



Labor Price Index for Physicians in Thailand

Phatthanawilai Inmai*

Pudtan Phanthunane[†]

Thaworn Sakunphanit*

Corresponding author: Phatthanawilai Inmai, phatthanawilai@hisro.or.th

Abstract

This research aimed to formulate and develop the labor price index (LPI) for physicians in Thailand in both public and private health service sectors. LPI was developed and used extensively in the US, Australia, New Zealand and Canada to enable the monitoring of labor cost in the healthcare market and planning wage policies in public and private sectors. However, LPI is new and has not been comprehensively studied and developed in Thailand. Physician compensation in this study included salaries and benefit or welfare. The total physician compensation in public and private hospitals was estimated from the annual budget and the survey by the National Statistical Office (NSO). The weight was calculated by the ratio of share for labor expenditure in a base year. The LPIs of 2008 to 2011 were calculated. The Laspeyres LPI was used in this study, and LPI of 2010 was defined as the base year.

It was found that between 2008 and 2011, the average of physician compensation in private hospitals was higher than public hospitals. On the contrary, the average growth rate of physician compensation in public hospitals was higher than private hospitals. The results showed that the LPI of public hospitals increased approximately 1.5-1.6% annually while the LPI of private hospitals declined approximately 1.4-1.5%. This study recommended that surveys to represent physician populations should be undertaken. Moreover, LPIs for other professional groups such as nurses, dentists, pharmacists, other medical workers working at back offices should also be studied.

Keywords: labor price index (LPI), physician compensation, weighted data

บทคัดย่อ

ดัชนีราคาค่าแรงแพทย์ในประเทศไทย

พัฒนาวิไล อินไหม*, พุดตาน พันธุนานะ[†], ถาวร สกุนพานิชย์*

*สำนักวิจัยเพื่อการพัฒนาหลักประกันสุขภาพไทย สถาบันวิจัยระบบสาธารณสุข, [†]คณะวิทยาการจัดการ เศรษฐศาสตร์ และการสื่อสาร มหาวิทยาลัยนเรศวร

ผู้รับผิดชอบบทความ: พัฒนาวิไล อินไหม

งานวิจัยนี้มีวัตถุประสงค์เพื่อจัดทำและพัฒนาดัชนีราคาค่าแรงแพทย์ในประเทศไทย ทั้งในภาครัฐและเอกชน ดัชนีราคาค่าแรงถูกพัฒนาอย่างต่อเนื่องในต่างประเทศ ได้แก่ สหรัฐอเมริกา ออสเตรเลีย นิวซีแลนด์และแคนาดาในการตรวจวัดต้นทุนค่าแรงในตลาดสุขภาพ อีกทั้งใช้ในการวางนโยบายค่าแรงทั้งในภาครัฐและเอกชน แต่ก็ยังไม่มีการพัฒนา

*Health Insurance System Research Office, Health Systems Research Institute

[†]Faculty of Business, Economics and Communications, Naresuan University



ตัวชี้วัดนี้ในประเทศไทย ค่าตอบแทนในการศึกษานี้หมายถึงเงินเดือนและค่าตอบแทน รวมถึงสวัสดิการต่างๆ ที่เป็นตัวเงิน กำหนดปี พ.ศ. 2551-2554 เป็นปีที่ศึกษา และใช้ปี พ.ศ. 2553 เป็นปีฐานสำหรับจัดทำตัวถ่วงน้ำหนักของค่าตอบแทน ประมาณค่าแรงแพทย์รวมในภาครัฐจากงบประมาณประจำปี และประมาณค่าแรงแพทย์รวมในภาคเอกชนจากการสำรวจค่าตอบแทนภาคเอกชนและการสำรวจโรงพยาบาลและสถานพยาบาลเอกชนของสำนักงานสถิติแห่งชาติ โดยเลือกใช้เทคนิคลาสเปร์ในการคำนวณดัชนีราคาค่าแรง

ผลการศึกษาพบว่า ค่าตอบแทนเฉลี่ยของแพทย์ในโรงพยาบาลเอกชนสูงกว่าโรงพยาบาลรัฐ แต่อัตราการเติบโตของค่าตอบแทนเฉลี่ยของแพทย์ในโรงพยาบาลรัฐสูงกว่าในระหว่างปี 2551-2554 ซึ่งแสดงให้เห็นว่าดัชนีราคาค่าแรงแพทย์ในโรงพยาบาลรัฐเพิ่มขึ้น 1.5-1.6% โดยประมาณ ขณะที่ดัชนีราคาค่าแรงของแพทย์โรงพยาบาลเอกชนลดลง 1.4-1.5% โดยประมาณ ทั้งนี้ในงานวิจัยต่อไปควรมีการสำรวจดัชนีราคาค่าแรงเพื่อให้สามารถสะท้อนค่าตอบแทนแพทย์ภาพรวมในระบบสาธารณสุขของประเทศได้ รวมถึงควรมีการศึกษาดัชนีราคาค่าแรงของบุคลากรทางการแพทย์สาขาอื่นๆ ด้วย ยกตัวอย่างเช่น พยาบาล ทันตแพทย์ เภสัชกร สหวิชาชีพ หรือเจ้าหน้าที่อื่นๆ ที่สนับสนุนบริการในโรงพยาบาล

คำสำคัญ: ดัชนีราคาค่าแรง, ค่าตอบแทนแพทย์, ค่าถ่วงน้ำหนักข้อมูล

Background and Rationale

Labor price index (LPI) is the economic indicator that was developed to measure changes in the prices of labor.⁽¹⁾ It is known as a base-weighted or fixed-weighted index⁽²⁾ which is similar to the measurement of the consumer price index (CPI). The Bureau of Labor Statistics defined CPI as measurement of change in the price level of a market basket of consumer goods and services purchased by households.⁽³⁾ On the other hand, LPI was developed to measure changes over time in labor costs. It compares the rate of changes in compensation between current years and base year of each occupation such as physicians, dentists, pharmacists, and nurses.⁽⁴⁾ The compensation considers both wage and non-wage factors. It expressed in terms of compensation per employee work hour.⁽⁵⁾ LPI is not only valuable to detect the change of labor cost, but also able to reflect the short term development of labor

cost of employment. Moreover, LPI can be used to prescribe the price of employment and wage determination policies.⁽⁶⁾ For example, the Ministry of Public Health (MOPH) can use the LPI as guidance in determining reasonable compensations of employees. Moreover, LPI may be used in planning of health care financing policies in the public and private sectors.

LPI was originally developed in 1976 by the Bureau of Labor Statistics (BLS) in the United States. However, it was initially known as “employment cost index (ECI)”⁽⁴⁾. The ECI or LPI is one of the US Government’s principal statistical series for measuring inflation in the economy in both public and private sectors. For the public sector, LPI has been used for formulating and assessing public policies, as well as to aid collective bargaining negotiations. In addition, LPI is used for estimating the Index Medicare Payments (IMP) and formulating monetary policy by the Federal Reserve Board (FRC), etc. On the



other hand, LPI has been used in the private sector to aid collective bargaining negotiations in salaries between employers and employees. Moreover, it has been used to assist in wage and salary administration and adjusted wages in long-term contracts. The limitation of constructing the LPI in the US was that the index did not cover some benefits such as the cost of training, hiring and retroactive payments. In addition, the number of random sample collected in the sampling process was relatively small to reduce the cost of survey, resulting in high sampling errors. The LPI in Canada was called “labor cost index, LCI” and was provided by Labour Statistics Division of Statistics Canada. The Canadian policy makers and researchers were to develop a reliable and comprehensive labor cost index for Canadian economy. The LCI measured both wage and non-wage of each occupation in industries. In addition to describing the LCI in general terms, it compared the LCI with other Canadian labor market indicators. Moreover, it described the uses and limitations of the LCI based on the experiences of some other countries.⁽⁴⁾ In Australia, the LPI was constructed by the Australian Bureau of Statistics (ABS)⁽¹⁾ as the Award Rates of Pay Index (ARPI). The target populations were the employees from all organizations in public and private sectors. It excluded enterprises primarily engaged in agriculture, forestry and fishery, private household employing staff and foreign embassies, consulates. The data for constructing the LPI were wages and salaries account, which was a major expenditure on labor

cost. It also included overtime and bonuses in this compensation. The cost was provided on the System of National Accounts (SNA93) concepts. The weight was created from proportion of total expenditure of each segment of industries. It was aggregated from the Survey of Employment and Earnings (SEE), the Major Labour Costs Survey (MLC), the Employee Earnings and Hours Survey (EEH) and the Census of Population and Housing. Afterward, questionnaire was developed to collect the data for measuring the LPI. The measuring of the LPI used same method with the US. Following successful adoption in the US, Australia, and Canada, there are many countries to develop their own LPI, which enabled them to monitor labor cost of health sectors in their country. It allowed to set health care financing policies for both public and private sectors.^(2,4,5) Although LPI had several benefits in particular terms of policy decision making, it was commonly used in developed countries. Accordingly, this research attempted to develop the LPI for the first time in Thailand.

In Thailand, the physician compensation in private hospital is calculated based on market mechanisms. It can reflect the price. If it is rising due to the high consumer demand, it gives a signal to producers to increase production according to the high demand. Nevertheless, physician compensation in public hospital is determined by the MOPH, the regulator of public hospital price systems. The MOPH adopts the guidelines of the compensation system by Thailand’s Office of the Civil Service Commission. The



physician compensations in public hospitals cover the salaries, allowances, overtime payments (OT), emoluments, and extra compensation for not practicing in a private clinic. Other allowances refer to incentives for physicians designed to solve the shortage of physicians in rural areas and to reduce the remuneration problems.⁽⁷⁾ However, some physicians working in urban areas did not agree and protested against some of the allowances policies. They argued that the physicians working in urban hospitals had higher workloads and more complex level of medical care performance. Therefore, they should not deserve lower allowances.⁽⁸⁾ While the argument regarding the physician compensation was still an ongoing debate, no study has yet been done on indicators to follow and analyze wage changes in Thailand's health sector. The development of LPI in Thailand would enable the monitoring of labor cost in the health sector, and the results can be used as a guideline to set health care financing policies in public and private sectors. This study was an initial development of LPI in the Thai health sector, focusing on physicians.

The objective of this research was to develop the LPI for physicians in public and private health sectors in Thailand. The target population covers physicians who worked in public and private hospitals in Thailand. The public hospitals were hospitals under the Office of Permanent Secretary in MOPH and military hospitals. Hence, the indicator development will be defined as "Physician's Labor Price Index," which

is LPI for physicians only.

Methodology

The LPI is a measure of changes in average employee compensations between specific periods and base year. The LPI in this study used the Laspeyres price index to measure the change of compensation. It used concept of weighted aggregate price index and was calculated in terms of prices (P) and quantities (Q). Prices were physician compensations and quantities were number of physicians. The methodology contains four parts: (1) the target population, (2) the collection of data, (3) the calculation of compensation, and (4) the calculation of the LPI.

1. Target population

The target population was physicians who were currently working at hospitals in Thailand. The hospitals were divided into two types: public and private hospitals. There were 944 public hospitals⁽⁷⁾ and 321 private hospitals.⁽⁹⁾ The public hospitals were hospitals under the Office of Permanent Secretary in the MOPH and other public hospitals (military hospitals only in the present study). Private hospitals in the present study did not cover private clinics.

1.1 Public hospitals

In Thailand, the compensation structure and payment system for physicians are different between public and private hospitals. The MOPH is the regulator of price systems and controls only on public hospitals. The salary



scales complied with the guidelines of the Office of the Civil Service Commission. The physician compensation in public hospitals covers the salary, allowance, overtime pay (OT), emoluments, extra compensations for not practicing in a private clinic.⁽⁸⁾ The salary calculated from average salaries of all physicians obtained from the MOPH.⁽¹⁰⁾ The salaries showed differences according to work experiences in table 1. In general, the physicians get a 6% salary increase annually. Therefore, 6% was used to estimate growth rate of compensation in the following years.

Then, the MOPH provided other allowances to physicians. These included incentives for physicians to work in remote areas. Some allowances were a policy incentive for retaining manpower in public health systems. Therefore, the Office of Permanent Secretary in the MOPH launched the regulation of the compensation for physicians in 2008 called the 4th announcement.⁽⁷⁾ It mentioned that the MOPH set the rural retention allowance for physicians to work longer in remote areas since majority of physicians working at rural hospitals move to cities after

a three-years compulsory service. In 2009 the MOPH issued the 5th announcement of the compensation for health workforce⁽¹¹⁾ allowing additional compensations to physicians in public health sector both during and after working hours. However, the MOPH had to solve more conflicts among physician groups because physicians who were working at secondary and tertiary hospitals got lower allowance than physicians who were working in remote areas, despite heavier workload at the secondary and tertiary hospitals than at district hospitals, and higher difficulty and complexity in addition. This led to the 7th announcement⁽¹²⁾ to adjust the allowance for physicians working at the secondary and the tertiary hospitals. In 2013 the MOPH revised the new fairer rate of allowances in the 8th and 9th announcements of the physician compensations in public health sectors.^(13,14) After that in the 10th announcement, it had cancelled rate of allowances in the 8th and back to use rate of allowances in the 4th announcement.⁽¹⁵⁾

In conclusion, key factors influencing the physician compensations in public hospitals were hospital type, hospital location and work experience.

1. Hospital types were classified as district hospitals, general hospitals, regional hospitals, and other public hospitals (military hospitals). For district hospitals, the physician compensations depended remarkably on two factors: the level of hospital and location of hospital as shown in table 2 and 3.^(7,11-15) District hospitals

Table 1 Salaries of physicians by work experiences

Work experiences	Salaries (Baht)
1 - 3 years	17,600
4 - 10 years	21,220
11 - 20 years	35,510
more than 20 years	47,500

Source: Office of Permanent Secretary in the Ministry of Public Health



Table 2 The allowance of physicians in 2001 – 2012 (Baht/month/person)

Work experience	The allowance of physicians (Baht/month/person)						
	Level 1 hospital (Primary and secondary care)			Level 2 hospital (Secondary care)			Level 3 hospital (Secondary)
	Normal area	Remote level 1	Remote level 2	Normal area	Remote level 1	Remote level 2	Normal area
	1 – 3 years	10,000	20,000	30,000	10,000	20,000	30,000
4 – 10 years	30,000	40,000	50,000	25,000	35,000	45,000	20,000
11 – 20 years	40,000	50,000	60,000	30,000	40,000	50,000	25,000
More than 20 years	50,000	60,000	70,000	40,000	50,000	60,000	30,000

Source: Office of Permanent Secretary, Ministry of Public Health

Table 3 The allowance of physicians in 2013 (Baht/month/person)

Work experience	The allowance of physicians (Baht/month/person)						
	First contact level (Primary and secondary care)			Medium level (Secondary care)			High level (Secondary care)
	Normal area	Remote level 1	Remote level 2	Normal area	Remote level 1	Remote level 2	Normal area
	1 – 3 years	10,000	20,000	30,000	10,000	20,000	30,000
4 – 10 years	30,000	40,000	50,000	20,000	40,000	50,000	15,000
11 – 20 years	40,000	50,000	60,000	25,000	50,000	60,000	20,000
More than 20 years	40,000	50,000	60,000	25,000	50,000	60,000	20,000

Source: Office of Permanent Secretary, Ministry of Public Health

were further divided to 3 levels (level 2.1, level 2.2 and level 2.3). Level 2.1 hospitals provided primary and secondary medical care at the first contact level. Level 2.2 hospitals provided primary and secondary medical care at the medium level. Level 2.3 hospitals provided secondary medical care at the higher level.

2. Hospital locations were classified as normal area, level 1 remote area and level 2

remote area. Different allowances were paid to physicians working in different locations. Physicians who worked at hospitals in the level 1 remote area received higher allowances than the level 2 remote area. Hospitals in the level 1 remote area were usually far from towns. They typically had more severe operational and financial issues than the hospitals in level 2 remote areas and normal areas. In summary,



Table 4 Number of hospitals by type of public hospitals

Hospital Level	District Hospitals		Normal Area	General/Regional Hospitals	Other Hospitals
	Level 2 Remote Area	Level 1 Remote Area			
2.1	39	57	486	96	110
2.2	8	8	121		
2.3		19			

hospital level and hospital location were determinants of differences in physician compensation.

3. Work experiences were categorized into 1-3 years, 4-10 years, 11-20 years and more than 20 years. The physicians who worked in a public hospital more than 20 years typically had significantly higher compensations than physicians worked shorter.

1.2 Private hospitals

Private hospitals were divided into four groups based on the number of beds: less than 30 beds, 31 to 50 beds, 51 to 100 beds and more than 100 beds.⁽¹⁶⁾ Physicians in private hospitals were divided into general practitioners and specialists.

2. Data collection

2.1 Physician’s compensations

Data on physician compensations in public hospitals were obtained from the financial report in 2013 by the Health Insurance Group of the Office of the Permanent Secretary under the MOPH.⁽¹⁰⁾ Data on physician compensations in private hospitals were obtained from the Private Pay Survey in 2008⁽⁹⁾ and 2010⁽¹⁷⁾ by

the National Statistical Office (NSO). The NSO explores the compensations of employees in private hospitals every two years. These reports consisted of the average salaries of each occupation in all sectors. It was very useful to compare the structure and rate of compensations between private and public sectors.

2.2 Numbers of physicians

Numbers of physicians in public hospitals were obtained from annual reports on public health resources in 2008-2011 at the Bureau of Policy and Strategy in the MOPH. Numbers of physicians in private hospitals were obtained from the Private Hospital Survey in 2006⁽¹⁶⁾ and 2011⁽⁹⁾ by the National Statistical Office.

3. The calculation of compensations

3.1 Compensations of physicians in public hospitals

The physician compensations in public hospitals covered salaries, allowances, OT, emoluments, the medical license allowances and non-private practice allowances. The pricing of compensation for physicians in public hospitals is determined by the MOPH.



i. **Salaries** are average salaries of all physicians who are paid by the MOPH. The rate of salary increase is about 6% per year. Therefore, the rate of 6% was used to estimate the growth rate of salary in each year.⁽¹⁰⁾

ii. **Allowances** are used to create incentives for physicians who were working in remote areas. Differences in allowances were based on hospital types, hospital locations types and work experience of the physicians. The allowances were obtained from the 4th announcement letter of compensation for physicians by the Office of Permanent Secretary in the MOPH in 2008.⁽⁷⁾ Same rates of allowances were used in the years 2008-2011.

iii. **Emoluments** are benefits that the MOPH pays according to work experience. Physicians in the senior professional level and the expert level get emoluments are 11,200 baht to 19,800 baht.

iv. **Overtime payments (OT)** are payments for the length of time an employee works beyond normal work hours. The OT is calculated by multiplying the hourly pay rate and overtime hours of working. The MOPH's Office of the Permanent Secretary estimated the number of OT from the average number of OT in one month by hospital types. The OT of physicians in general and regional hospital was 20 shifts per month, and 10 shifts per month for physicians in district hospitals. The rate of OT was 1,100 baht per shift.⁽¹⁰⁾

v. **The medical license allowances** are an amount of money paid to physicians for per-

forming certain services. Physicians who were working in the hospital for one to three years get 5,000 baht for the medical license allowance. Physicians who were working in the hospital for more than three years get the medical license allowance of 10,000 baht.

vi. **The non-private practice allowances** are incentives intended to prevent physicians work in the private sector after work hours. Physicians who do not practice in a private clinic would get 10,000 baht.

Thus, the total physician compensations in a public hospital can be expressed in the formula below.

Total compensations = salary + allowances + OT + emoluments + medical license allowances + non-private practice allowances

For compensations of physicians in other public hospitals, they were estimated from the compensations of physicians, who worked at public hospital under the Office of Permanent Secretary in the MOPH. Types of compensation paid in other public hospitals were similar to hospital in the MOPH such as allowances, emoluments, medical license fees and extra compensation for not practicing in a private clinic. However, OT was different.

3.2 Compensations of physicians in private hospitals

The private hospitals survey from the NSO is conducted every five years. Information from this survey was used by the Office of the National Economic and Social Development



Board to create the national health account and supply and use table. Compensations for physicians in private hospitals can be divided into salaries, pay for performance, and OT. The physician who had a longer working experience got higher salaries than the physician with less working experience.^(9,17)

In conclusion, the total compensations were calculated from the sum of salaries, other monthly allowances, OT, monthly payments according to performance and bonuses. Welfare or benefits in kind were excluded from the calculation.

Total compensations = salary + other monthly allowances + OT + monthly payments according to performance + bonuses

Type of physician was another key factor to estimate the total compensations of phys-

icians. Table 5 shows the breakdown into general practitioners and specialists.⁽¹⁷⁾ Due to data were not available in some years, so a growth rate of compensations was used to estimate the compensations in those years.

4. Calculation of LPI

4.1 First step

The base year in this research was 2010. An index of the base year was set to a level of 100.

4.2 Second step

The weights were calculated by the share for labor expenditure in the base year. The total expenditure was equal to 1.0. LPI expenditure weights were a measure of the relative importance of each elementary aggregate, based on employers' expenditure on labor.⁽¹⁾ Table 6 below demonstrated the weights of

Table 5 The average compensation of physicians in private hospitals in 2011

Position	Average pay (Baht/Month) as of January 2011 (before Tax)			
	Total	Salary	Monthly pay according to performance	Other monthly allowances
General practitioner	90,016	62,070	17,281	10,665
Specialist	113,922	81,623	21,586	10,713

Source: The 2011 Private Pay Survey (National Statistical Office, 2011)

Table 6 Weighted aggregations of elementary aggregates in public and private hospitals

Public Hospital	% Share	Private Hospital	% Share
District hospital	0.19	General practitioner	0.20
General hospital/Regional hospital	0.36	Specialist	0.80
Other public hospital	0.45		



elementary aggregates for public and private hospitals.

4.3 Third step

The LPIs for physicians in public and private hospitals were calculated. A LPI measured a price movement between two periods. The first period is the current year, denoted as the period “o” and the second period is the reference year, denoted as the period “t”. The number of physicians (Quantities; Q) is assumed to be constant. This formula refers to Laspeyres price index. It is represented according to the price in the current year and the price in a base of 100.⁽¹⁾ The LPI was calculated to consider changes of physicians’ compensations (Price; P) between the current year and the base year in public and private hospitals as the formula below.

$$LPI_L = \frac{\sum_i^n (P_t Q_o)}{\sum_i^n (P_o Q_o)} \times 100$$

where:

- LPI_L : Labor Price Index by Laspeyres
- P_t : total compensations in the current year
- P_o : total compensations in the base year
- Q_o : number of physicians in the base year

The Laspeyres formula above is expressed in terms of prices and quantities. The quantities may not be meaningful for this index. Thus, the Laspeyres formula is estimated using expenditure shares to weight price relatives. In this research, the expenditure share was the pro-

portion of total compensation in each hospital type, as represented below.

The calculation of compensation’s weights

$$w_0 = \frac{\sum_i^n (p_t q_o)}{\sum_i^n (p_o q_o)}$$

where:

- w₀ : weight of expenditure share
- p_tq_o : total compensation for the item i in the base year
- ∑_iⁿ(p_oq_o) : the whole compensation in the base year

Then, the Laspeyres index may be expressed as:

$$LPI_L = \sum w_0 \left(\frac{P_t}{P_o} \right) \times 100$$

where:

- LPI_L : Labor Price Index by Laspeyres
- P_t : total compensation in the current year
- P_o : total compensation in the base year
- w₀ : weight of expenditure share

Results

The results presented key findings of this research in three main parts: 1) Number of physicians in public and private hospitals; 2) Average compensation per month and total physician compensation in public and private hospitals; 3) LPI for physicians in public and private hospitals.

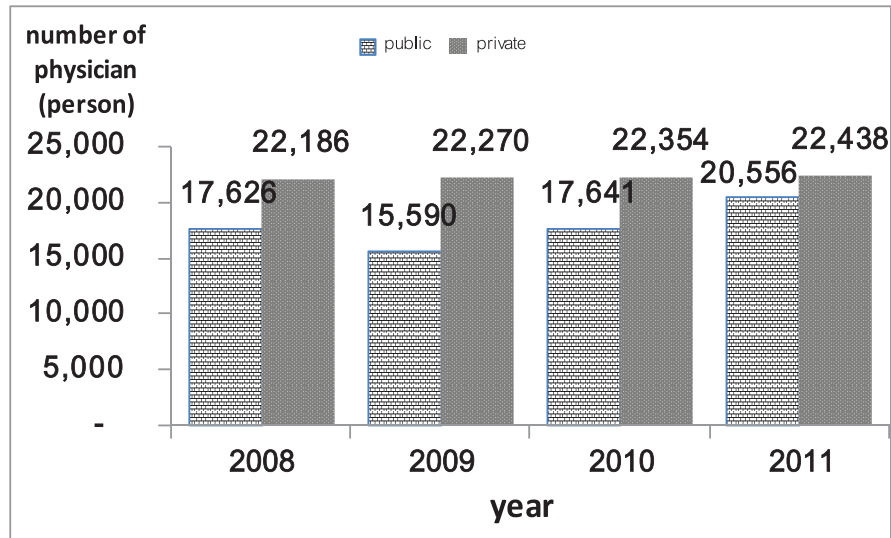


Figure 1 Number of physicians in public and private hospitals

Table 7 Average compensations per month for physicians by hospital type in public hospitals

Unit: Baht

Hospital Type	2008	2009	2010	2011
District hospital	98,831.04	100,196.62	101,644.13	103,178.50
General hospital/Regional hospital	85,009.62	86,375.19	87,822.70	89,357.07
Other public hospital	95,728.37	97,093.94	98,541.45	100,075.82
Total	96,950.59	98,316.16	99,763.68	101,298.04

1. Number of physicians

Figure 1 shows the trends for the number of physicians in public and private hospitals from 2008 to 2011. There was no significant difference in the number of physicians in private hospitals between 2008 and 2011. There was a slight increase amounting to approximately 80 persons per year or 0.4% of increase each year. In contrast, the number of physicians in public hospitals dramatically climbed, amounting to 13% from 2009 to 2010 and 16.5% from 2010 to 2011. In other words, there was a rising trend of

almost 5,000 physicians from 2009 to 2011.

2. Compensations

Table 7 shows the average compensations per month of physicians in each type of public hospitals between 2008 and 2011. Overall, it could be seen that the average compensations of physicians in public hospitals increased during 2008 to 2011. For district hospitals, the average compensations of physicians increased from 98,831.04 to 103,178.50 baht from 2008 to 2011 (1.4%, 1.4% and 1.5% increase, respective-

Table 8 Average compensations per month for physicians by physician type in private hospitals

Unit: Baht

Physician Type	2008	2009	2010	2011
General practitioner	104,407.50	100,732.50	97,057.50	93,641.21
Specialist	122,901.00	121,838.33	120,775.67	119,731.38
Total	113,654.25	111,285.42	108,916.58	106,686.29

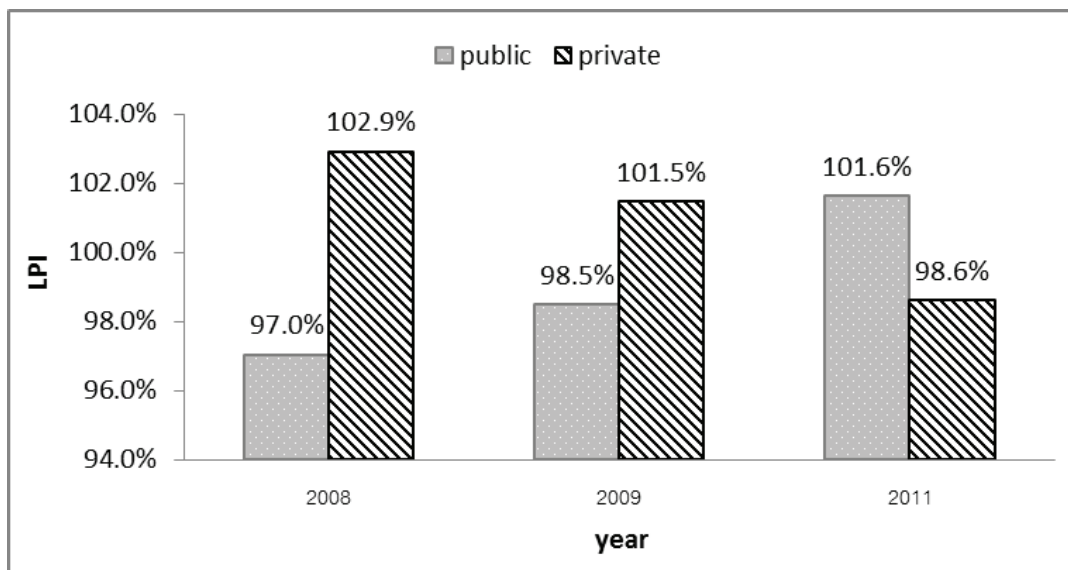


Figure 2 LPI for physicians in public and private hospitals

ly). For general hospitals and regional hospitals, the average compensations of physicians increased from 85,009.62 to 89,357.07 baht from 2008 to 2011 (1.6%, 1.7% and 1.7% increase, respectively). For other public hospitals, the average compensations of physicians increased from 95,728.37 to 100,075.82 baht from 2008 to 2011 (1.4%, 1.5% and 1.6% increase, respectively).

Table 8 shows average compensations per month of physicians in private hospitals between 2008 and 2011, with breakdown by physician type. Overall, the average compensations

of physicians in private hospitals decreased from 2008 to 2011. For general practitioners, the average compensations decreased from 104,407.50 to 93,641.21 baht from 2008 to 2011 (3.5%, 3.6% and 3.5% decrease, respectively). For specialists, the average compensations also decreased from 122,901.00 to 119,731.38 baht from 2008 to 2011, or a 0.9% decrease per year.

3. Labor Price Index (LPI)

Figure 2 shows the LPI for physicians in public and private hospitals between 2008 and



Table 9 Percentages of change for physicians' compensations in public hospitals (Reference year = 2010)

Hospital Type	Year		
	2008	2009	2011
District hospital	-0.5%	-0.3%	0.3%
General hospital/Regional hospital	-1.1%	-0.6%	0.6%
Other public hospital	-1.3%	-0.7%	0.7%
Total	-3.0%	-1.5%	1.6%

Table 10 Percentages of change for physicians' compensations in private hospitals (Reference year = 2010)

Physician Type	Year		
	2008	2009	2011
General practitioner	1.5%	0.7%	-0.7%
Specialist	1.4%	0.7%	-0.7%
Total	2.9%	1.5%	-1.4%

2011. The figure showed an increasing trend of LPI for physicians in public hospitals, denoted by an LPI increased from 97% to 98.5% from 2008 to 2009. Data in 2011 showed a further increase of LPI to 101.6%. On the other hand, the trend of LPI for physicians in private hospitals showed a decreasing trend. During the 2008 to 2009 period, the LPI for private hospitals declined from 102.9% to 101.5%. Year 2011 sees a further decrease of LPI down to 98.6%.

Table 9 shows percentages of change for physicians' compensations in public hospitals between the respective years with reference to 2010. Overall, percentages of change for physicians' compensations in public hospitals increased 1.6% from 2010 to 2011. Physicians in district hospitals on average had a 0.3% increase

in compensations. Those in general hospitals and regional hospitals had a 0.6% increase. The other public hospitals increased 0.7%.

Table 10 shows percentage of change for physicians' compensation in private hospitals. Overall, percentages of change for physicians' compensations in private hospitals decreased 1.4% from 2010 to 2011. The compensations of general practitioners in private hospitals decreased 0.7% from 2010 to 2011.

Discussion, Limitations and Recommendation

Discussion

The average physician compensation in private hospitals was higher than public hos-



pitals. On the contrary, the average growth rate of physician compensation in public hospitals was higher than private hospitals during 2008-2011. The results showed that an annual increase in LPI of public hospitals reached approximately 1.5-1.6% while the LPI of private hospitals declined approximately 1.4-1.5%. The increase of physician compensations in public hospitals was the effort by the MOPH to design financial incentives to retain physicians in the public sector not moving to private hospitals⁽⁷⁾. The percentage of salary changes for physicians in public hospitals was around 6% in 2013⁽¹⁰⁾. Nevertheless, the total compensation of physicians increased 1.5-1.6%, which is lower than the inflation rate at 3.30% and 3.81% in 2010 and 2011, respectively. This finding can be used in policy decision making to set appropriate compensations in physicians. On the other hand, the trend of LPI for physicians in the private hospitals was decreasing because of the increasing number of physicians from year to year. So, the decrease in compensations happened according to the rule of demand and supply in the labor market following Alfred Marshall concept in 1890 saying that “if the wages and salaries decrease, employers are more likely to hire a greater number of workers. The quantity of labor demanded will increase”⁽¹⁹⁾.

Limitations

It should be noted that some data used in this research were estimated. This might lead to low statistical power. Surveys can help improve

the issue of missing data and develop more accurate analysis. In addition, the data on physician compensations in private hospitals were collected by the NSO, therefore the LPIs calculated for the physicians in private hospitals were based on the sample data. In addition, the calculations of compensations should be considered in a per hour rather than per month basis, as compensations per hour can better reflect the actual compensations in the context of health workers⁽¹⁾. Ideally, the data for weighting of elementary aggregates to reflect the compensations of physicians in the health system should be total compensation of physicians in all health sectors. In the next research, the survey on the physician compensations from hospital in Thailand should better reflect real total physicians' compensation in health sectors.

Recommendation

In future research, a survey of compensations should be performed to minimize missing data. Also, survey sampling should be designed specifically for LPI development, as the present NSO survey was developed for different purposes. The next research should explore the methodology of weighting in elementary aggregates to reflect the physician compensations in the health sector. This is the methodology to develop weighting in the base year. The weight reflects the relative importance of each elementary aggregate that represents the physicians' expenditures.⁽¹⁾ One benefit of LPI is that it can be used to estimate labor cost in the health



sector to help determine next year's budget. The government can also use LPI to solve problems in the health sectors, for example, the problem of brain drain in public hospitals due to higher compensations in private hospitals. Therefore, the LPI can help set the wage policy for health workers. In addition, health research and development for health workers can make use of LPI in planning health workforce in the future. The National Health Account can use the LPI to estimate the total health expenditure due to compensations of health workers. In addition, the National Economics and Social Development Board (NESDB) can use the LPI to estimate the health expenditures in the national account system, as well as using LPI to adjust the salary index in the health sector by the National Statistical Office.

Finally, the future survey on compensations in public and private hospitals should adopt classification criteria used in this present study. Also, future studies should be expanded to other professional groups, such as, nurses, dentists, pharmacists, health workers and back officers. The methodology to create the weights of compensations by segment should also be considered.

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