The Contribution of Government Expenditure in improving the Human Development Index and Reducing Stunting Prevalence: An Indonesian Perspective

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Abstract

In South Sulawesi Province of Indonesia, stunting poses a significant challenge, with minimal reduction observed in recent years according to BPS data. Despite a notable increase in government spending to address stunting, this research aims to analyze the impact of government expenditures (DAK, Regional Expenditures, Village Funds) on the Human Development Index (HDI) and the prevalence of stunting in 2022. This quantitative study involves 21 districts and 3 cities in South Sulawesi Province. Quantitative analysis using Eviews 13 reveals that DAK, Regional Expenditures, and Village Funds have a direct positive effect on increasing the HDI in Barru District but do not directly influence stunting reduction. Collaboration among various Local Government Agencies (OPDs), stakeholder training, and innovations like the "One Day One Egg" program contribute to addressing stunting. Cross-sectoral synergy is key in combating stunting in this region.

Keywords: Government Spending, Human Development Index, Stunting Prevalence.

The Indonesian government has allocated significant funds to combat stunting. In 2022, the Ministry of Health allocated IDR 44.8 trillion for the Stunting Prevention Acceleration Program. These funds are channeled through various ministries and agencies to improve working, household, and health environments. The government aims to expand the program's coverage to all districts and cities in Indonesia, strengthening synergy among institutions (Bappenas, 2022; World Bank, 2021).

In 2023, the government continues to prioritize human resource quality improvement, including accelerating stunting prevention. The Coordinating Ministry for Human Development and Culture urged local governments to allocate their budgets to two national priority programs: reducing stunting and eradicating extreme poverty (Setiawan & Indraswari, 2019; Jannah & Rahayu, 2021).

In addition, the involvement of village assistant cadres and innovative initiatives such as the "One Day One Egg" program have significantly contributed to efforts to reduce stunting. This program, facilitated by the Barru Regency Social Service, involves the "Mpok Darti" group that provides education and support to stunted children and their families. Each village has six "Mpok Darti" members who directly help stunted children by giving one egg

per day for two months, causing a marked decrease in the prevalence of stunting in Barru Regency. These efforts demonstrate the importance of community-based interventions and innovative approaches in effectively addressing stunting (Kusumawati & Nurdiana, 2019; Sari & Yuniar, 2020).

Stunting prevention is a priority for national, provincial, city/district, and village development. According to Indra & Khoinurrofik (2022), a guided policy from the national to the local and village levels is necessary for stunting prevention. The central government ensures that all basic services are available at the city/district level, provinces provide technical support to local governments, and city/district governments set policies and targets. Villages implement programs based on local authority.

To reduce stunting prevalence, the government issued Presidential Regulation Number 72 of 2021 on the Acceleration of Stunting Reduction with a holistic, integrative, and quality approach through coordination among stakeholders. This regulation emphasizes synergy among stakeholders. The government also issued guidelines for using transfers to regions to support integrated stunting prevention interventions (Surbakti & Wahyuni, 2021).

Stunting is a condition where a child's growth is hampered due to poor nutrition, repeated infections, and inadequate psychosocial stimulation. A multisectoral approach is required to address stunting. The Indonesian Nutritional Status Survey (SSGI) recorded a stunting prevalence of 21.6% in 2022, down from 24.4% in 2021. The national target is below 14% by 2024. In South Sulawesi, stunting reduction was only 0.2% from 2021 to 2022.

The Ministry of Health aims to reduce stunting from 24% to 14% by 2024 through three interventions: ultrasound examinations for pregnant women, iron and folic acid supplementation for pregnant women, and quality complementary feeding for infants over six months.

According to Boachie, Ramu, and Põlajeva (2018), state spending on health can improve health outcome indicators. Central government spending in the State Budget (APBN) is divided into three parts: function, organization, and program. Health spending is a priority in the annual government budget.

The Directorate General of State Wealth allocated IDR 34.1 trillion for the stunting prevention program in 2023. This funding is channeled to 17 ministries and agencies and through Special Allocation Funds (DAK) to local governments. The absorption of physical DAK for the stunting prevention program reached 82.9% of the budget. According to Presidential Regulation 72 of 2021, local governments are expected to increase their budget allocation by at least 10% from the previous year for stunting reduction acceleration.

At the village level, governments can provide prioritized nutrition to pregnant women and children at Posyandu, ensure access to clean water, and better sanitation facilities. The Ministry of Villages, Development of Disadvantaged Regions, and Transmigration (2018) states that village authority is limited to providing infrastructure such as Poskesdes, Polindes, Posyandu, and their equipment. Villages are also authorized for operational services like transportation, incentives, and training for cadres, midwives, and health workers.

The village development concept for stunting prevention, such as the Millennium Villages Project (MVP), has successfully reduced stunting in Africa. Research by Pronyk et al. (2012) and Mitchell et al. (2018) showed that village development through investment effectively reduced stunting. Singh et al. (2014) found that poor infrastructure availability contributed to malnutrition in India, and improving public infrastructure supports children's health and mothers' empowerment.

Research by Rachmawati et al. (2018) indicated a significant relationship between healthy living behavior and stunting incidence in

children under five in Banten Province. Thus, stunting prevention intervention programs should include improving maternal education, such as parenting classes for pregnant women and mothers with young children. Dzulhijjy (2021) found that government spending on education and health significantly impacts the Human Development Index (HDI).

This study aims to examine the direct and indirect effects of Special Allocation Funds, Local Expenditure, and Village Funds on improving health indices and reducing stunting prevalence in South Sulawesi Province, Indonesia.

Methodology

This quantitative study employs parametric data and path analysis to investigate the impact of government spending on improving the Human Development Index (HDI) and reducing stunting prevalence in 24 districts of South Sulawesi. The study uses data from relevant agencies like the Central Bureau of Statistics, newspapers, magazines, and other publications. The unit of analysis is districts/cities as government units. Document review and interviews with stakeholders from Barru (lowest stunting rate in 2022) and Jeneponto (highest stunting rate in 2022) are used to confirm quantitative data analysis. Path analysis, conducted using SPSS and Eviews13, analyzes causal relationships in multiple regression where independent variables affect the dependent variable directly and indirectly. This technique tests the contributions shown by path coefficients in causal diagrams, examining direct and indirect relationships between variables X1 and X2 on Y, and the indirect effect of X1 on Y through X2. The regression formula tests hypotheses on the direct and indirect relationships between government spending and stunting prevalence through HDI improvement.

Research Model:
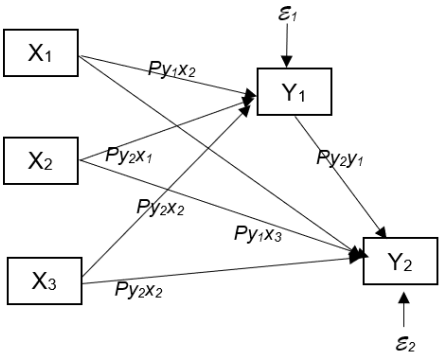
Line 1 model:

$Y2 = \rho\ y2y1 + \rho\ y2x1 + e2$ ..
……………………… (Model 1a)

$Y1 = \rho\ y1x1 ++ e1$
………….………………… (Model 1b)

Line 2 model:

$Y2 = \rho\ y2y1 + \rho\ y2x2 + e2$ ..
……………………… (Model 2a)

$Y1 = \rho\ y1x2 ++ e1$
………….………………… (Model 2b)

Line 3 model:

$Y2 = \rho\ y2y1 + \rho\ y2x3 + e2$ ..
……………………… (Model 3a)

$Y1 = \rho\ y1x3 ++ e1$
………….……….………… (Model 3b)

Information:

X1 : Special Allocation Fund (DAK)
X2: Regional Spending
X3 : Village Fund (DD)
Y1 : HDI
Y2: Stunting Prevalence
ρ : Influence value
e : *error*

Based on the above research model, the following Hypothesis is prepared:

H1 : There is a direct influence of the DAK on the improvement of the Human Development Index;

H2   : There is a direct influence of regional spending on the improvement of the Human Development Index;

H3   : There is a direct influence of Village Funds on the improvement of the Human Development Index;

H4   : There is a direct influence of DAK on Reducing the Prevalence of Stunting;

H5   : There is a direct influence of Regional Expenditure on Reducing the Prevalence of Stunting;

H6   : There is a direct influence of Village Funds on Reducing the Prevalence of Stunting;

H7   : There is a direct effect of increasing the Human Development Index on Reducing the Prevalence of Stunting

H8   : There is an indirect influence of DAK on Reducing the Prevalence of Stunting through increasing HDI;

H9   : There is an indirect influence of Regional Expenditure on Reducing the Prevalence of Stunting through increasing HDI;

H10 : There is an indirect influence of Village Funds on Reducing the Prevalence of Stunting through increasing HDI.

Research Results

1. Descriptive Statistics

The population in the study is Regencies and Cities in South Sulawesi, namely 21 Regencies and 3 Cities. Because the research population is not too large, the entire population is determined as a sample or a saturated sample. Consideration of determining the sample based on the number of districts/cities in South Sulawesi Province because the data that can be processed is Cross Section data, considering the availability of data on the Government Expenditure variable in the Village Expenditure/Village Fund sub-variable is only available in 2022 and stunting prevalence data is only available in 2021 and 2022. Thus, the data available to test the entire hypothesis does not allow the use of Time Series or Data Panel data, which requires a minimum of 10 data (Gudono, 2015). The following is a list of

regencies/cities in South Sulawesi that are the research samples.

Table 1. Regencies and Cities in South Sulawesi

No	Kabupaten/Kota	Ibu Kota Kabupaten	Luas Wilayah (km2)
1	Kabupaten Bantaeng	Bantaeng	395,83
2	Kabupaten Barru	Barru	1.174,71
3	Kabupaten Bone	Watampone	4.559,00
4	Kabupaten Bulukumba	Bulukumba	1.284,63
5	Kabupaten Enrekang	Enrekang	1.784,93
6	Kabupaten Gowa	Sungguminasa	1.883,32
7	Kabupaten Jeneponto	Bontosunggu	706,52
8	Kabupaten Kep. Selayar	Benteng	1.357,03
9	Kabupaten Luwu	Belopa	3.343,97
10	Kabupaten Luwu Timur	Malili	6.944,88
11	Kabupaten Luwu Utara	Masamba	7.502,28
12	Kabupaten Maros	Turikale	1.619,12
13	Kabupaten Pangkep	Pangkajene	1.132,08
14	Kabupaten Pinrang	Pinrang	1.961,67
15	Kabupaten Sidrap	Watang Sidenreng	1.883,23
16	Kabupaten Sinjai	Sinjai	798,96
17	Kabupaten Soppeng	Watansoppeng	1.557,00
18	Kabupaten Takalar	Pattallassang	566,61
19	Kabupaten Tana Toraja	Makale	1.990,22
20	Kabupaten Toraja Utara	Rantepao	1.215,55
21	Kabupaten Wajo	Sengkang	2.504,06
22	Kota Makassar	–	199,26
23	Kota Palopo	–	252,99
24	Kota Parepare	–	99,33

Source: South Sulawesi Province in Numbers, 2023.

The following is displayed data related to government financing related to stunting prevention in the form of Special Allocation Funds (DAK), Local Government Expenditures and Village Funds in Regencies/Cities in the Southern Province in 2022.

Table 2. Sources of Financing for Stunting in Regencies/Cities in South Sulawesi (000) Year 2022

NO.	KAB/KOTA	DAK	BELANJA PEMDA	DANA DESA
1.	Kab. Bantaeng	992.648.850	241.797.468	39.914.386
2.	Kab. Barru	849.866.072	196.937.533	37.587.577
3.	Kab. Bone	2.516.801.448	544.291.958	279.658.573
4.	Kab. Bulukumba	1.273.445.556	349.711.945	96.198.161
5.	Kab. Enrekang	1.215.291.258	219.029.673	93.572.159
6.	Kab. Gowa	1.888.046.053	447.503.053	114.315.399
7.	Kab. Jeneponto	1.157.619.841	285.194.988	80.705.134
8.	Kab. Luwu	1.406.521.291	345.464.806	173.939.398
9.	Kab. Luwu Timur	1.671.096.194	223.118.357	107.277.080
10.	Kab. Luwu Utara	1.445.110.878	278.130.840	148.828.937
11.	Kab. Maros	1.431.187.206	347.912.207	76.116.802
12.	Kab. Pangkep	1.401.202.868	340.221.945	63.473.026
13.	Kab. Pinrang	1.261.334.741	370.549.261	68.052.098
14.	Kab. Selayar	863.802.327	275.966.275	65.941.603
15.	Kab. Sidrap	1.150.790.855	295.457.466	68.804.311
16.	Kab. Sinjai	1.109.087.067	313.293.632	60.976.603
17.	Kab. Soppeng	1.351.463.328	333.502.428	45.296.879
18.	Kab. Takalar	1.390.963.809	285.781.357	66.131.612
19.	Kab. Tana Toraja	1.059.930.024	285.432.259	101.027.334
20.	Kab. Toraja Utara	950.583.315	244.342.655	97.218.877
21.	Kab. Wajo	1.301.431.908	376.884.751	115.673.119
22.	Kota Makassar	3.557.564.542	489.572.375	22.950.000
23.	Kota Palopo	1.014.172.711	228.103.626	9.000.000
24.	Kota Parepare	905.747.809	172.036.802	8.062.000

Source: From various sources, 2023.

2022 is an important year in efforts to combat stunting in South Sulawesi, and for this reason, the source of financing obtained by each district and city plays a key role. This year, stunting financing is sourced from several main sources, namely the Special Allocation Fund (DAK), Regional Government Expenditure, and Village Funds. Bantaeng Regency received a total financing of IDR 992,649,850,000 in 2022. The majority of this financing, around 76%, comes from the Special Allocation Fund (DAK), while Regional Government Expenditure and Village Funds each account for around 24% of the total financing. Meanwhile, Barru Regency received a total financing of IDR 849,866,072,000 in the same year. Around 77% of this amount comes from DAK, while Local Government Expenditure and Village Funds account for around 23% of the total financing.

Bone Regency has the largest total financing of IDR 2,516,801,448,000 in 2022. DAK is the main source of financing with a contribution of around 79%, while Local Government Expenditure and Village Funds contribute around 11% and 10% of the amount, respectively. This pattern can be seen in every district and city in South Sulawesi, where DAK dominates as the main source of financing for stunting control, followed by Local Government Expenditure and Village Funds. The central government and local governments are jointly committed to allocating sufficient resources to address the problem of stunting and improve the nutritional conditions of children in the region. This reflects the importance of collaboration between the central and regional governments in efforts to improve the welfare of children in South Sulawesi.

The following is displayed data related to the Human Development Index variables in Regencies and Cities in South Sulawesi Province.

Table 3. Human Development Index in Districts/Cities in South Sulawesi Year 2022

NO.	KAB/KOTA	IPM
1.	Kab. Bantaeng	69.69
2.	Kab. Barru	71.53
3.	Kab. Bone	67.01
4.	Kab. Bulukumba	70.34
5.	Kab. Enrekang	73.39
6.	Kab. Gowa	70.99
7.	Kab. Jeneponto	65.13
8.	Kab. Luwu	71.36
9.	Kab. Luwu Timur	73.92
10.	Kab. Luwu Utara	70.51
11.	Kab. Maros	71.00
12.	Kab. Pangkep	69.79
13.	Kab. Pinrang	71.97
14.	Kab. Selayar	68.35
15.	Kab. Sidrap	72.06
16.	Kab. Sinjai	68.33
17.	Kab. Soppeng	69.70
18.	Kab. Takalar	68.31
19.	Kab. Tana Toraja	69.88
20.	Kab. Toraja Utara	70.36
21.	Kab. Wajo	70.26
22.	Kota Makassar	83.12
23.	Kota Palopo	78.91
24.	Kota Parepare	78.54

Source: Bappeda of South Sulawesi Province, 2023.

The Human Development Index (HDI) is an important indicator that reflects the welfare and human development of a region. Based on the table above, in 2022 Makassar City achieved the highest HDI with a score of 83.12, indicating a high level of welfare and good human development in the city. Followed by Palopo City with an HDI of 78.91 and Parepare City with an HDI of 78.54, these cities also showed good performance in terms of community welfare. East Luwu Regency has the highest HDI among districts with a score of 73.92, indicating positive human development and a fairly good level of welfare. Enrekang Regency also achieved a fairly high HDI with a score of 73.39.

Meanwhile, several other districts in South Sulawesi, such as Jeneponto Regency and Bone Regency, have HDI below the national average, with scores of 65.13 and 67.01, respectively. Nonetheless, this HDI data provides a useful foundation for understanding the social and economic conditions in each district and city, as well as a basis for more effective policy planning to improve the welfare of its population.

These differences in HDI values illustrate the variety of socio-economic conditions throughout the South Sulawesi region. By understanding this

data, local governments and relevant agencies can identify areas that require special attention and further improvement efforts in order to achieve sustainable human development across the region.

Finally, the following data related to stunting variables is presented in the form of a table to provide an overview of the nutritional condition of children in the population studied.

Table 4. Stunting Prevalence Rate in Regencies and Cities in South Sulawesi in 2021-2022

NO.	KAB/KOTA	PREVALENSI STUNTING	
		2021	2022
1.	Kab. Bantaeng	22,5	22,1
2.	Kab. Barru	26,4	14,1
3.	Kab. Bone	34,1	27,8
4.	Kab. Bulukumba	30,8	28,4
5.	Kab. Enrekang	31,9	26,4
6.	Kab. Gowa	33,0	33,0
7.	Kab. Jeneponto	37,9	39,8
8.	Kab. Luwu	22,8	26,7
9.	Kab. Luwu Timur	19,9	22,6
10.	Kab. Luwu Utara	19,5	29,8
11.	Kab. Maros	37,5	30,1
12.	Kab. Pangkep	33,1	34,2
13.	Kab. Pinrang	24,5	20,9
14.	Kab. Selayar	27,7	32,1
15.	Kab. Sidrap	25,4	27,3
16.	Kab. Sinjai	30,1	29,4
17.	Kab. Soppeng	25,4	26,9
18.	Kab. Takalar	34,7	31,3
19.	Kab. Tana Toraja	29,2	35,4
20.	Kab. Toraja Utara	32,6	34,1
21.	Kab. Wajo	22,6	28,6
22.	Kota Makassar	18,8	18,4
23.	Kota Palopo	28,5	23,8
24.	Kota Parepare	24,8	27,1

Source: Bappeda of South Sulawesi Province, 2023.

From the table above in 2021 and 2022, the prevalence of stunting in various districts and cities in South Sulawesi is monitored. Bantaeng Regency has a stunting prevalence rate of 22.5% in 2021, which has decreased to 22.1% in 2022. In contrast, Barru Regency experienced a significant decline from 26.4% in 2021 to 14.1% in 2022. This is a positive change and shows an improvement in the nutritional condition of children in Barru Regency.

Several other districts, such as Bone Regency and Bulukumba Regency, also experienced a decrease in stunting prevalence rates between 2021 and 2022. Meanwhile, there are other districts that still face challenges in reducing stunting rates, such as Jeneponto Regency which has increased from 37.9% in 2021 to 39.8% in 2022. Makassar City, which is the capital of South Sulawesi, had a relatively low stunting prevalence rate in 2021 (18.8%) and experienced a slight decrease to 18.4% in 2022. Other cities, such as Palopo and Parepare, have also experienced interesting changes in stunting prevalence rates over the past two years.

These changes illustrate the hard work of the government and various related institutions to improve children's nutrition in South Sulawesi. This data can guide the formulation of more

effective health policies and programs to address stunting and improve children's welfare in this region (Rah et al., 2020; Beal et al., 2018; Heidkamp et al., 2020).

Based on data

The research variables in the form of Government Expenditure (DAK, Local Government Expenditure and Village Funds),

the Human Development Index and the stunting prevalence rate were then analyzed descriptively.

According to Ghozali (2016:19), descriptive statistics provide an overview or description of a data seen from the minimum value, maximum, mean value, and standard deviation. To provide an overview of the following descriptive analysis will be explained in table 4.5 as follows:

Table 5. Descriptive Statistics

|	DAK	LGE	DD	IPM	STU
Mean	3.12E+08	1.38E+09	85030045	71.43542	27.87500
Median	2.91E+08	1.27E+09	72460557	70.43500	28.00000
Maximum	5.44E+08	3.56E+09	2.80E+08	83.12000	40.00000
Minimum	1.72E+08	8.50E+08	8062000.	65.13000	14.00000
Std. Dev.	90248613	5.88E+08	57705080	3.945274	5.727982
Skewness	0.848896	2.450997	1.609705	1.405672	-0.350698
Kurtosis	3.466385	9.250152	6.595644	4.989126	3.326369
Jarque-Bera	3.100010	63.09395	23.29325	11.86028	0.598474
Probability	0.212247	0.000000	0.000009	0.002658	0.741384
Sum	7.49E+09	3.32E+10	2.04E+09	1714.450	669.0000
Sum Sq. Dev.	1.87E+17	7.96E+18	7.66E+16	357.9996	754.6250
Observations	24	24	24	24	24

Source: Eviews data processing results 13, 2023

Based on the results of data processing using Eviews 13, we obtained the following summary of several important variables. The Special Allocation Fund (DAK) has an average of about 312 million in unexplained currencies. The median value of the DAK, or median, is about 291 million, while its highest and lowest values are about 544 million and 172 million, respectively. Regional Expenditure has an average of around 1.38 billion, with a median of around 1.27 billion. The highest regional spending reached around 3.56 billion, while the lowest was around 850 million. The Village Fund, on the other hand, has an average of about 85 million, with a median of about 72 million. The highest village fund reaches about 280 million, while the lowest is about 8 million. The Human Development Index (HDI) showed an average of around 71.44, with a median value of around 70.43. The highest HDI reached 83.12, while the lowest was 65.13. The stunting rate has an average of around 27.88, with a median of

28.00. The highest stunting rate observed was 40.00, while the lowest was 14.00.

From the summary, it can be seen that the variations and distributions of each of the observed variables can be seen, providing a better picture of the conditions and characteristics associated with each of these variables.

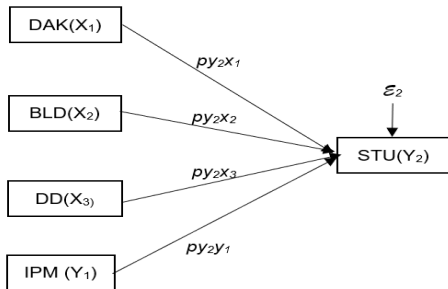For statistical testing, the structural model is divided into 2 (two) substructure models, namely:

Model Substructure I:
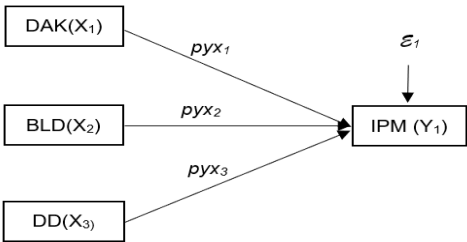
With the equation:

$$Y1 = py_1x_1 + py_1x_2 + py_1x_3 + E_1$$

Model Substructure II:

With the equation:

$$Y2 = py2x1 + py2x2 + py2x3 + py2y1 + E2$$

The results of the classical test show that the Sub Structural I and Sub Structural II models, data normality test, multicollinearity test, heteroscenity test and autocorrelation test are all eligible.

2. Regression Analysis (Direct Influence)

a. Sub Structural I

Overall, the results of the t-test (regression) indicate that the regression model used as a whole is significant, and independent variables such as DAK, LGE, and DD have a significant influence on HDI. In the context of this analysis, DAK and DD have a negative effect, while LGE has a positive effect on HDI. Further analysis and contextual interpretation may be needed to understand the practical implications of these findings.

From the results of the F test, the F-statistic value of 9.925723 is the result of the model significance test. This value is used to test the hypothesis that at least one of the independent variables has a significant impact on the dependent variable (HDI). The probability value (Prob(F-statistic)) is 0.000323, which is much smaller than the significance level usually used (e.g., $\alpha = 0.05$). Therefore, we can reject the null hypothesis (that there are no significant

independent variables) and conclude that the regression model as a whole is significant. The results of the significant F test (low probability of F-statistic) and high R-squared values indicate that the regression model used as a whole has a good tendency to account for variations in HDI with independent variables used.

The results of the Determination Coefficient Test (adjusted R2) that the Adjusted R-squared value of 0.537941 is still quite high and close to the R-squared value, indicating that the model has a large number of variability that can be explained by independent variables. The higher the Adjusted R-squared value, the better the regression model is at explaining the variation in the data. In this case, the Adjusted R-squared value shows that about 53.79% of the variation in HDI can be explained by independent variables in the model.

These results show that the regression model has a fairly good ability in explaining variations in HDI. An Adjusted R-squared value of about 53.79% indicates that most of the variation in IPM can be explained by independent variables in the model. While that is a good sign, further analysis may be needed to understand the practical impact of independent variables on HDI and ensure that the basic assumptions in the regression analysis have been met.

b. Sub Structural II

The results of the regression test using the Eviews device showed that the observed Dependent Variable was the Human Development Index (HDI). The analysis was carried out using the Least Squares method and involved 24 observations. The results of t-analysis show that the independent variables DAK, LGE, DD, and IPM are not significant in predicting the STU dependent variable in this regression model. Only intercepts (C) are statistically significant.

The results of the F test obtained a statistical F-value of 9.925723 are the results of the model significance test. This value is used to test the hypothesis that at least one of the independent variables has a significant impact on the

dependent variable (HDI). The probability value (Prob(F-statistic)) is 0.000323, which is much smaller than the significance level usually used (e.g., α = 0.05). Therefore, we can reject the null hypothesis (that there are no significant independent variables) and conclude that the regression model as a whole is significant. The results of the significant F test (low probability of F-statistic) and high R-squared values indicate that the regression model used as a whole has a good tendency to account for variations in HDI with independent variables used.

The test results of the determination coefficient of the Adjusted R-squared value of 0.537941 are still quite high and close to the R-squared value, indicating that the model has a large amount of variability that can be explained by independent variables. The higher the Adjusted R-squared value, the better the regression model is at explaining the variation in the data. In this case, the Adjusted R-squared value shows that about 53.79% of the variation in HDI can be explained by independent variables in the model.

3. Path Analysis (Indirect Influence)

Path analysis with the Sobel test is a statistical method used to test mediation in regression analysis. In the context of path analysis, mediation refers to the mechanism by which an independent variable influences a dependent variable through a mediator variable. The Sobel test is one approach to assess whether mediators play a significant role in linking independent variables to dependent variables.

The following is a statistical test calculation to determine whether there is a mediation effect significantly different from zero, provided that if the p-value of the mediation test result with the Sobel test is less than the significance level α = 0.05, then it can be concluded that there is an indirect effect. From the results of the calculation of the sobel test of the pathway 1 model, a p-value of 0.719 was obtained which indicates a p-value greater than 0.05 which means that it is not significant and there is no influence from X1 to Y2 through Y1. As for the results of the

calculation with the Sobel test for the Line 2 Model, a p-value of 0.817 was obtained which showed a p-value greater than 0.05 which means it was not significant and there was no influence from X2 to Y2 through Y1. Meanwhile, from the results of the calculation of the Sobel test for the Line 3 Model, a p-valuae value of 0.95 was obtained which indicates a p-value greater than 0.05 which means that it is not significant and there is no influence from X3 to Y2 through Y1.

Discussion

1. Direct Influence Analysis (Regression)

Regression analysis shows that the DAK variable has a negative regression coefficient (-2.56E-08) with a significance (p-value: 0.0323), indicating a significant negative influence on the Human Development Index (HDI). On the contrary, the LGE variable showed a positive regression coefficient (6.38E-09) with significance (p-value: 0.0005), indicating a significant positive influence on the HDI of LGE. Meanwhile, the DD variable has a negative regression coefficient (-2.98E-08) with significance (p-value: 0.0177), which describes a significant negative influence on HDI, similar to the DAK variable. With these findings, it can be concluded that these three variables play a role in influencing HDI, with DAK and DD having a negative influence, while LGE has a significant positive influence.

In addition, the results of the F test show that the regression model as a whole is significant, with a low probability of F-statistic. Approximately 53.79% of the variation in HDI can be explained by independent variables in the model. This confirms that independent variables such as DAK, LGE, and DD together significantly affect HDI in the context of this analysis.

2. Indirect Influence Analysis (Mediation)

Model Path 1: Special Allocation Fund (DAK)->HDI-> Stunting Prevalence (STU)

This model tests whether DAK has an indirect influence on STU through IPM.

However, the results of the Sobel test showed that the p-value was greater than 0.05 (0.2138), which means that there was no significant mediating influence of IPM in connecting DAK to STU. Therefore, it cannot be concluded that HDI plays a mediator role in the relationship between DAK and STU in this context.

Model Path 2: Regional Expenditure (BLD) -> HDI -> Stunting Prevalence (STU)

This model tests whether BLD has an indirect influence on STU through IPM. The results of the Sobel test showed that the p-value was greater than 0.05 (0.3679), which means that there was no significant mediating influence of HDI in connecting BLD to STU. Thus, it cannot be concluded that HDI plays a mediator role in the relationship between BLD and STU in this context.

Model Path 3 : Village Fund (DD) -> HDI -> Stunting Prevalence (STU)

In this model, it is tested whether DD has an indirect influence on STU through IPM. The results of the Sobel test showed that the p-value was greater than 0.05 (0.2968), which means that there was no significant mediating effect of IPM in connecting DD to STU. Therefore, it cannot be concluded that HDI plays a mediator role in the relationship between DD and STU in this context.

Overall, based on the results of the Sobel test for the three pathway models, there is insufficient evidence to support the hypothesis that HDI mediates the relationship between independent variables (DAK, BLD, or DD) and dependent variables (STUs) in this study. Therefore, at the significance level of $\alpha = 0.05$, it cannot be concluded that there is a significant mediating effect in the influence of independent variables on STU through HDI (Wang & Zhang, 2018; Goh et al., 2019).

Field facts show that Barru Regency's success in reducing the prevalence of stunting reveals significant achievements. From 2021 to 2022, the prevalence of stunting dropped markedly from 26.4% to 14.1%, marking a significant decline of 12.3%, which was the largest in South Sulawesi Province during this period. This success is attributed to three key factors: the readiness of the Stunting Prevention and Mitigation Team (TPPS) as well as multi-actor involvement in stunting governance, effective coordination among various government agencies and stakeholders, and innovative approaches to governance.

In Barru Regency, TPPS operates optimally, involving various related institutions such as Bappelitbangda, DPMD, Health Office, PUPR Office, and Communication and Informatics Office, ensuring coordinated efforts in handling stunting. Meanwhile, in Jeneponto Regency, the suboptimal performance of TPPS hinders effective stunting management due to a lack of support, commitment, and collaboration from relevant stakeholders.

In 2023, the government continues to prioritize human resource quality improvement, including accelerating stunting prevention. The Coordinating Ministry for Human Development and Culture urged local governments to allocate their budgets to two national priority programs: reducing stunting and eradicating extreme poverty (Setiawan & Indraswari, 2019; Jannah & Rahayu, 2021).

In addition, the involvement of village assistant cadres and innovative initiatives such as the "One Day One Egg" program have significantly contributed to efforts to reduce stunting. This program, facilitated by the Barru Regency Social Service, involves the Mpok Darti group that provides education and support to stunted children and their families. Each village has six "Mpok Darti" members who directly help stunted children by giving one egg per day for two months, causing a marked decrease in the prevalence of stunting in Barru Regency. These efforts demonstrate the importance of community-based interventions and innovative approaches in effectively addressing stunting (Santoso & Widyastuti, 2018; Suparyanto et al., 2020).

Conclusion

Based on the results of the analysis, it can be seen that the Special Allocation Fund (DAK), Regional Expenditure (BLD), and Village Fund (DD) have a significant direct influence on the increase in the Human Development Index (HDI). However, there was no direct effect through HDI on stunting prevalence (STU), suggesting that the influence of independent variables on STU was not mediated by HDI in this model. Nonetheless, stunting in Barru Regency has shown significant success, with the prevalence of stunting dropping dramatically from 26.4% in 2021 to 14.1% in 2022. This success can be attributed to the involvement of multi-actors in stunting governance, such as various Regional Apparatus Organizations

(OPDs) and innovative initiatives such as the "One Day One Egg" program.

Although the quantitative analysis highlights the relationship between DAK, BLD, DD, HDM, and STU, the extension of the analysis to other factors that can affect stunting such as child nutrition, access to health services, and environmental factors is important to consider. Although DAK, BLD, and DD have a direct influence on increasing HDI, it is important to remain focused on nutrition programs and improving access to quality food and good health care in an effort to reduce the prevalence of stunting. Collaboration between relevant sectors may be needed to address stunting holistically, while further analysis and research at the local level will help develop more focused strategies according to the needs of each region.

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