



## Macroeconomic Factors and the Outpatient Services Utilization Among Elderly in Thailand

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### Abstract

Economic growth and development lead to advancement in infrastructure, employment and income of people in the province. Such developments allow people in each province to have access to health resources and enjoy health services especially elderly. Therefore, the objective of this study was to estimate the impact of provincial economic factors affecting the elderly's use of outpatient services in Thailand. Used data were from the standard 43-file databases of the Health Data Center of the Ministry of Public Health, retrieving only those aged 60 years and above. This study was based on 5-year Panel Data from 2015 to 2019 using Fixed Effect Regression estimates. The estimated results revealed that the economic factors affecting access to health services among the elderly were as follows. The number of employed people increased by 1 person, causing the number of outpatient services for the elderly to decrease by 4.5 visits. Gross provincial product in the health category increased by 1 million baht, affecting the number of outpatient services of the elderly by 250 visits. The total consumer price index increased by 1 point, affecting the use of outpatient services by 57,595 visits. The interesting thing was that the price factor did not affect the number of service use, including economic factors or gross provincial product. This study reveals that economic affects the elderly's access to health services through gross provincial product, employment and price factors. From the results, the upcoming economic development should pay attention to the quality of life of the elderly from service use, especially the use of government welfare system.

**Keywords:** Macroeconomic Factors, Outpatient Service Utilization, Elderly, Fixed Effect Regression

### Introduction

The existence of services and the peculiarities of the socio-economic structure are both elements that influence a person's access to health services. When examining the dimensions of the elderly's access to outpatient services in Thailand, economic variables must be taken into account. Gross Domestic Product (GDP), unemployment, household spending, and other economic factors all influence the usage of health services.

Gross domestic or provincial product depends on the level we measure. At the national level, gross domestic product is the goods or services that produced in a country. If measured at provincial level, we called the Gross Provincial Product. The emergence of aggregate goods and services results in economic value reflecting the livelihoods and growth of urban societies. Such social factors are reflected in many areas such as economic growth, social and technological development, and education. Due to the city's prosperity, it has attracted the attention of many people and services. More urban growth tends to have more healthcare workers and more medical services than less developed areas (Nishiura et al., 2004; Nithiapinyasakul et al., 2016; Pagaiya et al., 2015). When resource availability is greater, the difficulty of access is less in the prosperous areas.

Employment is a variable that reflects household income. High unemployment deprives people of income, while having household employment gives people the ability to pay for goods or services. Health services are one of those services that have a cost to access. Although Thailand has health insurance, the cost of health care is much lower and people have access to services universally. But the cost of services uses also include the cost of



travel, accommodation, and personal expenses which the absence of work depletes personal income to pay such cost. Unemployment variables are therefore critical to accessing services (Dooley et al., 1996; Kraut et al., 2002; Quinn et al., 2009).

Household expenditure is a measure of whether a household's demand for health services is correlated with the costs incurred for services. Household expenditure is therefore another figure that reflects the ability to access health services. (Gotsadze et al., 2009; Kumara & Samaratunge, 2019)

Finally, the poverty variable is a measure of the disadvantaged population. This is where people with incomes below the poverty line have difficulty accessing services. It is, therefore, questionable whether the availability of desirable outpatient services for all groups of people, regardless of economic status or other factors, is whether people have access to those services or not.

These preliminary data leads to research questions as to what macroeconomic factors affect the elderly's access to outpatient care in Thailand. This content therefore aims to study the economic factors affecting the health care services of the elderly in Thailand. The benefits of this study lead to policy recommendations that will address the macroeconomic issue of access to services for the elderly in order to promote access to outpatient care for the elderly.

### Theories and Concepts

Outpatient care should be accessible to all ages, especially the elderly. "Health for All" is a statement from the WHO included within the Sustainable Development Goals (SDGs) policy. Specifically, goal 3 in SDGs is good health and well-being, whose key indicators are "By 2030, reduction by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being" (United Nations, 2022). From these indicators, it can be seen that health promotion, disease prevention, treatment and rehabilitation are the primary function of outpatient services, which is the first line of service for the elderly.

The elderly is more prone to physical ailments than any other age group who are facing with physical and mental illness (Abdi et al., 2019; Foley & Luz, 2021). Common conditions in older age include hearing loss, cataracts and refractive errors, back and neck pain and osteoarthritis, chronic obstructive pulmonary disease, diabetes, depression and dementia. As people aged, they are more likely to experience several conditions at the same time (World Health Organization, 2021). For this reason, the elderly has a higher need for outpatient services than other age groups. The study, Closing the Health Gaps for the Elderly in Thailand, said of the gaps in access to health services that "These gaps particularly affect poor elderly individuals and the oldest members of this group (those over 80 years old), especially the ones who live in rural areas". The results of the study showed the problem of access to services among the elderly with severe problems, consistent with the study of Annual prevalence of unmet healthcare need in Thailand: evidence from national household surveys between 2011 and 2019. They show that unmet healthcare need among elderly in Thailand is higher than other age groups and gradually increasing year on year from 3.3% in 2011 to 4.8% in 2019 (Vongmongkol et al., 2021). The number of annual health check-ups among the elderly in Thailand showed that 55.6% used the service, while 19.9% never had it, the rest occasionally used it (Institute of Geriatric Medicine, 2013).

According to Closing the Health Gaps for the Elderly in Thailand, they have some important conclusions such as *"the health benefits scheme decreased risks of impoverishment associated with health care expenses. The lack of caretakers and the lack of support for non-medical costs ... is making access difficult. This is a particular plight for the elderly poor in Thailand, ... Another key reason that contributes to low utilization of health services among*



older people is the dependency on caretakers and relatives to bring them to health facilities. The number of the elderly living with adult children is on the decline, from nearly 80% in 1990 to less than 60% in 2011” (World Bank Group, 2016). In short, poverty, elderly people living with children, and lack of public transport are the result of inequality economic development.

Gross Provincial Product (GPP) is the final value of production of goods and services within the province’s boundaries. This means that more production will result in greater incomes for the population. As income increases, this results in greater health expenditures (Gerdtham & Löthgren, 2002; Hitiris & Posnett, 1992; Mehrara et al., 2010; Zaman et al., 2017), including the cost of accessing services. Since the increase in production means an increase in employment (Okun’s Law) (Altunöz, 2019; Chand et al., 2017), low production and employment causes poverty. This mechanism prevents people from paying for basic services such as public transport, food and the cost of accessing health services due to lack of income.

The macroeconomic mechanisms mentioned above affect the use of health services. Income is an undeniable factor that greatly affects the use of health services. In Taiwan, eliminating the need to pay for health services has made it more accessible to older people with low incomes (Chen et al., 2007). A review of the DJ McMaughan literature reveals that lower income means less access to services in many countries (McMaughan et al., 2020). In the United States, poor elderly people face higher restrictions on access to services than rich people (Huguet et al., 2008). In Taiwan, the elderly persons with public health insurance usually received such benefits through employment (Chen et al., 2007). In South Korea, retirement leads to poor physical health, and such effect was moderately mediated by both monetary and non-monetary factors (Lee & Kim, 2017). The international literature reveals that health insurance can be obtained by working. Health insurance gives low-income seniors more access to health services (Hurd & McGarry, 1997; Nemet & Bailey, 2000; Tungu et al., 2020).

With the coming of aging society, it is important to deal with health care services for the large number of elderlies, especially dealing with elderly care, such as developing a long-term care system, because the elderly is facing various chronic diseases that have a long-term treatment. In Japan, long-term care was designed to care for low-income elderly. In addition, taxes are allocated to develop a more senior housing system. There are also other services such as home care to improve the quality of life of the elderly (Rupavijetra et al., 2016). Many countries in Europe have entered the aging society, such as Italy, Germany, France, Greece, and established a Subnetwork on Healthy Ageing within the European Healthy Cities Network, to provide guidance to member states in developing profiles of healthy ageing (Oliver et al., 2014). They focus on designing an elderly-friendly lifestyle and community. And the health service system focuses on long-term care and prevention of chronic disease problems (Ricciardi et al., 2014). The importance of social determinants of health is a part of developed countries giving importance to the aging society. The focus on “environmental and nutritional factors together with healthy lifestyles ... the most powerful factors that determine the health of a population”, (Liotta et al., 2018) is encouraging example for Thailand.

In this study, we adopt the theory of public goods which should be collectively consumed at non-rival and non-excludability (Samuelson, 1954). Outpatient services are considered to be private goods because certain groups of people can be excluded by imposing user charge. The consumption of services though not completely exhausted, can cause congestion in the service. However, according to the international health equity community, the development of health services should be accessible to all without systemic differences. (Whitehead & Dahlgren, 2006) Specifically, the development of a Universal Health Coverage scheme has taken people below



the poverty line from where they originally had no access to now be in a position to access health care. Moreover, universal health coverage can prevent household medical expenses from bankruptcy, keeping the household economy from collapsing. Such developments have brought health services closer to the term Public Goods. However, there is still some debate today as to whether “Is health a public commodity?”.

**Table 1** Qualification of Public and Private Goods

Qualifications of Goods & Services	Excludable	Non-excludable
<b>Rivalrous</b>	<b>Private Goods</b> Food, Clothing, Cars, Parking Spaces	<b>Common-pool Resources</b> Fish Stocks, Timber, Coal, Free Public Transport
	<b>Club Goods</b> Cinemas, Private Parks, Satellite Television, Public Transport	<b>Public Goods</b> Free to Air Television, Air, National Defense, Free and Open-source Software
<b>Non-rivalrous</b>		

One thing that differentiates public health services from others is universal health coverage. In foreign countries, the health insurance system may be different, but in Thailand people who are Thai citizens can access the services without restrictions on the collection of service fees. That makes the qualification of the public health service a non-excludable. It is something that everyone has to share like free public transport which makes it more categorized as Common-pool resources.

The book *Global Public Goods*, published under The United Nations Development Programme, discusses health as any commodity which is subject to government interpretation. If the government interprets public health services as a public good, then policy differentiation can reduce the disparity between rich and poor in accessing health services and preventing disease. (Chen et al., 1999) Another point of view, published in the Bulletin of the World Health Organization, states that when looking at the epidemic dimension and reducing the risk of communicable diseases, prevention of communicable diseases brings mutual benefits (Smith, 2003) such as Tuberculosis HIV/AIDS (Kaul & Faust, 2001) COVID-19 outbreaks. As such, public health services are closely related to public goods. Access to public health services should therefore not be unjustified. There are no differences in spatial, gender, race, religion or wealth, poverty, or any other factor that differentiates access to health services. Subsequently, the elderly’s access to outpatient care should not be restricted by economic status or other factors.

**Methods and Materials**

The populations of this study are the secondary data in the provincial level in Thailand. The variables for analysis were the number of outpatient visits of people aged 60 and above by province, and the following variables include all persons in the province: gross provincial product, gross provincial product in health category, provincial working condition, provincial average household expenditure, provincial price index, provincial health price index, and proportion of the poor in the province.

This study uses secondary data of various sources from 2015 to 2019 as the panel series. Health Data Center (HDC) of the Ministry of Public Health provided the data for the number outpatient visits (OPD) in public hospitals of older persons over 60 years of age as of the date of birth in 43 databases of the Ministry of Health. The National Statistical Office (NSO) of the Ministry of Digital Economy and Society provided provincial economic, employment and demographic data. Since Bangkok data in the HDC were rather incomplete, therefore,



only 76 provinces per year were recruited, in total 380 records. The effects of socio-economic factors on outpatient visits of older persons over the past 5 years at the provincial level were estimated by fixed effect model to see the determinants of outpatient visits (Allison, 2009; Kunz et al., 2019; Terraneo, 2015).

$$OPD = \beta_0 + \beta_1 Hhexpense + \beta_2 Labour + \beta_3 Poor + \beta_4 GPP + \beta_5 GPPhealth + \beta_6 CPI + \beta_7 CPIhealth + \gamma_1 I + \gamma_2 T + \epsilon_c + \eta_t + \mu$$

Where:	OPD	=	Number of outpatient (OPD) visits of elderly in each province (Times).
	Hhexpense	=	Average household expenditure in each province (Baht/Household/Month).
	Labour	=	Number of people employed in each province (People).
	Poor	=	Proportion of the poor to the provincial population (Percentage).
	Gpp	=	Gross provincial products (million Baht).
	Gpphealth	=	Gross provincial product, health and social activities category (Million Baht).
	Cpi	=	Provincial consumer price index (Point).
	Cpihealth	=	Provincial consumer price index, personal care and services category (Point).
	I	=	Provincial dummy variable from 1, ..., 76.
	T	=	Time variable from 2015 to 2019.
	$\epsilon_c$	=	Interception of provincial dummy variable.
	$\eta_t$	=	The error term of year dummies.
	$\mu$	=	The error term of the equation.

The study is based on the following assumptions:

1. Elderly people should at least receive outpatient services such as disease promotion and prevention.
2. Outpatient services can be accessed through the elderly's health insurance entitlement.
3. All older people recognize that access to outpatient services is essential.
4. All older people are aware of the existence of outpatient services.

This estimate is based on the fixed effect Within Group (WG) method or the demean method. Since the factor has a group of province variable, fixed effect regression can be analyzed by 2 methods, which is the analysis of fixed effect Least Square Dummy Variable (LSDV) using time variables and province variables to determine the effect of dummy variables by using demean method.

Time and province can be defined using dummy variables. But Thailand has a total of 76 provinces except Bangkok, inserting 76 dummy variables makes the number of variables too many. For a demean, the mean of the independent and dependent variables is used to eliminate the fixed effect.

The result of the preliminary hypothesis test of the regression equation was to test the relationship between independent variables by testing the correlation value. The correlation level was set not more than 0.60. No relationship between the independent variables (multicollinearity) was found. The test results for the relationship between the independent variables and the error of the equation (autocorrelation) by using the Durbin-Watson test using the critical value at the level of 1.5–2.5 found that the Durbin Watson value was 1.747 (Field, 2013). No correlation was found between the independent variables and error terms. The heteroskedasticity distribution test by plotting the error values revealed the normal distribution of the error values.

This study was approved by the Naresuan University Research Ethics Committee under the exemption category on 25 November 2021.



## Results

This economic factor estimate was based on a provincial analytical unit for all 76 provinces, excluding Bangkok. This is because the data on Bangkok were under-reported as compared to other provinces. This is an analysis of Fixed Effect Regression using Panel Data from 2015–2019 for a total of 380 records, showing the following preliminary statistics:

**Table 2** Descriptive Statistics of Variables

Variables	N = 76	2015	2016	2017	2018	2019
<b>N</b>		76	76	76	76	76
<b>OPD (Visits)</b>	Min	212,779	232,836	280,755	309,644	321,688
	Max	4,277,975	5,684,979	5,476,944	5,361,380	6,086,514
	Mean	1,279,441.38	1,484,575.28	1,678,448.33	1,710,209.28	1,832,974.86
	S.D.	812,346.69	953,903.09	1,041,484.81	1,064,037.90	1,140,628.24
<b>Hhexpense (Baht/Household /Month)</b>	Min	11,863.80	11,859.40	10,440.72	11,213.48	11,242.74
	Max	31,381.00	31,271.04	33,604.46	43,300.51	37,086.11
	Mean	18,796.14	18,561.90	18,743.18	18,561.99	18,347.27
	S.D.	4,285.87	4,048.61	4,592.48	5,092.18	4,498.63
<b>(Poor) Proportion of the Poor %</b>	Min	0.26	0.03	0.00	0.28	0.24
	Max	34.91	39.21	34.20	49.13	29.72
	Mean	9.00	11.15	10.03	12.90	8.05
	S.D.	7.38	9.15	8.28	9.23	6.53
<b>Labour (Persons)</b>	Min	109,587.64	111,290.58	109,603.52	109,984.45	107,970.51
	Max	1,366,251.50	1,348,887.33	1,361,389.13	1,332,149.47	1,353,608.77
	Mean	435,103.97	434,852.81	426,683.08	434,605.75	424,213.46
	S.D.	278,040.98	277,825.88	276,181.64	281,053.00	271,805.33
<b>Gpp (Million Baht)</b>	Min	6,542.40	6,574.17	6,790.63	7,038.38	7,444.00
	Max	548,897.99	565,535.33	578,181.79	614,278.11	617,652.01
	Mean	81,942.91	84,435.06	88,034.93	91,488.93	92,690.78
	S.D.	112,077.43	115,468.73	120,277.77	125,034.11	126,286.34
<b>Gpphealth (Million Baht)</b>	Min	334.47	342.71	356.47	375.04	383.32
	Max	20,868.29	22,291.55	23,153.29	23,553.91	25,656.37
	Mean	1,959.03	2,019.55	2,102.38	2,222.42	2,306.45
	S.D.	2,682.48	2,829.86	2,952.22	3,036.50	3,262.79
<b>Cpi</b>	Min	99.95	99.09	99.03	99.04	99.60
	Max	100.05	103.52	105.67	105.90	107.16
	Mean	100.00	100.61	101.40	102.25	103.03
	S.D.	0.03	0.83	1.18	1.31	1.34
<b>Cpihealth</b>	Min	99.94	99.09	98.37	98.93	98.61
	Max	100.04	105.16	108.24	112.12	125.48
	Mean	99.99	101.10	101.76	102.49	103.14
	S.D.	0.03	1.27	1.88	2.37	3.75

OPD data by province is the use of outpatient services for the elderly from 2015–2019, with a trend of continuously increasing service usage from 2015, averaging 1.2 million visits, increasing to an average of 1.8



million times. The number of service use is the highest in the province in 2015, equal to 4.2 million visits, increasing to 6 million visits, while the standard deviation of outpatient services among the elderly tends to increase as well, from 8 hundred thousand to 1.14 million visits.

The average provincial household expenditure data showed that the average provincial household expenditure from 2015 to 2019 was relatively stable. In 2015, the household expenditure per province averaged 18,796 baht per household. In 2019, the average household expenditure per province was 18,347 baht, which is not much different. However, the highest number of provincial household expenditures has increased, meaning there are provinces with higher median incomes.

The proportion of the poor data shows that in 2015 it was 8%, while the poverty rate increased in 2016–2018 by more than 10%, and the poor ratio dropped to 8% in 2019. The highest poverty rate and standard deviation were in the same direction during 2016–2018.

The data on the number of employed persons contradicts other variables because over a period of 5 years, the direction of the number of employed persons in the system was relatively stable, with no significant increase or decrease in both the mean, maximum and minimum values.

Average Gross Provincial Product data from 2015–2019 has an increasing trend. The average value in 2015 was 81 billion baht. In 2019, the mean gross provincial product was 92 billion baht, which corresponds to the highest, lowest, and standard deviation tends to increase.

Gross Provincial Product data in health and social services category has a trend of increasing growth over the past 5 years. The average Gross Provincial Product in the health and social work category was 1,959 million baht in 2015 to 2,306 million baht. In 2019, while the highest value of the Gross Provincial Product in the health and social services category was significantly different from the average. This shows the existence of provinces with very high numerical differences as well.

Consumer Price Index data for 2015–2019, using 2015 as the base year, making the 2015 index equal to 100. The direction of the consumer price index continued to increase from 100 to 103.03 points from an average of 76 provinces, while the peak and standard deviation tended to increase year by year, indicating the difference in cost of living in each province.

The Consumer Price Index (Cpi) data in the Health and Social Welfare Activities category has the same direction and trend as the Consumer Price Index. This was increased from 100 in 2015 to an average index of 103.14 points. However, the peak and standard deviation of the Cpi in health and social work activities continued to widen. The maximum and standard deviation of the health and social work activities category were more than double the total consumer price index.

Model estimates found that the relationship between independent variables and dependent variables had an R-square of 0.673. The model displays as follow:

$$OPD = (-324764.816) + (-4.520) \text{ Labour} + (250.364) \text{ Gpphealth} + (-57595.687) \text{ Cpi}$$

Estimates of covariance (ANOVA) found an F-Stat of 68.72,  $p < 0.01$ . Model estimation is based on Fixed Effect Regression model by Demean method since the number of dummy variables has a total of 76 variables.



**Table 3** Estimated Result from Fixed Effect Regression

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
(Constant)	-324764.816	25854.355		-12.56	.000			
Hhexpense	1.912	6.416	.010	.298	.766	-.031	.016	.009
Poor	1722.939	2973.016	.022	.580	.563	.026	.030	.017
Labour	-4.520	.568	-.255	-7.956	.000***	-.390	-.383	-.23
Gpp	.944	1.136	.031	.831	.407	.392	.043	.025
Gpphealth	250.364	41.808	.230	5.988	.000***	.533	.298	.179
Cpi	-57595.687	11496.820	-.286	-5.010	.000***	.494	-.253	-.14
Cpihealth	6366.425	5088.164	.047	1.251	.212	.391	.065	.037
2016	211732.234	26616.628	.323	7.955	.000***	-.215	.383	.237
2017	387293.664	31316.851	.591	12.367	.000***	.155	.542	.369
2018	460792.932	38548.627	.703	11.954	.000***	.216	.529	.357
2019	564005.249	47562.454	.860	11.858	.000***	.450	.526	.354

**Dependent Variable:** OPD

**R-square:** 0.673; **F-stat:** 68.72

**Remark:** Significant \*\*\*0.01, \*\* 0.05, and \*0.1

The results of the 5-year parameter estimates, using the Demean method to eliminate the fixed effect by province, showed that the increase in the number of employed people affected the elderly’s use of outpatient services. When having one more people working (Labour), the use of services decreased -4.52 visits, while the provincial gross product in health and social activities category (Gpphealth), affecting the use of outpatient services among the elderly in the same direction was when Gpphealth increase of 1 million baht, resulting in an increase in OPD visits of 250 visits, an increase in the total Consumer Price Index (Cpi) by one point, affecting the use of services, a decrease of 57,595 visits. While the effect of the time variable by using the 2020 variable as a control variable, it was found that the number of outpatient services among the elderly increased statistically every year. All variables affected the elderly’s use of outpatient services at a statistically significant level of 0.01.

However, household expenditure (Hhexpense), proportion of poor household (Poor), gross provincial product (Gpp), and consumer price index in health and social activity (Cpihealth) did not affect the elderly’s use of outpatient care services.

**Discussion**

The results of the estimates have several interesting findings. Before we discuss the findings, we will explore the strengths and weaknesses of Fixed effect estimation. The key advantage of using this method is we can control for unobserved variables that vary across provinces, but not over time or vary over time but not across provinces. More observation provides accuracy of the estimation, and the estimation is straightforward as multiple regression within the basic assumption to eliminate bias results. However, some limitation needs to be careful during the estimation are monitoring time lag effect, and standard errors shall not correlate over time. Those can be explored by using the serial correlation test and multicollinearity test (Allison, 2009; Hedges, 1994; Hill et al., 2020). In the results, we found that the most important issues selected for the discussion included access to services for the poor and CPI and access to services.



The results of the study revealed several interesting points when compared to foreign contexts. It is very evident that income or socioeconomic status affects the elderly's access to health services abroad (Amente & Kebede, 2016; Banerjee, 2021; Ghadamgahi et al., 2018; Vahedi et al., 2020; Zhang et al., 2018). Poor people are less likely to use outpatient services than those with better finances (Fitzpatrick et al., 2004). This may be because Thailand has universal health coverage.

According to foreign studies, the elderly in poor households have less access to health services. Adding a poverty variable to see if there are elderly people living in poor households will influence the variables that affect the elderly's access to services. From the beginning, we also expect that access to services for the poor elderly is likely to be more difficult because the poor will face multiple barriers to accessing services, including accommodation costs and travel expenses. However, the estimated results contrastingly show that the proportion of the poor at the provincial level did not affect the use of services of older persons. This may mean that the elderly in this model is not in poor households, or it may be that elderly in poor households also have access to outpatient care. This may be due to the fact that Thailand has achieved the universal health coverage since 2001 and cost restrictions effectively eliminated. Limwattananon et al. (2012) found an increase in the Universal Coverage scheme budget from 30 billion baht in 2003 to 46 billion baht in 2004 and the increase in the use of health services (both inpatient and outpatient services) of the poor and those near the poverty line. Most of the poor used services at public hospitals and primary care units which were parts of outpatient services, though a few went to pharmacies, and private clinics for convenience (Weraphong et al., 2013). This assumption confirmed by many articles. The results of studies abroad are no different from Thailand as the use of UCs policies affects access to services such as Turkey (Menon et al., 2013), Ghana (Amporfu, 2013), Canada (Veugelers & Yip, 2003).

Unlike being poor, the CPI significantly reduced the use of health services. It is possible that the cost of most health services provided is covered by universal health coverage. A study by Limwattananon et al. (2011) and Tangcharoensathien et al. (2014) found that direct health expenditures accounted for 45% of total household spending on health. After implementing the universal health insurance system, Expenses dropped to 20% and in 2006, they dropped to less than 15%. The fact that universal health coverage covers multiple expenses has dramatically reduced health costs (Hsu & Yang, 2017; Kirduang & Glewwe, 2018; Meemon & Paek, 2019; Paek et al., 2016). This was quite evident when all commodity CPI had a greater impact on the use of health services of elderly than the health and social activities price index. This is because the decision to get health care at a hospital involves not only the cost of medical care, but also the cost of travel, food and accommodation, and income opportunity costs which is not covered by the universal health coverage scheme.

Finally, the number of employed people increased, resulting in a decrease in the number of visits of the elderly. It is interesting because the elderly is an age that is highly dependent on others, making the workday population unable to bring the elderly to health services. Closing the Health Gaps for the Elderly in Thailand (World Bank Group, 2016) has clearly summarized that "Another key reason that contributes to low utilization of health services among older people is the dependency on caretakers and relatives to bring them to health facilities. The number of the elderly living with adult children is on the decline, from nearly 80% in 1990 to less than 60% in 2011". This barrier, combined with the distance to travel to outpatient care facilities, makes access difficult (Nemet & Bailey, 2000).



### Conclusion and Suggestions

This study was to test whether macroeconomic factors affecting access to health services of older persons at the provincial level. This estimation is based on panel data for the past 5 years from 2015 to 2019. It is a Fixed Effect Regression projection using the Demean method. The results of the study revealed that the economic variables affecting the number of outpatient services among the elderly at the provincial level were as follows. The increase in the number of employed people will affect the use of outpatient services among the elderly by 4.52 visits. The provincial gross product variable in the health and social activities category affects the elderly's use of outpatient care services. When the GPP in the health category increases by 1 million baht, it affects the use of services by 250 visits. The variable consumer price index or CPI affects the use of outpatient services the most. When the consumer price index increases by 1 point, it results in a decrease in service use by 57,595 visits. When comparing between periods, it was found that the number of service usage has continued to increase every year since 2015. The economic variables that did not affect the elderly's use of services were: Household expenditure, poverty ratio, gross provincial product, and consumer price index health and social activities. However, these economic variables should be further investigated as to why they do not affect the elderly's use of outpatient services. This is also the result of a broader estimate and to provide a clearer answer, an area-level study can be conducted to explore the factors affecting the decision to access outpatient care among elderly. In addition, cohort studies between elderly in poor households and elderly in a control group on access to outpatient care should be conducted separately in order to differentiate the effect of universal health coverage on people's access equally. From the results, the upcoming economic development in the elderly society should pay attention to the impact on the quality of life of the elderly, especially the use of government welfare services. For example, unemployment on the other hand causes the elderly to lack access to the public welfare system. The state should have a policy to distribute economic development to the provinces. Reducing economic disparities between provinces means more people are working in the provinces. Focus on seamlessly accessible policies such as the development of travel infrastructure.

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