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Study of Health Expenditure and Economic Welfare in Indonesia

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ABSTRACT: Health human resources is one of the important factors in the growth and economic development of a country, this is because HR is a catalyst of a change and innovation in everything. Health quality of human resources will affect the size of productivity produced in a country, which in turn will affect the amount of income per capita of the community and ultimately will have an impact on the level of community welfare. This study aims to analyse the influence and significance of the relationship between Health Expenditure and economic welfare in Indonesia. The research methods used are Granger Causality and Ordinary least square. Research variables included GDP per capita, health expenditure per capita, household consumption per capita, life expectancy, labour force level. Data sources come from the World Bank and other sources related to research data. The research data is sourced from World Bank in the form of annual time series namely 1980 to 2016. The results of the study show that based on the results of the Granger Causality, public health expenditure with economic growth and household consumption with economic growth has a two-way relationship. While economic growth with the workforce and economic growth with life expectancy has a direct relationship. Whereas based on OLS results show that health expenditure, life expectancy, labour force and household consumption have a significant positive relationship to GDP per capita as evidenced by the probability value. Suggestions that can be policy recommendations are focusing on institutional strengthening and budget allocation planning, especially in the health sector. In addition, with the development of technology, it can provide easy access to health services.

KEY WORDS: Health Expenditure, economic welfare, granger causality, OLS

I.INTRODUCTION

Endogenous economic growth theory was used by Paul Romer and Robert Lucas to criticize the theory of economic growth proposed by Sollow, which said that the key to long-term economic growth is capital (capital) and labor (labor) which in the long term can experience *diminishing returns* (Hernandez, 2003; Onyiwadu, 2015). Paul Romer and Robert Lucas suggest that human resources and the quality of human resources play a very important role in economic growth and development in a country, where the quality of human resources will determine the development of technology and science in the country (Hernandez, 2003; Mandiefe and Chupezi, 2017;). On the other hand, the quality of Human Resources (HR) owned by a country is also influenced by various factors, some examples of which are the level of education, level of health, and skills possessed by the HR of each country. One of the factors that greatly influences the quality of human resources as well as the productivity of a country both directly and indirectly is HR health.

Health HR is one of the important factors in the growth and economic development of a country, this is because HR is the catalyst of a change and innovation in all things (Piaou*et al.*, 2017). Health quality of human resources will affect the size of productivity produced in a country, which in turn will affect the amount of income per capita of society and ultimately will have an impact on the level of community welfare. Not only that the quality of HR health will also affect the development of new capabilities and knowledge for HR. Conversely, if a country has poor quality health, it will have a negative impact on growth and development in the country (Bloom and Canning, 2008). On the other hand, improving the quality of human health in a country also has an impact on increasing life expectancy.

Research conducted by Mandiefe and Chupezi. (2017) examined the impact of the ABUJA agreement carried out by African countries in 2001. Isis of the agreement was to allocate 15% of government expenditure for health financing. The research was divided into two groups of countries, namely groups of five African countries and groups of CEMAC countries. From the study Mandiefe and Chupezi.(2017) found that government spending on health has a positive and significant relationship to economic growth in the long run. Based on the results of the analysis conducted, it shows that government spending in the health sector can increase per capita expenditure by 0.3% in five African

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countries and 0.38% in CEMAC countries. The results of the same study also found by Ercelik (2018) found that government spending on the health sector had a positive and significant relationship to economic growth in the long run. Liang and Tussing (2019) also found that decreasing government spending on health in conditions of economic recession can reduce the quality of public health, which means that the procyclicality of government spending on health in the recession can impact on improving the quality of public health.

Stadhouders (2019) found that government spending on the health sector was not sustainable, so an effective financing system was needed. Meanwhile, the effectiveness of health financing depends on the system of financing, management of financing and determination of cost references. McCullough (2017) found that the impact of regional government spending on the health sector on economic growth depends on the system and the way people and the government allocate health funds. Different research results are shown by research conducted by Khan (2019) which examines the relationship between renewable energy, health government spending, logistics performance index, and environmental economic sustainability with a proxy for carbon emissions on economic growth in ASEAN countries in 2007 -2017 using the SEM (Structural Equation Model) method. The results of this study indicate that government spending on health and environmental sustainability has a negative relationship to economic growth in ASEAN.

Improving the quality of public health in Indonesia shows that the quality of human resources in Indonesia in terms of health has increased, so that the increase is expected to contribute positively to economic growth and development in Indonesia with increasing community productivity. Thus the level of income per capita of the community also increases as shown in Figure 1.1.

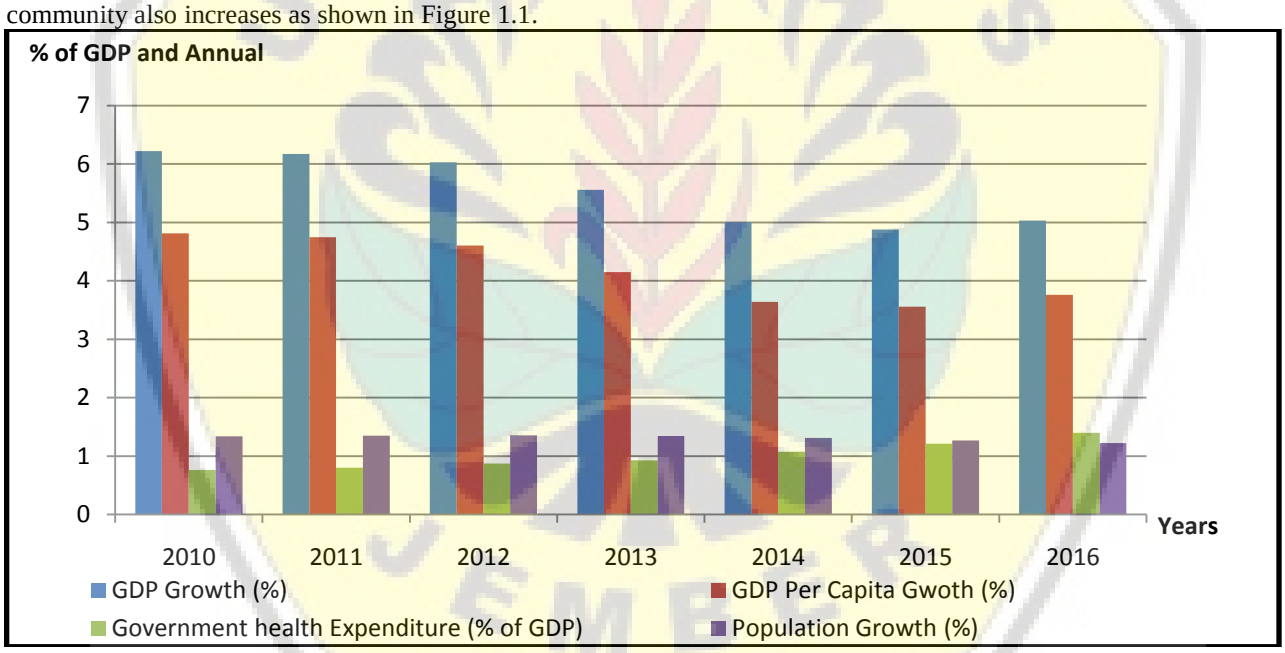

Figure 1.1 Dynamics of Economic Growth and Government Expenditures on Health and the Number of Populations in Indonesia in 2010-2016.
Source:World Bank Data Indicator

In Figure 1.1 it can be seen that the amount of income per capita in Indonesia continues to increase, but the percentage increase in per capita income every year has decreased. The decline in the percentage increase in per capita income in Indonesia was caused more by external conditions that were full of uncertainty and so that the Indonesian economy experienced pressure from both the financial and non-financial sectors. This uncertainty also resulted in a decline in public demand, which made economic conditions in Indonesia weakened which then impacted economic growth in Indonesia. However, economic growth in Indonesia is still positive and the level of economic weakness in Indonesia is not as large as other countries. Although the economy in Indonesia has weakened due to global economic conditions that are full of uncertainties the government continues to pay attention to the health quality of human resources in Indonesia, which aims to improve the quality of human resources in Indonesia. The increase was also carried out in line with the increase in the population in Indonesia. Which is the quality of health in a country is also one indicator of measurement in economic development. Based on the description of the background above, this study will focus more on the study of how the level of government spending in the health sector can affect economic growth.

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II. LITERATURE REVIEW

Government expenditure is one of the important instruments in Keynes's view to produce a demand that will move an economy and social needs. In this case, government expenditure becomes a government intervention in controlling an economy. One form of government expenditure to support social needs is expenditure on health. The importance of health is a key aspect of a community's economic development and welfare. Investment in the health sector is driven by the formation of government spending as a manifestation of public expenditure. In the majority of developing countries, government investment and expenditure in the health sector are the main components to fulfill the Millennium Development Goals (MDGs) especially for developing countries that have large populations and indicated a demographic bonus. This is important because the quality of people's health will determine their well-being in the present and the future (Serge and Julius, 2017).

Adolph Wagner, a German Economy, stated that there is a law to increase activities in a country. The law states that there are inherent trends in government activities to increase both intensively and extensively so as to encourage various internal and external activities of the state. Wagner's theory describes the functional relationship between economic growth and government activities with the effect that the government sector grows relatively fast against the economy (Alor, et al., 2018). In Wagner's theory, public expenditures that lead to government spending fall into several categories, including administrative and protective obligations, welfare and the role of equitable income distribution and the provision of public goods and services such as market failures that require an expansion of government investment activities (Bhatia, 2002).

Public expenditure theory, traditionally, received little attention to date which was driven by the classical notion of Laissez-Faire philosophy and confidence in the progress of the free market mechanism. However, the emergence of a welfare economy increases the role of the state, especially in the field of infrastructure provision and the theory of public expenditure is increasing (Taiwo and Taiwo, 2011). This public expenditure also promotes economic growth, planning, regional disparity and distributive justice (Bathia, 2002). This public expenditure on the health sector aims to improve the quality of human resources in the face of development and prosperity. The development of a healthy system to finance health care is one of the main mechanisms for demonstrating the efforts and political commitment of leaders. The financing system for good health aims to improve quality especially in terms of health care accompanied by good economic performance so that it can have a positive effect on the economy and welfare (Piabuo and Tieguhong, 2017).

Health growth is generally extended to single country case studies such as empirical studies conducted by Alhowaish, (2014) by investigating the relationship and direction of causation between health care expenditures and economic growth in Saudi Arabia. The findings indicate a direct causal relationship from economic growth to health care expenditures. Meanwhile, Bakare and Sanmi (2011) explore the relationship between health care expenditure and economic growth in Nigeria. The empirical findings show a significant and positive relationship between health care expenditure and economic growth. Sulku and Caner, (2011) explore the long-term relationship between GDP per capita and health expenditure per capita and the rate of population growth in Turkey. Empirical results reveal that a 10% increase in GDP per capita results in an increase of 8.7% in total per capita health expenditure controlling population growth.

Meanwhile, Akram et al. (2008) explore the relationship between various indicators of health and economic growth in Pakistan and reveal the results that there is causality from health indicators to GDP per capita. GDP per capita is positively affected by long-term health indicators. But in the short term health indicators do not significantly affect GDP per capita. One indication of the improvement of a country's development can be seen from the quality of health which reflects the quality of its human resources so that a budget that is included in government expenditure for health is needed(Ozturk and Topcu, 2016).

III. METHODOLOGY

Type of data used in this study is the annual time series secondary data, namely 1980-2016. Determination of the year of research is based on Indonesia's economic conditions and expenditures on the health sector which every year experience improvements to increase *human capital*. The condition is also in line with the existence of several large programs to help communities improve *human capital* such as PKH (Hope Family Program) for the health and education fields. The variables used in this study consisted of GDP per capita, health expenditure per capita, household consumption per capita, life expectancy, labor force level. Data sources come from the *World Bank* and other sources related to research data.

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The specification of the research model used in this study adopted from the research conducted by Piabuo and Tieguhong (2017). Piabuo and Tieguhong (2017) sought to find evidence for a causal relationship between health expenditure and economic growth and to verify the existence of co-integration, so that long-term relationships between research variables. It also seeks to verify whether the impact of health spending on economic growth is higher in African countries that reached the Abuja Agreement than CEMAC countries. The research method used by Piabuo and Tieguhong (2017) is the Granger Causality Test, co-integration test panel and OLS panel.

$$GDP\ per\ capita_t = \alpha + \beta_i HE_t + \gamma_i HCons_t + \delta_i LE_t + \omega_i LF_t + + \varepsilon_t \quad (3.2)$$

Where

GDP per capita	: income per capita;
HE	: health sector expenditure
Hcons	: Household consumption
LE	:life expectancy
LF	: level of work participation
$\beta_i, \gamma_i, \delta_i, \omega_i, \varphi_i$	: Variable coefficient
ε_t	: Error term
t	: time

The research method used to answer empirical questions in this study is *GrangerCausality* and OLS. The basic principles of the Granger causality test are as follows: To check whether the variable X is the cause of another Y variable, the limited regression model is represented by the equation. (1) Below must be determined in advance to show that Y can be explained by the values of its own past. Then, the value of past X as an explanatory variable is introduced into the equation. (1) to get an unrestricted regression model. (2) If introducing past X values can significantly increase the prediction level of Y, then X is said to be the cause of Y Granger.

Ordinary Least Square (OLS) is often used for estimating different functional relationship parameters. In other words OLS is a general linear modeling technique that can be used to model a single response variable that has been recorded at least the interval scale. The technique may be applied to single or multiple explanatory variables and also categorical explanatory variables that have been coded correctly. The OLS procedure minimizes the number of squared residues. In statistics, ordinary least squares (OLS) or linear least square are methods for estimating unknown parameters in a linear regression model. This method minimizes the number of vertical squares of the distance between the responses observed in the dataset and the responses predicted by the linear approach. The OLS estimator is consistent when the regression is exogenous and there is no a multicollinearity, and the optimal estimator class is not linear bias when errors are heteroscedasticity and serially uncorrelated (Zulfikar, 2018).

IV. RESULTS AND DISCUSSION

Based on the aim of the study who wanted to see the relationship between public health expenditure on economic growth and the pattern of direction of the relationship of influence on public health expenditure on economic growth carried out in two ways. The first way is to see the relationship between public health expenditure on economic growth using the Granger Causality analysis tool. The second way is to see the pattern of the direction of the influence of public health expenditure relations on economic growth with the analysis tool *Ordinary Least Square* (OLS).

The use of the Granger Causality analysis tool aims to see the causal relationship between public health expenditure on economic growth. there is a granger causality relationship if the probability value is smaller than the alpha value (α = 1%, 5% and 10%). Thus we can know the causality relationship between variables.

Table 4.1.explain the results of the granger causality analysis on the dependent variable independently. In the relationship of variable public health expenditure with economic growth there is a two-way relationship. This can be seen in the probability value of the variable public health expenditure with an economic growth of 0.044 smaller than the alpha value (α = 5%). On the other hand, the probability value of the relationship between economic growth and public health expenditure is 0.033 smaller than the alpha value (α = 5%). The same results are also shown in the relationship between household consumption and economic growth which has a two-way relationship. The probability value of the relationship between household consumption and economic growth is 0.077 smaller than the alpha value (α = 5%). Meanwhile, the probability value of economic growth with household consumption of 0,000 is smaller than alpha value (α = 1%).

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Table 4.1. Granger Causality Analysis

Relationship between variables	Probability
HE with GDP	0.044 **
GDP with HE	0.033 **
LE with GDP	0.017 **
GDP with LE	0.343
LF with GDP	0.012 **
GDP with LF	0.869
Hcons with GDP	0.077 **
GDP with Hcons	0,000 *

* Significant α = 1%, ** significant α = 5%, *** significant α = 10%

Different results with the relationship of life expectancy with economic growth that has a one-way relationship. This condition can be seen from the value of the probability of the relationship of life expectancy with economic growth of 0.044 smaller than the alpha value (α = 5%). Meanwhile, the probability value of the relationship between economic growth and life expectancy of 0.343 is greater than the alpha value. The same results are also shown in the workforce relationship with one-way economic growth. This can be seen from the probability value of the labor force relationship with economic growth of 0.012 smaller than the alpha value (α = 5%). Meanwhile, the probability value of the relationship between economic growth and the workforce is 0.869 greater than alpha.

On the other hand, the aim of the study is to look at the pattern of the direction of the influence of public health expenditure relations on economic growth with the analysis tool *Ordinary Least Square* (OLS). The relationship between variables can be said to have a significant effect if the probability value is smaller than the alpha value (α = 1%, 5% and 10%). In addition, the use of *Ordinary Least Square* (OLS) can see the pattern of relationships between dependent variables independently through coefficient values.

Table 4.2. The results of the analysis of the *Ordinary Least Square* (OLS)

Variable	coefficient	T-Statistic	Prob.
HE	***0.090519	2.496830	0.0623
LE	0.087747**	0.0079	2.835826
LF	7.619547*	3.749879	0.0007
HCONS	0.272309 *	4.055759	0.0003
C	1.424288 0.1640		19.30257
R-squared	0.862255		

* significant α = 1%, ** significant α = 5%, *** significant α = 10%

Table 4.2.is the result of analysis using *Ordinary Least Square* (OLS). In the variable public health expenditure with significant positive economic growth effect. This result can be seen from the probability value of 0.06 smaller than the alpha value (α = 10%) which is accompanied by a positive coefficient. This condition explains that improving public health will have an effect on improving the quality of life of the people who later encourage economic growth in Indonesia (Aboubacar&Xu, 2017; Ndedi, et al., 2015; Piabuo&Tieguhong, 2017; Sharma, 2018). In the relationship of variable life expectancy rates with significant positive economic growth influence. This can be seen from the probability value of 0,000 smaller than the alpha value (α = 1%) with a positive coefficient. This condition explains that high life expectancy levels accompanied by high productivity will have an influence on economic growth (Cervellati&SUnde, 2011; Ngangue& Manfred, 2016; Sharma, 2018).

The same results are also shown in the relationship of the labor force level with economic growth. the probability value of the labor force level of 0.007 is smaller than the alpha value (α = 1%) with a positive coefficient. Thus, increasing the level of the workforce with good quality will contribute to increasing economic growth (Kargi, 2014; Rahman, 2014). The level of household consumption also has a role to play in economic growth. This condition can be seen from the probability value of a household consumption level of 0,000 smaller than the alpha value (α = 1%) accompanied by a positive coefficient. This explains that an increase in household consumption will encourage economic growth (Karim, et al., 2010; Ndedi et al., 2015).

Thus the steps taken are calculating the allocation of health spending appropriately so that sustainable health can be achieved. In addition to the existence of decentralization, the government is more active in formulating problems that exist in its territory, especially in the health sector so that it can formulate policies appropriately based on the

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characteristics of the region it owns. In addition to financial control, the development of more effective and efficient applications / systems for distributing health assistance. This study shows that health spending is a fundamental determinant of the economic growth of each country and that increased health costs lead to higher growth rates. Performance-based financing can be a significant mechanism that is also believed to increase transparency and accountability in achieving the target.

V. CONCLUSION

This study aims to determine the relationship of influence between public health expenditure on economic growth knowing the pattern of the relationship between public health expenditures on economic growth and research objects in Indonesia. Based on the results of the analysis it can be concluded that:

1. Based on the results of granger causality shows that public health expenditures with economic growth and household consumption with economic growth have a two-way relationship. While economic growth with the workforce and economic growth with life expectancy has a direct relationship.
2. Based on OLS estimation results show that health expenditure, life expectancy, labor force and household consumption have a significant positive relationship to GDP per capita as evidenced by the probability value. This shows that when the amount of health expenditure in life expectancy, labor force and household consumption increases, it will affect economic growth.

Suggestions that can be policy recommendations are focusing on institutional strengthening and budget allocation planning, especially in the health sector. In addition, the development of technology can provide easy access to health services. While viewed from empirical studies, this study still has limitations so that further research is more deepening in relation to services healthy looking at the characteristics in each region in Indonesia, so that it can implement decentralization in the field of health.

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