

# Patterns of Outpatient Services and Charge for Patients Enrolled in the Universal Health Coverage Scheme

Kanet Sumpattanon\*

Nilawan Upakdee<sup>†</sup>

Supasit Pannarunothai\*

## Abstract

**Background:** In 2011, the Universal Health Coverage (UHC), which is a public health insurance scheme, covered approximately 48.3 million (74.3%) of the Thai population. This study aims to examine the patterns of outpatient services and analyze the difference between mean of charge in healthcare per patient per year among the various outpatient-service patterns.

**Methods:** The data was gathered from outpatient service providers in Chiang Mai, Khon Kaen, Lampang and Songkla in 2011. We generated thirty-one patterns of outpatient services based on five categories of existing healthcare providers: 1) Health Centers (HC); 2) Community Hospitals (CH); 3) General/Regional Hospitals (GH/RH); 4) University Hospitals (UH); and 5) Other Hospitals (OH). Descriptive statistical analysis and one-way analysis of variance (ANOVA) were used to assess the difference between mean of charge in healthcare per patient per year among the various outpatient-service patterns.

**Results:** For those accessing a single health facility, 29.1 % occurred in HC, 19.8% occurred in CH, and 7.5% occurred in GH/RH. For those accessing two different health facilities, 20.8% occurred in HC and CH, 4.5% occurred in HC and GH/RH, and 2.1% occurred in CH and GH/RH. For those accessing three different health facilities, 2.8% occurred in HC, CH and GH/RH. Other patterns of access in outpatient service in excess of three health facilities per year were less than 1.0%. In terms of charge (per patient per year), HC generated the lowest (295.4 Baht) while both GH/RH and UH generated the highest (13,236.2 Baht). The mean of charge in healthcare services among the thirty-one patterns were significantly different. A subset of seven groups was classified that corresponded to the patterns.

**Conclusions:** Outpatient-service patterns were consistent with policy of Universal Health Coverage Scheme (UCS). UCS patients are able to access a variety of healthcare services from primary to tertiary care. Different service patterns affected charges differently. To allocate budget and improve the payment system for outpatient services, UCS policymakers should consider the impact of patterns on outpatient services.

**Key words:** outpatient services, services patterns, outpatient utilization, Universal Health Coverage Scheme, charge

## บทคัดย่อ

รูปแบบการให้บริการและค่ารักษาพยาบาลสำหรับผู้ป่วยนอกในระบบหลักประกันสุขภาพถ้วนหน้า  
คณะศัลยกรรมกระดูก\*, นิลวรรณ อยู่ภักดี<sup>†</sup>, สุภสิทธิ์ พรรณารุโณทัย\*

\*คณะแพทยศาสตร์ มหาวิทยาลัยนเรศวร, <sup>†</sup>คณะเภสัชศาสตร์ มหาวิทยาลัยนเรศวร

ในปี 2554 ระบบหลักประกันสุขภาพถ้วนหน้าเป็นการประกันสุขภาพของภาครัฐ มีความครอบคลุมประชากรไทย  
ประมาณ 48.3 ล้านคน (คิดเป็นร้อยละ 74.3 ของประชากรทั้งประเทศ) การศึกษานี้มีวัตถุประสงค์เพื่อหารูปแบบของการ

\*Faculty of Medicine, Naresuan University Phitsanulok 65000, Thailand, <sup>†</sup> Faculty of Pharmaceutical Sciences, Naresuan University Phitsanulok 65000, Thailand.



ใช้บริการผู้ป่วยนอกในระบบหลักประกันสุขภาพแห่งชาติ ค่าใช้จ่ายของผู้ป่วยต่อคนต่อปี และความแตกต่างระหว่างค่าใช้จ่ายของผู้ป่วยกับรูปแบบการให้บริการในแผนกผู้ป่วยนอกต่อปี วิธีการศึกษาใช้ข้อมูลผู้ป่วยนอกรายบุคคลที่ใช้บริการในปี 2554 จาก 4 จังหวัด คือ เชียงใหม่ ขอนแก่น ลำปาง สงขลา กำหนดรูปแบบการให้บริการ 31 รูปแบบ จาก 5 ประเภทหน่วยบริการ ประกอบด้วย สถานีอนามัย โรงพยาบาลชุมชน โรงพยาบาลศูนย์/ทั่วไป โรงพยาบาลมหาวิทยาลัย และโรงพยาบาลอื่น ๆ การวิเคราะห์ข้อมูลใช้สถิติเชิงพรรณนาและการวิเคราะห์ความแปรปรวนระหว่างค่าใช้จ่ายของผู้ป่วยต่อคนต่อปี กับรูปแบบของการให้บริการ ผลการศึกษาพบว่าการใช้บริการในหน่วยบริการประเภทเดียว มีการใช้บริการในสถานีอนามัยเฉลี่ยร้อยละ 29.1% ที่โรงพยาบาลชุมชนร้อยละ 19.8 ลำดับที่สาม คือ โรงพยาบาลศูนย์/ทั่วไป ร้อยละ 7.5 การใช้บริการหน่วยบริการ 2 ประเภท พบว่ามีการใช้บริการสูงสุดที่สถานีอนามัยและโรงพยาบาลชุมชนคิดเป็นร้อยละ 20.8 เป็นที่สถานีอนามัยและโรงพยาบาลศูนย์/ทั่วไป ร้อยละ 4.5, โรงพยาบาลชุมชนและโรงพยาบาลศูนย์/ทั่วไปร้อยละ 2.1 สำหรับการให้บริการหน่วยบริการ 3 ประเภท พบว่าใช้บริการสูงสุดที่สถานีอนามัย, โรงพยาบาลชุมชนและโรงพยาบาลศูนย์/ทั่วไป ร้อยละ 2.8 สำหรับรูปแบบการให้บริการอื่นๆ มีการใช้บริการน้อยกว่าร้อยละ 1.0 ด้านค่าใช้จ่ายของผู้ป่วยต่อคนต่อปี พบว่าค่าใช้จ่ายต่ำสุดอยู่ที่การให้บริการที่สถานีอนามัย คิดเป็น 295.4 บาทต่อคนต่อปี และสูงสุดที่โรงพยาบาลศูนย์/ทั่วไปและโรงพยาบาลมหาวิทยาลัย คิดเป็น 13,236.2 บาทต่อคนต่อปี จากการหาความแตกต่างระหว่างค่าเฉลี่ยค่าใช้จ่ายกับรูปแบบการให้บริการทั้ง 31 รูปแบบ สรุปได้ว่าค่าใช้จ่ายสามารถจัดกลุ่มรูปแบบการให้บริการได้ 7 กลุ่มที่มีค่าใช้จ่ายที่ต่างกัน

จากการศึกษารูปแบบการให้บริการมีความสอดคล้องกับนโยบายระบบหลักประกันสุขภาพถ้วนหน้า ความแตกต่างของรูปแบบการให้บริการมีผลต่อค่าใช้จ่ายของผู้ป่วย ในการจัดสรรงบประมาณและพัฒนาระบบการจ่ายเงินสำหรับผู้ป่วยนอกผู้กำหนดนโยบายควรคำนึงถึงรูปแบบการให้บริการผู้ป่วยนอกด้วย

**คำสำคัญ:** บริการผู้ป่วย, รูปแบบการให้บริการ, การให้บริการผู้ป่วยนอก, ระบบหลักประกันสุขภาพถ้วนหน้า, ค่ารักษาพยาบาล (ราคาเรียกเก็บ)

## Background

Thailand has achieved Universal Health Coverage (UHC) in 2002. In 2011, a majority of the Thai population (74.3%) were covered by the Universal Health Coverage Scheme (UCS). Efforts have been made to ensure UC coverage for all Thais. As a result, outpatient utilization had increased from 111.95 million visits in 2003 to 154.18 million visits in 2011<sup>(1)</sup>. The utilization of outpatient services is one of the main factors in the budget calculation for health benefits under the UCS. Price and quantity approach (PQ approach) can be used to estimate the budget for people enrolled in the UCS. The total budget equals the sum of health expenditure per capita multiplied by the number of people enrolled in the UCS in the area. Given how the patterns of outpatient services

affect the actual cost of healthcare services, these patterns should be considered for appropriate budget estimates. Database for health-service usage provides preliminary empirical evidence that illustrates the use of healthcare services.

National Health Security Office (NHSO) is in charge of budget management and benefit packages for the UCS. NHSO has designed the model for outpatient services whereby patients are treated at the point of care. Most healthcare registration systems start from primary-care level which serves as a gate keeper. Primary care facilities include health centers and outpatient clinics, which are parts of the main hospital. The healthcare services in Thailand include both public and private sectors. Currently, there are five main types:

1. Health Centers (HC);
2. Community Hospitals (CH);

3. General/Regional Hospitals (GH/RH); 4. University Hospitals (UH); and 5. Other Hospitals (OH) which encompass private hospitals and those outside the jurisdiction of the Ministry of Public Health (MoPH).

In this study, we reviewed a number of studies related to the pattern of service utilization in various countries. A study on the patterns of ambulatory care utilization in Taiwan showed that 21.7% of patients visited academic medical centers, 26.9% visited metropolitan hospitals, 29.3% visited local community hospitals, and 87.4% visited physician clinics. Total percentages exceeded 100.0% because a patient might visit several facilities<sup>(2)</sup>. A study on pattern utilization by types of provider in Tehran, the capital city of the Islamic Republic of Iran, found that patients were likely to seek care in public hospitals (31.5%), specialist offices (31.2%), general practitioners (13.5%), private hospitals (10.3%), emergency departments (10.1%) and traditional medicine (3.4%), respectively<sup>(3)</sup>. In 2011, a study on the pattern of UC utilization found that patients accessed health centers (30.9%), community hospitals (25.2%), general hospitals (19.5%), private clinics (15.4%), public hospitals outside the Ministry of Public Health (4.4%), private hospitals (2.9%), University Hospital (1.3%) and other (0.4%), respectively [9]. A study on the determinants of health-seeking behaviors in Somali found four main factors, namely, 1) access determinants (cost, distance, low reliability of point of care, drug supplies and stock outs, poor quality, security and delay 2) socio-cultural determinants (lack of knowledge or previous exposure, low awareness of potential benefits or poor acceptability of services), 3) gender bias, and 4) decision-making power<sup>(4)</sup>. Several factors of care seeking should be

taken into account to define the benefits for the people. A study in Southeast Nigeria found that medical service fees and location of patients were positively related to primary healthcare services<sup>(5)</sup>. The payment mechanism for outpatient is measured by age-adjusted capitation. NHSO-allocated budget for general outpatients had increased from 574 Baht in 2003 to 667 Baht, 754.6 Baht, 795.4 Baht, 985.8 Baht and 983.5 from 2009 to 2013, respectively<sup>(6-11)</sup>. In addition, from the literature review, we found that patterns of outpatient utilization are different in various units. Each pattern could be used for budget estimation. We focus on outpatient services because it has more patients and various units.

## Objectives

1. To examine patterns of outpatient service utilization in the UCS
2. To analyze charges per patient per year according to patterns of utilization
3. To assess the difference between means of charges in healthcare service among the various patterns of utilization

## Methods

### 1. Data source

Data in the NHSO health electronic records in fiscal year 2011 were used. Outpatient records were composed of demographic, diagnostic and charge information. In FY 2011, approximately 154.2 million visits to outpatient services were registered. The data was selected by sampling technique.

### 2. Data Sampling

In this study, a province is considered a unit of



sampling. We selected four provinces from seventy-seven provinces. We were able to use purposive-with-condition sampling method because of a large set of data (154.2 million visits in 2011 of UCS beneficiaries). The following three criterias were used:

*Criterion 1:* The secondary data from electronic health records must be complete. Selected province must have data sent from each health unit to NHSO within FY2011 and completed in 12 months, which accounted for at least 70.0% of health facilities.

*Criterion 2:* Completeness of the three levels of care

Selected provinces must have three levels of care: 1. primary level (Health Centers), 2. secondary level (Community Hospitals and hospitals outside Ministry of Public Health administration), and 3. tertiary care level (General/Regional Hospitals and University Hospitals). The context of outpatient utilization emphasizes patients' service utilization at the unit they

registered. Health service utilization starts from primary to tertiary levels. The primary level provides integrated services that include medical treatment, prevention, protection and rehabilitation. Patients with severe conditions are referred to a network hospital in secondary level. Patients with high severity and in need of comprehensive care must be sent to tertiary hospital in the same network.

*Criterion 3:* Utilization rate was calculated

The utilization of services in selected provinces in criteria 1 and 2 will be ranked on the top-ten list of utilization rate (UR). We chose provinces with high utilization rates by looking at an average registration rate and average outpatient utilization due to a variety of UC-covered diseases and the likelihood of treatment being prescribed for the continuity of care.

### 3. Data Validation

The data was consisted of two components. Part I: demographic (age, sex, date of birth and personal identify code) and part II: outpatient services (hospi-

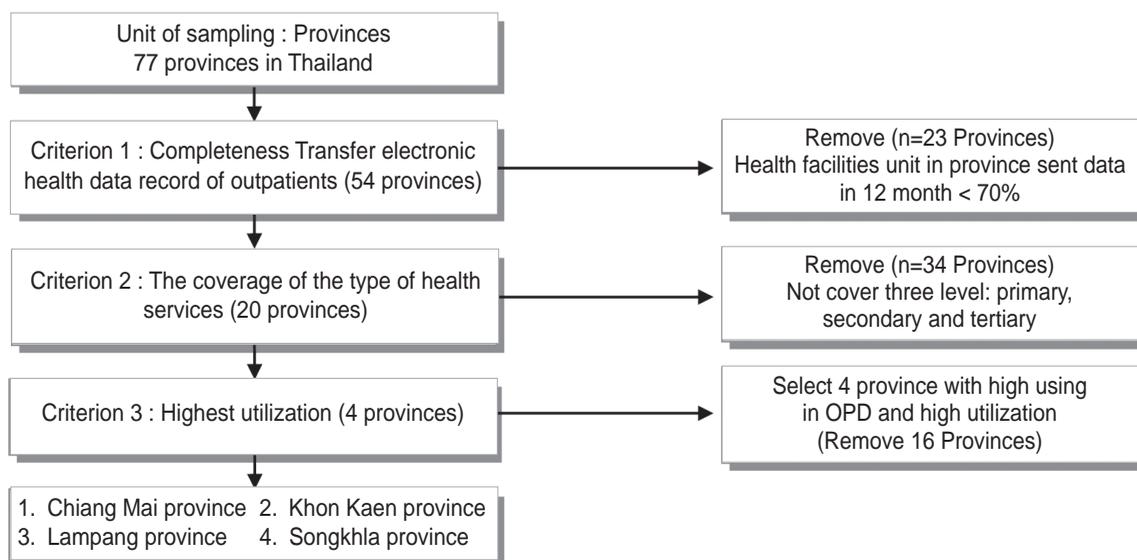


Figure 1 A diagram illustrates the selection process

**Table 1** Number of data electronic record of outpatient services in 4 provinces

Data validation	Chiang Mai	Khon Kaen	Lampang	Songkhla	4 provinces
1. Data at the beginning	4,487,424	4,721,484	2,055,805	2,961,952	14,226,665
2. Final record after cleaning data	4,067,029	4,236,079	1,935,392	2,667,437	12,905,937
Proportion of record after cleaning data	90.6%	89.7%	94.1%	90.1%	90.7%

tal code, type of service unit, date service, diagnosis code and charge per visit). Data was validated for any duplicate and missing value. It appeared that Khon Kaen had 89.7% of records after data manipulation; Songkhla had 90.1%; Chiang Mai had 90.6%; and Lampang had 94.1%. Completeness of data in four provinces was more than 89.7%.

#### 4. Data Analysis

Statistical analysis assessed the difference between mean of charge among the various patterns of service utilization. Data analysis was divided into three parts:

**Part 1)** Analysis of service utilization to identify the use of macro level. The study used descriptive statistics to describe the patterns of outpatient services in the four provinces. We examined patterns of service utilization in the four provinces and the use of each type of services within one year. The study explored the number of services in five categories 1. HC, 2. CH, 3. GH/RH, 4. UH and 5. OH. We identified thirty-one patterns of access to outpatient services in accordance with the above five categories. The patterns include access to a single outpatient service facility; access to two different facilities; access to three different facilities; access to four different facilities; and access to five different facilities.

**Part 2)** Analysis of the average charge per patient per year using descriptive statistics to obtain

mean of charge.

**Part 3)** One-way Analysis of Variance (One-way ANOVA) to test the difference between mean of charge and thirty-one patterns of the utilization, and tested multiple comparisons using the Scheffe test at the 0.05 level of statistical significance.

## Results

### 1. Patterns of outpatient utilization

1.1 Outpatient-service utilization of the four provinces

Table 2 shows the number of outpatient services and the number of people enrolled in the Universal Coverage in each province. We found that the outpatient utilization rate (3.61) and the use of outpatient department (OPD) per patient rate (5.50) in Lampang were higher than the other three provinces.

1.2 Outpatient visits in the four provinces

Of the four provinces, a majority of outpatient visits occurred in HC (43.5%), 35.3% occurred in CH, and the other types less than 10.0% occurred in OH as illustrated in Table 3.

1.3 Patterns of outpatient-service utilization in five types of providers

We identified patterns of outpatient utilization by finding possible combinations of the five categories of healthcare providers, generating thirty-one patterns of the utilization. Table 4 shows the identi-

**Table 2** Number of outpatient services and people enrolled in the UC and utilization rate

Item	Chaing Mai	Khon Kaen	Lampang	Songkhla	4 provinces
1. Number of OP visit	4,067,029	4,236,079	1,935,392	2,667,437	12,905,937
2. Number of Patient	782,403	910,894	351,711	607,535	2,652,543
3. UCS member	1,186,782	1,342,832	536,563	1,045,681	4,111,858
4. OPD per patient rate (1/2)	5.20	4.65	5.50	4.39	4.87
5. Utilization rate (1/3)	3.43	3.15	3.61	2.55	3.14

**Table 3** Number of outpatient visits in health care facilities

Pattern of health care utilization	Chaing Mai		Khon Kaen		Lampang		Songkhla		4 Provinces	
	N (Visit)	(%)	N (Visit)	(%)						
1. Health center (HC)	1,794,302	(44.1)	2,021,035	(47.7)	851,898	(44.0)	948,136	(35.5)	5,615,371	(43.5)
2. Community hospital (CH)	1,570,470	(38.6)	1,424,248	(33.6)	769,392	(39.8)	795,581	(29.8)	4,559,691	(35.3)
3. General hospital (GH)	215,475	(5.3)	57,832	(1.4)	-	(-)	257,935	(9.7)	531,242	(4.1)
4. Regional hospital (RH)	-	(-)	349,218	(8.2)	295,067	(15.2)	325,015	(12.2)	969,300	(7.5)
5. University hospital (UH)	230,955	(5.7)	247,416	(5.8)	-	(-)	309,569	(11.6)	787,940	(6.1)
6. Other hospital (OH)	255,827	(6.3)	136,330	(3.2)	19,035	(1.0)	31,201	(1.2)	442,393	(3.4)
<b>Total</b>	<b>4,067,029</b>	<b>(100.0)</b>	<b>4,236,079</b>	<b>(100.0)</b>	<b>1,935,392</b>	<b>(100.0)</b>	<b>2,667,437</b>	<b>(100.0)</b>	<b>12,905,937</b>	<b>(100.0)</b>

fied patterns:

1) Major outpatient service was likely to use health service in one health facility (65.5%); HC (29.1%), CH (19.8%). The utilization of two health facilities was approximately 30.0%; highest utilization was found in HC and CH (20.8%).

2) For access to a single facility, HC had the highest percentage of utilization (29.1%), followed by CH (19.8%), and GH/RH (7.5%).

3) For access to two facilities, the highest percentage of the utilization occurred in HC and CH (20.8%), followed by the service at HC and GH/RH (4.5%), and CH and GH/RH (2.1%).

4) For access to three facilities, the highest percentage of the utilization occurred in HC, CH and GH/

RH (2.8%). The other combinations were less than 1.0%.

5) For access to four facilities and five facilities, most services were less than 0.2%.

### 2. Charge in outpatient service

Table 5 demonstrates charge by thirty-one utilization patterns. The lowest charge appeared in HC (295.4 Baht); the highest in a combination of GH/RH and UH (13,236 Baht).

### 3. Test of ANOVA between charge and utilization patterns

The means difference of charge was statistically significant at the 0.05 level. We used Scheffe's test to analyze the within-group difference in means. The thirty-one patterns could be classified into seven homogenous groups (Table 6).

Table 4 Patterns of health care utilization number of patients

Pattern of health care utilization	Chaing Mai		Khon Kaen		Lampang		Songkhla		4 Provinces	
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
<b>Using in one type of health facility</b>	<b>513,380</b>	<b>(65.6)</b>	<b>593,481</b>	<b>(65.2)</b>	<b>211,761</b>	<b>(60.2)</b>	<b>419,870</b>	<b>(69.1)</b>	<b>1,738,492</b>	<b>(65.5)</b>
1. Health center (HC)	223,889	(28.6)	293,997	(32.3)	95,040	(27.0)	159,213	(26.2)	772,139	(29.1)
2. Community hospital (CH)	176,973	(22.6)	161,479	(17.7)	78,761	(22.4)	106,923	(17.6)	524,136	(19.8)
3. General and Regional hospital (GH/RH)	21,571	(2.8)	57,876	(6.4)	34,498	(9.8)	84,168	(13.9)	198,113	(7.5)
4. University hospital (UH)	42,615	(5.4)	57,305	(6.3)	-	(-)	62,176	(10.2)	162,096	(6.1)
5. Other hospital (OH)	48,332	(6.2)	22,824	(2.5)	3,462	(1.0)	7,390	(1.2)	82,008	(3.1)
<b>Using in two type of health facilities</b>	<b>238,458</b>	<b>(30.5)</b>	<b>276,244</b>	<b>(30.3)</b>	<b>120,675</b>	<b>(34.3)</b>	<b>161,607</b>	<b>(26.6)</b>	<b>796,984</b>	<b>(30.0)</b>
6. HC+CH	183,838	(23.5)	201,832	(22.2)	78,983	(22.5)	85,934	(14.1)	550,587	(20.8)
7. HC+GH/RH	18,293	(2.3)	34,580	(3.8)	26,091	(7.4)	41,182	(6.8)	120,146	(4.5)
8. HC+UH	3,148	(0.4)	3,629	(0.4)	-	(-)	3,340	(0.5)	10,117	(0.4)
9. HC+OH	4,938	(0.6)	4,128	(0.5)	724	(0.2)	1,202	(0.2)	10,992	(0.4)
10. CH+GH/RH	11,872	(1.5)	15,686	(1.7)	13,271	(3.8)	15,811	(2.6)	56,640	(2.1)
11. CH+UH	8,866	(1.1)	2,901	(0.3)	-	(-)	5,632	(0.9)	17,399	(0.7)
12. CH+OH	2,160	(0.3)	4,329	(0.5)	617	(0.2)	490	(0.1)	7,596	(0.3)
13. GH/RH+UH	1,195	(0.2)	3,382	(0.4)	-	(-)	5,630	(0.9)	10,207	(0.4)
14. GH/RH+OH	1,324	(0.2)	2,921	(0.3)	989	(0.3)	1,995	(0.3)	7,229	(0.3)
15. OH+UH	2,824	(0.4)	2,856	(0.3)	-	(-)	391	(0.1)	6,071	(0.2)
<b>Using in three type of health facilities</b>	<b>28,731</b>	<b>(3.7)</b>	<b>37,995</b>	<b>(4.2)</b>	<b>18,955</b>	<b>(5.4)</b>	<b>24,229</b>	<b>(4.0)</b>	<b>109,910</b>	<b>(4.1)</b>
16. HC+CH+GH/RH	15,834	(2.0)	25,732	(2.8)	17,482	(5.0)	14,861	(2.4)	73,909	(2.8)
17. HC+CH+OH	1,018	(0.1)	3,427	(0.4)	580	(0.2)	370	(0.1)	5,395	(0.2)
18. HC+CH+UH	8,741	(1.1)	2,652	(0.3)	-	(-)	3,776	(0.6)	15,169	(0.6)
19. HC+OH+UH	354	(0.0)	279	(0.0)	-	(-)	66	(0.0)	699	(0.0)
20. HC+GH/RH+OH	341	(0.0)	1,884	(0.2)	630	(0.2)	900	(0.1)	3,755	(0.1)
21. HC+GH/RH+UH	731	(0.1)	1,405	(0.2)	-	(-)	2,183	(0.4)	4,319	(0.2)
22. CH+GH/RH+OH	168	(0.0)	663	(0.1)	263	(0.1)	151	(0.0)	1,245	(0.0)
23. CH+GH/RH+UH	1,117	(0.1)	1,513	(0.2)	-	(-)	1,705	(0.3)	4,335	(0.2)
24. CH+UH+OH	269	(0.0)	145	(0.0)	-	(-)	51	(0.0)	465	(0.0)
25. GH/RH+UH+OH	158	(0.0)	295	(0.0)	-	(-)	166	(0.0)	619	(0.0)
<b>Using in four type of health facilities</b>	<b>1,812</b>	<b>(0.2)</b>	<b>3,102</b>	<b>(0.3)</b>	<b>320</b>	<b>(0.1)</b>	<b>1,804</b>	<b>(0.3)</b>	<b>7,038</b>	<b>(0.3)</b>
26. HC+CH+GH/RH+UH	1,443	(0.2)	2,017	(0.2)	-	(-)	1,496	(0.2)	4,956	(0.2)
27. HC+CH+GH/RH+OH	168	(0.0)	737	(0.1)	320	(0.1)	159	(0.0)	1,384	(0.1)
28. CH+HC+OH+UH	131	(0.0)	105	(0.0)	-	(-)	36	(0.0)	272	(0.0)
29. CH+GH/RH+OH+UH	38	(0.0)	98	(0.0)	-	(-)	26	(0.0)	162	(0.0)
30. GH/RH+HC+OH+UH	32	(0.0)	145	(0.0)	-	(-)	87	(0.0)	264	(0.0)
<b>Using in five type of health facilities</b>	<b>22</b>	<b>(0.0)</b>	<b>72</b>	<b>(0.0)</b>	<b>0</b>	<b>(0.0)</b>	<b>25</b>	<b>(0.0)</b>	<b>119</b>	<b>(0.0)</b>
31. HC+CH+GH/RH+UH+OH	22	(0.0)	72	(0.0)	-	(-)	25	(0.0)	119	(0.0)
<b>Grand Total</b>	<b>782,403</b>	<b>(100.0)</b>	<b>910,894</b>	<b>(100.0)</b>	<b>351,711</b>	<b>(100.0)</b>	<b>607,535</b>	<b>(100.0)</b>	<b>2,652,543</b>	<b>(100.0)</b>



**Table 5** Charge by thirty-one patterns of utilization (Baht/patient/year)

Pattern of health care utilization	Charge by combination of service in health facilities (Baht/patient/year)
<b>Using in one type of health facility</b>	
1. Health center (HC)	295.4
2. Community hospital (CH)	877.4
3. General and Regional hospital (GH/RH)	1,959.6
4. University hospital (UH)	4,711.3
5. Other hospital (OH)	1,429.3
<b>Using in two type of health facilities</b>	
6. HC+CH	1,228.5
7. HC+GH/RH	1,395.5
8. HC+UH	2,384.6
9. HC+OH	1,167.5
10. CH+GH/RH	2,660.2
11. CH+UH	4,585.6
12. CH+OH	1,794.5
13. GH/RH+UH	13,236.2
14. GH/RH+OH	1,956.3
15. OH+UH	2,435.4
<b>Using in three type of health facilities</b>	
16. HC+CH+GH/RH	2,772.4
17. HC+CH+OH	1,842.9
18. HC+CH+UH	4,504.6
19. HC+OH+UH	2,964.9
20. HC+GH/RH+OH	2,276.8
21. HC+GH/RH+UH	6,432.4
22. CH+GH/RH+OH	3,949.7
23. CH+GH/RH+UH	9,026.5
24. CH+UH+OH	4,079.1
25. GH/RH+UH+OH	5,644.2
<b>Using in four type of health facilities</b>	
26. HC+CH+GH/RH+UH	7,528.5
27. HC+CH+GH/RH+OH	3,684.4
28. CH+HC+OH+UH	4,633.7
29. CH+GH/RH+OH+UH	11,644.2
30. GH/RH+HC+OH+UH	4,721.3
<b>Using in five type of health facilities</b>	
31. HC+CH+GH/RH+UH+OH	6,299.1
<b>Grand Total</b>	<b>1,259.9</b>

**Table 6** The difference between means of charge and thirty-one patterns of utilization

Group	Combination of service-type users in each health facilities	Charge (Baht/patient/year)	F	P value
1	HC	295	566.40	<.000
2	CH, OH, HC+OH, CH+HC, RH/GH+HC	877 - 1,429		
3	CH+OH, RH/GH, HC+UH, RH/GH+OH, OH+UH, CH+RH/GH RH/GH+HC+OH, CH+HC+OH	1,794 - 2,660		
4	CH+RH/GH+HC, HC+OH+UH, CH+OH+UH, CH+RH/GH+OH CH+RH/GH+HC+OH	2,772 -4,079		
5	UH, CH+UH, CH+HC+UH, RH/GH+HC+UH, RH/GH+OH+UH, CH+HC+OH+UH, RH/GH+HC+OH+UH, CH+RH/GH+HC+OH+UH	4,505 - 6,432		
6	CH+RH/GH+HC+UH	7,528		
7	RH/GH+UH, CH+RH/GH+UH, CH+RH/GH+OH+UH	9,027 - 13,236		

## Discussion

### 1. The use of outpatient services

The results from this study corresponded with the UCS, which allows patients to access health services from primary to tertiary levels. The primary care is considered a gate keeper in the system. The patterns of outpatient utilization in this study suggested that people tended to access a single facility, particularly in HC. Access two different types of facilities were likely to occur at HC and CH. Access to three facilities mostly occurred at HC, CH and GH/RH. Primary care level should therefore increase the strength of its system.

The different patterns of outpatient utilization should be taken into account for the formulation of the payment and allocation criteria in outpatient services, especially the utilization pattern that allows multiple accesses to healthcare providers and the re-

ferral system. The utilization of more than one type of unit is more than 30.0%. A budget should therefore be allocated for the referral system.

### 2. Charge of outpatient services

Charge ranges between 295-13,236 Baht. The charge at HC was the lowest (295 Baht) while the highest was generated by both GH/RH and UH (13,236 Baht). Additionally, from the thirty-one patterns of utilization, we were able to identify seven homogeneous groups. In 2011, National Health Security Office allocated the budget for 795.4 Baht for each person enrolled in the UCS. The results showed that the utilization pattern may be used to adjust the budget for UCS access. The study suggested that charge be can be used as a reference for allocation. However, this study only focused on drug and procedure charge. We thus suggested further study on standard method for comparison, exclusive of prevention and promo-



tion programs. The data in this study used medical charge in outpatient services in the hospital and health center. Analysis may need other data resources such as Survey of Health and Welfare of the Office of National Statistics, which provides more information on conventional and traditional drug usage among patients who visit clinics or pharmacies.

### Conclusion

1. The main finding in outpatient services utilization was consistent with the UCS policies, which allow patients access to primary, secondary, and tertiary care levels. Most services occurred at HC, CH&HC, and CH, consecutively. Approximately, each facility had 69.7% of the services. The lowest charge was found in HC (295.4 Baht/patient/year).

2. The study suggests that different patterns of utilization affect charges of medical care differently. When allocating budget and improving payment system, policymakers and UC stakeholders should consider the effect of outpatient utilization pattern.

3. Charges in this study included drug and treatment expenses per patient per year. For charge to explicitly reflect actual cost, a study on health expen-

diture on other components (i.e. labor cost, capital cost), excluding prevention and promotion programs, is recommended.

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