



The Effect of Education, Health and Social Expenditure Allocations on the Human Development Index (HDI) Level of the City District Aceh Province

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ABSTRACT

This study explores the effects of government expenditure allocations in education, health, and social sectors on the Human Development Index (HDI) levels in Aceh Province, Indonesia. The Human Development Index, introduced by the United Nations Development Programme, measures a country's achievements in health (life expectancy), education (mean years of schooling and expected years of schooling), and standard of living (GNI per capita). Recognizing the pivotal role these expenditures play in enhancing community welfare, this research aims to address the critical issues of economic disparities and limited access to education and healthcare in the Babussalam District, Southeast Aceh Regency. By employing a quantitative approach and analyzing data from 314 respondents through multiple regression analysis, the findings indicate that allocations for education, health, and social programs significantly influence the HDI levels, highlighting the crucial impact of targeted government spending on improving human development outcomes. The study underscores the importance of development and empowerment programs, advocating for strategic investments in these key areas to foster community welfare and development.

Keywords: village fund, development, empowerment, development program, and community welfare

1. Introduction

1.1. Economic development represents a multifaceted process necessitating a comprehensive reorganization and reorientation of existing social and economic systems to attain sustainable growth and elevate the quality of life within a society (Todaro & Smith, 2011). At the core of gauging and comprehending the success of these developmental endeavors lies the Human Development Index (HDI), inaugurated by the United Nations Development Programme (UNDP) in 1990. The HDI stands as a pivotal metric for evaluating advancements in the quality of human life, encapsulating achievements in health, education, and living standards.

Furthermore, regional development assumes a critical role in catalyzing economic activities within communities, thereby contributing to broader economic growth. This approach underscores the significance of integrating human development perspectives into regional economic strategies, ensuring that endeavors aimed at enhancing economic performance are intricately aligned with advancements in human welfare and opportunities for all members of society (Arga, 2023).

The measurement of HDI quality entails three fundamental dimensions: lifespan (as measured by life expectancy), knowledge (assessed through literacy rate indicators and average length of schooling), and living standards (evaluated by the average per capita expenditure) (Rochmah & Sukmana, 2019). These dimensions collectively furnish a comprehensive overview of human development within a given region.

Investments in education and health emerge as imperative, given their direct influence on the fundamental dimensions of HDI—longevity and healthy living, knowledge acquisition, and the establishment of proper living standards. The pivotal role of such investments in augmenting population productivity underscores the significance of governmental expenditure in these sectors.

Aceh Province, situated on the northern tip of Sumatra, Indonesia, has experienced significant socio-economic transformations in recent years. Despite progress in various sectors, including infrastructure and governance, Aceh still grapples with persistent challenges in education, health, and social welfare. The aftermath of natural disasters and historical conflict has left lasting scars on the region, necessitating targeted interventions to uplift communities and improve overall well-being. Against this backdrop, understanding the impact of education, health, and social spending on Aceh's Human Development Index (HDI) becomes paramount for policymakers and development practitioners seeking to address the province's unique needs and enhance its socio-economic resilience.

Despite endeavors to enhance the Human Development Index in Aceh Province through various initiatives such as community engagement partnerships, the Education Priority Program 2023-2026, improved coverage of integrated health services (posyandu), and the development of local food resources, there remains a necessity for further elaboration on these efforts.

Given the discerned development gaps in education, health, and social sectors within Aceh Province, this study, titled "The Effect of Education, Health, and Social Spending on the Level of Human Development Index (HDI) of Aceh Province," aims to investigate how allocations in these areas influence the HDI. By focusing on education, health, and social expenditure allocation as key variables, the research seeks to understand their impact on Aceh's HDI, thereby highlighting the critical need for targeted investment to foster regional development and improve the quality of life.

2. Method

2.1. Tables

The primary method used in this study is quantitative analysis, focusing on the relationship and impact between independent variables (Education Expenditure, Health Expenditure, and Social Expenditure) and the dependent variable (Human Development Index - HDI). The data for this study were collected from secondary sources, including the Central Bureau of Statistics (BPS) and the Directorate General of Financial Balance of the Ministry of Finance. The specific data collected encompassed:

- a. Human Development Index (HDI) of Aceh Province for the years 2011-2021.
- b. Average Length of Schooling (RLS) in Aceh Province for the years 2011-2021.
- c. Life Expectancy (AHH) in Aceh Province for the years 2011-2021.
- d. Per Capita Income in Aceh Province for the years 2011-2021.
- e. APBD data series on Expenditure Per Function of Education, Health, and Social Protection for 2011-2021.

Before conducting hypothesis testing using regression analysis, it is necessary to test the classical assumptions such as the normality test and partial F-test (t-test).

The normality test aims to assess whether the data distribution of the variables used in the study follows a normal distribution. Data that adheres to a normal distribution is considered suitable for regression analysis.

To test for normality, we use a normal probability plot to compare the cumulative distribution of the data with a normal distribution. The t-test is used to determine the individual influence of each independent variable on the dependent variable. After that, the data is analyzed using multiple linear regression to determine the influence of the independent variables on HDI. The regression equation model is then formulated to depict this relationship.

These data sets were analyzed using multiple linear regression to determine the influence of the independent variables on HDI. The regression equation model is:

$$Y = a + b_1 \times BP + b_2 \times BK + b_3 \times BS + e$$

Information :

Y	=	IPM (%)
BP	=	Education Expenditure (Rp. Millions)
BK	=	Health Expenditure (Rp. Millions)
BS	=	Social Expenditure (Rp. Millions)
a	=	Constant
b _{1,2}	=	Regression coefficient
e	=	error

This regression model is grounded in the theoretical framework that suggests government expenditures in education, health, and social sectors are critical determinants of HDI, reflecting a society's overall well-being and development. The choice of these variables is supported by literature indicating their direct impact on the components of HDI, namely education (through RLS), health (through AHH), and living standards (through Per Capita Income).

The analysis aims to quantify the extent to which variations in these expenditures can explain changes in the HDI of Aceh Province, providing insights into the effectiveness of fiscal policies targeted at human development. The theoretical foundation for this model is rooted in the work of economists and development theorists who have emphasized the importance of targeted government spending in promoting human capital development as a driver of broader economic and social progress.

3. Discussion

Research data was obtained from districts/cities in Aceh Province. Aceh Province has 18 regencies, five towns, 289 sub-districts, and 6,514 gampong or villages. The boundaries of Aceh Province, the North and East, are bordered by the Strait of Malacca, the South by North Sumatra Province and the West by the Indonesian Ocean. The only land connection is with North Sumatra Province, so it has a reasonably high dependence on North Sumatra Province. The population of Aceh Province is 5,274,871 people, with North Aceh Regency having the largest population of 602,793 people. In comparison, the area with the most minor population is Sabang Regency, with as many as 41,197 people.

The data collected is based on the APBD data series per function of Education, Health and Social Protection of the Regency / City Government of Aceh Province in 2011 – 2021 through the Directorate General of Financial Balance of the Ministry of Finance website. That can be seen in Table 1 below.

Table 1. Per Capita Income (thousand rupiah) of Aceh Province in 2011-2021

Kab/kota	Tahun										
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Simeulue	5781	5854	5950	5956	6328	6542	6677	6824	7210	7085	7148
Aceh Singkil	7123	7165	7208	7221	7602	8068	8230	8506	8715	8707	8776
Aceh Selatan	6890	6913	6989	7003	7224	7397	7567	7891	8187	8089	8180
Aceh Tenggara	6731	6788	6989	6949	7001	7212	7359	7685	8067	8020	8030
Aceh Timur	6897	7178	7219	7288	7623	7825	7961	8252	8600	8489	8577
Aceh Tengah	9330	9365	9400	9435	9473	9920	10021	10394	107892	10673	10780
Aceh Barat	7632	7688	7744	7771	8135	8559	8989	9134	9692	9516	9593
Aceh Besar	8246	8344	8497	8622	8775	8788	8965	9192	9661	9641	9644
Pidie	9076	9121	9167	9182	9233	9273	9377	9492	9824	9816	9860
Bireuen	6822	6996	7232	7319	7622	7885	8237	8378	8889	8857	8867
Aceh Utara	6465	6562	9714	6838	7327	7520	7632	7919	8189	8122	8201
Aceh Barat Daya	6655	6828	6966	7059	7303	7567	7723	8093	8491	8316	8428
Gayo Lues	7635	7646	7709	7742	7780	8048	8322	8529	8845	8791	8856
Aceh Tamiang	7455	7478	7554	7569	7750	7766	7931	8032	8362	8327	8367
Nagan Raya	6834	6902	7019	7084	7141	7460	7732	7936	8348	8216	8292
Aceh Jaya	8596	8679	8691	8721	8749	8789	8322	9262	9682	9615	9666
Bener Meriah	9289	9580	9645	9721	9760	10140	1043	10626	11124	11098	11118

Source: BPS Aceh Province 2022

Based on the Data in Table 1, assumption tests are used to determine whether this study's regression model can be tested. The classical assumption test consists of four: normality, heteroscedasticity, multicollinearity and autocorrelation. The four tests should not be found in the regression model to be used, and the resulting data should be normally distributed. Regression capital is worth testing when these conditions have been met.

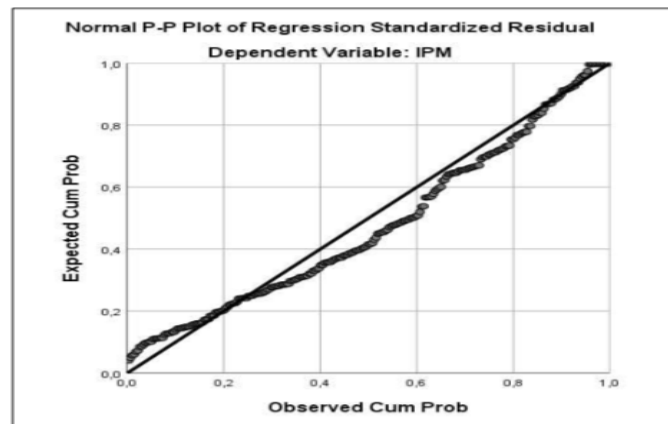


Figure 1. Normal P-Plot of Regression Standardized Residual

By looking at the standard graph view of the plot in Figure 1, it can be concluded that the data spreads around the diagonal line and follows the direction of its diagonal line. This indicates that the data is usually distributed. Normal distribution means that the distribution of data in the Education, health, social and HDI spending data groups for 2011 – 2021 comes from a normally distributed population.

Coefficients^a

Model	Unstandardized Coefficients		Standardized	t	Sig.	
	B	Std. Error	Coefficients			
			Beta			
	(Constant)	67,536	,719		93,917	,000
1	Education	-1,793E-12	,000	-,050	-,511	,610
	Health	1,057E-11	,000	,211	2,101	,037
	Social	2,700E-11	,000	,057	,824	,411

a. Dependent Variable: IPM

Source: Primer Data Processed, 2022

Based on Table 1 the multiple linear regression was:

$$Y = 67,536 - 1.793E-12 Bp + 1,057E-11 Bk + 2,700E-11 Bs$$

In this analysis, the constant holds a value of 67.536. This signifies that in the absence of independent variables, such as Education Spending, Health Spending, and Social Spending, with a value of 0 (zero), the Human Development Index (HDI) in the districts/cities of Aceh Province would remain at 67.536. The variable Education Spending (Bp) is valued at 1.793E-12. A negative sign associated with Education Spending indicates an inverse relationship, implying that an increase in Education Spending would decrease the HDI in the districts/cities of Aceh Province by 1.793E-12.

Conversely, the variable Health Spending (Bk) holds a value of 1.057E-11, with a positive sign, suggesting a direct influence where an increase in Health Spending would elevate the HDI in the districts/cities of Aceh Province by 1.057E-11. Similarly, the variable Social Spending (Bs) is valued at 2.700E-11 and also bears a positive sign, indicating a direct effect whereby each increment in Social Spending would enhance the HDI in the districts/cities of Aceh Province by 2.700E-11. Thus, these variables delineate their respective impacts on human development in Aceh, underscoring the significance of prudent budget allocation to ameliorate societal well-being.

Education Expenditure

The analysis reveals a paradoxical negative relationship between education expenditure and HDI in Aceh Province. This unexpected outcome can be attributed to several factors undermining the efficacy of education spending. A substantial portion of the budget has been allocated towards building infrastructure, such as schools, at the expense of qualitative improvements in education, like teacher training, curriculum development, and provision of learning materials. The rapid demographic growth in Aceh amplifies the challenge, necessitating increased education services to maintain, let alone enhance, educational standards. Moreover, barriers such as geographical inaccessibility, socioeconomic factors, and cultural attitudes towards education limit the active participation in educational programs. Consequently, despite increased budgets, the anticipated improvement in education indices—a crucial component of HDI—remains unmet. This scenario underscores the necessity of not just increasing the education budget but optimizing its allocation and utilization towards areas that directly contribute to HDI improvement.

Health Expenditure

Contrary to education spending, health expenditure in Aceh Province exhibits a positive and significant relationship with HDI. This finding is consistent with previous research indicating that government spending in the health sector positively impacts HDI by enhancing life expectancy and reducing infant mortality rates. The increase in life expectancy to 69.96 years and the decline in infant mortality rates from 2017 to 2020 reflect the successful improvement in health services, both in terms of quantity and quality. These improvements directly contribute to the HDI's health dimension, affirming the pivotal role of health expenditure in fostering human development.

Social Expenditure

The effect of social expenditure on HDI in Aceh Province is positive yet not statistically significant. This outcome diverges from findings in other regions where social protection spending has shown a direct positive impact on HDI. In Aceh, the inefficacy of social protection spending to significantly uplift HDI could be linked to the suboptimal implementation of social programs aimed at mitigating poverty, unemployment, and inequality. Despite allocations for social protection, Aceh remains among the with the highest poverty rates in Indonesia. This discrepancy highlights the need for more effective and targeted social protection programs that not only address immediate social needs but also contribute substantively to improving HDI.

4. Conclusion

This study has elucidated the differential impacts of education, health, and social expenditure on the Human Development Index (HDI) in the districts/cities of Aceh Province. Notably, education spending has shown a negative, albeit insignificant, effect on HDI. This outcome primarily stems from the government's emphasis on physical infrastructure over the qualitative enhancement of human resources, including the development of teachers and students. Conversely, health expenditure positively and significantly influences HDI, evidenced by increased life expectancy and reduced infant mortality rates. These improvements reflect enhancements in both the quantity and quality of health services from 2011 to 2021. Social expenditure, while positively related to HDI, did not significantly impact the districts/cities of Aceh Province, attributed to the suboptimal implementation of social protection programs aimed at mitigating poverty, unemployment, and inequality. Collectively, these expenditures account for only 4 percent of the variance in Aceh's HDI, suggesting that other unmeasured variables significantly contribute to human development outcomes.

Limitations

The study's explanatory power is limited by several factors:

1. **Complex Nature of HDI Determinants:** HDI, a composite measure, encapsulates diverse aspects of human development (education, health, and living standards), whose determinants are complex and may not be fully captured by education, health, and social spending alone. This complexity indicates that significant influencing factors were likely omitted from the analysis.
2. **Data and Measurement Limitations:** The effectiveness of government spending in education, health, and social protection sectors may be affected by the measurement methods and data quality. Inaccuracies in financial data or inefficiencies in spending could diminish the model's explanatory power.
3. **External and Unmeasured Variables:** Besides the studied variables, other factors, including economic growth, employment rates, infrastructure development, environmental conditions, and political stability, likely account for the remaining 96% of the variance in HDI, underscoring the importance of considering a broader array of determinants in future research.
4. **Regional Specificities and Policy Implementation:** The unique socio-economic and cultural context of Aceh, along with the effectiveness of policy implementation related to education, health, and social

protection, plays a crucial role. The manner in which funds are allocated and utilized at the local level, governance, administrative capacities, and alignment with local needs and priorities are critical in influencing HDI outcomes.

Future Research

Future research should address these limitations by incorporating a wider range of variables, improving data accuracy, and examining the efficiency of government expenditure. Additionally, studies should consider the socio-economic and cultural nuances of Aceh to propose targeted, effective interventions for human development.

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