The Effect of Macroeconomics and Access to Health Service on Stunting in Indonesia

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Reni Eka Septiani*, Tri Mulyaningsih, Mulyanto

Faculty of Economics and Business, Sebelas Maret University, Surakarta, Indonesia

Corresponding address: Reni Eka Septiani
Email: reniekaseptiani@gmail.com

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Abstract

Background: The prevalence of stunting in Indonesia is still above the World Health Organization standard. This study aims to analyze the effect of economic growth, income inequality, the Human Development Index (HDI), poverty, government spending on the health sector, and access to health services on the prevalence of stunting in Indonesia.

Methods: The random effect technique is utilized to estimate the role of macroeconomic variables and access to health services on stunting in 34 provinces in Indonesia.

Results: Economic growth has a positive effect on stunting, HDI and access to health services has a negative effect on stunting. Income inequality, poverty, and government spending on the health sector has no effect on stunting.

Conclusion: Economic growth has a positive effect on stunting because the growth of income is not evenly distributed and income increases are not spent on nutrition. Increasing inclusive economic development and policies that lead to stunting reduction, especially in provinces with high stunting rates are very much needed. HDI and better access to health services are proven to lower stunting. Some policy recommendations are improving access to health services and making sure that the services can reach all pregnant women. Optimizing nutrition services, consultations, and education for pregnant women through health service centers are very much needed.

Keywords: stunting, macroeconomics, access to health services

Abstrak

Latar belakang: *Prevalensi stunting di Indonesia masih di atas standar yang ditetapkan World Health Organization (WHO). Tujuan penelitian ini adalah menganalisis pengaruh pertumbuhan ekonomi, ketimpangan pendapatan, Indeks Pembangunan Manusia (IPM), kemiskinan, pengeluaran pemerintah sektor kesehatan, dan akses pelayanan kesehatan terhadap prevalensi stunting di Indonesia.*

Metode: *Teknik random effect digunakan untuk mengestimasi pengaruh variabel makroekonomi dan akses pada pelayanan kesehatan terhadap stunting di 34 provinsi di Indonesia.*

Hasil: *Pertumbuhan ekonomi berpengaruh positif terhadap stunting, IPM dan akses pelayanan kesehatan berpengaruh negatif terhadap stunting, ketimpangan pendapatan, kemiskinan, dan pengeluaran pemerintah sektor kesehatan tidak berpengaruh terhadap stunting.*

Kesimpulan: *Pertumbuhan ekonomi berpengaruh positif terhadap stunting karena pertumbuhan pendapatan tidak merata dan peningkatan pendapatan tidak dibelanjakan untuk gizi. Peningkatan pembangunan ekonomi yang inklusif dan kebijakan yang mengarah pada pengurangan stunting terutama di provinsi dengan angka stunting yang tinggi sangat diperlukan. IPM dan akses pelayanan kesehatan yang lebih baik terbukti menurunkan prevalensi stunting. Beberapa rekomendasi kebijakan adalah meningkatkan akses terhadap layanan kesehatan dan memastikan bahwa layanan tersebut menjangkau seluruh ibu hamil. Optimalisasi pelayanan gizi, konsultasi, dan edukasi ibu hamil melalui puskesmas sangat diperlukan.*

Kata kunci: *stunting, makroekonomi, akses pelayanan kesehatan*

INTRODUCTION

Sustainable Development Goals (SDGs) are the 2030 agenda to change the world by realizing human well-being, economic prosperity, and environmental protection. The program has 17 points of sustainable development goals, one of which is the second point, namely ending hunger, achieving food security and better nutrition to encouraging sustainable agriculture. One form of action to realize this goal is the handling of the stunting problem.

Stunting is a child condition who has a height less than -2 standard deviations from the international child growth standard set by World Health Organization (WHO) or their height is less when compared to their age. Stunting is a benchmark for global malnutrition and has a major impact on the qualitative development of human capital. The problem of stunting has become the focus of the government in recent years because the prevalence of stunting occupies the highest position compared to other nutritional problems. The percentage of stunting under-fives in Indonesia is still relatively high, this is indicated by the percentage of stunting under-fives in Indonesia which is still above the standard set by the World Health Organization (WHO) of 20%. According to data from the Indonesian Ministry of Health, the prevalence of stunting in 2017 was 29.6%, in 2018 it was 30.8%, and in 2019 it was 27.67%.[1]

Stunting has a bad long-term multiplier impact because it not only affects the future lives of stunted children but also has a wider impact on the country's economy. The occurrence of stunting is caused by a lack of nutritional intake, especially in the 1000 days of the golden period starting from in the womb to children aged 2 years, this incident not only affects the growth rate of the child's height but also affects the development of other body functions such as the brain. Studies related to the negative impact caused by stunting in various countries have been carried out. Children who are stunted experience a decrease in cognitive development by 7% compared to children who are not stunted.[2] Other studies also state that stunting has the potential to cause economic losses to the country because those who are stunted have low productivity.[3] The growth rate of height affects the wages that a person will receive and it was found that an increase in height by 1 centimeter can increase wages by 4% for men and 6% for women.[4] According to Tulchinsky and Varavikova, the concept of macroeconomics in the health sphere includes economic activities related to the health sector in the aggregate which is useful for improving health [5]. The economy can also affect health status through macroeconomic policies such as increasing per capita Gross Domestic Product (GDP), poverty alleviation, and increasing human capital.[5] Factors thought to be related to stunting include economic growth, income inequality, Human Development Index (HDI), poverty, government spending on the health sector, and access to health services. The variables used adopted from previous research include: economic growth,[6-8] income inequality,[9,10] HDI,[11] poverty,[7,12] government spending on the health sector,[13] access to health services.[14,15]

Economic growth in developing countries is often used as a tool to improve public health and nutrition because with an increase in economic growth there will be an increase in people's income which in turn can improve the nutritional status of the community.[9,6] The occurrence of economic growth allows for large aggregate investments in nutrition, health, water, and sanitation.[16] Previous studies have found that an increase in per capita income by 10% reduces the prevalence of stunting by 2.7%.[8] Other studies have shown that economic growth substantially reduces the prevalence of stunting in Ethiopia.[17] The results of different studies found that there was no direct effect between economic growth and poverty on stunting.[7]

Inequality of income distribution is a factor that is thought to affect stunting. The higher gap between the income of the rich and the income of the poor can reduce the health status of the community, while the more equitable distribution of income leads to an increase in living standards in the form of improving health and nutritional status.[18] Previous research has shown that economic inequality at the provincial level in Ecuador has a significant negative impact on height.[10]

The next factor is the Human Development Index (HDI). The HDI represents the quality of human resources which is assessed by three indicators, namely life expectancy, education level as seen from the expected length of schooling, and economic level as seen through a decent standard of living. The higher the HDI value in a country, the higher the welfare of the people in that country, so that problems related to stunting can be suppressed. This is in line with research before that there is a negative correlation between HDI and malnutrition in middle and low-income countries.[11]

Based on UNICEF data, stunting is mostly experienced in developing countries with details of 37.7 million or 36.2% in low-income countries and 114.2 million or 22.7% in middle-income countries, while in developed countries it is 1.6 million or

2.5%.[19] This indicates that the low income of the people of a country affects the nutritional status of children in that country. The influence of poverty on the level of poor health can also be explained through 4 things: unhealthy habits, allostatic burden, inability to access health services, and choices that are not optimal.[5]

The next factor is health sector government spending and access to health services. These factors become variables that are expected to reduce the rate of stunt performances in Indonesia. Health expenditure is a component of national income that has an important role in improving the achievement of Indonesia's health status.[5] Research on countries that are members of the Organization for Economic Cooperation and Development (OECD) resulted in the finding that health care spending can significantly promote better health outcomes.[20] In contrast to the results of a study in Ethiopia which showed that there is no significant relationship between public health spending on malnutrition in toddlerhood.[13]

Access to health services is related to the suitability of services to the needs and reach of health services. The coverage of Supplementary Feeding (PMT) for pregnant women with Chronic Energy Deficiency in each province represents the variable of access to health services in this research. Provision of supplementary food (PMT) for pregnant women with Chronic Energy Deficiency (CED) is a service program that is to the need for stunting prevention. Pregnant women are included in the vulnerable group for nutritional problems, because if the intake of protein and energy is not sufficient it can cause Chronic Energy Deficiency (CED) which has a direct effect on the fetus who only receives a small amount of nutritional intake, thus at risk of stunting. Access to health services in previous research consists of Ante Natal Care (ANC) for pregnant women.[15] Ease of access to health services helps the community to get an education and appropriate treatment when facing health problems, including stunting. Another study found that access to health services in the form of length of travel time to health facilities had a negative effect on children's height.[14]

Based on some previous studies showing differences in results, differences in proxies of research variables, and adverse effects of stunting. It would be interesting to conduct further studies in Indonesia, especially Indonesia, as a developing country with a high prevalence of stunting. The negative impact of stunting on a person's cognitive development and productivity in adulthood which can cause losses to the state due to the low quality of human resources and loss of potential state revenue, therefore investment in children's health is urgently needed. Investing in children's health can be pursued through the establishment of appropriate economic policies. This is because economics can affect health status through macroeconomic policies such as increasing per capita Gross Domestic Product (GDP), poverty alleviation, and increasing human capital.[5] Therefore, this research is important to do as a complement to previous research and the results of the research can be used as a reference for the government in formulating policies, especially in the economic field.

METHODS

This study aims to analyze the effect of economic growth, income inequality, the Human Development Index (HDI), poverty, government spending on the health sector, and access to health services on the prevalence of stunting in Indonesia. This research is quantitative explanatory research. Explanatory research aims to explore the relationship between the dependent and independent variables with the formulation of hypotheses based on theoretical support and relevant previous research.

Data Types and Sources

The type of research data is quantitative data in the form of panel data. Panel data is combination of time series data and cross section data. The panel data used is interspatial data by taking data from, 34 provinces in Indonesia in 2017-2019. The data taken in this study is in the form of secondary data obtained from the Central Statistics Agency, Nutrition Status Monitoring Book 2017, Basic Health Research 2018, Indonesian Toddler Nutrition Status Study 2019, Health Profile of DKI Jakarta in 2017-2018, Health Profile of Indonesia in 2017, 2018, and 2019.

Dependent Variable

The dependent variable in this study is the prevalence of stunting. Stunting is a child condition who has a height less than -2 standard deviations from the international child growth standard set by World Health Organization (WHO) or their height is less when compared to their age. Stunting in toddlers was chosen as a variable that represents the condition of child malnutrition because stunting is a condition of chronic and long-term malnutrition. Prevalence of stunting data was obtained from Nutritional Status monitoring 2017, Basic Health Research 2018, and Indonesian Toddler Nutrition Status 2019. The stunting prevalence unit is percent (%).

Independent Variable

1. Economic Growth

   Economic growth is an increase in the productivity of goods and services in society from year to year. The economic growth variable is proxied to the Regional Gross Domestic Product rate per province at constant prices 2010 expressed in percent (%). The data source was obtained from the publication of Central Statistics Agency in 2020.

2. Income Inequality

   Income inequality is inequality of income distribution in society which is characterized by the distribution of income, most of the national output is only enjoyed by a handful of community groups or the national output is only controlled by a small portion of the population. The income inequality variable is proxied by the Gini index. Data sources were obtained from Central Statistics Agency.

3. Human Development Index (HDI)

   According to Central Agency Statistics, the human development index is a number that measures the achievement of human development based on 3 basic dimensions, namely: life expectancy, school years expectancy, and Gross National Product per capita. HDI is expressed in index number. The data source is obtained from Indonesia's Health Profile.

4. Poverty

   According to Central Agency Statistics, poverty is condition of economic inability to meet basic needs in the form of food or non-food such as clothing and shelter or living below the poverty line. The poverty variable is proxied by the percentage of poor people per province expressed in unit of a percent (%). Data source were obtained from Central Statistics Agency.

5. Health Sector Government Spending

   Government spending is public spending because it is used to finance programs related to public services.[21] Government expenditure in the health sector is government expenditure in the context of facilitating public services, especially in the health sector, which can be in the form of physical or on physical facilities, for example programs, procurement of equipment and procurement of medical personnel. This variable proxied by the special allocation fund for health per province which expressed in IDR. Data source were obtained from Health Profile of Indonesia and Health Profile of DKI Jakarta.

6. Access to health services

   Access to health services is the convenience or affordability of consumers I obtaining health services according to their needs.[22] Access to health services in this study was proxied by the coverage of Supplementary Feeding to pregnant women with Chronic Energy Deficiency (CED) in percent (%). Data source were obtained from Health Profile of Indonesia. This proxy was chosen based on the theory of the dimensions of access to health services namely availability of service in accordance with needs and accuracy is related to the suitability of services with user needs.[22]

Determination of Panel Data Regression Model

Panel data analysis is a combination of cross-section and time series data. The econometric model used is as follows:

$$STUNT_{it} = \alpha_0 - \beta_1 EG_{it} + \beta_2 GINI_{it} - \beta_3 HDI_{it} + \beta_4 POV_{it} - \beta_5 LnDAK_{it} - \beta_6 PMT_{it} + \varepsilon_{it} \quad (1)$$

Information:
STUNT=Stunting
EG = Economic growth
GINI = Income inequality
HDI = Human Development Index
POV = Poverty
LnDAK= Health sector government expenditure
PMT = Access to health services
α = Intercept
$\beta_1, .., \beta_6$ = Regression coefficient of the independent variable
i = Data cross-section
t =Time series data, 2017-2019
it = error component

Determination between the Common Effect Model (CEM) or the Fixed Effect Model (FEM) through the chow test. Determination of the Fixed Effect Model (FEM) or Random Effect Model (REM) through the Hausman test.

Hypothesis Testing.

Hypothesis testing is testing the significance level of the independent variable on the dependent variable. The hypothesis tests carried out were the F-statistical test (simultaneous), the T-statistical test (partial), and the coefficient of determination (R2).

RESULTS

Chow Test

If the probability value is > 0.05, the method used is the Common Effects Model (CEM), while if the probability value is < 0.05, the method used is the Fixed Effects Model (FEM). Chow's test results show a p-value of 0.0000 < 0.05. It can be concluded that the method used is a fixed effects model.

Hausman Test

Hausman's test was used to determine the best model between a Fixed Effects Model (FEM) or a Random Effects Model (REM). Hausman's test results showed a p-value of 0.3077 > 0.05. It can be concluded that the method used is a random effects model.

Hypothesis Testing

The analysis in this study uses the Random Effect Model (REM) approach. Based on regression estimation, this research model can be formulated as follows:

STUNTS = 67.63920 + 0.240829 EG + 1.512160 GINI – 0.907849 HDI – 0.052520 POV + 1.068057 LnDAK – 0.045998 PMT

Table 1. Regression Results with Random Effects Approach

Variable	Variable Definition	Coefficient	Probability
C		67.63920	0.0180
EG	Economic growth	0.240829	0.0658*
GINI	Income inequality	1.512160	0.9273
HDI	Human Development Index	-0.907849	0.0002***
POV	Percentage of poor people	-0.052520	0.7547
LnDAK	Health sector government spending	1.068057	0.1573
PMT	The coverage of Supplementary Feeding in pregnant women with CED	-0.045998	0.0482**
R-squared	0.350508		
Adjusted R-squared	0.309487		
F-statistics	8.544681		
Prob(F-statistics)	0.000000		

[a]Note: Significance level *p<0.1 **p<0.05 ***p<0.01

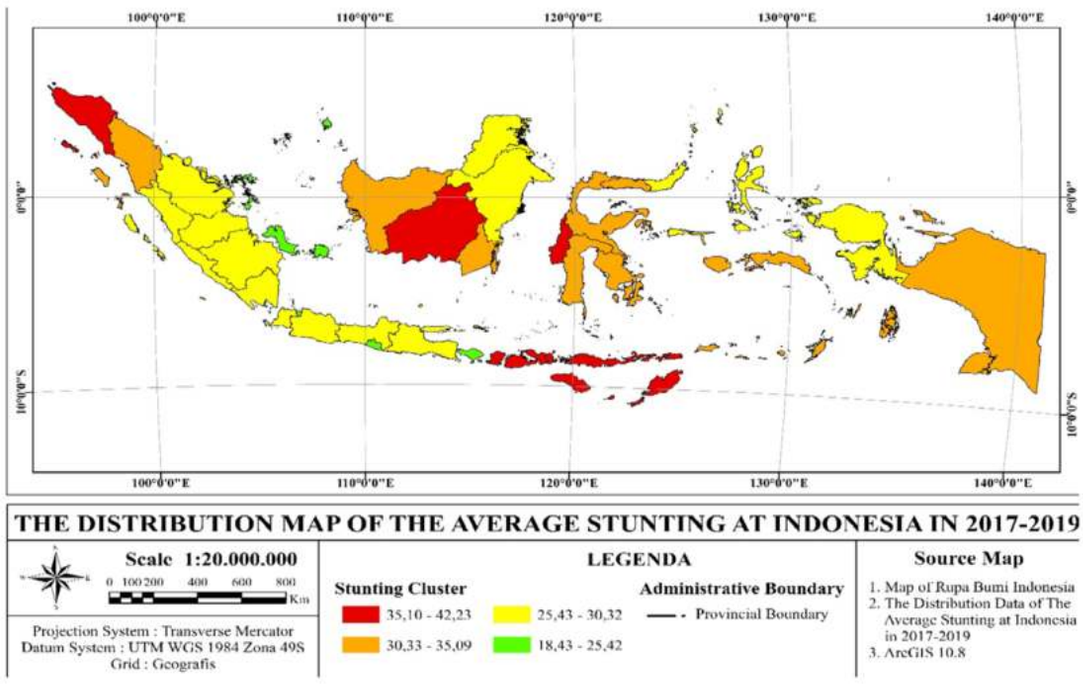

Figure 1. Distribution Map of Average Stunting (%)

Source: Authors calculation using ArcGIS 10.8, 2022

Stunting

Based on the data that has been collected, it can be seen that the percentage of Indonesia's stunting rate in 2017-2019 has an average of 29.36%. The prevalence of stunting does not meet the standard limit allowed by WHO, which is 20%. The distribution of stunting prevalence in Indonesia can be seen in the Figure 1.

Based on the map above, the areas in red are areas with a high prevalence of stunting including Aceh, West Nusa Tenggara, East Nusa Tenggara, Central Kalimantan, and West Sulawesi. Areas in green are areas with the lowest prevalence of stunting, including Bangka Islands, Riau Islands, Jakarta, Yogyakarta, and Bali.

Economic Growth

Indonesia's economic growth during 2017-2019 averaged 5.09%. The distribution of the average distribution of Indonesia's economic growth can be seen in the Figure 2.

Based on the map bellow, areas with solid colors show areas with the highest average economic growth rate. The area is dominated by provinces on the island of Sulawesi and parts of Kalimantan. Provinces located on the islands of Java and Bali are in the dark blue color zone, which means that these provinces are included in the category of the second highest level of economic growth. Areas in yellow indicate areas with a low average economic growth rate. These areas are West Nusa Tenggara and Papua.

Income Inequality

The average Gini index for Indonesia in 2017-2019 is 0.385. The distribution of Indonesia's average income inequality can be seen in the Figure 3.

Spatially, the highest income inequality is indicated by a dense map color. Jakarta and West Java are included in the dark color zone. Jakarta is the nation's capital, so the concentration of development occurs in the province and has become an attraction for people outside Jakarta to seek livelihoods.

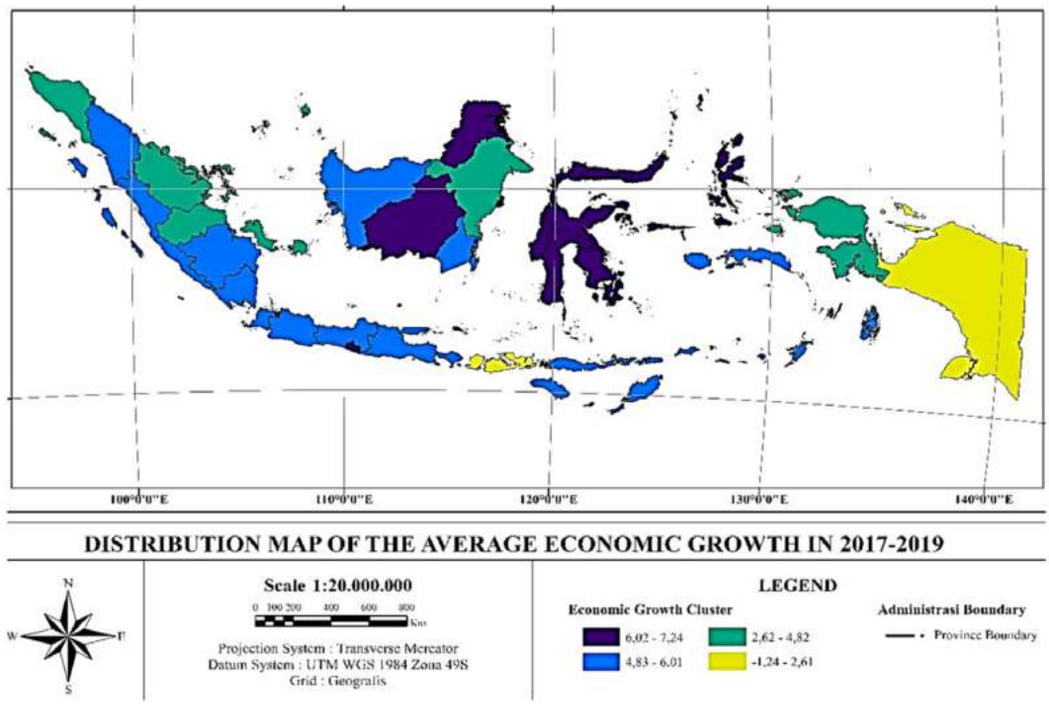

Figure 2. Distribution Map of the Average Economic Growth (%)

Source: Authors calculation using ArcGIS 10.8, 2022

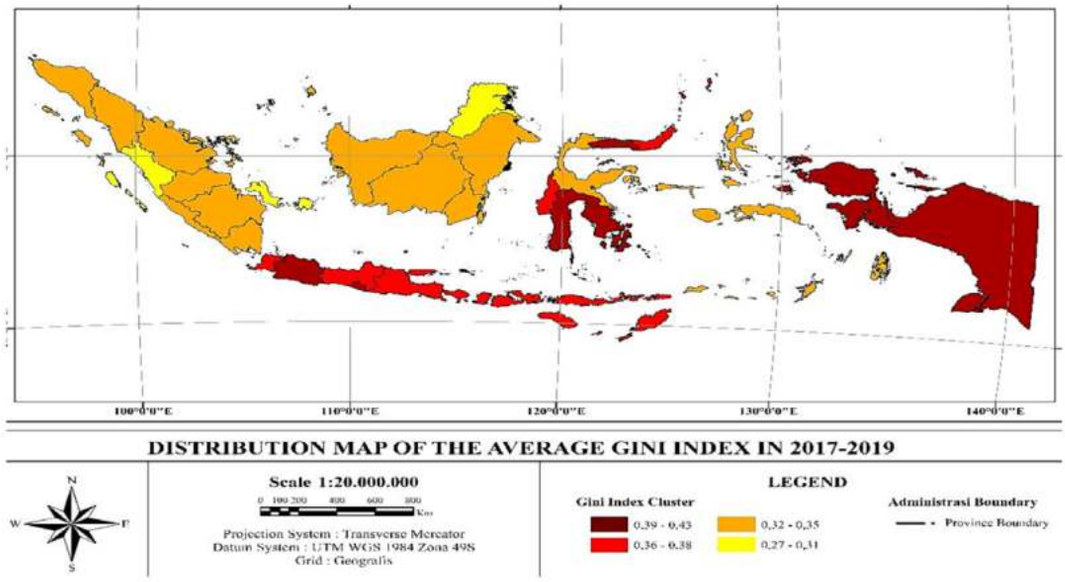

Figure 3. Distribution Map of the Average Gini Index

Source: Authors calculation using ArcGIS 10.8, 2022

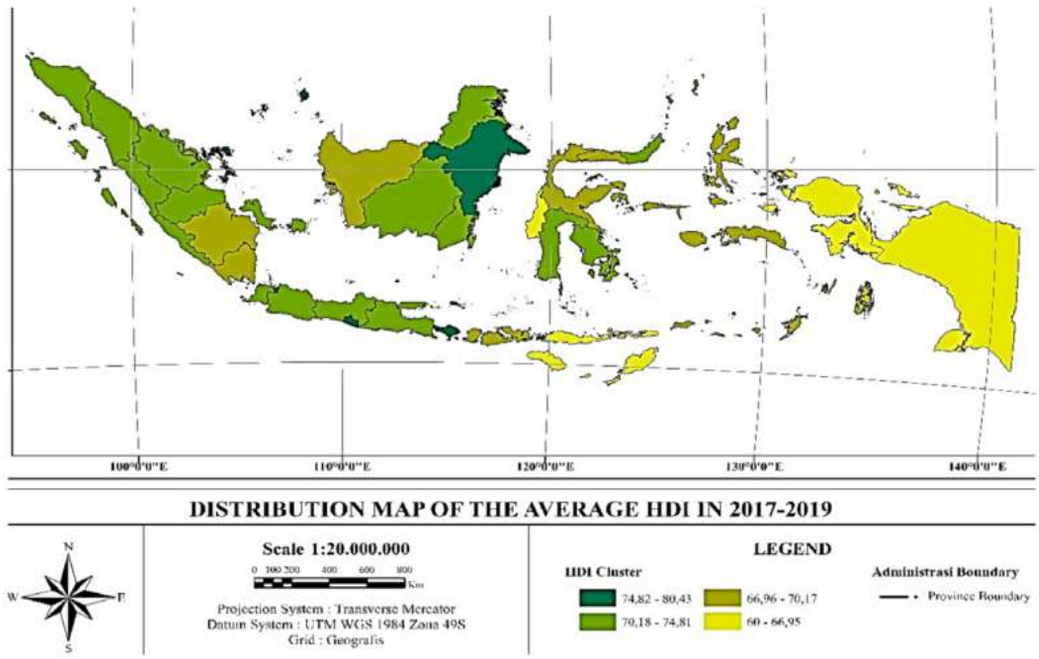

Figure 4. Distribution Map of the Average HDI

Source: Authors calculation using ArcGIS 10.8, 2022

Human Development Index (HDI)

Indonesia's average HDI during 2017-2019 was 71.37. Indonesia's HDI is included in the high category. The distribution of HDI in Indonesia can be seen on the Figure 4.

Based on the map above, the dense color zones describe the condition of areas with the highest HDI, including Riau Islands, DKI Jakarta, DI Yogyakarta, Bali and East Kalimantan. Areas with light colors depict areas with low HDI, the majority of which are in eastern Indonesia, such as Papua and West Papua.

Poverty

The average percentage of Indonesia's poor population during 2017-2019 was 9.67%. The distribution of Indonesia's average income inequality can be seen in the Figure 5.

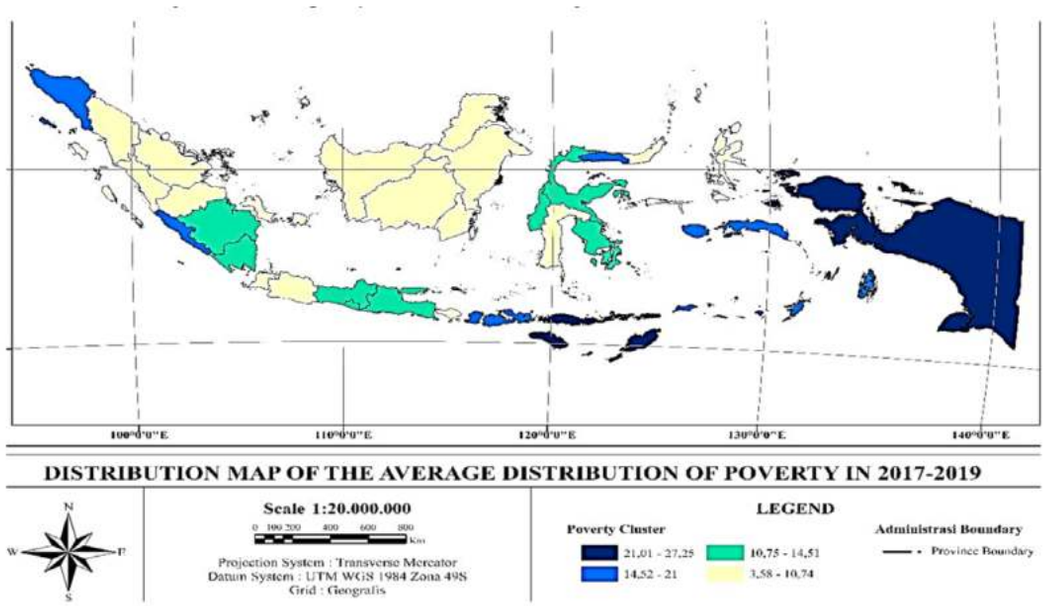

Figure 5. Distribution Map of the Average Distribution of Poverty (%)

Source: Authors calculation using ArcGIS 10.8, 2022

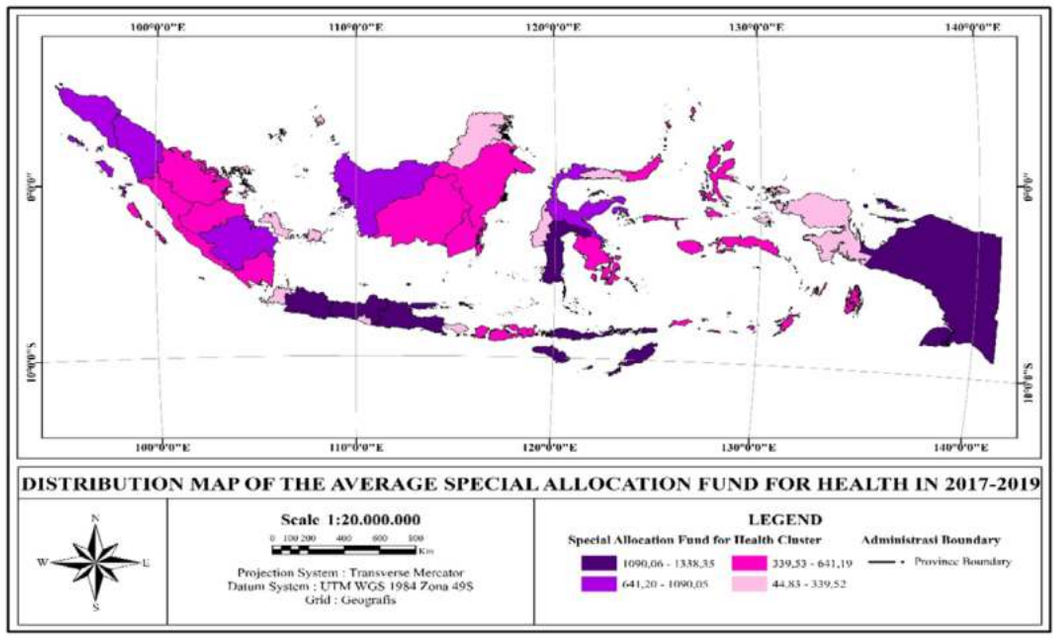

Figure 6. Distribution Map of the Average Special Allocation Fund for Health (Billion)

Source: Authors calculation using ArcGIS 10.8, 2022

Based on the map above, areas with solid colors show the first highest poverty rate in that area. Provinces that are in the dark color zone are the provinces of NTT, Papua and West Papua. Areas with light colors represent low poverty in that area. Based on the map above the entire island of Borneo is in the light color zone. Poverty in all provinces in Kalimantan is in the lowest category.

Health Sector Government Spending

The average special allocation fund for the health sector during 2017-2019 was IDR 18.80 trillion. The distribution of Indonesia's average income inequality can be seen in the Figure 6.

Based on the map above, the solid color shows the regional zones with the highest special allocation fund for the health sector. Most of the provinces in Java, such as West Java, Central Java and East Java, are in the dark color zone. When viewed from the total population, these three provinces are the provinces with the largest population in Indonesia, so the amount of special allocation fund for health is also large. East Nusa Tenggara is also the province

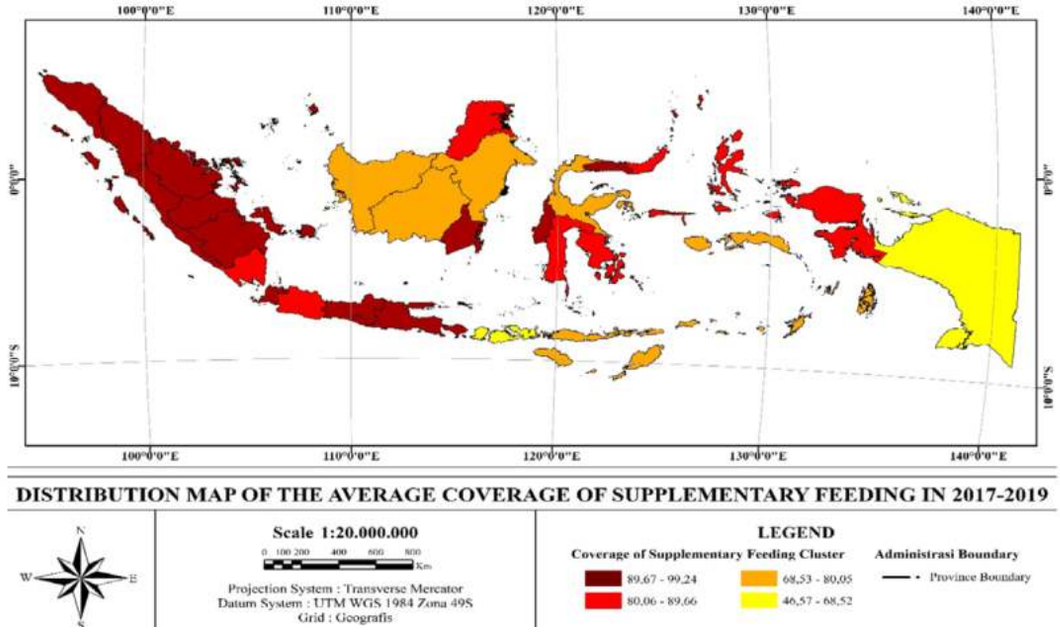

Figure 7. Distribution Map of the Average Coverage of Supplementary Feeding (%)
Source: Authors calculation using ArcGIS 10.8, 2022

with the highest special allocation fund acquisition for the health sector because East Nusa Tenggara is included in the Remote, Border and Islands Areas, so that the health sector is a priority concern of the central government, moreover the highest stunting rate is found in East Nusa Tenggara.

Access to Health Services

The average coverage of supplementary feeding during 2017-2019 was 86.7%. The highest average supplementary feeding coverage for Chronic Energy Deficiency (CED) pregnant women is dominated by the provinces on the islands of Sumatra and Java. The distribution of Indonesia's average income inequality can be seen in the Figure 7.

DISCUSSIONS

Analysis of the Effect of Economic Growth on Stunting

According to the results of the regression, the coefficient value of economic growth is 0.240829, and the probability is 0.0658 < 0.1. The use of significance level 0.1 or 10% based on previous research reference conducted by Marry's research, Larrea and Kawachi's research, and Harttgen et al. research.[8,16,10] Economic growth has a significant positive effect on the prevalence of stunting. Increased economic growth does not necessarily reduce the incidence of stunting. Previous research found a positive effect between economic growth and stunting in 9 countries from 23 countries in Africa, economic growth did not lead to a decrease in malnutrition rates, even a decrease in malnutrition rates occurred despite negative income growth.[16] This happens because there is an unequal distribution of income, so a high Gross Domestic Product does not increase health status. Indonesia's income distribution inequality seen from the average Gini index value per Indonesian province in 2017-2019 is still in the moderate (medium) category. There are 97% of provinces in Indonesia have an average Gini index of moderate. Economic growth does not lead to a reduction in stunting due to several things including income growth is not evenly distributed and increased income in the community is not spent on needs that can improve nutritional status.[6]

Balanced nutrition plays a role in supporting children's growth and development, so food with balanced nutrition is a direct determinant of children's health. A balanced diet contains proteins, carbohydrates, minerals, fats, and vitamins. The fulfillment of this content can be found in the following foods: fruits, vegetables, meat, fish, eggs, milk, and nuts. Based on The Health Ministry of Indonesia, the consumption rate of cigarettes is higher than the consumption of healthy foods. The percentage of expenditure per capita of the Indonesian people obtained from the Indonesian ministry of health can be seen in Table 2.

Table 2. Percentage of People's Per Capita Expenditure in The Year 2017-2019

No	Item Group	Percentage (%)			
		2017	2018	2019	Average
1.	Grains	5.93	5.95	5.57	5.81
2.	tubers	0.56	0.50	0.51	0.52
3.	Fish/shrimp/squid/shellfish	3.91	3.85	3.89	3.83
4.	Meat	2.41	2.05	2.13	2.20
5.	Eggs and milk	2.83	2.86	2.78	2.82
6.	Vegetables	4.09	3.53	3.25	3.62
7.	Nuts	1.09	1.00	0.97	1.02
8.	Fruits	2.20	2.53	2.36	2.36
9.	Oil and coconut	1.31	1.20	1.13	1.21
10.	Drink ingredients	1.65	1.53	1.44	1.54
11.	Spices	0.93	0.96	0.93	0.94
12.	Other consumption	1.05	0.91	0.86	0.94
13.	Prepared food and drink	16.65	16.82	17.26	16.91
14.	Cigarette	6.33	5.82	6.05	6.07

Based on Table 2, the highest average level of expenditure per capita of the Indonesian people is food and beverages at 16.91%. Cigarette consumption occupies the second highest position with a percentage of 6.07% compared to consumption of nutritious foods such as grains, tubers, meat, eggs and milk, fish/shrimp/squid/shellfish, vegetables, fruits, and nuts. Economic growth is only effective in reducing the prevalence of stunting if it is directed at improving children's diet, overcoming gender inequality, strengthening women's status, improving sanitation quality, and reducing poverty and inequality in income distribution.[4]

Analysis of the Effect of Income Inequality on Stunting

The income inequality coefficient represented by the Gini index is 1.512160 with a probability of 0.9273. This result suggests that income inequality does not have a significant positive effect on the prevalence of stunting. This result is supported by research in Africa which resulted in the finding that there is no strong relationship between income inequality and the level of malnutrition.[23]

These results are also in line with research in Egypt which did not find a significant relationship between the Gini index and malnutrition.[9]

Analysis of the Influence of the Human Development Index (HDI) on Stunting

According to the statistical test results, coefficient value of HDI is -0.907849, and the probability is 0.0002 < 0.01. This suggests that HDI has a significant negative effect on the prevalence of stunting. These results are consistent with previous studies showing a negative relationship between HDI and developmental delay.[11]

A previous study yielded similar results, which showed a significant association between HDI and the percentage of children under 5 who were undernourished.[24]

Low HDI is associated with high disease transmission rates and worsening nutritional status. The education dimension of the Human Development Index, measured by years of schooling, is related to the educational attainment of working-age women; women's higher educational attainment is associated with improved nutritional status of children in developing countries.[9]

The dimensions of a decent standard of living in HDI are closely related to income, when family income increases, purchasing power and ability to access food also increases.[25]

Analysis of The Effect of Poverty on Stunting

Poverty has no significant negative effect on the prevalence of stunting. Poverty has a weak influence on malnutrition and poverty is not the only factor that affects child malnutrition, the nutritional status of children does not only depend on the household economy but other factors that also determine nutritional status such as maternal education, social, birth spacing, and religious background because in the research findings it was found that the prevalence of malnutrition was also found in the richest quintile of society.[12] Another study stated that there was no effect of poverty on stunting.[7]

The incidence of stunting can also be due to the high level of consumption of low-nutrient foods in children under the age of 2 years and the worst factor is when parents do not associate the problem of stunting with providing nutritious food, but parents assume that stunting occurs due to heredity.[25]

Other studies mention other factors such as urbanization, rainfall, and good governance also affect the prevalence of stunting.[8]

Analysis of The Effect of Health Sector Government Spending on Stunting

Based on statistical test results health sector government spending has no significant positive effect on the prevalence of stunting. The results are in line with previous research that there is no significant relationship between health expenditure (percentage of GDP contributed to the health sector) and child malnutrition.[13]

The influence of health sector spending in improving health status does not necessarily exist due to several things including:

1. An increase in government spending on health causes private health spending to fall as households divert funds for other uses.
2. Expenditures are allocated for health care such as procurement of health workers and drug supplies, but complementary services both inside and outside health are inadequate, such as difficult access to transportation to health care centers and unaffordable drug prices.
3. The allocation of government spending on the health sector is not effective if the level of corruption in the government still occurs, so the funds that go down for health improvement needs are small.[26]

Based on Indonesia Corruption Watch (ICW) report in 2018, health sector corruption was in the fifth highest position with a total of 21 cases, and the value of state losses reached Rp. 56.3 billion, the bribe value reached Rp. 2 billion, and illegal levies worth Rp. 4.9 million.[27]

Analysis of The Effect of Access to Health Services on Stunting

Access to health services in this study was proxied by the coverage of Supplementary Feeding (PMT) in pregnant women with Chronic Energy Deficiency (CED). Reducing stunting prevalence requires direct nutritional investment.[6]

Provision of Supplementary Food (PMT) to pregnant women with Chronic Energy Deficiency (CED) is one of the service programs provided to pregnant women who experience Chronic Energy Deficiency (CED) as a form of intervention for specific nutrition programs carried out by the Ministry of Health through the Community Health Center and Service Post Integrated to reduce stunting prevalence.[28]
Based on regression results, it was found that there was a significant negative effect between coverage of Supplementary Feeding to pregnant women with CED and the prevalence of stunting. These results are supported by previous research, although with different proxies which state that access to health services in the form of a length of travel time to health facilities has a negative effect on children's height in Rwanda.[14]

Another study found that access to health services in the form of Ante Natal Care (ANC), namely periodic examinations of pregnant women, has a negative effect on the prevalence of stunting.[15]

CONCLUSION

The results estimation shows that economic growth has a positive effect on stunting. The growth of income is not evenly distributed and income increases are not spent on nutrition. Increasing inclusive economic development and policies that lead to stunting reduction, especially in provinces with high stunting rates are very much needed. The Human Development Index and better access to health services are proven to lower stunting prevalence. Some policy recommendations are improving access to health services and making sure that the services can reach all pregnant women. Optimizing nutrition services, consultations, and education for pregnant women through health service centers are very much needed.

REFERENCES

1. Kementrian Kesehatan RI. Data dan Informasi Profil Kesehatan Indonesia 2018. Jakarta: Kementrian Kesehatan RI; 2019.
2. Ekholuenetale M, Barrow A, Ekholuenetale CE, Tudeme G. Impact of stunting on early childhood cognitive development in Benin: evidence from Demographic and Health Survey. Egypt Pediatr Assoc Gaz. 2020;68(1).
3. Renyoet BS, Martianto D, Sukandar D. Potensi Kerugian Ekonomi Karena Stunting Pada Balita Di Indonesia Tahun 2013. J Gizi dan Pangan. 2016;11(3):247–54.
4. McGovern ME, Krishna A, Aguayo VM, Subramanian S V. A review of the evidence linking child stunting to economic outcomes. Int J Epidemiol. 2017;46(4):1171–91.
5. Ahsan A, Bella A, Kusuma D, Thabrany H, Ariany R, Fattah R, et al. Pengantar Ekonomi Kesehatan. Seri Ekono. Jakarta: PPJK Kementrian Kesehatan Republik Indonesia; 2022. 98 p.
6. Vollmer S, Harttgen K, Subramanyam MA, Finlay J, Klasen S, Subramanian S V. Association between economic growth and early childhood undernutrition: Evidence from 121 Demographic and Health Surveys from 36 low-income and middle-income countries. Lancet Glob Heal [Internet]. 2014;2(4):e225–34. Available from: http://dx.doi.org/10.1016/S2214-109X(14)70025-7
7. Sari DDP, Sukanto S, Marwa T, Bashir A. The Causality between Economic Growth, Poverty, and Stunting: Empirical evidence from Indonesia. J Perspekt Pembiayaan dan Pembang Drh. 2020;8(1):13–30.
8. Mary S. How much does economic growth contribute to child stunting reductions? Economies. 2018;6(4).
9. Rashad AS, Sharaf MF. Economic Growth and Child Malnutrition in Egypt: New Evidence from National Demographic and Health Survey. Soc Indic Res. 2016;135(2):769–95.
10. Larrea C, Kawachi I. Does economic inequality affect child malnutrition? The case of Ecuador. Soc Sci Med. 2005;60(1):165–78.
11. Ssentongo P, Ssentongo AE, Ba DM, Ericson JE, Na M, Gao X, et al. Global, regional and national epidemiology and prevalence of child stunting, wasting and underweight in low- and middle-income countries, 2006–2018. Sci Rep [Internet]. 2021;11(1):1–13. Available from: https://doi.org/10.1038/s41598-021-84302-w
12. Jose S. Economic Growth, Poverty and Malnutrition in India. Ekon Yaklasim. 2016;27(99):165.
13. Biadgilign S, Ayenew HY, Shumetie A, Chitekwe S, Tolla A, Haile D, et al. Good governance, public health expenditures, urbanization and child undernutrition Nexus in Ethiopia: An ecological analysis. BMC Health Serv Res. 2019;19(1):1–10.
14. Aoun N, Matsuda H, Sekiyama M. Geographical accessibility to healthcare and malnutrition in Rwanda. Soc Sci Med [Internet]. 2015;130:135–45. Available from: http://dx.doi.org/10.1016/j.socscimed.2015.02.004
15. Rode S. Child Malnutrition and Low Access to Health Care Facilities in Mumbai Metropolitan Region. Glob J Sci Front Res [Internet]. 2015;15(2):49–59. Available from: https://www.researchgate.net/publication/277589778%0D
16. Harttgen K, Klasen S, Vollmer S. Economic growth and child undernutrition in sub-sahara Africa. Popul Dev Rev. 2013;39(3):397–412.
17. Biadgilign S, Shumetie A, Yesigat H. Does economic growth reduce childhood undernutrition in Ethiopia? PLoS One. 2016;11(8):1–14.
18. Hajebi E, Razmi MJ. Effect of Income Inequality on Health Status in a Selection of Middle and Low Income Countries. Equilibrium. 2014;9(4):133–52.
19. UNICEF, WHO, World Bank. Levels and Trends in Child Malnutrition. 2017th ed. UNICEF, WHO, World Bank. Washington DC; 2017. 1–15 p.
20. Bradley EH, Elkins BR, Herrin J, Elbel B. Health and social services expenditures : associations with health outcomes. 2011;(March).
21. Mongan JJS. Pengaruh pengeluaran pemerintah bidang pendidikan dan kesehatan terhadap Indeks Pembangunan Manusia di Indonesia. J Perbendaharaan, Keuang Negara, dan Kebijak Publik. 2019;4:163–76.
22. Levesque J., Harris MF, Russell G. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. Int J Equity Helath. 2013;12(18).
23. Mphumuzi S. National Income and Malnutrition in Africa : a Rapid Assessment. 2018;(89403).
24. Ramani A. Hubungan Indeks Pembangunana Manusia dengan Indikator Penyakit, Lingkungan dan Gizi Masyarakat. Ikesma [Internet]. 2014;10(1):13–21. Available from: https://jurnal.unej.ac.id/index.php/IKESMA/article/view/1678/1395
25. Kavle J, Mehanna S, Saleh G, Foaud M, Hamed D, Hassan M, et al. Examining Factors Associated with Stunting in Lower Egypt in Comparison to Upper Egypt [Internet]. Maternal and Child Health Integrated program. USAID (United States Agency International Development); 2014. 73 p.
26. Bokhari FAS, Gai Y, Gottret P. Government Health Expenditures ang Health Outcomes. Health Econ. 2007;273(September 2006):257–73.
27. Alamsyah W, Abid L, Sunaryanto A. Laporan Tren Penindakan Kasus Korupsi Tahun 2018. Indonesia Corruption Watch; 2018.
28. TNP2K. 100 Kabupaten/Kota Prioritas untuk Intervensi Anak Kerdil (Stunting). Jakarta Pusat: Sekretariat Wakil Presiden Republik Indonesia; 2017.