

## Analysis of the Influence of Per Capita Income and Regional Expenditure on the Reduction of Stunting Rates in Maluku Province (2016 – 2024 Period)

Terezia V. Pattimahu<sup>1</sup>, Izaak Tonny Matitaputty<sup>2</sup>, Maryam Sangadji<sup>3</sup>, Muhammad Ridwal Assel<sup>4</sup>

Faculty of Economics and Business, Pattimura University, Ambon, Maluku, Indonesia, 79233

Email: lency24.valency@gmail.com ,tonnymatitaputty@gmail.com

maryam\_sng@yahoo.co.id , ridwan2juli@gmail.com

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### ***Abstract***

#### **Keywords:**

*Regional Expenditure, Per Capita Income, Stunting*

*Stunting has received serious attention from the government due to its numerous influencing factors and implications for people's lives and socioeconomic conditions. This study aims to determine the influence of per capita income and regional spending on reducing stunting rates in Maluku Province. To this end, secondary data published by government agencies was collected. The data was then analyzed using multiple linear regression statistical tools. The results of the study show that per capita income has a negative and significant effect on reducing stunting rates in Maluku Province, while regional spending has a positive, although not significant, effect*

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## INTRODUCTION

A World Bank research report in collaboration with SMERU shows that Indonesia is among the countries with the lowest nutritional status, with a stunting prevalence of around 31%. This condition is directly proportional to the increase in government spending on nutrition improvement efforts (Nurbani et al., 2019). This means that government spending, including by local governments, has not yet had a maximum impact on reducing stunting rates, necessitating evaluation at all stages of budgeting and its use.

Indeed, the government budget is related to the process of determining the amount of funding allocated for each program or sector that utilizes public funds (Sumenge and Ariel, 2013). Furthermore, the budget serves as a performance assessment tool, particularly in terms of the effectiveness and efficiency of budget use by government agencies. Government agencies are required to create spending budgets to ensure more effective and efficient use of funds. Therefore, spending by regional government agencies (OPD) is expected to align with service objectives and be on target, ensuring that the budget can deliver results in addressing community issues and achieving well-being.

The government's primary focus is improving public health, including improving nutrition. A community's nutritional status can be reflected in stunting rates in a region. Stunting is a chronic malnutrition problem caused by insufficient nutritional intake over a prolonged period, resulting in inadequate nutritional intake that does not meet nutritional needs (Awaludin, 2019).

Stunting can impact various aspects, including health, social, and economic aspects. From a health perspective, stunting will impact a child's physical and mental development, increasing the risk of infection and non-communicable diseases in adulthood, and development, thus impacting mortality and morbidity (Jatiningsih and Budiono, 2023). From a social perspective, it will impact

the quality of human resources, as reflected in the Human Development Index (HDI). A study by Riadi et al. (2023) showed a significant correlation between high stunting rates and low HDI, and vice versa. Meanwhile, from an economic perspective, it will reduce productivity levels, lower incomes, and even cause losses to regional finances (Khotimah, 2022; Zahra and Aries, 2024). The World Bank reported (2017) that stunting eliminates 11% of GDP and reduces adult workers' income by up to 20%, exacerbating social inequality.

Many factors contribute to stunting, including genetic factors such as parental height (Kusuma and Nuryanto, 2013). Other factors include environmental conditions such as access to drinking water sources and adequate sanitation (Rambi and Budyanra, 2024). Access to health facilities is limited and pregnant women rarely visit integrated health posts (Indahsari and Larasati, 2023). Social factors include parental education levels (Ananda and Dallah, 2025). Economic factors include family income and expenditure, even regional income or revenue (Adityaningrum et al., 2023; Mansuda et al., 2024; Kuswanti et al., 2024; Aprillianti and Nurhayati, 2025).

In Maluku Province, the stunting rate fluctuated throughout the study period. In 2016, it was around 28.4%, dropping to 26.1% in 2018. However, in 2022, the highest increase occurred, reaching 34.02%, although it dropped again to 29% in 2024. This could indicate that stunting management has not addressed the root cause. Policies have been implemented in various locations, such as the basic food aid program (Novalianita and Handayani (2023)), and even macroeconomic programs in the form of trade reform, particularly food prices (Ilman and Wibisono, 2019). The POM Center in Ambon initiated the development of the GEBRAK STUNTING (Joint Movement to Reduce Stunting) innovation.

Given the complexity of stunting in Maluku Province, this study analyzes it from a macroeconomic perspective, specifically the socioeconomic conditions of the community, as reflected in per capita income and government intervention in the form of regional spending. This research is expected to provide information on the socioeconomic conditions of the community and government funding for stunting management.

## LITERATURE REVIEW

Health is a fundamental human need. Good public health can boost economic activity, as human capital theory suggests, suggesting that human capital plays a significant role in spurring economic growth. Generally, health correlates with the productivity of both the population and workers. Improved health prolongs working life and increases physical endurance, which in turn contributes to increased economic growth.

Stunting is a health problem currently faced by various countries, including Indonesia and Maluku Province. Stunting is the failure of a child's growth process to reach its linear growth potential as a result of chronic malnutrition, recurrent infections, and inadequate psychosocial stimulation related to economic and environmental status (Prendergast and Humphrey, 2014). Stunting conditions based on the Indonesian child growth curve are indicated by a height/age (PB/A) or height/age (H/A) value of less than the 10th percentile in early life, which will result in failure to reach ideal height until adulthood (Batubara, et al., 2006).

Based on data from WHO and the World Bank in 2012, the incidence of stunting in children under 5 years old reached 165 million children. The Ambitious World Health Assembly targets a reduction in stunting rates by 2025 to 40% (Jatiningsih and Budiono, 2023). Indonesia, based on the results of the Indonesian Nutritional Status Survey (SSGI) in 2024, the stunting rate was 19.8%, a decrease compared to 2023 ([kemkes.go.id/id/ssgi](https://kemkes.go.id/id/ssgi), 2024). Maluku Province in 2024 was 29% lower than in 2023, although still higher than the RPJMD which set 20%.

Various theories explain that stunting is influenced by many factors. One of these is the socioeconomic conditions of a community, reflected in per capita income or per capita

expenditure. High incomeLower-income families have limited access to adequate nutrition and quality healthcare. Low-income families generally struggle to afford sufficient nutritious food for their children, even though good nutrition is crucial for their growth and development. Conversely, those with higher incomes have sufficient resources to meet basic needs, including nutritious food.

The results of Kusumayanti's study andZurrahmi (2020) demonstrated a relationship between family income and the nutritional status of toddlers. Gantini et al. (2024) stated that high incomes influence the types of food purchased and the hygiene of the food. This increases the proportion of nutritious foods such as fruits, vegetables, nuts, and various other foods. Conversely, those with low incomes tend to choose food based on price and quantity rather than nutritional quality, focusing on foods high in carbohydrates and low in high-protein foods.

A program that can help address this is the basic food assistance program (Novalianita and Handayani, 2023). This program was originally known as non-cash food assistance (BPNT). This is also related to food prices. International experience shows that low food prices positively impact low-income communities because they spend a larger portion of their family income on food consumption, leading to improved nutritional status. Conversely, high food prices force people to shift their consumption to less nutritious foods, which ultimately increases the likelihood of stunting.

In addition, government intervention in the form of providing funds forFunding various stunting management programs is crucial for successfully reducing stunting rates in the regions. The available budget serves as the foundation for the government to conduct public service and economic activities (Tantri and Irmawati, 2018). However, studies show that regional revenue sources have not been able to reduce stunting rates in various regions (Mansula et al., 2024). The per capita budget of regional governments is not directly proportional to the reduction in stunting rates in those regions. Regions with low stunting rates spend a larger per capita budget, but the reduction in stunting rates is smaller than regions with high stunting rates. Two factors contribute to this: low effectiveness due to regional dependence on the central government, which is not supported by synchronization between the central and regional governments in quality planning and budgeting, and low intervention results due to a lack of supporting factors (Nurbani et al., 2019).

## METHODS

This research is a quantitative study using secondary data obtained from Maluku Provincial Government Agencies, such as the Maluku Provincial Statistics Agency, the Maluku Provincial Regional Planning Agency, and other sources related to this research topic. The collected data were then analyzed using statistical tools, namely multiple linear regression with the following general equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \mu$$

Where:

$Y$  = Stunting Rate  
 $X_1$  = Income per capita  
 $X_2$  = Government expenditure  
 $\beta_0$  = Intercept  
 $\beta_1$  = Regression coefficient of income per capita  
 $\beta_2$  = Regression coefficient of government expenditure  
 $\mu$  = interfering factor.

The regression coefficient figures are then given an econometric interpretation so that they are in accordance with the objectives of this research.

## RESULTS AND DISCUSSION

Maluku Province administratively has eleven districts/cities. Maluku Province is an archipelago consisting of 559 islands, and of these islands, several are classified as large islands, such as Seram Island, Buru Island, Ambon Island, Wetar Island, Yamdena Island, and several islands in Southeast Maluku Regency. Therefore, the Maluku Islands Region is influenced by the climate of the tropical and seasonal climate.

The population of Maluku Province, based on the 2020 Census, reached 1,848,923. According to the 2024 population registration, the population was 1,945,648, spread across eleven regencies/cities. Furthermore, when viewed by regency/city in 2024, Central Maluku Regency had the largest population, with 440,848 people, or approximately 22.66%, followed by Ambon City with 362,639 people, or 18.64%, and South Buru Regency with the smallest population, with 80,842 people. This indicates that population distribution is relatively uneven (Central Statistics Agency, 2025).

Stunting management in 2019 focused on Central Maluku Regency, West Seram and Aru Islands (Waliulu and Rumaolat, 2021) and in 2024 it was increased to six districts, namely Central Maluku, West Seram, Aru Islands, East Seram, Southeast Maluku and Southwest Maluku due to fluctuations and even increases in stunting rates in these areas (Maluku Provincial Health Office, 2019). Empirical findings on the influence of per capita income and regional expenditure on stunting in Maluku Province are shown in table 1 below:

Table 1  
Model of the Influence of Per Capita Income and Regional Expenditure on Stunting in Maluku Province

Dependent Variable: Y

Method: Least Squares

Date: 09/13/25 Time: 13:06

Sample: 2016 2024

Included observations: 9

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| X1       | -62.91522   | 24.40082   | -2.578406   | 0.0419 |
| X2       | 19.42229    | 23.12277   | 0.839964    | 0.4331 |
| C        | 915.5812    | 665.7837   | 1.375193    | 0.2182 |

|                      |           |                         |          |
|----------------------|-----------|-------------------------|----------|
| R-squared            | 0.528869  | Mean dependent variable | 28.32667 |
| Adjusted R-squared   | 0.371825  | SD dependent var        | 3.673690 |
| SE of regression     | 2.911674  | Akaike info criterion   | 5.236535 |
| Sum squared residual | 50.86706  | Schwarz criterion       | 5.302276 |
| Log likelihood       | -20.56441 | Hannan-Quinn criter.    | 5.094665 |
| F-statistic          | 3.367657  | Durbin-Watson stat      | 2.244114 |
| Prob(F-statistic)    | 0.104574  |                         |          |

The model can be rewritten as:

$$Y = 915,581 - 62,916X_1 + 19,422X_2$$

$$Se = 665,784 \quad 24 \quad 23,123$$

$$t = 1.375 \quad -2.0.840$$

$$R^2 = 0.528$$

$$F = 3.367$$

The model above can be explained for each regression coefficient value as follows.

1. The intercept value  $\beta_0 = 0.179$  means that if there is no change in the per capita income and government expenditure variables, the stunting rate will change by at least 915.581 points.
2. The value of per capita income on the stunting rate  $\beta_1 = -62.915$  means that if there is a change in per capita income of 1 percent, the stunting rate will decrease by 62.915 percent units, assuming that government spending does not change.
3. The value of government expenditure on stunting rates  $\beta_2 = 19.422$  means that if there is a change in government expenditure of 1 percent, the stunting rate will increase by 19.422 percent, assuming that per capita income does not change.

Table 1 shows that the per capita income variable has a  $q$  value of 0.042. If  $\alpha$  is set at 5 percent, then  $q$  is smaller than  $\alpha$ , so it is concluded that income has a negative and significant effect on stunting rates. The government expenditure variable has a  $q$  value of 0.433. If  $\alpha$  is set at 5 percent, then  $q$  is greater than  $\alpha$ , so it is concluded that government expenditure has a positive but insignificant effect on stunting rates.

Simultaneously, the  $F$  value is 3.368 and the  $q$  value is 0.105. If  $\alpha$  is set at 5 percent, then  $q$  is greater than  $\alpha$ , so it is concluded that the two independent variables, namely per capita income and government expenditure, together have an insignificant effect on the stunting rate at  $\alpha$  of 5 percent. Meanwhile, the correlation coefficient ( $R$ ) is 0.727, which indicates the relationship between the two independent variables (per capita income and government expenditure) with the stunting rate, is included in the moderate category. The  $R^2$  value of 0.529 or 52.9 percent can be concluded that the variation in the decrease in the per capita income and government expenditure variables can explain the variation in the increase and decrease in the stunting rate variable by 52.9 percent, while the remaining 47.1 percent is determined by other variables outside the analysis model. The model, after being tested for classical assumptions, is considered suitable for estimation.

Based on the results of quantitative analysis using multiple linear regression, the results of this study are formulated as follows: The hypothesis stating that per capita income has a negative and significant effect on stunting rates is accepted because the calculation results show that the coefficient value is negative and the probability is smaller than the  $\alpha$  value of 5 percent (0.05). This means that the influence of per capita income has a negative and significant effect on stunting rates. The hypothesis stating that government expenditure has a negative and significant effect on stunting rates is rejected. Because the calculation results show that the coefficient value is positive

and the probability is greater than the  $\alpha$  value of 5 percent (0.05). This means that the influence of government expenditure has a positive and insignificant effect on stunting rates.

### Discussion of Research Results.

The problem of stunting is complex and is not solely caused by economic or health factors, but a number of social, cultural, and political factors also influence stunting conditions. The stunting problem in Maluku remains a serious concern, as it remains relatively high, even exceeding the national average.

Based on the results of the 2023 Indonesian Health Survey (SKI), the prevalence of stunting in Maluku Province increased by 2.3% from 26.1% in 2022 to 28.4%. Seven of the 11 regencies/cities in Maluku experienced a significant increase, namely Aru Islands Regency, which rose from 28.1% to 40.6%. Southeast Maluku rose from 26.8% to 34%. Tual City rose from 24.9% to 32%. West Seram Regency rose from 27.5% to 31.4%. Southwest Maluku rose from 25.7% to 29.9%. Central Maluku Regency also experienced a significant increase, from 27% to 29.4%. And East Seram Regency rose from 24.1% to 27.5%. Meanwhile, four other regencies/cities experienced declines: Tanimbar Islands, from 31.5% to 25.1%. Buru Regency, from 23.3% to 20.3%. South Buru, from 41.6% to 35.5%, and Ambon City, from 21.1% to 20.7%. <https://ambon.pom.go.id/berita/inovasi-gebrak-stunting-solusi-kurangi-angka-stunting-di-provinsi-maluku>)

Several factors can be identified as the root cause of stunting as follows:

1. **Lack of Access to Adequate and Balanced Nutrition** Many families in Maluku, especially in rural and remote areas, struggle to access nutritious food. Inadequate nutrition before, during, and during the first 1,000 days of life can stunt a child's growth. Economic factors, particularly per capita income, play a crucial role. Low-income families have limited access to nutritious food, resulting in inadequate nutrition for children.
2. **Lack of Education and Awareness about Nutrition** Many parents lack a sufficient understanding of the importance of nutrition and a balanced diet during a child's growth period. Inappropriate feeding practices contribute to malnutrition in children, resulting in children not receiving the nutrients they need for growth. A lack of nutrition education among the community leads to unhealthy and unbalanced diets.
3. **Limited Access to Health Services** Limited health facilities, particularly in rural and remote areas, result in limited access to maternal and child health services. This worsens the nutritional status of children and mothers during pregnancy and breastfeeding. Limited health facilities can hinder the early identification and treatment of malnutrition in children. Furthermore, knowledge and awareness of routine and periodic nutritional check-ups remain lacking.
4. **Environmental Sanitation and Hygiene Problems** An unhygienic environment can lead to various diseases, including diarrhea, which can interfere with nutrient absorption and worsen a child's nutritional status. Poor sanitation, inadequate access to clean water, and inadequate sanitation facilities also contribute to stunting rates.

The research results show that per capita income has a negative and significant effect on stunting rates, meaning that increasing per capita income will significantly reduce stunting rates. This suggests that efforts to reduce stunting should be approached from a more economic perspective. Increasing per capita income requires a complex strategy. Maluku's traditionally agrarian economy is closely linked to stunting rates. This means that high stunting rates occur in rural areas where the majority of the population relies on agriculture for their livelihoods.

Bhutta's (2008) research shows that poverty is a major determinant of stunting rates. Therefore, interventions to address stunting are focused on the poor. Policies that support equitable distribution include broad accessibility to social protection and empowerment for the

poor. Empowering rural communities is a crucial strategy for effective management, increasing economic activity that can boost income, which in turn will reduce stunting rates.

In addition to per capita income, regional expenditure still needs to be optimized. Research shows that regional expenditure actually has a positive, though not significant, impact. This means that increasing regional expenditure will actually increase stunting rates. These research findings provide preliminary evidence that budget allocations, particularly to productive sectors and those directly related to stunting reduction, need to be managed effectively. Reducing stunting in Maluku is a program that requires proper management.

Regional expenditure reflected in the Regional Revenue and Expenditure Budget (APBD) is still relatively small when compared to other regional expenditures in Indonesia. This is due to the still-low regional revenue, particularly from Regional Original Income (PAD). Balancing funds, particularly the Special Allocation Fund (DAK), are an alternative for financing various physical programs, particularly those in the health sector. This data overview provides an indication that fiscal imbalance still exists in Indonesia.

The 2021 Supreme Audit Agency (BPK) report shows that fiscal inequality in Indonesia remains very high. More regions fall into the "Not Yet Independent" category. Only 1.99% of local governments are independent, 9.94% are on the path to independence, and 88.07% are not yet independent. Maluku Province, in this study, is included as a region on the path to independence. The 2023 Regional Fiscal Study of Maluku Province shows that the realization of the physical DAK budget for stunting intervention is very low, even low compared to other sectors, at only IDR 1.56 billion, or 67.31% of the total budget ceiling of IDR 2.31 billion (Ministry of Finance of the Republic of Indonesia, 2023).

The results of this study provide information and guidance that addressing stunting rates requires the involvement of various stakeholders, including the government, the community, and social institutions. The national government, adopted by local governments, has set a target of reducing stunting to 14% by 2024 through the five pillars of the National Strategy for Stunting:

1. Commitment of regional leaders.
2. Behavior change campaign.
3. Convergence of central-regional programs.
4. Local food security.
5. Real-time dashboard based monitoring system.

The Food and Drug Monitoring Agency (BPOM) is one of the government institutions mandated by Presidential Decree 72 of 2021 to carry out sensitive interventions. Therefore, the POM Center in Ambon initiated the development of the GEBRAK STUNTING (Joint Movement to Reduce Stunting) innovation. For the success of this innovation, collaboration with various parties is needed so that the program to accelerate stunting reduction in Maluku Province can be realized through both sensitive and specific interventions. In implementing this Gebrak Stunting Innovation, the POM Center in Ambon collaborates with Regional Apparatus Organizations, Ministries/Institutions, Professional Organizations, Humanitarian Organizations, and Academics. A total of 13 collaborators are committed to working together to make this activity a success.

Currently, there are several institutions that are collaborators, including the Maluku Provincial Health Office, Ambon City Health Office, POM Center in Ambon, Maluku Husada Health Sciences College, Prof. Dr. J. A Latumeten Hospital Health Sciences College, Indonesian Pharmacists Association of Maluku Province, Indonesian Doctors Association of Maluku Province, Indonesian Dentists Association of Maluku Province, Indonesian National Nurses

Association of Maluku Province, Indonesian Pharmacist Association of Maluku Province, Indonesian Nutritionist Association, Indonesian Food Technologist Association and Buleleng Health College Pharmacy Graduate Alumni Association (<https://ambon.pom.go.id>).

## CONCLUSION

The stunting phenomenon in Maluku Province is multidimensional, not just a health phenomenon but also related to the social, cultural, and economic conditions of the community. Per capita income significantly influences stunting reduction. This suggests the need to stimulate the economy, particularly among low-income communities, through empowerment of micro, small, and medium enterprises. Meanwhile, regional expenditures have a positive, albeit insignificant, impact. This implies the need for targeted budget allocation across various stunting reduction programs.

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