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Socioeconomic Factors Affecting Healthcare Expenditures in Selected Asian Countries

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Abstract

The rising cost of healthcare in Asian countries has become a matter of concern, reflecting an extensive influence of socioeconomic factors. This study highlighted that the financial burden on healthcare systems is crucial for ensuring sustainable and equitable access to medical services. However, the impact of socioeconomic factors on healthcare expenditures varies across countries and regions. Therefore, this study seeks to determine socioeconomic factors affecting healthcare expenditures in 10 Asian countries, utilising annual data starting from 2006 to 2020. By employing panel data analysis and the model of fixed effect with a feasible generalised least squares method, the finding shows that the impact of variations in factors such as life expectancy and urbanisation are positive and significant towards healthcare expenditures. Meanwhile, the gross domestic product (GDP) and unemployment rate adversely affect healthcare expenditures, and the findings indicate significant relationships between these variables and healthcare spending. Hence, the finding suggests that the government should look into the substantial healthcare costs and increase investments and funds to reduce the financial load on the country's healthcare sectors and ensure that the healthcare industry is well-equipped to handle rising demand and deliver high-quality services to the public.

Keywords: Asian Countries, GDP, Healthcare Expenditures, Life Expectancy, Unemployment Rate, Urbanization, Panel Data Analysis

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1.0 Introduction

Many nations pay attention to health conditions in Asian countries as a result of the rise of globalisation, urbanisation, industrialisation, and energy consumption (Li et al., 2021). This may be due to socioeconomic factors that lead to the crucial healthcare sector ensuring the well-being of a population. The importance of the healthcare sector lies in its ability to effectively manage multiple health issues through the provision of high-quality health services. For example, the increasing prevalence of infectious diseases such as dengue, Chikungunya, Zika, MERS-CoV, and Influenza has highlighted the value of having a good quality of health services in place to prevent the spread of such diseases and to provide timely treatment to those affected.

Moreover, emerging countries have witnessed an unexpected increment in non-communicable diseases such as diabetes, cardiovascular disease, and obesity in recent years (Fazal et al., 2022). Both the health and economic burden of NCDs is predicted to grow as the country's population ages. In 2017, the cost of dealing with NCDs added up to RM 1.67 billion and the most expensive category of tests was for patients with cardiovascular disease (CVD), which amounted to RM 899.83 million, making up 53.77% of the total cost (MOH, 2019). As a consequence, healthcare costs continue to increase all over the world, and policymakers face the challenge of providing adequate healthcare to their citizens while ensuring the sustainability of healthcare systems.

In addition, since 2020, COVID-19 has severely limited human activities, resulting in the rise of healthcare spending due to the significant changes in the proportion of health spending to GDP. Based on the preliminary statistics, it is predicted that the average GDP share allotted to health will increase from 8.8% in 2019 to 9.7% in 2020 (OECD, 2021). The quantity of unwell patients and the scope of medical interventions necessary to preserve patients during the crisis significantly impact healthcare systems. The COVID-19 outbreak has caused about 73.5 million people to be infected by the pandemic, with more than 1.6 million deaths worldwide, as reported by WHO on 16 December 2020 (Roslan, 2021).

On the other hand, there is an increased demand for healthcare services, including medical treatment, prescription drugs, and hospitalisation, due to the ageing population.

Older adults consume more medications than younger ones as they are more likely to have more than one chronic medical illness (Ruscin & Linnebur, 2021). Hence, the increased demand for medical services leads to higher healthcare costs for a country, posing the immediate concern of whether individuals can afford the substantial expenses associated with treatment.

Apart from that, most medications used to treat chronic illnesses among the elderly require prolonged usage that must be taken for several years. Other medications may be used for a limited period to treat infections, some types of pain, and constipation (Ruscin & Linnebur, 2021). This has put pressure on the economy since the government is being forced to spend more money on healthcare services, leaving fewer resources for other critical areas.

Additionally, it is estimated that by 2050, there will be an increase of as much as 1.5 billion older generations worldwide, which will substantially influence the public and individual budgets of many different facets of society (José Oscar Olmedo-Aguirre et al., 2022). Of course, developing countries, like most Asian countries, are more affected by the rise in economic spending on older individuals' health care.

Socioeconomic factors such as GDP, life expectancy, unemployment rates, and urbanisation are all important socioeconomic factors that affect healthcare spending. Therefore, the objective of this research is to find answers to several fundamental questions as follows :

i. To measure the effects of socioeconomic factors, which are gross domestic product (GDP), life expectancy, urbanisation and unemployment on healthcare expenditures in selected Asian countries.
ii. To identify the most affected country's health expenditures among the selected Asian countries.

2.0 Literature Review and Hypotheses Development

2.1 Healthcare Expenditure

In recent years, the issue of healthcare expenditure has received significant attention, particularly in the context of Asian countries, as the rising healthcare costs are influenced by the evolving demographics and lifestyles of Asian countries. Healthcare expenditures are the cost of current healthcare that includes the supplies and services used annually. According to the International Trade Administration (2022), healthcare expenditures in Malaysia are expected to double to $2.8 billion by 2028.

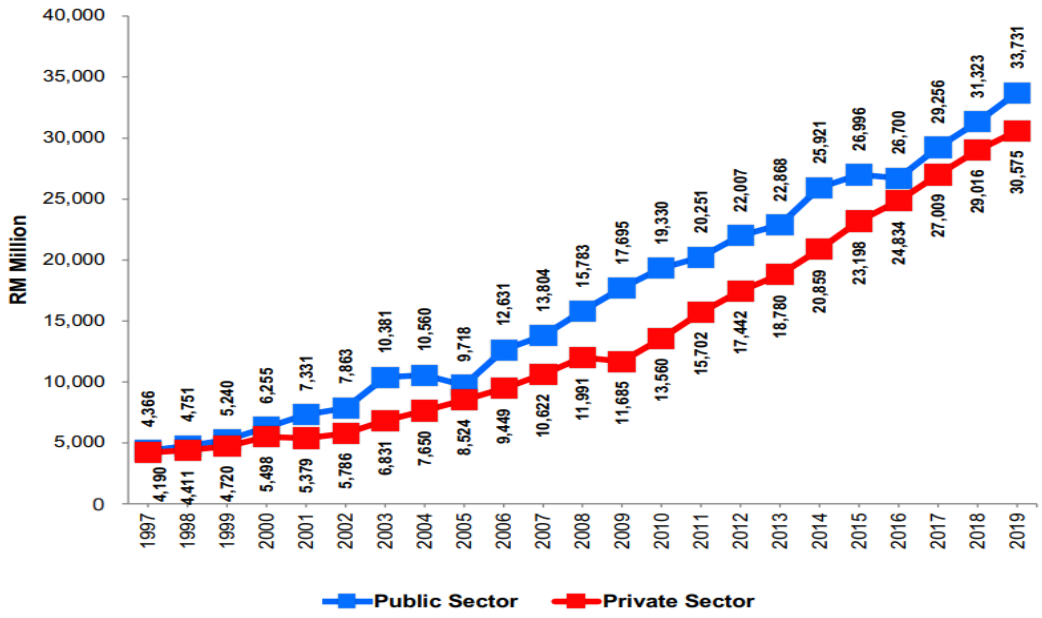
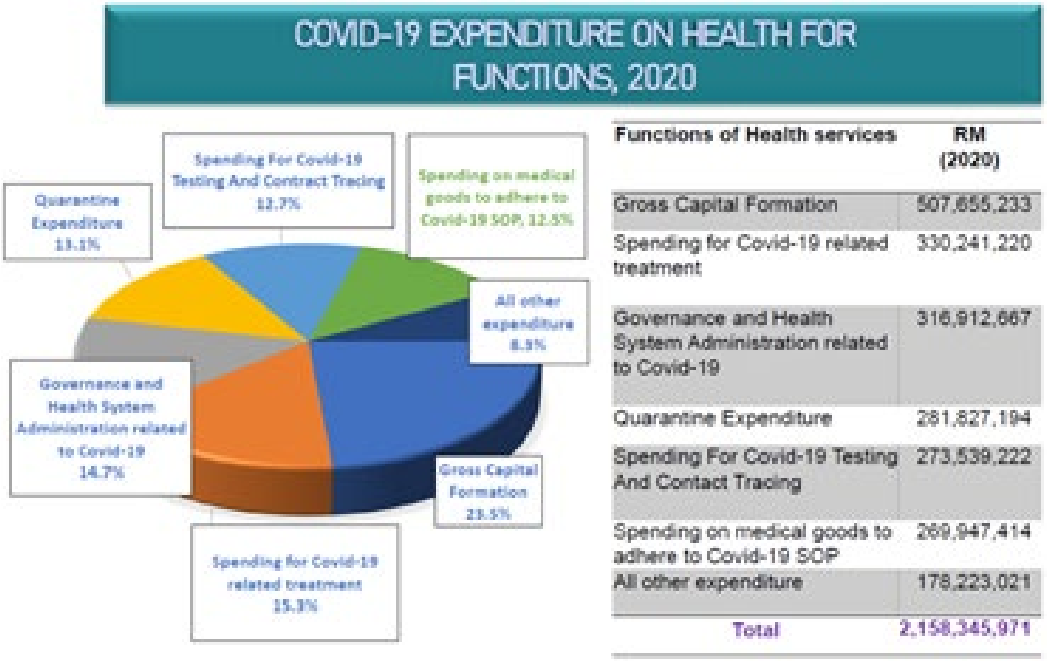


Figure 1: Total Expenditure on Health by Sources of Financing (Public vs. Private), 1997-2019

Figure 1 shows the Health Expenditure Report 1997-2019 of Malaysia National Health Accounts (2021), and the result illustrated that the public sector accounted for 52% (RM 33.371 million) of overall health spending, while the private sector contributed for 48% (RM 30.575 million). This pattern of the public sector having a bigger percentage of health expenditure than the private sector was continuous from 1997 to 2019. Over this time period, both public and private sector healthcare spending increased in general, emphasising that both sectors have grown their healthcare expenditures over time.



Functions of Health services	RM (2020)
Gross Capital Formation	507,655,233
Spending for Covid-19 related treatment	330,241,220
Governance and Health System Administration related to Covid-19	316,912,667
Quarantine Expenditure	281,827,194
Spending For Covid-19 Testing And Contact Tracing	273,539,222
Spending on medical goods to adhere to Covid-19 SOP	269,947,414
All other expenditure	178,223,021
Total	2,158,345,971

Figure 2: COVID-19 Expenditure on Health, 2020

Figure 2 illustrates the budgets of Malaysia National Health Accounts (MNHA) (2021). Malaysia spent RM2.16 billion on health due to COVID-19 in 2020, which represents 3.2 per cent of total health expenditure in both public and private sectors. The MNHA Steering Committee, as presented on November 3, provided information on the distribution of expenditures related to COVID-19 by the MOH. The largest portion of spending, accounting for 23.5 percent or RM507.66 million, was allocated to gross capital formation. Treatment expenses for COVID-19 ranked second with RM330.24 million (15.3%), followed by governance and health system administration costs associated with COVID-19 at RM316.91 million, 14.7% (MNHA, 2021). Moreover, the government has committed $7.7 billion to the Ministry of Health (MOH) for operational and developmental costs in order to maintain the state of the nation's health and prepare for the endemic phase of COVID-19, making it the second-largest allocation in the National Budget 2022.

Other than that, the International Trade Administration (2022) also mentioned that Malaysia's healthcare system prioritises public healthcare, particularly in addressing the requirements of the ageing population, as 10% of the population is 60 years old and above. Furthermore, considering the large percentage of deaths caused by non-

communicable diseases, the management of non-communicable diseases (NCDs) takes it as a critical issue. It focuses on monitoring and preventing NCDs, especially given that Malaysians have the highest diabetes prevalence in Southeast Asia, with one in every five persons afflicted.

2.2 Socioeconomic Factors Affecting Healthcare Expenditures

2.2.1 Growth Domestic Product (GDP)

International Monetary Fund defines Gross domestic product (GDP) as a financial indicator that quantifies the total value of all the final goods and services produced within a given timeframe within a country or group of countries. A study by Zaman et al. (2017) explored the relationship of healthcare expenditures with life expectancy and Gross Domestic Product (GDP) in Bangladesh. The findings indicated a positive relationship between GDP and health spending, with an average rise in overall health spending of 0.0432 units for every unit increase in GDP.

In addition, a study conducted by Zornitsa et al. (2022) used data from 2014 to 2019 to explore the relationship between GDP and healthcare expenditures in Bulgaria. According to the study, rising GDP resulted in rising healthcare expenditures, which was the main cause of rising healthcare costs in Bulgaria. The results show that as GDP expands, both individuals and governments have more disposable income to allocate towards healthcare expenditures.

Another study by Jakovljevic et al. (2020) evaluated the influence of real GDP growth on healthcare spending in two groups, which are the G7 (United States, Japan, Germany, United Kingdom, France, Italy, and Canada) and the EM7 (China, India, Russia, Brazil, Indonesia, Mexico, and Turkey) using panel data analysis between the years 2000 to 2016. The results showed some important distinctions between the two groups, G7 and EM7. GDP has a positive and significant influence on healthcare spending in the G7 countries. In contrast, GDP has an adverse influence and significant effect on dependent variables, such as healthcare expenditures in the EM7 countries.

Thus, GDP is often associated with higher healthcare spending due to increasing wealth and resources dedicated to healthcare. Nevertheless, in particular countries, when GDP rises, the government may prioritise other sectors above healthcare, such as infrastructure or defence, resulting in reduced healthcare spending despite overall economic expansion.

2.2.2 Life Expectancy

Life expectancy denotes the anticipated number of years an individual is expected to live, providing a statistical estimate of the average duration of life within a given population. This measure encompasses the probable lifespan of a person based on various factors such as health conditions, medical advancements, and overall societal well-being. Life expectancy serves as a valuable indicator for assessing the general health and longevity of a population.

A study by Jaba et al. (2014) investigated the relationship between life expectancy and healthcare expenditures in 175 countries using panel data analysis between 1995 and 2010. The results obtained from the analysis revealed a positive and significant relationship between life expectancy and healthcare expenditures. This implies that countries with higher healthcare expenditures per capita tend to experience greater life expectancy at birth.

Another study conducted by Jaison and Matthew (2020) evaluated the influence of life expectancy towards healthcare expenditures in sub-Saharan African countries from 1995 to 2018 across 45 countries in the region. The study employed fixed effects and generalised methods of moment estimation approaches for its analysis and found a positive and significant relationship between life expectancy and healthcare expenditures per capita in sub–Saharan African countries.

Hence, longer life expectancy is frequently associated with an ageing population. As people live longer, the frequency of age-related health disorders and chronic illnesses rises, resulting in greater demand for healthcare services and higher expenditures.

2.2.3 Unemployment Rate

The number of unemployed people as a proportion of the labour force is known as the unemployment rate, and it is seasonally adjusted (OECD, 2023). It is used to comprehend the state of the labour market. A study conducted by Isfahani et al. in 2020 identified empirical research papers that focused on the impact of unemployment on health in Iran between the years 2003 and 2018. The study found that there is a causal relationship between unemployment and health where both variables have a negative and significant effect on each other. This means that unemployment negatively impacts health, and at the same time, poor health can lead to increased unemployment rates.

Other than that, a study by Faramarzi et al. in 2019 examined the relationship between the unemployment rate and health expenditure per capita. Through the use of a random effect panel data model covering the period from 2005 to 2013, the study found a statistically significant relationship between these variables. Specifically, the results indicated that a 1% increase in the unemployment rate was associated with a $138 decrease in health expenditure per capita. This study found that economic crises, as represented by higher unemployment rates, can have a negative relationship with healthcare expenditures.

Therefore, as our population ages, the strain on public healthcare systems naturally grows due to the healthcare requirements. When the unemployment rate rises, more people may seek help from government-funded healthcare programmes, which will have an additional impact on these institutions. The increase in demand may require additional resources and funds to satisfy the healthcare demands.

2.2.4 Urbanisation

Urbanisation in this study refers to the urban population representing people residing in urban areas as outlined by national statistical offices. The calculation relies on World Bank population estimates and urban ratios sourced from the United Nations World Urbanization Prospects. A study by Shao et al. (2022) analysed the relationship between

urbanisation and healthcare expenditure in China using annual data from 31 provinces from 2001 to 2019.

The study used panel threshold model and revealed that healthcare spending in China's Eastern and Central regions is significantly and positively impacted by urbanisation. The findings indicated that the connection between urbanisation and healthcare spending becomes stronger when the proportion of elderly people exceeds a certain threshold, specifically, 10.72% in the Eastern region and 7.00% in the Western region.

Moreover, another study conducted by Atalay and Bakirtaş (2019) investigated the impact of urbanisation on health expenditures in 89 developing countries over the period 2006-2015, utilising both static and dynamic panel data techniques. The findings confirmed that urbanisation contributes to healthcare expenditures in developing countries. The GMM estimator suggested that a 1% increase in the urban population corresponds to a 0.38% increase in health expenditures per capita.

Most studies showed that urbanisation could positively influence healthcare expenditures in many ways. As a result, cities have more healthcare demands, resulting in increased healthcare costs to treat these health concerns.

3.0 Methodology

3.1 Data Collection

Data for 10 Asian countries from the World Bank were collected from 2006 until 2020. The dependent variable of this study is Healthcare expenditure (HE). On the other hand, the socioeconomic factors, which are the independent variables of this study, include Gross domestic product (GDP), Life Expectancy (LE), Unemployment rate (UE), and Urbanization (URB).

Table 1: Data and Variables

Dependent Variable			
HE	Healthcare Expenditures	Current Health Expenditure (percentage of GDP)	World Bank (2006-2020)
Independent Variables			
GDP	Gross Domestic Product	GDP growth (annual %)	World Bank (2006-2020)
LE	Life Expectancy	Life expectancy at birth, total (years)	
UE	Unemployment Rates	Unemployment, total (% of total labour force) (modelled ILO estimate)	
URB	Urbanisation	Urban Population (% of total population)	

3.2 Data Analysis

3.2.1 Descriptive Statistics

This study provides mean, median, minimum, maximum, and standard deviation values for each of the variables. Every variable in this healthcare expenditure model will describe the set of data.

3.2.2 Panel Unit Root Test

The Levin, Lin, Chu (LLC) test is one of the panel unit root tests used to determine the presence of unit root in the panel data model. A unit root implies that a time series variable is non-stationary, meaning the mean and variance fluctuate over time and are unstable in the long run.

H_0: : Variable has a unit root

H_a: : Variable has no unit root

3.2.3. Panel Data Regression

The panel data regression method is used to achieve objective 1. This study used the panel data estimation method, and for studies that cover multiple countries, panel data estimation is the best approach to follow. The relationships between HE and GDP, LE, UE and URB will be tested by using panel data regression and adopting a health outcome model as follows:

$$HE_{it} = a_{it} + \beta_1 GDP_{it} + \beta_2 LE_{it} + \beta_3 UE_{it} + \beta_4 URB_{it} + u_{it}; \quad (1)$$

where,

HE = Health expenditure

α_{it}= Constant intercept i-country and t-time period

$\beta_1 - \beta_4$= Coefficient of regression

GDP = Gross Domestic Product (growth rate)

LE = Life Expectancy

UE = Unemployment rate

URB = Urbanization

u = error term

i= entity (country)

t = time

3.2.4 Fixed Effect Model

The fixed Effect Model is to investigate the relationship between dependent variable and independent variables of different countries over time. FEM eliminates those time-invariant characteristics; hence, it allows this study to evaluate the net effect of the independent variables on the dependent variable. The entities in this study are countries. As a result, this model is capable of examining whether the entities selected in ASIAN

countries are correlated with socioeconomic variables. Therefore, the fixed effect model in this study has the following form:

$$HE_{it} = a_i + B_1 GDP_{it} + B_2 LE_{it} + B_3 UE_{it} + B_4 URB_{it} + u_{it} \quad (3)$$

where,

a_i = fixed effect of country i

3.2.5 Generalised Least Square Model (GLS)

GLS approaches are used to estimate unknown coefficients in a linear regression model where the independent variable correlates with the residuals. The Ordinary Least Squares (OLS) approach solely evaluates the linear regression model's parameters. The major advantage of using OLS regression to estimate parameters is its simplicity. The generalised least squares (GLS) test plays an important role in dealing with outliers, heteroskedasticity, and bias in data. It is capable of providing 'Best Linear Unbiased Estimates' estimators. As a result, the GLS estimator is fair, consistent, efficient, and asymptotically normal (Chetty, 2017).

3.2.6 Testing for Random Effects: Breusch-Pagan Lagrange Multiplier

The Breusch-Pagan test and the Lagrange Multiplier test are both statistical tests used in the panel data model to assess the presence of heteroscedasticity in regression models and determine whether random effects are statistically significant. LM test relies on estimation with the hypothesis; hence, the null and alternative hypotheses in this test are as follows:

$H_0: \sigma_u^2 = 0$ which means Pooled OLS is significant

$H_a: \sigma_u^2 \neq 0$ which means Random Effect Model is significant

3.2.7 Hausman Specification Test

Hausman Test is designed to assist in making a choice between fixed and random effects. The test will be used to determine the statistical significance of the difference between the coefficient estimates obtained by fixed effect and random effect under the null hypothesis that the random effect estimates are efficient and consistent and fixed effect estimates are inefficient.

H_0 : Random Effect Model

H_a : Fixed Effect Model

If the null hypothesis is rejected, the study can conclude that the fixed effect model is appropriate.

3.3 Diagnostic Check

3.3.1 Multicollinearity Test (Variance Inflation Factor)

There are several ways to detect multicollinearity in a dataset, such as using the Variance Inflation Factor (VIF) or calculating the Pearson's Correlation Matrix of the independent variables. An independent variable's VIF score represents how well it is explained by other independent variables.

3.3.2 Heteroskedasticity (Wald Test)

Heteroskedasticity can be checked using the Modified Wald statistics for group-wise heteroskedasticity in the residuals of regression models. A P-value lower than 0.05 indicates that the heteroskedasticity problem exists.

3.3.3 Serial Correlation (Autocorrelation)

The Durbin-Watson Test is used in this study to detect the presence of autocorrelation in the panel data. Durbin-Watson test relies on estimation with the hypothesis; hence, the

null and alternative hypothesis for positive and negative autocorrelation in this test are as follows:

$H_0: \rho = 0$, no autocorrelation

$H_a: \rho > 0,$ positive autocorrelation

3.3.4 Cross-Sectional Dependence Test: Breusch Pagan LM Test

In panel data analysis, cross-sectional dependence refers to the potential correlation or interdependence among individual units (cross-sectional units or entities) in a panel or panel dataset. The null hypothesis of the Pesaran CD test is that there is no cross-sectional dependence.

H_0 : Residuals are not correlated across entities

H_a : Residuals are correlated across entities

If the p-value is lower than 0.05, it means that there is a cross-sectional dependence.

4.0 Results and Discussion

This study used descriptive statistics and unit root tests before moving on to panel data analysis. The descriptive statistics in Table 2 display the values of observation, mean, standard deviation, minimum and maximum to illustrate the variables' characteristics.

Table 2: Descriptive Statistics

Variable	Mean	Std. dev	Min	Max	Observations
HE	0.0397284	0.021828	0.0185097	0.1090425	150
GDP	9.683593	1.026172	7.931708	11.53889	150
LE	4.300097	0.0828821	4.118923	4.437461	150
UE	3.646433	1.9259	0.25	9.32	150
URB	0.6035071	0.2225715	0.27748	1.0	150

Table 2 summarises descriptive statistics for each variable based on data collected annually from 2006 until 2020. The result shows that the average log of GDP per capita is $9.68 in the ten selected Asian countries. The highest GDP recorded in this study is $11.54, which was achieved by Singapore in 2019, while Lao had the lowest GDP at $7.93 in 2006. Meanwhile, the average HE is 3.97%, with Japan recording the highest HE, 10.9% in 2020, while Brunei achieved the lowest HE, which was 1.85% in 2012. Furthermore, Japan also recorded the highest number of LE which is 84.56 years in 2020. This suggests that Japan's high healthcare costs could be linked to a larger population of elderly individuals who often require extra healthcare services for age-related illnesses. The standard deviation above shows that all variables are less volatile, indicating a more consistent and less varied pattern.

Table 3: Levin Lin-Chu Unit Root Test Results (Level)

Variables	t-Statistic	P-value
HE	-4.29890	0.0000
GDP	-1.89130	0.0293
LE	-5.50481	0.0000
UE	-1.98935	0.0233
URB	-6.29438	0.0000

Table 3 presents the outcomes of the Levin Lin-Chu unit root test conducted on all variables. The obtained p-values for each variable are below 0.05, suggesting that the data does not have a unit root and can be considered stationary with a high level of significance. Hence, all variables are deemed suitable for use in this study as it is necessary to assess stationarity in panel data.

Table 4: Result of Panel Data Analysis

	Pooled OLS	**Random Effect**	**Fixed Effect**	**Fixed Effect with GLS**
Constant	-0.804 (-7.85)***	-0.538 (-2.59)***	-0.363 (-1.48)	-0.394 (-11.22)***
GDP	-0.029 (-10.07)***	-0.010 (-2.19)**	-0.007 (-1.30)	-0.008 (-7.14)***
LE	0.248 (9.96)***	0.148 (2.62)***	0.098 (1.46)	0.102 (10.31)***
UE	-0.0001 (-0.19)	-0.001 (-2.66)***	-0.001 (-2.09)**	-0.001 (-6.79)**
URB	0.091 (6.68)***	0.076 (3.57)***	0.091 (3.66)***	0.091 (19.24)***
Breush-Pagan	664.00 (0.000)***			
Hausman Test		12.30 (0.015)***		
Observation	150			
Multicollinearity				
Heteroskedasticity			1807.77 (0.000)***	
Serial Correlation			19.49 (0.000)***	
Cross Sectional Dependence			143.956 (0.0000)***	

1. Figures in the parentheses are t-statistic, except for the Breusch-Pagan LM test, Hausman test, Heteroskedasticity and Serial Correlation tests, which are p-values.
2. ** and *** indicate 5% and 1% significance levels.

Table 4 shows the results of panel data analysis throughout 10 Asian countries to investigate two objectives. The results revealed that the prob>chi2 value for the Breush-Pagan test is 0.00, indicating rejection of the null hypothesis. Hence, the random effects model is preferable. Furthermore, the Hausman test yields a prob>chi2 value of 0.015, which is below 0.05, leading to the rejection of the null hypothesis. Hence, the fixed effects model emerges as the optimal choice for panel data analysis in this study, and this model is applied to evaluate the dataset, considering individual country characteristics, within a panel data consisting of 10 Asian countries over a 15-year period.

In conducting diagnostic checks, it is observed that there is no multicollinearity issue, as evidenced by the VIF being below 10, specifically at 5.32. However, the presence of heteroskedasticity is indicated by a p-value below 0.05, leading to the rejection of the null hypothesis. This signifies that the variances are not constant, revealing a heteroscedasticity problem. Other than that, the autocorrelation test yields a p-value of 0.0017, which is below 0.05, prompting the rejection of the null hypothesis. Consequently, a serial correlation problem is identified in the data. Additionally, the cross-sectional dependence test shows a p-value of 0.05, indicating that the cross-sectional are correlated.

Hence, this study used fixed effect with the GLS model to rectify heteroskedasticity, serial correlation and cross-section dependence problems. The effect of all independent variables is significant at the 5% and 1% levels, as indicated in Table 4, given that their individual p-values were lower than 0.05 and 0.01. The GDP, LE and URB are said to be statistically significant at 1% level, whereas unemployment rates is statistically significant at 5% level towards healthcare expenditures.

The panel regression equations may be written as follows, taking into account the models that were discussed in the previous section:

$$HE_{it} = -0.394_i - 0.01\ln(GDP)_{it} + 0.102\ln(LE)_{it} - 0.001UE_{it} + 0.091URB_{it} + u_{it} \quad (6)$$

The GDP coefficient shows a negative and significant influence on healthcare expenditures. A 1% increase in GDP reduced healthcare expenditures by 1%. Despite

that this study discovered the adverse relationship of GDP, it contradicts the results from previous studies findings Zornitsa et al. (2022) and Zaman et al. (2017) that while GDP generally increases healthcare spending, a study found a distinction between developed (G7) and developing (EM7) countries. The G7 showed a positive link, but the EM7, mostly Asian nations, had a negative one. This suggests that a country's economic structure matters. When economic growth comes from non-healthcare sectors such as technology, industry, or finance, healthcare spending may not rise proportionally, leading to a negative relationship.

The unemployment rate coefficient also shows a negative and significant relationship with healthcare spending, as a 1% increase in unemployment rate reduced healthcare expenditures by 0.1%. Meanwhile, unemployment rates have a negative influence on healthcare expenses, which is in line with previous study findings (Isfahani et al., 2020; Faramarzi et al., 2019). This could happen since unemployment often leads to a decrease in household income as individuals lose their main source of income. As a result, people may prioritise basic requirements such as housing and education over healthcare expenses.

Apart from that, a study by Standing G. (2000) stated that there are two main ways to give some income stability to the unemployed: unemployment insurance benefits and unemployment assistance. The latter nations were seen as having a system where benefits were determined based on financial need. Most industrialised nations portrayed an image of reliance on unemployment insurance benefits. Hence, an increment in unemployment rates can strain government budgets due to increased demand for unemployment benefits, resulting in a negative link between unemployment and healthcare expenditures.

The life expectancy shows a positive and significant relationship with healthcare expenditures, indicating that the greater the life expectancy, the greater the healthcare expenditures in Asian countries. According to the equation, an increase of 1 year in life expectancy tends to boost healthcare expenditures by 10.2%. As a result, this investigation's conclusions are consistent with those of Jaba et al. (2014) and Jaison and Matthew (2020). This shows that there is a growth in the percentage of elderly individuals

within the population due to the prevalence of chronic diseases and health conditions associated with ageing. This shift in demographics can result in higher healthcare expenditures as additional expenses are required to meet the specific healthcare demands of an ageing population.

In addition, urbanisation also comes with a positive and significant influence on healthcare expenditures, where an increase of 1% urbanisation has increased 9.1% of healthcare expenditures. This result was supported by Shao et al. (2022), whose study found that urbanisation in both Eastern and Central regions significantly contributes positively to healthcare expenditures, particularly in regions experiencing a high level of population ageing. This shows that challenges in urban areas, such as environmental deterioration and lifestyle changes, lead to health inequalities. The ageing population intensifies the probability of illness, driving up the need for medical care and health services. Hence, urbanisation will drive up healthcare expenses.

Table 5: Result of Cross-Section Specific Effect

Cross Section	Fixed Effect
Brunei	-0.3941***
China	0.0270***
Indonesia	0.0198***
Japan	0.0450***
Lao	0.0329***
Malaysia	0.0038**
Pakistan	0.0294***
Philipine	0.0293***
Singapore	-0.0168***
Thailand	0.0208***

The data above are obtained from the lower section of the fixed effect with GLS outcome. As shown in Table 5, all test statistics are significant at 1% and 5% level. The result shows that socioeconomic factors can vary from country to country. Healthcare

appears to be a necessary good expenditure where the coefficients are less than one in all of the countries. In other words, healthcare appears to be an essential that is consistently demanded across these countries, and changes in socioeconomic factors have a relatively modest impact on healthcare spending.

Japan appeared to be the most affected country and was more responsive to GDP, life expectancy, unemployment rates, and urbanisation compared to the other countries, as Japan had the highest coefficient, which was 0.045. This result is supported by a study by Boungnarasy M. (2011), which showed that Japan has the highest coefficient among 11 Asian countries. However, healthcare expenditures appeared to be luxury as the coefficient was larger than 1. The pooled regression equation for Japan in this study may be written as:

$$HE_{it} = 0.349_i - 0.01\ln\,(GDP)_{it} + 0.102\ln\,(LE)_{it} - 0.001UE_{it} + 0.091URB_{it} + u_{it} \quad (7)$$

Following Japan, other nations in the dataset also exhibit varying degrees of responsiveness to these factors. Lao (0.0329), Pakistan (0.0294), Philippines (0.0293), China (0.0270), Thailand (0.0208), Indonesia (0.0198), and Malaysia (0.0038) emerged as countries where healthcare expenditures seem to be less affected, where these countries come out with a slightly lesser extent than Japan. This suggests that the interplay of socioeconomic factors holds significance in influencing healthcare spending patterns in these countries. On the other hand, Singapore (-0.0168) and Brunei (-0.3941), yield a negative coefficient associated with the socioeconomic variables.

5.0 Conclusion and Future Research

5.1 Conclusion

This study investigated socioeconomic factors affecting healthcare expenditures in 10 Asian countries from 2006 until 2020. This study used panel data analysis and determined that the fixed effect with the GLS model offers the most suitable description of the data, effectively accomplishing the primary and secondary objectives. This

approach provides a systematic comprehension of how these socioeconomic factors intricately contribute to healthcare expenditure patterns. For objective 1, the results revealed the significance of all independent variables, which are GDP, life expectancy, unemployment rate, and urbanisation, in influencing healthcare costs.

The regression analysis reveals various relationships between the socioeconomic factors and the dependent variable, healthcare expenditures. Unemployment rates exhibit a negative and significant relationship with healthcare expenditures; however, the influence of unemployment rate is not too high, as whenever it increases by 1%, it reduces only 0.1% of healthcare expenditures. GDP also found a negative and significant relationship with the dependent variable, suggesting its substantial influence on healthcare expenditures. Conversely, the results for life expectancy and urbanisation are positive and statistically significant.

The intertwining dynamics of life expectancy and urbanisation are steering many countries toward the phenomenon of population ageing. Rising life expectancy and ageing populations, especially in urban areas of Asian countries, will strain healthcare spending due to increased chronic diseases. Additionally, the ageing of the population is a varying phenomenon that is reflected in the particular urban environments of some places. Moreover, urban areas are often recognised for having a thriving economy, and some particular areas are experiencing a significant increase in the proportion of their elderly population. This might put further pressure on healthcare as the environment in this area is congested and far from nature.

The life expectancy stands out as the most crucial factor affecting healthcare expenditures. However, it also presents obstacles since elderly people usually need more comprehensive and specialised medical care. Healthcare systems are experiencing a great deal of strain as a result of this demographic trend towards an ageing population, which drives up healthcare costs.

The results for objective 2 indicated that Japan is the most affected country in terms of GDP, life expectancy, unemployment rates, and urbanisation among the ten selected Asian countries. The other countries emerged as countries with healthcare expenditures that seem to be less affected.

5.2 Future Research

This study used data from 2016 until 2020. One limitation of this study is the limited availability of data in recent years. As a result, the precise importance of certain inputs may not have been properly represented in this study. Therefore, future research should incorporate data from more recent years, specifically 2021 and 2022, to enhance the current study's applicability. This inclusion would provide a more accurate and up-to-date understanding of the relationships between variables.

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