

*The Comparison of Health Insurance System on Survival Time Among Elderly Patients
With Stroke in Standard-Level Hospital, Southern Thailand*

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Abstract

Mortality rates from stroke in the elderly are likely to increase. The quality and accessibility of healthcare are crucial factors that affect clinical outcomes. This study aimed to compare the effect of health insurance (Government Enterprise Officer (OFC) and Universal Coverage Scheme (UCS)) on survival time among elderly patients with Ischemic stroke (IS) and hemorrhagic stroke (HS) and overall stroke (IS and HS) in Standard-Level Hospital in southern Thailand. A retrospective study was conducted by utilizing the hospital database from January 2005 to December 2022. Patients were identified by using ICD-10 (I60-I63), totaling, 4,123 patient records. Data was analyzed by Kaplan–Meier survival analysis and Wilcoxon rank sum test. The results found that number and median [25th-75th percentile] age of elderly stroke patients with OFC was 1,593, (38.64%), and median age was 74 [68-81] years, with UCS was 2,530 (61.36%), and median age was 73 [67-79] years. After 204 months (17 years) of follow-up, 76 patients died (1.84%), 65 had IS (1.93%) and 11 had HS (1.46%). Survival probability between the OFC and the UCS found a statistically significant difference between the health insurance systems among ischemic stroke patients (Log-rank test $p=0.0085$), and overall stroke patients (Log-rank test $p=0.0075$). A comparison of survival time between the OFC and the UCS for overall stroke patients was significantly different ($p<0.001$). Therefore, health insurance system is important for survival rates of stroke patients. there is a need to promote the development of the health system under a shared direction and set of standards.

Keywords: Stroke, Elderly, Health Insurance, Survival

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Introduction

Stroke is a major cause of death and disability globally, and its impact on the elderly population in Thailand is particularly alarming. Mortality rates from stroke among older adults in the country are projected to increase, presenting a significant public health challenge. Key determinants of patient survival include the quality of healthcare, access to medical services, and the appropriateness of available treatment options. Additionally, patients' access to various healthcare rights significantly influences the level of care they receive.

Thailand's healthcare system operates under different entitlements, and the conditions governing service utilization may lead to disparities in service provision (Thitinat Bhumithavorn, 2020). These disparities may stem from variations in resource allocation, the availability of medical professionals, and access to specialized care. Although prior research has identified notable differences in service provision based on the type of healthcare entitlement patients possess (Nawat Kaewnoparat, 2014), it remains unclear whether these disparities result in differences in survival rates among stroke patients.

Understanding potential differences in survival rates among stroke patients across different healthcare entitlements is crucial. Such knowledge can guide healthcare policymakers and practitioners in formulating targeted strategies to address inequities and enhance outcomes for stroke patients. Bridging this research gap will be pivotal in improving the overall quality of healthcare and ensuring equitable access to life-saving treatments for all individuals affected by stroke in Thailand.

Objective

This study aimed to compare the effect of health insurance (Government Enterprise Officer (OFC) and Universal Coverage Scheme (UCS)) on survival time among elderly patients with Ischemic stroke (IS) and hemorrhagic stroke (HS) and all type stroke (IS and HS) in Standard-Level Hospital in southern Thailand.

Materials and Methods

Study Design and Period

A retrospective study involves examining historical data to identify patterns, trends, and outcomes in a specific patient population. In this particular study, researchers utilized a hospital database spanning 17 years, from January 1, 2005, to December 31, 2022, at a standard-level hospital in southern Thailand. This long period of data collection allows for a comprehensive analysis of trends and changes over time.

Population and Sample

The study focused on patients diagnosed with specific types of strokes, as identified by ICD-10 codes I60-I63. These codes correspond to various forms of stroke, such as Ischemic stroke (IS) and hemorrhagic stroke (HS). In total, the study examined 4,123 patient records, providing a substantial sample size for analysis.

Data Analysis and Management

The data underwent a process of cleaning, coding, entry, and analysis through the utilization of STATA program version 18. Summary statistics: frequencies and tables, were employed to

present categorical variables, while the mean was used for continuous variables in the sample.

Statistical Analysis

The data were analyzed using two statistical methods: Kaplan–Meier survival analysis and the Wilcoxon rank sum test. The Kaplan–Meier survival analysis is a method commonly used to estimate survival probabilities over time, allowing researchers to assess patient outcomes and survival rates. The Wilcoxon rank sum test, also known as the Mann-Whitney U test, is a non-parametric test used to compare differences between two independent groups. This study, likely compared survival rates or other outcomes between different patient groups based on various factors such as treatment received or other demographic and clinical characteristics.

Results

General Information of Study Sample

All 4,123 stroke patients in this study. Over half of them were female, the number and median [25th-75th percentile] age of elderly stroke patients with OFC was 1,593, (38.64%), and median age was 74 [68-81] years, with UCS was 2,530 (61.36%), and median age was 73 [67-79] years and marital status is mostly married 85.52% (Table 1).

General information	Types of health insurance		Total
	OFC (n=1,593) n (%)	UCS (n=2,530) n (%)	(n=4,123) n (%)
Sex			
Male	854 (39.78)	1,293 (60.22)	2,147 (52.07)
Female	739 (37.40)	1,237 (62.60)	1,976 (47.93)
Age (years)			
60 - 69	483 (34.16)	931 (65.84)	1,414 (34.30)
70 - 79	628 (39.13)	977 (60.87)	1,605 (38.93)
≥ 80	482 (43.66)	622 (56.34)	1,104 (26.78)
Median (P ₂₅ – P ₇₅)	74 (68-81)	73 (67-79)	73 (61-80)
Marital status			
Single	35 (21.60)	127 (78.40)	162 (3.93)
Married	1,412 (40.05)	2,114 (59.95)	3,526 (85.52)
Ever married	146 (33.56)	289 (66.44)	435 (10.55)
Type of stroke			
IS	1,311 (38.89)	2,060 (61.11)	3,371 (81.76)
HS	282 (37.50)	470 (62.50)	752 (18.24)
All type	1,593 (38.64)	2,530 (61.36)	4,123 (100)
Status			
Death	20 (26.32)	56 (73.68)	76 (1.84)
Survive	1,573 (38.87)	2,474 (61.13)	4,047 (98.16)

Table 1: General information of study sample (n=4,123)

Kaplan-Meier Survival Curve Based on Types of Health Insurance Among Stroke Patients

After 204 months (17 years) of follow-up, 76 patients died (1.84%), 65 had IS (1.93%) and 11 had HS (1.46%). Survival probability between the OFC and the UCS found a statistically significant difference between the health insurance systems among ischemic stroke patients (Log-rank test $p=0.0085$), and overall stroke patients (Log-rank test $p=0.0075$), (Figure 1 – 3).

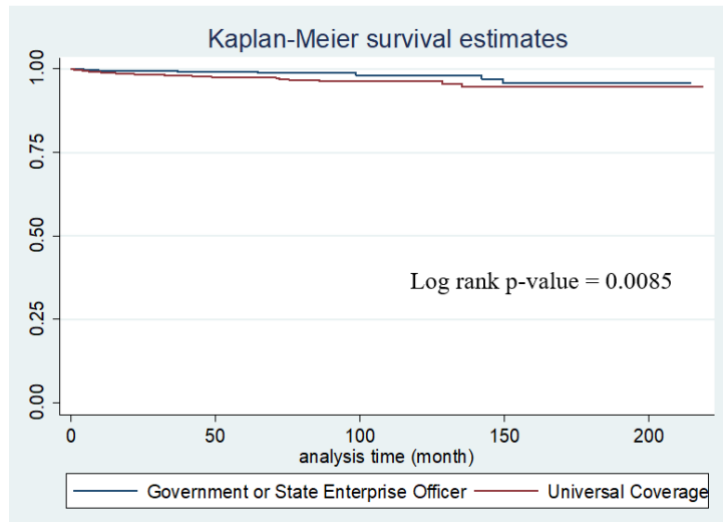


Figure 1: Ischemic stroke patients

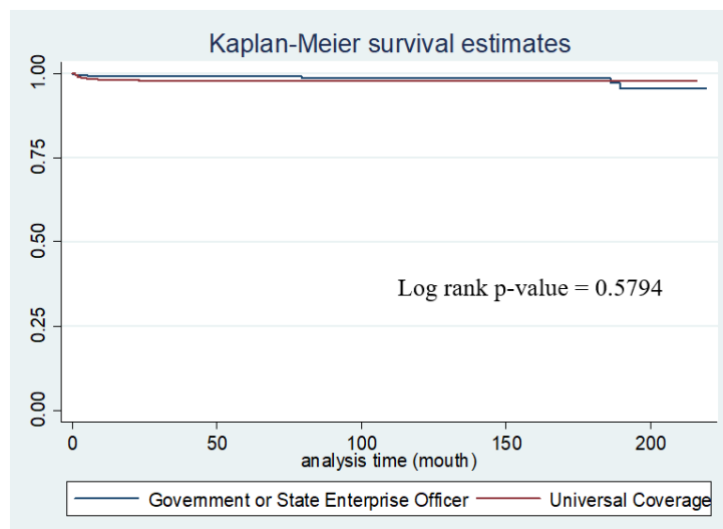


Figure 2: Hemorrhagic stroke patients

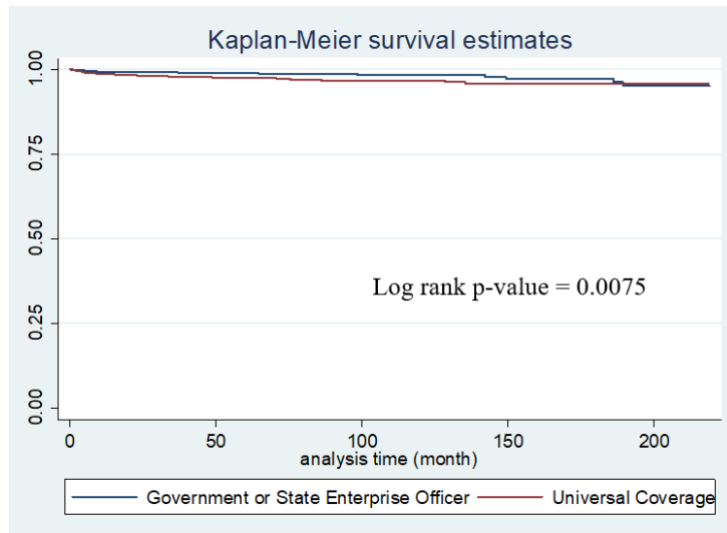


Figure 3: Ischemic and Hemorrhagic stroke patients

Comparison of Survival Time Based on Types of Health Insurance for Stroke Patients

A comparison of survival time between the OFC and the UCS for overall stroke patients was significantly different ($p < 0.001$). Data is presented as median [25th-75th percentile], and p -value < 0.05 was considered a significant difference (Table 2).

Type of stroke	Status	Types of health insurance		p-value
		OFC	UCS	
IS	Death	21.12 (4.93-64.67)	10.77 (4.30-33.53)	0.3115
	Survive	43.90 (21.20-67.80)	42.22 (20.53-63.68)	0.0257*
HS	Death	42.23 (0.97-185.96)	1.97 (1.97-4.93)	0.4073
	Survive	102.10 (48.83- 176.97)	66.97 (30.47-122.43)	$< 0.001^*$
Overall	Death	21.12 (4.55-88.87)	9.75 (3.93-29.93)	0.1585
	Survive	50.27 (24.13-86.97)	44.57 (21.80-68.80)	$< 0.001^*$

Table 2: Comparison of survival time based on types of health insurance for stroke patients

Discussion and Conclusion

The comparison of survival times between elderly stroke patients with different health insurance systems revealed a statistically significant difference ($p < 0.001$) between those covered by the Office of the Civil Service Commission (OFC) insurance and those under the Universal Coverage Scheme (UCS). This finding suggests that the type of health insurance a patient has can significantly influence their outcomes after a stroke.

This result aligns with previous research, such as the study by Hong-Qiu Gu et al. (2018), which identified insurance status as an independent predictor of stroke outcomes. It underscores the crucial role that access to quality healthcare plays in the recovery and survival of stroke patients.

Moreover, the findings point to broader systemic issues within health insurance. Fragmentation in the health insurance system can lead to disparities in care due to inconsistent benefit packages and uneven access to healthcare services. These inconsistencies

can result in unequal access to necessary medical care and financial protection, as noted by McIntyre D et al. (2013).

Research from Chen, R. L., & Shih, M. Y. (2015) examined the impact of health insurance on stroke patient outcomes in Taiwan, offering insights into how different types of health insurance affect patient outcomes, particularly in terms of healthcare access and quality. Similarly, Coshall, C. (2013) explored the influence of insurance status on stroke outcomes, highlighting disparities in care based on insurance type.

While not specific to stroke, the study by Glymour, M. M., & Avendaño, M. (2013) provided a broader perspective on how social determinants, including insurance coverage, influence health outcomes and access to care.

Lastly, Wang, Y. et al. (2017) investigated the impact of different health insurance schemes on stroke outcomes in China, providing context for how insurance influences recovery and survival rates.

These insights highlight the importance of a cohesive health insurance system to improve survival rates among stroke patients. Policymakers should strive to develop a unified health system with common standards and goals to address the disparities caused by fragmented insurance schemes. This approach can lead to more equitable care, better health outcomes, and enhanced financial protection for stroke patients across different insurance plans.

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