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Assessment of the Economic Cost of Alternative Medicine

Sarun Weesaphen

Faculty of Management Science, Ubon Ratchathani University, Ubon Ratchathani, Thailand
Corresponding author: sarun_wee@hotmail.com

Abstract

This research aimed to assess the economic cost of alternative medicine. The research hypotheses state that the direct cost for patients with shoulder ache, backache, knee ache, paresis, and paralysis world be higher than the indirect cost. The study employed the human capital using prevalence approach. The results show that the direct cost for patients with the listed conditions was higher than the indirect cost because most of the direct cost involved expenses related to medical care, food, accommodation, and travel. The study's findings also revealed that expenses for patients from non-local districts were usually higher than those from the local area, and that most patients had an education at a lower level than bachelor degree - meaning that they had low or no income. The indirect cost was relatively low and the cost of travel and waiting for medical care was not higher than expected.

Keywords: Assessment, Economic Cost, Alternative Medicine

1. Introduction

In 1962, some human diseases such as poliomyelitis, neurosis, and arthritis were found by the World Health Organization to be unable to be permanently treated by modern operation processes. As a result, investigation of the best ways to treat persons with these conditions commenced, leading to the emergence of alternative medicine. This approach avoided the use of medicines, instead employing acupuncture therapy, spinal adjustment, nerve healing, traditional warm and cool treatments, Tai Chi or Taijiquan (exercise for the elderly and the development of meditation to develop movement of all body parts and promote cell system performance). The simultaneous employment of this treatment approach with heat and light relieves tension and pain, and enhances muscular flexibility (Alternative Medicine, 2012).

Folk medicine is associated with villagers' needs and communities' rituals and systems. Further, folk medicine is also employed as an intermediary tool and is advocating patients' power toward the decision making for the medical care. Despite government expenditure, modern medicine is unable to meet all communities' needs, and folk medicine continues to exist as an alternative in local communities, Neelapamorn (2000). Local people are familiar with alternative medicine in hospitals, and it reduces medical costs, increases local people's incomes by the sale of herbs used in treatments, Chopchit (2000) and the provision of massage services that average 500 baht per month, Intamoon (2007). Medical technology and treatments have developed rapidly but people's roles in them are passive. Alternative medicine is able to these roles active, especially by the use of massage (Alternative Medicine, 2012).

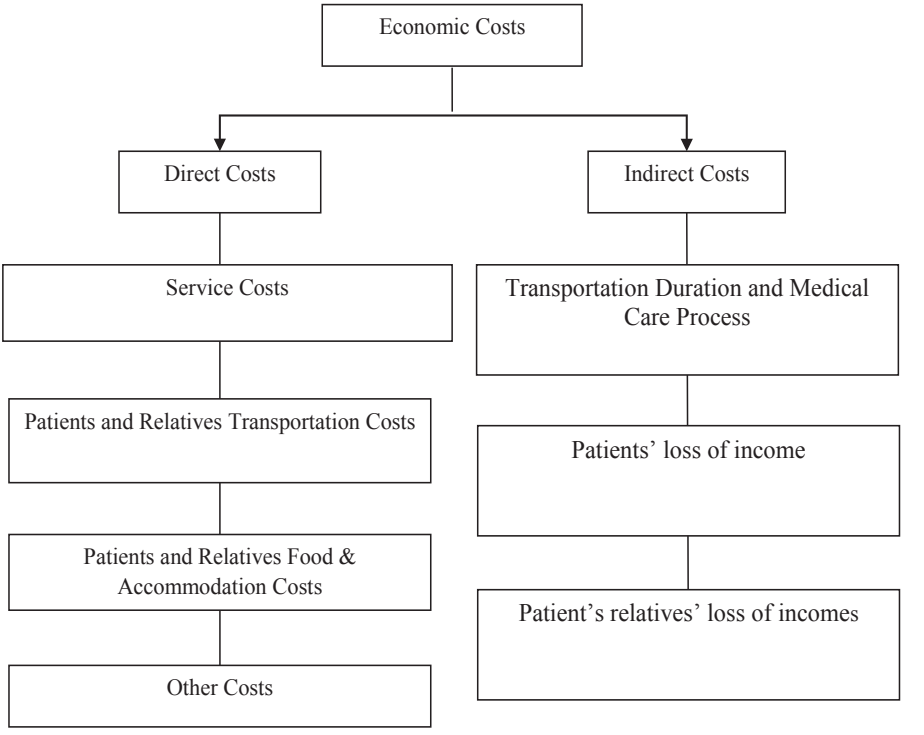
The Department for Development of Thai Traditional and Alternative Medicine (DTAM), Ministry of Public Health is the leading organization associated with traditional folk medicine and is mostly concerned with conditions to do with the muscular and structural systems, such as back ache, paralysis, repetitive stress disorder, and osteo-arthritis. The number of patients served by DTAM has increased from 546 people in 2002 to 20,768 people in

2009, and 60% of these are elderly persons of an average age of 67. A large number of these people (40.7%) suffer from back ache, followed by leg muscle disorders, paralysis, and hand muscle disorders. These patients need special assistance for the treatment because of their disability, Punnawittayapun (2010).

A study by, Srijaroenjira (2003) showed that alternative medicine consists of three major types, traditional Thai medicine (51%), traditional Chinese medicine (77%), and naturopathic medicine (20%). The most common conditions were found to be orthopedic muscular disorders followed by neurological disorders, especially paralysis. Analysis of the medical financial cost indicated direct costs for such items as medicines, x-rays, doctors, and operations, and indirect costs such as food, transport, accommodation, and loss of income during patients' treatment periods. The average direct costs of the Chronic Obstructive Pulmonary Disease (COPD), Coronary Heart Disease (CHD) and Lung Cancer (LC) patients were 8,953.15, 31,106.62, and 61,630.29 baht/person/year respectively, and the indirect costs were 1,457.51, 1,852.31, and 39,698.59 baht/person/year respectively, Pongpanich (2003). There are 47.8 percents of the popularity among patients towards the implementation of integrated medicine and alternative medicine has been spreading to the patients and most of it involves yoga and exercise amounting to an average cost of 8.58 U.S. dollar/person/month showing that integrated medicine and alternative medicine are more popular among high income patients than low income ones, Moolasarn (2005). Also, most of the direct costs is related to the payment of medical fees and the indirect costs are related to opportunity cost such as transportation duration, and loss of income. The most valuable direct cost is the medical cost of the in-patients. The most valuable indirect costs are the loss of income of the patients' relative because they have to stop working in order to take care of the patients. The direct cost is mostly caused by the expenses for the medical care during the patients' stay in hospital such as some of them have to spend about 88 days in a hospital. In addition, those who live in the remote area also have high costs of transportation. Most patients are senior citizens with low or no income so the loss of the indirect cost due to being sick, traveling, and waiting for medical care is not much as expected, Peerakum (2007).

The economic costs of diabetes are made up of the direct medical payment (23%), indirect medical payment (40%), and the indirect costs (38%), Chattopadhyay (2008). There are two types of human capital, as follows: 1) the direct cost includes the medical fees, transportation fees, food and accommodation fees and 2) the indirect cost includes the opportunity cost. The highest direct cost is the patient's relatives' transport, and the highest indirect cost is the patient's relatives' loss of incomes during the time in hospital. Moreover, most of the patients holding a lower undergraduate degree earn little income. Therefore, the indirect costs; from the loss of income, the transportation and the medical care process; are a small impact comparing to those mentioned earlier, Tejcharoenpanit (2009).

2. Conceptual Framework



2.1 Hypothesis

The hypothesis states that the direct costs of patients with shoulder ache, back ache, knee ache, paresis, and paralysis are higher than the indirect costs.

According to, Peerakham (2007) and Tejcharoenpanit (2009), it can be seen that the overall direct cost is higher than the indirect cost because most of the direct cost is mostly from the medical care expenses. Additionally, the patients living in remote area, being senior citizens, and possessing education level lower than bachelor's degree have low indirect cost from being sick and receiving medical care because they have low income or even no income.

2.2 Research Methodology

This research employed questionnaires for the collection of data about economic costs and human capital via the prevalence approach which studied the target population in a short period at a specific time. This method could compare health conditions of the target population at a specific time and show the values of the lost resources of both direct cost and indirect cost but not considering the time when the patients began to develop the illness. The cost data was divided into: 1) direct costs and 2) indirect costs (opportunity costs). Antecedent costs were calculated from each patient's medical expenses based on the average calculation during a half year. The samples include the patients with shoulder ache, backache, knee ache, paresis and paralysis in the Department of Rehabilitation Medicine, Sappasitthiprasong Hospital having a medical registration during January – June in 2014.

2.3 Populations and Samples

The participants in the study were patients with shoulder ache, back ache, knee ache, paresis, and paralysis treated by acupuncture therapy in the Department of Rehabilitation Medicine, Sappasitthiprasong Hospital from January to June in 2014. The finite population included patients with shoulder ache, 78 persons suffering from back ache 80 persons treated for knee ache,

34 persons, and 95 persons with paresis and paralysis. Stratified sampling and purposive sampling were used to produce a sample of 44 patients with shoulder ache, 47 patients with back ache, 21 patients with knee ache, and 55 patients with paresis and paralysis (total 167 persons).

2.4 Research Instruments

The questionnaires included the following parts:

Part 1: personal information related to gender, age, marriage status, education level, occupation, current salary, family's current income, and the number of family members.

Part 2: the information concerning patients' medical process consisting of the frequency of medical visits during the last six months and the effects on their work, transportation to a hospital and the reasons for medical care.

Part 3: information about patient's relatives, such as gender, age, occupation, salary during the last 6 months, visits to a hospital, the effects on their work and how often they needed to put off their work.

2.5 Analysis

1. The questionnaires were analyzed to produce averages, percentages, interval scales, arithmetic means, and standard deviations.

2. Opportunity costs per patient for a half year equals the number of hours times the transportation and medical care process—done by Microsoft Office Excel 2007.

3. The loss of income per patient equals the total days that they were absent from their job during the last six months times the daily income—done by Microsoft Office Excel 2007.

4. The loss of income per patient's relatives equals the total days spent in a hospital taking care of the patient during the last six months times the daily income—done by Microsoft Office Excel 2007.

3. Findings

1. Responses to the general information part of the questionnaire showed that 59.28% were females, 50.90% were aged between 41 and 60 years old, 77.25% were married, 79.04% had an education level below undergraduate degree, and 22.76% were business owner (entrepreneurs). During the last six months, 65.87 percents of them had received medical treatment between 1 and 5 times. Over half (54.49%) had to stop work during their medical visit, and most (56.28%) used private cars and/or motorcycles for transport. Most (53.90%) of the payments of the medical fees was done through the Health Insurance Card (see table1).

Table 1: General information of patients

General information	Responses	Numbers	Percentage
Genders	Male	68	40.72
	Female	99	59.28
Ages	below 15 years old	0	0.00
	15 – 25 years old	7	4.19
	26 – 40 years old	27	16.17
	41 – 60 years old	85	50.90
	over 60 years old	48	28.74
Marriage status	Single	20	11.98
	Divorced	6	3.59
	Married	129	77.25
	Widowed	12	7.18
Education Levels	Lower than undergraduate degree	132	79.04
	Undergraduate degree	29	17.37
	Graduate degree	6	3.59

Table 1: General information of patients (cont.)

General information	Responses	Numbers	Percentage
Occupations	Business owners/entrepreneurs	38	22.76
	Officers	18	10.78
	Agriculturalists	30	17.96
	Government officers/state enterprise officers	37	22.16
	Students	13	7.78
	Retired persons	23	13.77
	Others	8	4.79
Medical visits during the last six months	1 – 5 times	110	65.87
	6 - 10 times	29	17.37
	More than 10 times	28	16.76
Leaves of absence during the visits	Yes	91	54.49
	No	76	45.51
Transport to a hospital	Private cars and motorcycles	94	56.28
	Public transportation	49	29.34
	Rented cars	19	11.38
	Taking a lift	2	1.20
	Others	3	1.80
Payments	Personal payment	3	1.80
General information	Responses	Numbers	Percentage
	Health Insurance Card	90	53.90
	Social Insurance Card	20	11.97
	Reimbursement from organizations	2	1.20
	Direct Reimbursement	50	29.93
	Others	2	1.20

2. The average income of the participants was 10,608 baht. The average family income was 21,101 baht and the average number of family members was 4 persons (see table 2).

Table 2: Means and Standard Deviations of Patients

Personal Information	Means	Standard Deviation
Current income (baht)	10,608	13,060.6
Current income of Family Members (baht)	21,101	20,962.3
Numbers of Family Members	4.1296	1.6182

3. The general information concerning the patients' medical process showed the average transport cost was 615.57 baht, the duration of the transport was 1.98 hours, the duration of the medical care process was 2.30 hours, the average cost of food and accommodation was 298.18 baht, and the average medical fees were 913.75 baht (see table 3).

Table 3: Means and Standard Deviations

Patient's Medical Information	Means	Standard Deviations
Transportation fees (baht)	615.57	756.21
Transportation Duration (hours)	1.98	1.52
Medical Care Process (hours)	2.30	1.86
Food and Accommodation fees (baht)	298.18	396.04
Medical Fees (baht)	913.75	943.66

4. The average income of patient's relatives was 10,719 baht (see table 4).

Table 4: Means and Standard Deviations of patient's relatives

General Information	Means	Standard Deviations
Current income	10,719	11,585

5. Responses showed that the 70.77% of the patients' relatives were females, 43.08% were aged between 26 and 40 years old, 21.54%, had their own business (entrepreneurs), and 79.63% took leave of absence during the time in a hospital (see table 5).

Table 5: General Information in relation to Patients' Relatives and Family Members

General Information	Responses	Numbers	Percentage
Genders	Male	19	29.23
	Female	46	70.77
Age	Below 15 years old	0	0.00
	15 – 25 years old	3	4.62
	26 – 40 years old	28	43.08
	41 – 60 years old	26	40.00
	Over 60 years old	8	12.31
Occupations	Business owners / entrepreneurs	14	21.54
	Officers	12	18.46
	Labors	2	3.08
	Retired persons	0	0.00
	Unemployed	2	3.08
	Government Officers/States Enterprise Officers	10	15.38
	Agriculturalists	12	18.46
	Housekeepers	5	7.69
	Students	3	4.62
	Others	5	7.69

Table 5: General Information in relation to Patients' Relatives and Family Members (cont.)

General Information	Responses	Numbers	Percentage
Leave of Absence	Yes	43	79.63
	No leave of absence	7	12.96
	No because of unemployed status	4	7.41

6. Responses indicated that for patients' relatives and family members the average cost of transport was 742.05 baht, an average of 3.77 hours was spent on this transport, an average of 2.10 hours was spent in the medical care process,, the average cost of food and accommodation was 1,073.08 baht, and the average leave of absence was 1.28 day (see table 6).

Table 6: Means and Standard Deviations

Information of Patients' Medical Treatment	Means	Standard Deviations
Transport fees (baht)	742.05	639.98
Transportation duration (hours)	3.77	12.58
Medical care process (hours)	2.10	1.68
Food and Accommodation Fees (baht)	331.03	506.6
Medical fees (baht)	1,073.08	864.57
Leaving for Absence (Days)	1.28	0.61

7. Responses showed that the average direct costs (medical, food, and accommodation) for patients with shoulder ache, back ache, knee ache, paresis, and paralysis were 2,308.78 baht per person (47.86%). Average transport costs were 946.60 baht per person (19.62%). The overall direct cost was 3,255.38 baht per person (67.48) Regarding the indirect costs, the average patients' opportunity costs (transport and the medical care process) was 231.72 baht per person (4.80%) followed by the average patient's relatives' costs (duration of transport) at 292.21 baht per person (6.06%). Aside from

these, the average loss of income for the patients was 467.33 baht per person (9.69%) and for the relatives was 577.52 baht per person (11.97%). Lastly, the average overall indirect costs were 1,568.78 baht per person (32.52%), and the average overall economic costs were 4,824.16 baht per person (see table 7).

Table 7: The economic costs regarding all sicknesses

Cost Types	All patients	
	Baht/Person	Percentage of all costs
1.Direct costs 1.1 Medical fees, food and accommodation fees 1.2 Transport fees (patients and relatives)	 2,308.78 946.60	 47.86 19.62
Overall direct costs	3,255.38	67.48
2.Indirect Costs 2.1 Opportunity Costs (Traveling & Medical Care Process) -Patients' Opportunity Costs - Relatives' Opportunity Costs 2.2 Patients' Loss of Income 2.4 Patients' Relatives' Loss of Income	 231.72 292.21 467.33 577.52	 4.80 6.06 9.69 11.97
Overall Indirect Costs	1,568.78	32.52
Overall Costs	4,824.16	100.00

8. The average direct costs (medical, food and accommodation costs) for patients with shoulder ache was 1,255.25 baht per person (28.87%) and the transport fees for both patients and relatives was 1,214.81 baht per person (27.94%). The average overall direct costs for patients with shoulder ache was 2,470.06 baht per person (56.82%), and the indirect costs – opportunity costs (transport and medical care process) averaged 454.82 baht per person (10.46%). The average opportunity cost for patients' relatives was 269.17 baht

per person (6.19%). The average loss of income for patients was 716.13 baht per person (16.47%) and the relative is 437.06 baht per person (10.28%). the average overall indirect costs were 1,877.18 baht per person (43.18%) and the average overall economic costs were 4,347.24 baht per person (see table 8).

Table 8: Economic Costs for Patients with Shoulder Ache

Cost Types	Shoulder Ache Patients	
	Baht/ Person	Overall Cost Percentage
1.Direct Costs		
1.1 Medical, Food and Accommodation Fees	1,255.25	28.87
1.2 Transport Fees (Patients and Relatives)	1,214.81	27.94
Overall Direct Costs	2,470.06	56.82
2.Indirect Costs		
2.1 Opportunity Costs (Transport & Medical Care Process)		
- Patients' Opportunity Costs	454.82	10.46
- Relatives' Opportunity Costs	269.17	6.19
2.2 Patients' Loss of Income	716.13	16.47
2.3 Relatives' Loss of Income	437.06	10.28
Overall Indirect Costs	1,877.18	43.18
Overall Costs	4,347.24	100.00

9. Based on the calculation of the economic cost of the back-ache patients, it shows that the direct cost regarding the medical, food and accommodation fees is average of 1,301 baht per person (27.47%), and the transportation fees for both patients and their relatives are 1,238.28 baht per person (26.14%), and the indirect costs – opportunity costs (transport and medical care process) averaged 272.79 baht per person (5.76%). The average opportunity cost for patients' relatives was 568.96 baht per person (12.01%). The average loss of income for patients was 467 baht per person (9.86%) and the relative is 888.88 baht per person (18.77%). the average overall

indirect costs were 2,197.67 baht per person (46.39%) and the average overall economic costs were 4,736.95 baht per person (see table 9).

Table 9: The Economic Cost of the Back-Ache Patients

Cost Types	Back-Ache Patients	
	Baht/person	Overall Cost Percentage
1.Direct cost		
1.1 Medical, Food and Accommodation Cost	1,301	27.47
1.2 Patients and Relatives' Transportation Cost	1,238.28	26.14
Overall direct cost	2,539.28	53.16
2.Indirect cost		
2.1 Opportunity Costs (Transport & Medical Care Process)		
- Patients' Opportunity Costs	272.79	5.76
- Relatives' Opportunity Costs	568.96	12.01
2.2 Patients' Loss of Income	467	9.86
2.3 Relatives' Loss of Income	888.88	18.77
Overall Indirect Cost	2,197.67	46.39
Overall Economic Cost	4,736.95	100.00

10. For the economic cost calculation of the knee-ache patients, it can be seen that the direct cost regarding the medical, food and accommodation cost is average 965.04 baht per person (29.07%) including the transportation costs for both patients and relatives is 1,073.80 baht per person (32.35%). The overall direct cost of the knee-ache patients is 2,038.84 baht per person (61.41%). Paying attention to the indirect cost, the indirect cost concerning the patients' opportunity cost—transportation and medical care process—is average of 167.95 baht per person (5.06%) as well as the relative's opportunity cost is average 228.75 baht per person (6.89%). Furthermore, the patients' loss of income is average 464.28 baht per person (13.99%) and the relatives' is

average 420 baht per person (12.65%). The overall indirect cost is 1,280.98 baht per person (38.59%), and the overall economic cost is 3,319.82 baht per person (see table 10).

Table 10: The Economic Cost of the Knee-Ache Patients

Cost Types	Knee-Ache Patients	
	Baht/ Person	**Overall Cost Percentage**
1.Direct Cost		
1.1 Medical, Food and Accommodation Cost	965.04	29.07
1.2 Transportation Cost (Patients & Relatives)	1,073.80	32.35
Overall Direct Cost	2,038.84	61.41
2.Indirect Cost		
2.1 Opportunity Costs (Transport & Medical Care Process)		
- Patients' Opportunity Costs	167.95	5.06
- Relatives' Opportunity Costs	228.75	6.89
2.2 Patients' Loss of Income	464.28	13.99
2.3 Relatives' Loss of Income	420.00	12.65
Overall Indirect Cost	1,280.98	38.59
Overall Economic Cost	3,319.82	100.00

11. The economic cost calculation of the paresis and paralysis patients, it shows that the direct cost of medical, food and accommodation cost is average of 2,025.15 baht per person (41.80%) and the transportation cost of patients and relatives is 1,655.39 baht per person (34.17%). Additionally, the overall direct cost is 3,680.54 baht per person (75.97%). Paying attention to the indirect cost, the indirect cost concerning the patients' opportunity cost—transportation and medical care process—is average of 296.87 baht per person (6.13%) as well as the relative's opportunity cost is average 189.69 baht per

person (3.87%). Furthermore, the patients' loss of income is average 332.70 baht per person (6.87%) and the relatives' is average 344.69 baht per person (7.12%). The overall indirect cost is 1,163.95 baht per person (24.03%), and the overall economic cost is 4,844.49 baht per person (see table 11).

Table 11: The Economic Cost of the Paresis and Paralysis Patients

Cost Types	Paresis and Paralysis Patients	
	Baht / Person	Overall Cost Percentage
1.Direct Cost		
1.1 Medical, Food and Accommodation Cost	2,025.15	41.80
1.2 Transportation Cost (Patients and Relatives)	1,655.39	34.17
Overall Direct Cost	3,680.54	75.97
2.Indirect Cost		
2.1 Opportunity Costs (Transport & Medical Care Process)		
- Patients' Opportunity Costs	296.87	6.13
- Relatives' Opportunity Costs	189.69	3.87
2.2 Patients' Loss of Income	332.70	6.87
2.3 Relatives' Loss of Income	344.69	7.12
Overall Indirect Cost	1,163.95	24.03
Overall Economic Cost	4,844.49	100.00

4. Discussion

Most of the patients were female aged between 41 to 60 years old having a married status, an education level lower than undergraduate, and their own business as entrepreneurs. Their average income was 10,608 baht with a standard deviation of 13,060.60. The highest ratio of patients' occupation—both business owners and government and state enterprise officers is as high as 44.92%, making much difference in terms of income.

The lowest income of the entrepreneurs is 2,000 baht and the highest is 30,000 baht. The lowest income of government or state enterprise officers is 7,900 baht and the highest is 62,370 baht. The current family income is average of 21A,101 baht with the standard deviation of 20,962.30 because entrepreneur and business owner earn at least 8,000 baht and maximum of 50,000 baht whereas the government officers and state enterprise officers earn at least 15,000 baht and maximum of 100,000 baht. During the last six months they have a medical treatment for 1 – 5 times with the work leave. Moreover, the patients have to spend for the cost of transportation (private cars and motorcycles) to the hospital with the average cost of 615.57 baht and the standard deviation of 756.21. Referring to the standard deviation, the shoulder-ache patients have the least transportation cost of 40 baht and the highest cost of 4,500 baht—based on the distance from the patients' home and a hospital. Aside from the back-ache patients spend at least 40 baht the maximum rate of 3,000 for the transportation cost in accordance with the distance from their homes to a hospital (the furthest distance is travelling from Yasothon province). For the knee-ache patients, they spend at least 40 baht and the highest cost of 2,400 for the transportation—based on their distance from Buntthárik district followed by the paresis and paralysis patients spending the least of 20baht and the highest of 3,000 for the transportation—the furthest distance starting from Amnart Charoen province. In addition, the transportation duration is average of 1.98 hours including the medical care process of 2.30 hours. The food and accommodation cost is 298.18 baht with the standard deviation of 396.04 due to the relatives' stay during the patients' treatment at a hospital leading them to spend the maximum cost of 3,000 baht. Apart of the transportation cost, the calculation of economic cost shows that the patients with shoulder ache, back ache, knee ache, paresis and paralysis have the direct cost more than the indirect cost because most causes of the direct come from the medical-check-cost, food and accommodation cost and the transportation cost; travelling from different district. These patients encounter very long queues, insufficient hospital staff and resources: two doctors, two assistants and two examination rooms. Therefore, they have to spend more time and money on accommodation, food, and transportation cost

in order to wait for tomorrow's service. Furthermore, most of patients have a lower undergraduate degree which causes the less income to unemployed situation. Therefore, the calculation of indirect cost according to the salary and the opportunity cost; transportation and medical-check-duration; result with the low levels of indirect cost calculation. Thus, this is consistent with the study by Khongsak Peerakham (2007) and Masuma Tejcharoenpanit (2009) stating that the overall direct cost is considerably higher than the indirect one because the direct cost deriving from the medical-treatment cost, including the transportation cost and the most of patients are elderly, a lower undergraduate degree, who earn little income. This causes the indirect cost regarding the medical treatment and opportunity cost—transportation and medical-checking-duration resulted with the low level of calculation.

5. Suggestions

Based on the findings of this study, it brightens that most of the direct cost comes from the patients' transportation cost; travelling from another district to a hospital; and most of them could not arrive to the hospital on time. By this reason, the patients have to spend more cost for the food, accommodation as well as the transportation. This is the economic loss of patients because of the increase of expenses including the opportunity cost from the work leave. To solve the aforementioned issues, the researcher recommends that there should be an increased number of medical officers working in local hospitals to serving local patients. This would help patients in rural areas or to reduce the expenses, especially transport and other relevant costs.

Suggestions for Further Research

1. For patients with paresis and paralysis, the researcher should conduct in-depth interviews because there may be other direct costs beyond medical costs, accommodation, food, and transport costs, such as house expansion/construction for patients, and specific medical equipment. This would lead to consistent calculation of indirect costs.

2. There should be a comparative study on the economic costs of acupuncture therapy and massage.

3. There should be further analysis on the production of alternative medical officers based on the economic value analysis in order to contribute in the policy of producing the future medical officers.

Limitations of the study

The target group was not big enough as expected because the time that the researcher began to collect data during January – June in 2014 overlapped with rice growing season resulting in less patients especially farmers coming to hospitals.

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