

## Human Development Index in Papua: the roles of government spending in education and healthcare

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### ABSTRACT

The Human Development Index (HDI) in Papua Province is low compared to other provinces in Indonesia. This study aims to find out how government spending in education and healthcare relates to HDI in Papua Province. Based on panel data regression from 2013–2022, this study finds that government spending in education and healthcare has a significant impact on HDI. The local government earmarks a further 20% of the local budget for education expenditures, excluding teachers' salaries, and increases healthcare spending by 10% of the local budget, excluding salaries. The study reveals that it is particularly essential to prioritize those expenditures in order to maintain the provision of basic services in Papua. The local government oversees these responsibilities, taking into account not only the expenditure but also the citizen's experience. This implies that government spending at the local level plays an essential role in achieving outcomes by improving access to fundamental public services and promoting public welfare.

**Keywords:** Education, Health care, Human Development Index, Papua

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### INTRODUCTION

Development is considered a way to advance the nation, which involves human resources. To avoid burdening the country, a high amount of money must be accompanied by adequate quality human resources (Ashshiddiqi et al., 2021). Lestari et al. (2023) use the Human Development Index (HDI) as an indicator to measure the quality of human resources, taking into account the influence of education and health expenditure.

The government releases regulations to support the education and health sectors. The 1945 Constitution mandates that the state provide at least twenty percent of the State/Local Budget for education. Meanwhile, the budget for healthcare is allocated at least five percent of the State Budget, while the Local Budget allocates at least ten percent for the health sector (Mongan, 2019).

In terms of HDI, the Papua Province has a significant difference compared to other provinces in Indonesia. According to BPS data, the HDI in Papua Province during 2013–2022 has always been the lowest among other provinces. This shows that there is a significant gap between Papua Province and other provinces in Indonesia regarding the HDI, especially between Papua Province and the Capital (Afif & Yulianti, 2018). The large difference between the HDI in Papua Province and other provinces,

considered an outlier, will influence Indonesia's average HDI (Kusnandar & Rizki, 2019).

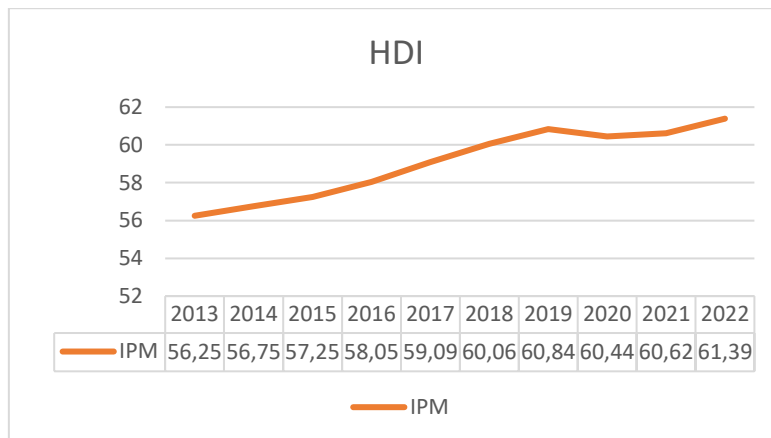
The government's spending on education and health influences the HDI. In Papua, there were fluctuations in both education and health spending from 2013 to 2022, as shown in Table 1.

**Table 1.** Education and Health Expenditures in Papua Province

Year	Education Spending	Growth ( %)	Health Spending	Growth ( %)
2013	3,018,374,938,759	-	2,415,558,646,339	-
2014	3,636,855,790,659	20%	2,747,930,448,012	14%
2015	4,395,658,294,119	21%	3,454,071,959,732	26%
2016	3,181,900,584,578	-28%	2,829,479,365,921	-18%
2017	4,436,581,241,637	39%	3,881,918,176,560	37%
2018	4,397,242,670,912	-1%	5,067,098,024,569	31%
2019	4,640,577,753,650	6%	4,737,523,786,181	-7%
2020	4,652,503,311,437	0%	4,899,128,127,249	3%
2021	4,825,979,726,287	4%	5,091,336,374,149	4%
2022	4,946,857,453,607	3%	5,155,400,665,704	1%

Source: Regional Education, DJPK, processed by the author.

According to reports, the increase in education and health spending in Papua Province still makes the HDI the lowest compared to other provinces in Indonesia. During this period, the HDI in Papua increased, although not significantly (see Figure 1).



Source: BPS, processed by the author

**Figure 1.** HDI in Papua Province 2013-2022

Previous research in Papua Province from 2013 to 2022 found that education spending did not have a significant impact on HDI (Sopiah & Siregar, 2023), but Darwin (2023) asserts that education spending has a positive impact on HDI. Meanwhile, health spending does not have a significant effect on HDI (Marlin et al., 2022), and according to Darwin (2023), health spending has a positive influence on HDI.

This research focuses on Papua Province's low HDI compared to other provinces, as well as fluctuations in education and health spending. The differences in previous research results open up the opportunity to carry out this study. It is critical to determine whether or not education and health spending have an impact on HDI in Papua Province. This study attempts to answer the questions: (1) Does education and health spending influence the HDI in Papua Province? (2) How do education and health expenditures influence the HDI in Papua Province?

## METHOD

This study employs a multiple linear regression research model. The equation used is as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

where:

- $Y$  = Human Development Index
- $\alpha$  = Regression equation constant
- $X_1$  = Education spending
- $X_2$  = Health spending
- $\beta_1, \beta_2$  = Regression coefficient or slope
- $\varepsilon$  = Error

The Directorate General of Fiscal Balance published the education and health expenditure per district or city of Papua Province for 2013–2022. The BPS has published the HDI for Papua Province for 2013–2022, which serves as the dependent variable.

## RESULTS

The panel data regression yielded the results shown in Table 2.

**Table 2.** Chow Test Results

Variables	Coefficient	Std.Error	t. Statistics	Prob.
lnEducation	0.43616	0.36112	1.21000	0.28800
lnHealth	2.30922	0.28907	7.99000	0.00000
_cons	-14.09953	7.44944	-1.89000	0.06000
R-squared	0.1482			
Prob > F	0.0000			

Source: STATA 17 output, processed by the author

From these results, it is known that the probability cross-section F value (0.0000) is smaller than the significance coefficient  $\alpha$  (0.05). The Chow test results taken were  $H_0$  rejected and  $H_1$  accepted. As a result, we selected the Fixed Effect Model (FEM) approach as the model.

**Table 3.** Hausman Test Results

	(b) FEM	(B) BRAKES	(bB) Difference	sqrt(diag(V_b-V_B)) Std.Error
lnEducation	0.436162	0.5504856	-0.1143236	0.0267028
lnHealth	2.309223	2.279232	0.0299915	0.0148559
chi2 (2)	18.40			
Prob > chi2	0.0001			

Source: STATA 17 output, processed by the author

According to these results, the random cross-section probability value (0.0001) is smaller than the significance coefficient  $\alpha$  (0.05). Based on the Hausman test, it was  $H_0$  rejected and  $H_1$  accepted. As a result, we selected the Fixed Effect Model (FEM) approach as the model.

After conducting both the Chow test and the Hausman test, we used the Fixed Effect Model (FEM) as the regression estimation model to analyze the influence of education and health spending on panel data. Table 4 presents the regression estimation results.

**Table 4.** Panel Regression Estimation Results

Variables	Coefficient	Std.Error	t. Statistics	Prob.
lnEducation	0.43616	0.36112	1.21000	0.28800
lnHealth	2.30922	0.28907	7.99000	0.00000
_cons	-14.09953	7.44944	-1.89000	0.06000
R-squared	0.1482			
Prob > F	0			

Source: STATA 17 output, processed by the author

Based on the results of panel data regression using the *Fixed Effect Model*, the model equation is:

$$HDI_{it+1} = \alpha_1 + \beta_1 \ln Education_{it} + \beta_2 \ln Health_{it} + \epsilon_{it}$$

Based on the results of the regression estimation, the final regression model is:

$$HDI_{it+1} = -14.09953 + 0.436162 (\ln Education)_{it} + 2.309223 (\ln Health)_{it} + \epsilon_{it}$$

From this regression model, it can be described as follows.  $\alpha$  is a constant or intercept symbolized `_cons` in Stata output. So the value of the HDI variable in Regency/City *i* in year *t* is -14.09953 if all independent variables have a value of zero.

$\beta_1$  is the regression coefficient of the education spending. The education spending variable is transformed into natural logarithms so that the interpretation uses the log-lin model. In the regression results, the value of  $\beta_1$  is 0.436162, which means that the HDI will experience an increase of 0.436 percentage points for every one percent increase in the education expenditure in district/city *i*, assuming that other variables are considered constant.

$\beta_2$  is the regression coefficient of the health expenditure. These variables are transformed into natural logarithms so that the interpretation also uses the log-lin model. In the regression results, the  $\beta_2$  value is 2.309223, which means that the HDI will experience an increase of 2.309 percentage points for every one percent increase in the realization of health expenditure in district/city *i*, assuming that other variables are considered constant.

The regression results for the education expenditure produced a regression coefficient of 0.436162 with  $P > |t|$  of 0.228. The regression coefficient value means that an increase of 1% in education spending will increase 0.436162 percentage points of the HDI. Meanwhile the  $P$  value  $> |t|$  is greater than the significance  $\alpha$  of 0.05, meaning that the education expenditure realization variable does not have a significant effect on the HDI. This means that education spending has a positive but not significant effect on HDI. The increase in education spending does not have a significant influence on the increase in HDI.

The results of the regression for health spending show that the regression coefficient has a value of 2.309223 with a value of  $P > |t|$  of 0.0000. These results illustrate that an increase in health spending by 1% will increase the HDI by 2.309 percentage points, while the  $P$  value  $> |t|$  which is smaller than the significance  $\alpha$  of 0.05 means that the health spending variable has a significant effect on the HDI. This means that health spending has a significant positive effect on HDI. An increase in health spending can improve the HDI.

The value  $R^2$  is 0.1482, which means that the independent variables (educational and health spending) can explain the dependent variable (HDI) by 14.82%, while the remaining 85.38% is explained by other variables.

## DISCUSSION

Education spending will increase the level of HDI. Previous research shows that government spending on education has a significant effect on human development (Aquariansyah, 2018; Fahmi &

Dalimunthe, 2018; Harjunadhi & Rahmawati, 2020; Hidayati & Imaningsih, 2022). Other studies yield conflicting results, suggesting that government spending on education does not significantly impact human development (Siregar et al., 2023; Sopiah & Siregar, 2023). This research shows that education spending has a positive but insignificant impact on HDI. This implies that the Papua Provincial government's increase in education spending has no significant impact on HDI. For this reason, there is a need for further policies from the local government that contribute to increasing the HDI.

Inadequate infrastructure in the education sector is one of the factors that causes education spending to have less impact on HDI. In 2018–2019, Papua Province needed 550 more elementary schools. This will have an impact on the Pure Enrollment Rate (APM), which will ultimately impact the HDI. Apart from that, lack of access to transportation and the long distance between schools cause low community participation in reaching educational services (Sumule et al., 2022).

The need for qualified teachers is also problematic in Papua Province. The teacher's attendance rate is only 18%. This is due to the difficulty of school access, especially for Jayawijaya Regency and Lanny Regency. Conversely, the teachers' salaries are inadequate. This causes teachers to feel uneasy when they are teaching in that area (Hisanah et al., 2022).

Apart from low teacher participation, inequality in the distribution of educational facilities is another significant problem. Many schools in remote areas need more basic facilities, such as textbooks, stationery, and educational technology. This lack of facilities limits students' access to learning resources and hinders teachers' efforts to provide quality education (Afriansyah, 2022).

To increase the education budget, a comprehensive strategy is required. For example, the education budget focuses on infrastructure development, providing facilities, improving teacher welfare and training, and developing programs that can improve the accessibility and quality of education in remote areas. Furthermore, we must increase transparency and accountability in managing education funds to prevent misuse and guarantee their benefits in enhancing the quality of education and the Human Development Index.

Furthermore, health spending has a significant positive effect on HDI. This implies that the regional government, with an increase in health spending, can improve the HDI. This is in accordance with research by Setiawan & Fikriah (2020), Maryozi et al. (2022), and Sopiah & Siregar (2023). Based on the research results, we can conclude that the health sector in the Papua region exhibits fair budget management.

However, the health budget in Papua Province faces several challenges. Mongan (2019) believes that well-targeted investment in the health sector will impact human development. Investing in the construction of health facilities and the procurement of medicines and medical equipment can enhance the quality of public health. Problems in the health sector in Papua Province include the poor service structure, low access to nutrition, and inadequate infrastructure. This will impact the HDI, especially in the health sector (Ahyuni & Sutjipto, 2023).

Unequal health infrastructure is also a problem. Only some districts and cities in Papua Province have Regional General Hospitals (RSUD). In addition, Community Health Centers tend to be concentrated in urban areas, making operational costs and access to health services expensive for people in remote areas. Inadequate facilities, such as clean water and electricity supplies, hinder health services.

Over the last ten years, the development of education and health expenditure in Papua Province has fluctuated. Considering the huge influence of education and health spending on society, local governments need to continue increasing spending in these sectors. For this reason, local governments need to manage their spending to create the maximum impact on human development.

## CONCLUSION

This study examines how education and health spending affect the HDI in Papua Province. It covers the period 2013–2022, with observations from 29 districts and cities in Papua Province. The data analysis reveals that education and health spending have a significant impact on HDI at the same time. Other variables explained the remaining 85.38%, with education and health spending contributing 14.82%. Education spending has a partially positive but insignificant effect on HDI.  $P > |t|$  and the variable coefficients of education spending on HDI are 0.228 and 0.436162, respectively. This means that education spending has no significant effect on HDI. Health spending has a partially positive and significant effect on HDI.  $P > |t|$  and the variable coefficients of education spending on HDI are 0.000 and 2.309223, respectively. These imply that health spending has a significant impact on HDI.

## Recommendations

Local governments are advised to increase their commitment to education spending by 20% of the Local Budget excluding teacher salaries, and health spending by 10% of the Local Budget excluding salaries, to increase accessibility of basic public services and community welfare. In Papua Province, optimizing mandatory spending is important to catch up with basic service facilities and infrastructure. The central government is expected to monitor and evaluate the fulfillment of Local obligations, not only about the amount of spending but also about spending allocations that directly affect the community, as well as directing local spending to be more effective and efficient for maximum impact.

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