurse……

   Other……
9. Amount of Population in the locate……

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GEN-2 Performance record of the clinic A

No	Item of operating	Amount of client (UC)	Percentage
1.	**Age group**		
	- 0-15 year	……	……..
	- >15-45 year	……	……..
	- >45-60 year	……	……..
	- >60 year	……	……..
2.	**Health promotion and prevention**		
	- ANC	……	……..
	- VAC	……	……..
	- Family planning	……	……..
	- Advice	……	……..
3.	**Treatment**	……	……..
4	**Other**		
	- Dental health care	……	……..
	- Referral	……	……..
5	**Medicine**	……	……..
6	**Type of clients**		
	- SSS	……	……..
	- UC	……	……..
	- Self-payment	……	……..

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MC-1: Material cost record (for medicine)

Item	Name	Unit	Amount	Standard price (/unit)	Total price	Activity
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

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MC-2: Material cost record (Public utility cost)

Month	Tap water (baht)	Electrical (baht)	Telephone (baht)
October			
November			
December			
January			
February			
March			
April			
May			
June			
July			
Total			
Average			

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MC-3: Material cost record (Rent)

Proportion of area		Zone					Total
Activity	**Percentage**	**1**	**2**	**3**	**4**	**5**	
Health promotion and prevention							
Treatment							
Other							

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MC-4: Area in Clinic A

Zone 1 Area……cm^2 Zone 4 Area…… cm^2

Zone 2 Area……cm^2 Zone 5 Area……cm^2

Zone 3 Area……cm^2

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CC-1: Capital cost for durable good

No. Zone……..

Item	Name	Price/piece	Amount	Total price	Type of Activity
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

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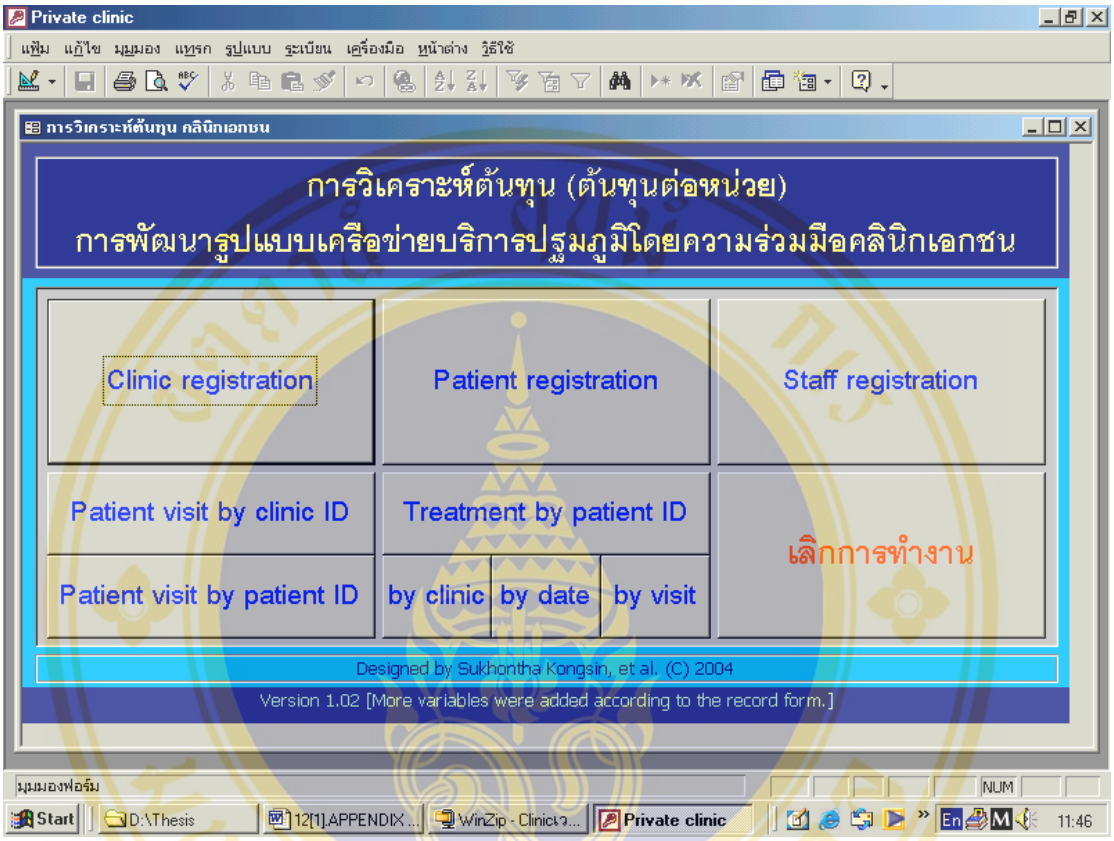
Record form for general information of the clinic A



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Record Form code MC-1: Material cost record (for medicine)

Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
Adalat (5 mg)	Cap	878.33	1.82	1,598.57	1,598.57	-
Adalat (10 mg)	Cap	2,021.00	3.00	6,063.00	6,063.00	-
Actifed	Tab	496.67	0.47	234.43	234.43	-
Actifed	Bottle	12.33	36.00	444.00	444.00	-
Acyclovir cream	Piece	3.67	26.00	95.33	95.33	-
Albendazole	Tab	5.33	4.25	22.67	22.67	-
Allopurinol (100 mg)	Tab	88.00	0.64	56.01	56.01	-
Ambroxol	Bottle	16.00	28.00	448.00	448.00	-
Amitryptyline (10 mg)	Tab	2.33	0.20	0.47	0.47	-
Amco	Tab	77.33	0.88	68.05	68.05	-
Amcopan	Tab	193.33	1.36	263.71	263.71	-
Amoxycillin (250 mg)	Cap	691.33	1.60	1,106.13	1,106.13	-
Amoxycillin (500 mg)	Cap	798.33	1.55	1,237.42	1,237.42	-
Amoxycillin (125 mg)	Cap	90.00	18.25	1,642.50	1,642.50	-
Amoxycillin (250 mg)	Cap	8.67	26.50	229.67	229.67	-

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Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
ASA gr 1	Tab	570.33	0.04	24.81	24.81	-
Archifen E.D	Tab	0.33	14.02	4.67	4.67	-
Atarax	Tab	454.00	0.25	115.66	115.66	-
Ativan (0.5 mg)	Tab	167.67	0.32	53.65	53.65	-
Ativan (1 mg)	Tab	16.00	0.45	7.20	7.20	-
Atenol (50 mg)	Tab	1,463.33	1.02	1,492.60	1,492.60	-
Atenol (100 mg)	Tab	850.33	2.73	2,319.28	2,319.28	-
Bactrim	Tab	373.33	0.72	268.15	268.15	-
Bactrim	Bottle	18.67	10.00	186.67	186.67	-
B-co	Tab	1,161.33	0.11	131.23	131.23	-
B1-6-12	Tab	3,193.00	0.24	766.32	766.32	-
Bellerga	Tab	38.33	1.20	46.00	46.00	-
Bricanyl	Bottle	5.00	8.60	43.00	43.00	-
Bisacodyl	Tab	48.67	0.13	6.55	6.55	-
Bisolvon	Tab	2,097.00	0.70	1,467.90	1,467.90	-
Buscopan	Bottle	5.33	17.50	93.33	93.33	-
Brufen (200 mg)	Tab	182.67	0.33	59.37	59.37	-

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Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
Buscopan	Tab	170.67	1.36	232.11	232.11	-
Buscopan injection	Dose	2.67	13.00	34.67	34.67	-
Bricanyl	Tab	54.00	2.50	135.00	135.00	-
Cardeloc (100 mg)	Tab	2942.00	1.00	2,942.00	2,942.00	-
Calamine	Bottle	0.67	35.00	23.33	23.33	-
Carfergot	Tab	88.67	5.50	487.67	487.67	-
Cetirizine	Tab	67.00	1.00	67.00	67.00	-
Chalkcap (1 G)	Tab	44.00	12.00	528.00	528.00	-
Chloramphenical E.D	Tab	24.00	0.13	3.12	3.12	-
Cimetidine (400 mg)	Tab	471.67	1.48	698.07	698.07	-
Cinnarazine	Tab	342.33	0.13	44.50	44.50	-
Cloxacillin (250 mg)	Cap	286.33	2.00	572.67	572.67	-
Cloxacillin (500 mg)	Cap	511.67	3.50	1,790.83	1,790.83	-
Cloxacillin (125 mg)	Cap	24.67	22.75	561.17	561.17	-
Cloxacillin (250 mg)	Cap	8.67	12.00	104.00	104.00	-
Cohistan	Tab	1.67	15.00	25.00	25.00	-
Colchicine	Tab	100.00	1.36	136.40	136.40	-

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Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
Consinut	Tab	61.33	0.62	38.03	38.03	-
CPM	Tab	1,307.33	0.06	73.86	73.86	-
CPM (60 cc)	Bottle	204.33	4.75	970.58	970.58	-
Calcium lactate	Tab	280.67	0.18	51.85	51.85	-
Danzen	Tab	153.67	2.10	322.70	322.70	-
Dextro	Tab	417.00	20.00	8,340.00	8,340.00	-
Diazepam (2 mg)	Tab	484.33	0.09	45.77	45.77	-
Diazepam (5 mg)	Tab	53.33	0.14	7.71	7.71	-
Daflon	Tab	2.67	8.50	22.67	22.67	-
Diclofenac	Tab	512.00	0.15	76.80	76.80	-
Dicloxacillin (250 mg)	Cap	102.67	2.11	216.83	216.83	-
Dicloxacillin (500 mg)	Cap	42.67	4.00	170.67	170.67	-
Dimen lolo	Tab	82.33	0.16	13.52	13.52	-
Dramamine	Tab	53.33	0.16	8.76	8.76	-
Dilantin	Tab	293.67	0.48	141.84	141.84	-
Digoxin	Tab	46.67	0.18	8.49	8.49	-
Eltroxin	Tab	137.67	0.55	75.72	75.72	-

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Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
Enaril (5 mg)	Tab	1,785.67	4.72	8,422.99	8,422.99	-
Enaril (20 mg)	Tab	1,721.00	10.66	18,345.86	18,345.86	-
Erythromycin (125 mg)	Tab	18.00	22.00	396.00	396.00	-
FBC	Tab	1,812.33	0.26	471.21	471.21	-
Flatulence	Tab	1,105.33	0.20	221.07	221.07	-
Fenamon SR	Tab	58.67	7.81	458.07	458.07	-
Flurium (5 mg)	Tab	4.33	0.88	3.81	3.81	-
Folic acid	Tab	63.67	0.08	5.22	5.22	-
Glibencamide	Tab	8,763.00	0.66	5,739.77	5,739.77	-
Gynecon	Tab	9.33	4.00	37.33	37.33	-
HCTZ TO	Tab	2,838.00	0.24	671.19	671.19	-
Hista-oph	Bottle	2.67	25.00	66.67	66.67	-
Humulin 70/30	Bottle	5.33	370.00	1,973.33	1,973.33	-
Isordil (5 mg)	Tab	53.33	1.10	58.67	58.67	-
Isordil (10 mg)	Tab	735.67	0.82	602.14	602.14	-
Kenalog=Keno	Tube	16.67	56.00	933.33	933.33	-
Kela lotion	Bottle	17.33	15.00	260.00	260.00	-

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Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
Ketoconazole	Tab	59.33	6.00	356.00	356.00	-
Kremil-s	Tab	585.33	0.65	380.47	380.47	-
Lasix	Tab	180.67	0.32	57.36	57.36	-
Lipolo (300 mg)	Tab	323.33	7.40	2,392.67	2,392.67	-
Locholes (300 mg)	Tab	46.67	7.40	345.33	345.33	-
Lopid (300 mg)	Tab	905.33	7.40	6,699.47	6,699.47	-
Lorazene (0.5 mg)	Tab	26.67	0.32	8.49	8.49	-
Lincocin injection (2 cc)	Bottle	14.67	11.00	161.33	161.33	-
Magesto	Tab	312.33	0.51	159.29	159.29	-
Mebendazole	Tab	0.67	13.00	8.67	8.67	-
Metformin	Tab	8786.00	1.13	9,906.22	9,906.22	-
Motilium	Tab	401.67	0.64	255.66	255.66	-
Motilium	Bottle	31.67	11.00	348.33	348.33	-
Moduretic	Tab	294.67	4.80	1,414.40	1,414.40	-
MTV	Tab	981.33	0.19	181.55	181.55	-
MTV	Bottle	1.00	12.00	12.00	12.00	-
Mydocalm	Tab	664.67	1.50	997.00	997.00	-

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Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
Miotin น้ำ	Bottle	4.67	120.00	560.00	560.00	-
Mybacin	Tab	5.00	3.98	19.89	19.89	-
Nelapine (5 mg)	Tab	88.00	1.82	160.16	160.16	-
Neooptal E.D	Tab	4.67	19.00	88.67	88.67	-
Neutroplex syr	Bottle	2.67	30.00	80.00	80.00	-
Norgesic	Tab	569.33	1.90	1,081.73	1,081.73	-
Norflox (100 mg)	Tab	52.00	0.91	47.29	47.29	-
Norflox (200 mg)	Tab	37.33	1.38	51.59	51.59	-
Norflox (400 mg)	Tab	203.33	1.55	314.66	314.66	-
Nospa	Tab	3.67	2.10	7.70	7.70	-
Obimin AF	Tab	53.33	65.00	3,466.67	3,466.67	-
Opsa-hist E.D	Bottle	14.67	25.00	366.67	366.67	-
ORS	Package	193.67	3.41	660.40	660.40	-
Paracet (325 mg)	Tab	1280.67	0.14	174.81	174.81	-
Paracet (500 mg)	Tab	5295.00	0.23	1,191.38	1,191.38	-
Paracetamol (120 mg) -60cc	Bottle	326.33	6.50	2,121.17	2,121.17	-
Paracet syr (120 mg) -30cc	Bottle	54.33	3.25	176.58	176.58	-

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Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
Paracetamol injection	Dose	2.67	2.75	7.33	7.33	-
Pen V	Bottle	12.67	9.25	117.17	117.17	-
Pen V (400,000)	Tab	240.00	0.70	168.00	168.00	-
Poliflunarizine	Tab	9.33	0.88	8.21	8.21	-
Phenobarb gr 1	Tab	133.33	0.09	12.13	12.13	-
Ponstan	Cap	41.33	0.77	31.99	31.99	-
Polyoph E.D	Bottle	7.67	22.00	168.67	168.67	-
Prednisil E.D	Bottle	4.33	30.00	130.00	130.00	-
Prednisolone	Tab	61.33	0.33	20.15	20.15	-
Prenolol (50 mg)	Tab	31.33	1.36	42.73	42.73	-
propanolol (10 mg)	Tab	198.00	0.43	85.14	85.14	-
propanolol (40 mg)	Tab	133.33	0.78	104.00	104.00	-
PTU	Tab	938.67	0.50	469.33	469.33	-
Revicon	Tab	16.00	66.00	1,056.00	1,056.00	-
Rulid (150 mg)	Tab	183.33	13.20	2,420.00	2,420.00	-
Salbutac	Tab	97.33	0.19	18.49	18.49	-
Senokort	Tab	56.00	0.43	24.08	24.08	-

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Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
Smecta	Tab	5.67	13.00	73.67	73.67	-
Stugeron	Tab	258.00	24.00	6,192.00	6,192.00	-
Tussil (5 mg)	Tab	8.00	0.41	3.25	3.25	-
Tramol inj	Tab	1.33	32.60	43.47	43.47	-
Vit c	Tab	60.00	0.90	54.00	54.00	-
Voltaren	Tab	1319.33	4.60	6,068.93	6,068.93	-
Voragel DMS	Tab	378.00	9.00	3,402.00	3,402.00	-
Neotica balm 100g	Tube	203.33	62.00	12,606.67	12,606.67	-
Betameth cream BS	Tube	13.33	29.00	386.67	386.67	-
Betatone-N cream	Tube	66.67	20.00	1,333.33	1,333.33	-
Clobet cream (0.1%)	Tube	66.67	26.00	1,733.33	1,733.33	-
Miconazole cream	Tube	100.00	15.08	1,508.00	1,508.00	-
0.02% TA	Tube	223.33	12.00	2,680.00	2,680.00	-
0.1% TA BS	Tube	660.00	9.00	5,940.00	5,940.00	-
Tara plus cream	Tube	146.67	9.34	1,369.87	1,369.87	-
Dressing	Set	45.33	40.00	1,813.33	1,813.33	-
DTP	Dose	52.33	21.00	1,099.00	-	1,099.00

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Name of medicine	Unit	Amount	Standard price / unit	Total price	Activity	
					Treatment	P&P
OPV	Dose	52.33	41.00	2,145.67	-	2,145.67
Tritanrix-HB	Dose	2.00	1230.00	2,460.00	-	2,460.00
JE	Dose	38.00	53.50	2,033.00	-	2,033.00
Priorix = MMR	Dose	14.33		0.00	-	0.00
TT=tetanus toxoid	Dose	18.33	22.00	403.33	-	403.33
Hepatitis	Dose	11.33	240.00	2,720.00	-	2,720.00
PCEC	Dose	23.00	280.00	6,440.00	-	6,440.00
Contraceptual	Dose	19.67	20.00	393.33	-	393.33
Contraceptual	Dose	4.00	12.00	48.00	-	48.00
UC group(%)	56.57	-	-	180,322.20	162,579.86	17,742.33
Non UC(%)	43.43	-	-	138,437.21	124,816.04	13,621.17
Client (%)	100	-	-	318,759.41	287,395.90	31,363.50

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Record Form code CC-1: Capital cost record

Item	Received data	Total price (baht)	Useful life (Year)	Depreciation/ year	Depreciation	Price at present time	Activity
ตู้ใส่ของ 2 ชั้น	1999	2,000	3	400	1,200.00	800.00	AVERAGE
ตู้เย็น	1999	8,000	3	1,600	4,800.00	3,200.00	PP/ Treatment
เครื่องพ่นยา	1999	1,000	3	200	600.00	400.00	Treatment
ถังออกซิเจนกลาง	1999	2,000	3	400	1,200.00	800.00	Treatment
ถังขยะล้างแผล	1999	3,000	3	600	1,800.00	1,200.00	Treatment
รถใส่อุปกรณ์ฉุกเฉิน, ล้างแผล	1999	4,100	3	820	2,460.00	1,640.00	Treatment
เตียงตรวจโรคพร้อมเก้าอี้รองเท้า	1999	6,500	3	1,300	3,900.00	2,600.00	PP/ Treatment
เตียงล้างแผล	1999	2,000	3	400	1,200.00	800.00	Treatment
โต๊ะตรวจ	1999	5,000	3	1,000	3,000.00	2,000.00	AVERAGE
เก้าอี้รอตรวจ	1999	5,000	3	1,000	3,000.00	2,000.00	AVERAGE
เก้าอี้แพทย์	1999	1,500	3	300	900.00	600.00	AVERAGE
เครื่องปรับอากาศ	1999	80,000	3	16,000	48,000.00	32,000.00	AVERAGE
เคาน์เตอร์จัดยา	1999	5,000	3	1,000	3,000.00	2,000.00	AVERAGE
ตู้เก็บ ประวัติผู้ป่วย	1999	3,500	3	700	2,100.00	1,400.00	AVERAGE
โต๊ะทำบัตร	1999	1,200	3	240	720.00	480.00	AVERAGE
เก้าอี้สำนักงาน	1999	400	3	80	240.00	160.00	AVERAGE

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Item	Received data	Total price (baht)	Useful life (Year)	Depreciation/ year	Depreciation	Price at present time	Activity
ตู้ใส่ยา	1999	8,000	3	1600	4,800.00	3,200.00	AVERAGE
ชั้นวางยา Stock	1999	4,000	3	800	2,400.00	1,600.00	AVERAGE
โทรทัศน์	1999	6,500	3	1,300	3,900.00	2,600.00	AVERAGE
ชั้นวางโทรทัศน์	1999	800	3	160	480.00	320.00	AVERAGE
เครื่องมือช่วยหายใจชนิดมือบีบผู้ใหญ่	1999	4,000	3	800	2,400.00	1,600.00	Treatment
เครื่องวัดความดันโลหิตชนิดตั้งโต๊ะ	1999	2,000	3	400	1,200.00	800.00	AVERAGE
ชุดล้างแผล	1999	10,000	3	2,000	6,000.00	4,000.00	Treatment
ชุดเย็บแผล	1999	3,000	3	600	1,800.00	1,200.00	Treatment
ชุดหูฟัง	1999	2,000	3	400	1,200.00	800.00	AVERAGE
เครื่องตรวจ หู ตา	1999	8,500	3	1,700	5,100.00	3,400.00	AVERAGE
เครื่องชั่งน้ำหนักชนิดยืน	1999	1,000	3	200	600.00	400.00	AVERAGE
เครื่องชั่งน้ำหนักเด็กเล็กแบบนอน	1999	500	3	100	300.00	200.00	AVERAGE
คอมพิวเตอร์	1999	Free	3	0	0.00	0.00	0
โต๊ะวาง คอมพิวเตอร์	1999	1,100	3	220	660.00	440.00	AVERAGE
ชั้นพลาสติก 4 ชั้น	1999	1,200	3	240	720.00	480.00	PP/Treatment
ม่านกั้น 3 ส่วน	1999	1,250	3	250	750.00	500.00	AVERAGE
พัดลมสี่เหลี่ยม15*15"	1999	700	3	140	420.00	280.00	AVERAGE

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Record Form code MC-2: Material cost record (Utility)

Month	Year	Tap water	Electrical	Telephone	Total
October	2003	156.00	3,424.00	3,584.00	7,164.00
November	2003	208.00	4,220.00	1,394.00	5,822.00
December	2003	246.00	4,800.00	1,118.00	6,164.00
January	2004	248.00	4,322.00	1,361.00	5,931.00
February	2004	138.00	4,690.00	1,570.00	6,398.00
March	2004	237.00	4,922.00	1,416.00	6,575.00
April	2004	210.00	5,280.00	1,238.00	6,728.00
May	2004	223.00	5,994.00	1,371.00	7,588.00
June	2004	257.00	5,496.00	1,353.00	7,106.00
July	2004	214.00	4,795.00	1,353.00	6,362.00
Total		2,137.00	47,943.00	15,758.00	65,838.00
		Average/month	6583.80 baht		
		3 month	19751.40 baht		

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Table 14 The area in the clinic A dividing utility of area

No. Zone	Area	Unit	Percentage	Price/area
Zone 1	33.00	m2	43.00	8,600.47
Zone 2	14.58	m2	19.00	3,799.84
Zone 3	14.58	m2	19.00	3,799.84
Zone 4	1.76	m2	2.29	458.69
Zone 5	12.82	m2	16.71	3,341.15
Total	76.74	m2	100.00	20,000.00

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Record Form code MC-3: Material cost record (Rent)

Activity	Percentage	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	TOTAL	
Proportion of area	Of client	33 m2	14.58 m2	14.58 m2	1.76 m2	12.82 m2	76.74 m2	For 3 Month
	Bath/area	8,600.47	3,799.84	3,799.84	458.69	3,341.15	20,000.00	60,000.00
Health promotion and prevention	14.04	1207.64	533.56	533.56	64.41	469.15	2808.30	8,424.91
Treatment	81.75	7030.54	3106.22	3106.22	374.96	2731.26	16349.21	49,047.62
Other	4.21	362.92	160.07	160.07	19.32	140.74	842.49	2527.47

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Dividing area in clinic according to utility

Area in clinic		Health promotion and prevention	Treatment	Referral	Dental Care	Administration	Supporting of service
	1. Register and check a type of remedy	Yes	Yes	Yes	Yes	Yes	Yes
	2. Record weigh	Yes	Yes	Yes	Yes	Yes	Yes
	3. Record height	Yes	Yes	Yes	Yes	Yes	Yes
	4. Record vital sign	Yes	Yes	Yes	Yes	Yes	Yes
	5. Waiting for doctor	Yes	Yes	Yes	Yes	Yes	Yes
	6. Give the medicine	Yes	Yes	Yes	Yes	Yes	Yes
Zone 1	7. Payment	Yes	Yes	Yes	Yes	Yes	Yes
Zone2	Investigate	Yes	Yes	Yes	Yes	Yes	Yes
Zone3	Treatment	Yes	Yes	Yes	No	Yes	Yes
Zone4	Restroom	Yes	Yes	Yes	Yes	Yes	Yes
Zone5	A lounge	No	No	No	No	Yes	No

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BIOGRAPHY

NAME	Miss Nattayanee Seingnoo
DATE OF BIRTH	29 September 1976
PLACE OF BIRTH	Nakorn Rajsima, Thailand
INSTITUTIONS ATTENDED	Mahidol University, 1994-1998. Bachelor's degree in Nursing Mahidol University, 2002-2005. Master of Sciences (Public Health) Major in Health Administration
POSITION & OFFICE	*Position:* Professional Nurse 6 Siriraj Hospital, Bangkok

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