



Reviewing the Resilience of the Performance of the Household Consumption and Health Sectors towards Regional Economic Growth in Indonesia Before and During the Covid-19 Period 2018 to 2021

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Abstract. The COVID-19 pandemic has hit various sectors of life, including the economy in Indonesia. The severity of the impact is rumored to have disrupted economic stability, especially in the regions. For this reason, this study needs to study and assess how strong the impact affects the regional economy as reviewed from the performance of Household Consumption and Health as a contributor to the regional economy in Indonesia. Using 136 observations from 34 provinces during the period from 2018 to 2021 in Indonesia, the Wilcoxon Test proved that there was no change in the performance of Household Consumption and Health to be able to shake the regional economy both before and during the COVID-19 period.

Keywords: COVID-19, Regional Economy, Household Consumption, Health.

1 Introduction

Although it has been more than three years since the first case of COVID-19 infection was confirmed in 2019 [1] the existence of this pandemic is still real, especially with the emergence of Eris (EG.5) whose spread has dominated more than 51 countries in Europe, Asia and West as well as most regions in the country, especially from July to August 2023 [2] Although WHO considers this new variance not yet a serious threat [3], [4] but the concerns of various parties, especially experts, about the potential risks it poses are undeniable, namely the global recession that is escalating, including depleted food supplies, supply chain disruptions, and forms of restrictions that can disrupt productivity at large [5].

As in other countries, COVID-19 has created pressure on Indonesia's food security through declining incomes and reduced access, as well as increased transaction costs and uncertainty in the country's food system. The impact of COVID-19 on food security concerns various actors in food systems, different food commodities, and various aspects, including availability, access, and nutrition. On the demand side, COVID-19 threatens food security through its adverse effects on employment and poverty, as well

as nutritional and health outcomes [6][7]. The most extreme impact occurs in the decline in household income, especially for those who work as laborers in the industrial and informal sectors [8][9].

The stability of food availability and access is affected by COVID-19-related travel bans and the closure of informal food markets to achieve greater social distancing. These closures may not affect all foods evenly – perishable products such as fruits, vegetables and animal-sourced foods can experience more stockouts compared to products that can be stored such as grains and vegetable oils. For poor consumers, a forced shift to more expensive food outlets such as supermarkets, following open-air market closures and bans on street vendors, could further disrupt food access and reduce food quality. In the medium term, prolonged reduced access to preferred foods and a shift to cheaper, less nutritious foods can lead to deterioration of nutritional status [10].

In the health sector, the COVID-19 pandemic has had an impact on the physical and mental health of the community, including health workers. Several studies have shown symptoms of depression, anxiety, and sleep disturbances in health workers during the pandemic, and other mental health impacts that have occurred on society [11][12][13].

The previous highest record in Indonesia with the highest number of daily confirmed new cases was 14518 cases, which was recorded on January 30, 2021. On July 15, 2021, the number increased almost fourfold to 56757 cases. From June 17, 2021 to August 22, 2021, Indonesia recorded more than 10,000 new daily cases consecutively, with an average of 30475 daily cases in a given time period.

Although from a certain point of view, judging that 2.04 million people out of Indonesia's 270 million population are infected with COVID-19 does not necessarily reflect the actual number of cases on the ground significantly, this figure is a very serious indicator to handle. A survey conducted by the Jakarta health office, together with the University of Indonesia, the Eijkman Institute for Molecular Biology and the Indonesia CDC, in March 2021 found that the number of individuals in Jakarta who have COVID-19 antibodies is seven times higher than the official records of COVID-19 patients recorded in Jakarta [14].

The Government of Indonesia has issued various policies to combat Coronavirus Disease (COVID-19). However, cases continued to fluctuate for a year after the pandemic. So that the capacity of the health care system is very important, especially in Indonesia, to accommodate various health care demands. Some indicators that indicate the government's unpreparedness for health capacity are that the availability of medical staff at that time was insufficient to handle the potentially increasing demand as the pandemic highlighted the human resource challenges that the healthcare system has faced. The pandemic has exposed the fragility of medical supply chains. The surge in the number of patients requiring hospitalization has led to a depletion of medical supplies. Existing health infrastructure is still inadequate to cope with the increase in COVID-19 cases, which also exposes the limited capacity of health infrastructure to manage medical waste. The COVID-19 pandemic has further exposed the weaknesses of the patient referral system and the limited capacity of the healthcare system to provide essential health services in prolonged emergencies. The Government of Indonesia needs to increase the country's health capacity. Various strategies have been proposed to address these growing challenges. Nonetheless, the challenge of increasing

healthcare capacity highlights that such efforts can only represent one part of the pandemic response equation. An effective pandemic response ultimately requires a government commitment to increase healthcare capacity and flatten the curve simultaneously [15]

So in order to review the situation and conditions above, the important thing that needs to be studied is how the situation and conditions of the COVID-19 pandemic have shaken the Indonesia economy, especially in terms of Household Consumption and Health on regional economic growth in Indonesia and how much changes have occurred due to the shock.

2 Literature Study

2.1 Household Consumption

Consumption is household spending on goods and services [16, p. 497] with the exception of the purchase of new homes. Meanwhile [17, p. 175] explains that consumption is household spending on goods and services such as food, clothing and entertainment. Bernanke also categorized the consumption of products into two properties, namely durables and non-durables. Durables products are long-lived consumer goods such as cars and furniture. Meanwhile, non-durables products are short-lived products such as food and clothing and services.

In the scope of economics, there are four theories that build an understanding of consumption [18], namely:

1) Keynes's theory of consumption emphasizes The Absolute Income

This theory is based on the postulate that current consumption is the function of the current income. Mathematically, it can be written as follows:

$$C=fY$$

Where C is consumption and Y is current income. The principles of this theory are as follows:

- a) Real consumption is a positive function of real income that can be spent today. This means that this theory is valid in the short term. So, technically it can be written as follows:

$$C=fY \text{ dan } \Delta C/\Delta Y > 0$$

- b) The Marginal Propensity to Consume (MPC) is the proportion of marginal income consumed and expressed in decimal numbers between 0-1. So that it can be stated $0 < \text{MPC} < 1$
- c) The MPC value must be less than the APC (the Average Propensity to Consume) value, so $\Delta C/\Delta Y < C/Y$
- d) MPC declined as revenue increased

The weakness of this theory is that it does not include the element of empirically *disposable income*.

- 2) Duesenberry's consumption theory emphasizes The Relative Income. This theory states that the proportion of income consumed by a household depends on the level of income from the household itself and not from absolute income.

- 3) Friedman's consumption theory emphasizes The Permanent Income. This theory states that permanent income is the average of all income anticipated by households in the long term. This method includes all components of capital and wealth such as labor income. So that the postulation of Friedman can be written as follows:

$$C=fY_p$$

Since C is proportional to Y_p , then

$$C=kY_p$$

Where k indicates the proportion of revenue consumed.

- 4) The circular consumption theory emphasizes The Life Cycle theory from Alberto Ando and Franco Modigliani. This theory states that individual consumption over time will depend on the resources available to the individual, the rate of return on capital of the individual, and the age of the individual. The principle in this theory is:
- a) The total consumption of an individual depends on his current physical and financial wealth and the income of the workforce from his or her lifetime
 - b) Consumption expenditure is financed from lifetime income and wealth accumulation
 - c) The level of consumption of the individual is constant throughout his life

2.2 Health

Health is a prosperous and healthy condition from the physical, mental and spiritual that makes humans and people do an activity and will produce productivity from that health [19]. Health is defined as a state of health, both physically, mentally, spiritually and socially that enables everyone to live a productive life socially and economically as stated in Article 1 Paragraph 1 of Law of the Republic of Indonesia Number 36 of 2009 concerning Health [20]. In the context of the economy, health is correlated with the condition of the country's economy as explained in Law No. 36 of 2009 at the beginning of point c, that everything that causes health problems in the people of Indonesia will cause great economic losses to the country, and every effort to improve the degree of public health also means investment in the development of the country [20, p. 1]. Referring to point c above, it is very clear that health is one of the main factors that can affect the country's economic condition. The correlation between health factors and the country's economy lies in the expenditure allocated by the government of at least 5% (five percent) of the State Revenue and Expenditure Budget outside of salaries, and at least 10% for provincial governments, districts/cities from the Regional Revenue and Expenditure Budget outside salaries as explained in Article 171 paragraphs (1) and (2) [20, p. 65].

In the context of a country's economy, health is considered part of human capital which is one of the determining factors for economic growth. A number of theories and research results have proven and revealed the role, function and correlation between health and the economy of a country. Mushkin, is the first person to emphasize the importance of health factors which are elements of human capital [21] Mushkin stated that education for human capital is as important as human education for health itself. On the one hand, Mushkin argues that the two have similarities as personal investment

and personal consumption. On the other hand, Mushkin explained that there is a difference that health investment can increase the number and quality of the workforce. Meanwhile, investment in human capital can only improve the quality of the workforce. Health investment cannot be separated from the quality of education of the individual itself. Investment in education (human capital) is part of the development process that aims to find and encourage talent, and implement creative roles. Meanwhile, health investment aims to prevent killing, death and destruction of the environment in order to maintain the sustainability of nature.

In contrast to [22, p. 2], both argue that in national economic development, health factors play a more important role as investments that can reduce disease and mortality rates and reduce the loss of human resources. In other words, the role of the health sector is more important in national economic development which functions as a catalyst for a country's human capital [23] has strengthened this opinion through the neo-classical economic growth model by including the concept of health capital. In his model, Barro explains that health has a direct impact on productivity. In addition, improving the degree of health is able to reduce the rate of death and disease, which has an impact on increasing human resources. Mankiw, Romer, Weil and Lucas [24] developed a model of health that is considered a factor of production. So the model emphasizes that increased production must be associated with improved health, especially an increase in life expectancy in a country or region [25] put forward his model of health and infrastructure as endogenous factors of economic growth that can affect labor productivity and household utilities. He argued that infrastructure not only affects the production of goods, but also provides health services. The assumption of this theory is that individuals can only provide effective services from human resources when they are healthy. So that by increasing productivity, health indirectly affects economic growth.

A number of research results prove that health is an important factor in the country's economic development. The disruption of public health in a country due to outbreaks, pollution of air, water and so on will have a negative impact on economic growth in the country. During the Covid-19 pandemic, the implementation of Large-Scale Social Restrictions (PSBB) or Lockdown in a number of countries in an effort to limit the spread of the Covid virus, has been able to reduce the economic burden from the health burden and have the ability to significantly reduce air pollution levels [26]. However, negative impacts from social and economic aspects also arise such as domestic violence, depression and anxiety, increasing the number of school dropouts, unemployment and loss of income and purchasing power [27][28]. Covid 19, as an outbreak that threatens health and even human life, also has an impact on other economic activities such as international trade activities and global supply chains [29].

2.3 GDP (Gross Regional Domestic Product) / GDP (Gross Domestic Product)

GDP/GDP is defined as the market value of final goods and services produced in a country in a certain period which is usually measured in one year [18, p. 96][20, p. 45]. In estimating GDP in an open economy, it is important to know that the income earned by foreign nationals in the country is part of the GDP component, while the income of

the population of a country abroad is not part of the GDP component. There are several things that are obstacles in calculating GDP, namely:

- a) Determining final goods and non-final goods
- b) Evaluate non-marketed goods and services, such as agricultural products that are consumed by farmers themselves and not sold in bulk
- c) Calculate income from illegal activities and professions such as smuggling, production and sale of prohibited goods
- d) Calculate inventory of unsold items
- e) product prices that are distorted as a result of indirect taxes

2.4 GDP Calculation Method

The GDP Calculation Method refers to the circular flow of income which is basically divided into product flows and money flows. Money flows in this case are categorized into two parts, the first is to pay production factors (wages, salaries, honorarium) and the second is to pay for goods and services. Based on these two flows of money and goods, the calculation of national income can be divided into three methods, namely:

Net Product Method or The Value Added Method. The calculation of national income by the Production Method is based on the amount of value of goods and services produced by a society or country in one year. All the final value of goods and services is added up [31]. This method consists of stages, namely first estimating the value of gross products from various types of products in a country. Second, determining the cost of materials and services used and the depreciation of physical assets. Third, calculate the difference (deduction) of costs and depreciation from the gross value to get the net value of domestic output. Mathematically, it can be written as follows:

$$NI = P_1Q_1 + P_2Q_2 + \dots + P_nQ_n$$

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$$NI = \sum_{i=1}^n P_i Q_i$$

Factor Income Method. The calculation of national income using the income method is by summing up all the income earned by all economic actors in a society or country in a certain period (Hanantijo, 2012). The income is in the form of rent, interest, wages, profits and so on. This method refers to the assumption that household expenditure is synonymous with its receipts. So that the income method is complementary to the calculation of national income using the expenditure method. In this revenue method, there are two things that are included in the calculation, namely depreciation and indirect taxes. Depreciation needs to be included in the calculation of national income because depreciation is part of the company's revenue that is not distributed by the owner of the production factor. Indirect taxes are taxes that basically the tax burden can be shifted to other parties by taxpayers such as sales tax, spectacle tax, development tax, and so on. Actually, indirect taxes are only the transfer of purchasing power from taxpayers to

the government that occurs at the time of the transaction, so that indirect taxes are not received by the owners of production factors and must be calculated by themselves. Mathematically, it can be expressed as follows:

$$\text{National Income GDP} = \text{Rent} + \text{Wages} + \text{Interest} + \text{Profit} + \text{Depreciation}$$

Expenditure Method. In calculating national income by the expenditure method, it is by adding up all economic sector expenditures, namely from households, companies, governments and the foreign sector in a society or country in a certain period. Every expenditure made by households, both individual households and government households is referred to as (C = consumption), corporate expenditure is usually in the form of investment (I = Investment), government expenditure (G = Government Expenditure). For countries that have economic relations with other countries or foreign relations, there is still net expenditure on the purchase of goods and services by foreign people and entities, such expenditure is called exports – imports (X-M = net export). So in a nutshell, the equation between national income and the expenditure method can be expressed mathematically as follows:

$$\text{National Income GDP} = C + I + G + (X - M)$$

In this expenditure approach, the type of expenditure that needs special attention is expenditure in the form of purchasing capital goods or investments. In economics, investment is only specialized in corporate household expenditures to buy new capital goods, so investment is always in the form of adding real capital goods to the existing stock of capital goods.

Based on the three methods above, it will produce the same value, so it can be described as:

$$\text{GNP} = \text{GNI} = \text{GNE}$$

Where GNP is Gross National Product; GNI is Gross National Income and GNE is Gross National Expenditure.

3 Research Method

This descriptive quantitative research aims to examine the difference in the performance of the Household Consumption (X1) and Health Variables (X2) variables on their contribution to increasing Real GDP in 34 provinces in Indonesia. With 136 observations of panel data from 2018 to 2021, this study analyzed the best model of panel data among three models, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) as well as the Wilcoxon test as a comparative analysis tool for the difference between the two samples.

4 Results and Discussion

4.1 Results

The initial stage in this study is to determine the best model to use to analyze the next panel data. Through the three stages of Model Test, the researcher then summarized three panel data estimation models, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) as presented in the table below.

Table 1. Panel Data Model Estimation

Kategori	Common Effect Model (CEM)	Fixed Effect Model (FEM)	Random Effect Model (REM)
C	94.67187	232.5154	188.8859
Ln_KonRT	0.389351	0.075802	0.249003
Ln_Kshtn	0.275633	-0.003221	0.001332
Adjusted R-squared	0.695619	0.996991	0.216425
F-statistic	155.2618	1278.849	19.64361
Prob(F-statistic)	0.000000	0.000000	0.000000
Durbin-Watson stat	0.201465	1.898460	1.109478
Dependent Variable	Ln_PDRBRiil		
Sample	2018-2021		
Periods included	4		
Cross-sections included	34		
Total Panel (balanced) ob- servations	36		
Included Observations	136		

Sources: data processed by researcher, 2024

Chow Test and Hausman Test. The Chow test is one of the tests to determine the best model between the Fixed Effect Model (FEM) and the Common Effect Model (CEM). The Fixed Effect Model is the best choice if the Cross-section Chi-square value in the model test is below the Sig. $\alpha = 0.05$ value. Based on the results of Chow's test on both models (FEM & CEM), it can be stated that FEM was selected as the best panel data estimation model with Prob values. The cross-section of the Chi-square is $0.0000 < \alpha = 0.05$. Meanwhile, in the Hausman test, which is one of the tests to determine the best model between the Fixed Effect Model (FEM) and the Random Effect Model (REM), it is stated that the Fixed Effect Model is also the best choice with a Cross-section Chi-square value of 0.0000 below the value of Sig. $\alpha = 0.05$ as presented in the table below.

Table 2. Test Panel Data Model

Category	Chow test			Hausman		
	Statistic	d.f.	Prob.	Chi-Sq. Sta- tistic	Chi- Sq. d.f.	Prob.

Cross-section F	404.610416	(33,100)	0.0000		
Cross-section Chi-square	666.634406	33	0.0000		
Cross-section random			50.213155	2	0.0000

Sources: data processed by researcher, 2024

Normality Test. Panel data in this study is non-parametric. The normality test proves that all variables (Y, X1 and X2) have a Prob. (0.000000) value < Sig. $\alpha = 0.05$ so it can be said that the panel data distribution is not normally distributed. As presented in the figure below.

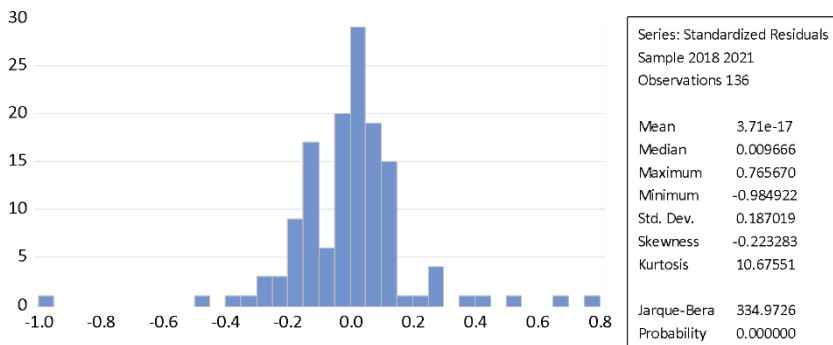
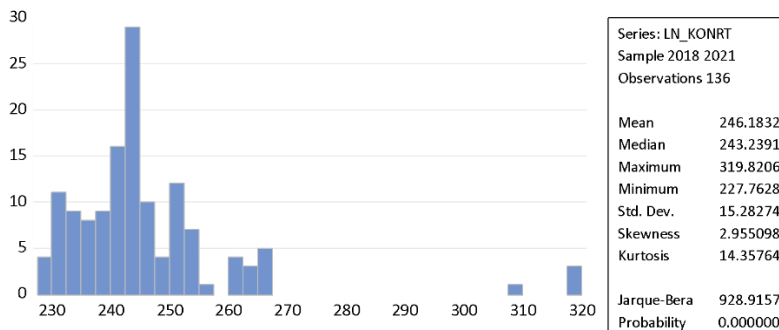


Fig. 1. Normality Test

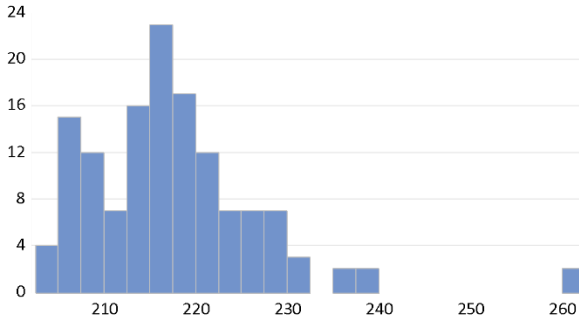
In other words, the Fixed Effect Model (FEM) panel data is not normally distributed.

Wilcoxon Test. Based on the results of the Wilcoxon test, it was obtained that the value of Prob. Wilcoxon/Mann-Whitney of $0.9393 > 0.05$ which means that there is no difference in performance in the Household Consumption sector to contribute to regional GDP in Indonesia before and during Covid 19.

ConsRT Variables

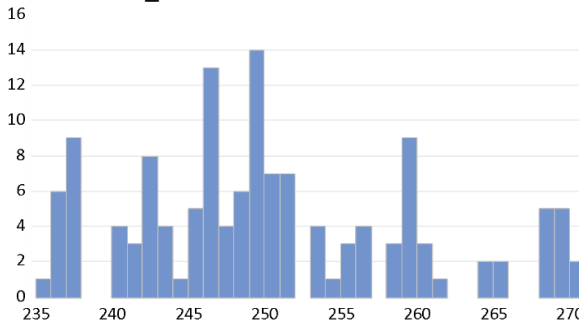


Variable Ln_Kshtn



Series: LN_KSHTN	
Sample 2018 2021	
Observations 136	
Mean	217.5078
Median	216.5874
Maximum	261.5535
Minimum	203.9824
Std. Dev.	9.405661
Skewness	1.704165
Kurtosis	8.505115
Jarque-Bera	237.5637
Probability	0.000000

Variable Ln_PDRB Riil



Series: LN_PDRB_RIIL	
Sample 2018 2021	
Observations 136	
Mean	250.4760
Median	249.1918
Maximum	270.1675
Minimum	235.7154
Std. Dev.	9.120726
Skewness	0.511602
Kurtosis	2.558285
Jarque-Bera	7.038341
Probability	0.029624

Fig. 2. Wilcoxon Test with ConsRT Variables

Based on the results of the Wilcoxon test on the Health variable, it was obtained that the value of Prob. Wilcoxon/Mann-Whitney by $0.6121 > 0.05$ which means that there is no difference in performance in the health sector to contribute to regional GDP in Indonesia before and during Covid 19.

Based on the results of the wilcoxon test, a Prob value was obtained. Wilcoxon/Mann-Whitney by $0.6121 > 0.05$ which means that there is no difference in performance in the real GDP sector of the regions in Indonesia to contribute before and during the Covid 19 period.

4.2 Discussion

The results of the panel data analysis stated that the variables Ln_KonRT (X1) and Ln_Kshtn (X2) were not normally distributed with the Probability value respectively below the value of Sig. $\alpha = 0.05$. For the probability value of the variable Ln_PDRB_Riil (Y) of $0.029 < \text{Sig. } \alpha = 0.05$ which is also abnormally distributed. Meanwhile, the results of the Wilcoxon test on the three variables stated that for the Prob value. Ln_KonRT (X1) of 0.939, Prob. Ln_Kshtn (X2) of 0.612 and Prob. Ln_PDRB_Riil (Y) of 0.778 where the three are stated to be no difference.

Table 3. Distribution of Normality and Wilcoxon test variables Ln_KonRT, Ln_Kshtn, Ln_PDRB_Riil

No	Variabel	Distribusi Normalitas	Wilcoxon Test	Keterangan	Kesimpulan
		Asym. Prob	Prob.Sig	Normalitas	Sama (H_1)/Beda(H_0)
1.	LN_KONRT	0,000	0,939	Tidak	Sama
2.	LN_KSHTN	0,000	0,612	Tidak	Sama
3.	LN_PDRB_RIIL	0,029	0,778	Tidak	Sama

H1: There is a difference in the performance of the Household Consumption sector relative to Regional GDP in Indonesia before and during the COVID-19 period.

In terms of examining the condition and situation of Indonesia's economy in the midst of the Covid-19 pandemic, the researcher suspects that there is a difference in the contribution of household consumption (X1) to the Real Regional GDP in Indonesia throughout 2018 to 2021. The facts prove that most of the food is consumed by urban residents, especially households. The results of the study [32] found that as many as 38% of households in the agri-food sector who are clean producers, and work as workers and non-land owners have decreased by 20%. Where among them are net consumers and obtain food through the market or sell their agricultural products in the market. With the shock of the pandemic, it has a great impact on those who have been very dependent on the market. In line with this, [33] strengthens evidence that there is a change in consumer behavior in line with public awareness of COVID-19 and large-scale physical restrictions. At the beginning of the pandemic, where public awareness and knowledge about COVID-19 were still limited, panic buying behavior has emerged and everyone has started providing food to reduce the risk of food shortages. The next condition is during the pandemic, where the government's policy of imposing mass physical restrictions made most people postpone buying food directly and do more activities indoors, which of course caused a drastic decrease in the number of offline purchases. So it can be assumed that this condition will certainly bring about significant changes in the household consumption sector. However, based on the results of the Wilcoxon test summarized in Table 3 above, it is stated that the Significance Probability value is 0.939 which is greater than the value of Sig. $\alpha = 0.05$. So it can be stated that there is no difference in performance in the contribution of the Household Consumption sector to the real GDP of regions in Indonesia. In other words, the allegation that there is a difference in performance in the Household Consumption sector in affecting the real GDP of regions in Indonesia is not proven.

H2: There are differences in the performance of the health sector in relation to Regional GDP in Indonesia before and during COVID-19.

At least 214 countries have been reported to have confirmed COVID-19 cases and 185 countries have confirmed local transmission, including Indonesia (Sutarsa et al., 2020). The pandemic has changed the way people interact, including in health behaviors. In health services, patients are in quarantine, human movement is restricted, and health workers are at risk of infection. Meanwhile, on the other hand, there is no certainty how long the pandemic will last, giving rise to other health problems, namely anxiety, depression and other mental health problems (Setiawati et al., 2021b; Syamlan

et al., 2022b). On the other hand, [37] found a correlation between health risks to the economy as reviewed from monetary policy stimulus. The demand for money during the pandemic has increased sharply for medical and health needs rather than consumption. The effective policy at that time was to provide enough liquidity for households to buffer against health risks. So it can be assumed that this condition has significantly changed the condition of the real GDP of regions in Indonesia. However, based on the results of the Wilcoxon test on the health sector of 0.612, it is stated that there is no difference in the contribution (performance) of the health sector to the Real Regional GDP in Indonesia both before the pandemic and during the COVID-19 pandemic throughout 2018 to 2019 as listed in Table 3 above. In other words, the allegation that there is a difference in performance in the Household Consumption sector in affecting the real GDP of regions in Indonesia is not proven.

5 Conclusion

This study concludes that although the data from the three variables (X1, X2 and Y) were not normally distributed throughout 2018 to 2021 caused by the Covid 19 pandemic anomaly, overall Covid 19 did not interfere with the performance of the Household Consumption (X1) and Health Sector (X2) sectors against the Real GDP (Y) of regions in Indonesia. The quick response and accurate handling as well as the right policies from the government in resolving this pandemic problem nationally have been able to provide good vitality to the Indonesia economy. So this is probably what causes almost no meaningful changes in the performance and contribution of the two independent variables. On the other hand, the limitations of this study are in the time span and the number of cross sections of data used. So that it can be perfected in the next research.

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