

THE EFFECT OF SPECIAL ALLOCATION FUNDS FOR HEALTH AND SANITATION ON UNDER-FIVE MORTALITY RATE IN ACEH PROVINCE, INDONESIA

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Abstract

Special allocation fund is one of the state budget allocations to assist certain regions in driving development, especially health development. One of the ways to measure health development is the under-five mortality rate. The under-five mortality rate in Aceh Province from 2010 to 2019 showed a downward trend but nationally it is ranked eighth out of 34 provinces in Indonesia. The purpose of this study is to estimate the effect of special allocation fund for health and sanitation on under-five mortality in Aceh Province. The data are time series data from 2010 to 2019 and cross section data are 23 districts/cities. The best model to analyze this research is Fixed Effects Model. The results showed that special allocation fund for sanitation and income per capita had a positive effect on under-five mortality because sanitation funds were not properly used, namely poor households and income per capita did not represent low-income residents. The results also showed that the special allocation fund for health, mean years of schooling, and number of midwives have a negative effect where any increase in these variables would reduce under-five mortality.

Keywords: Mortality rate, Health, Sanitation, Panel Model

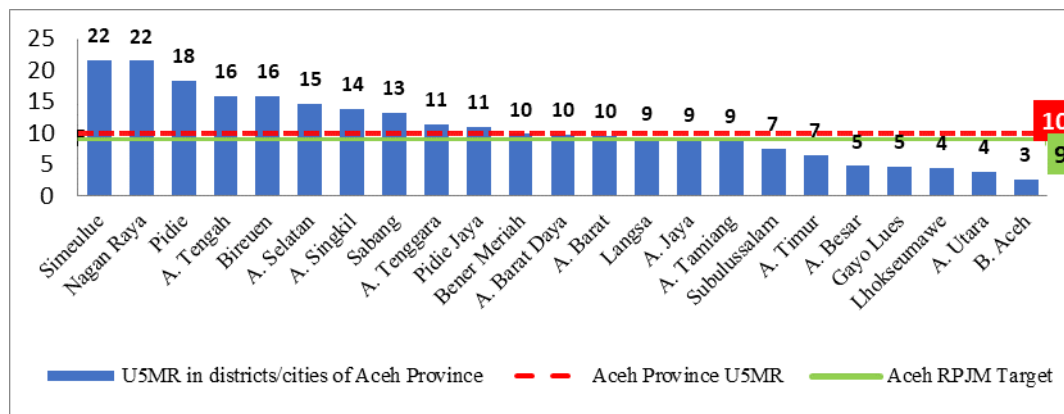
1. Introduction

1.1 Introduce the Problem

Health development is an effort to improve healthy human resources. One of the priorities focuses in health development for the next generation is to improve the health of pregnant women and children. Improving the health of pregnant women and children is very important to create a quality and competitive young generation. In turn, a competitive generation will contribute positively to the development of a region. The success in improving children's health can be seen from the under-five mortality rate indicator. World Bank data shows that the under-five mortality ratio in Indonesia shows a downward trend from 35.5 per 1000 live births in 2009 to 25 per 1000 live births (World Health Organization and UniCeF, 2010).

Based on data, it shows that the highest under-five mortality occurred in North Kalimantan, West Papua, and then in the third place in North Maluku. Aceh Province is the eighth highest under-five mortality, accounting for 995 cases. The under-five mortality rate in Aceh Province for the

last 5 years has shown a declining trend, in 2015 as many as 13 per 1000 live births, in 2016 as many as 12 per 1000 live births and from 2017 to 2019 it decreased to 10 deaths per 1000 live births. In this figure, Aceh Province Under-five Mortality Rate is still higher than the target of the Indonesian Ministry of Health in Strategic Plan of the Ministry of Health Republic of Indonesia 2015-2019 for Medium Term Development Plan target of 9 per 1000 live births.



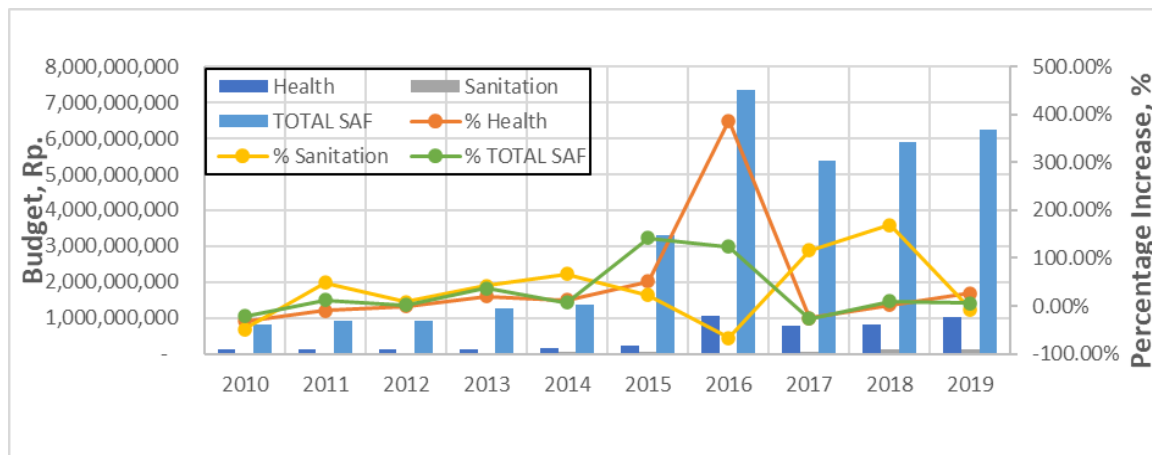
Source: Aceh Provincial Health Office (2020)

Figure 1. Aceh Province Under-five Mortality Rate in 2019

Figure 1 shows the variation in cases of under-five mortality in Aceh Province in 2019. Ten regions show under-five mortality per 1000 live births according to the RPJM target of ≤ 9 cases. Meanwhile, thirteen regions are still not in accordance with the RPJM target, even three regions namely Simeulue, Nagan Raya and Pidie show high cases. It explains that public investment in social services such as health and education are important determinants in increasing life expectancy coupled with increasing access to clean water and sanitation (Hlafa et.al., 2019) and the poor sanitation has an impact on children such as contracting diarrhea and can cause stunting as well as the total child deaths in the world, 45% of child deaths are caused by malnutrition (Waite et al., 2015).

This condition demands government authority in improving the degree of public health through fiscal policy. The government's role in the health sector can be seen from the provision of government expenditures to improve the quality and access of health services. The special allocation fund (SAF) is one of the government expenditures that plays a greater role in the provision of basic service facilities for the community, such as education, health and infrastructure. The SAF used include health funds and sanitation funds.

The SAF for health and sanitation in Aceh Province fluctuate. This fluctuation was caused by the budget allocation which was adjusted based on planning from the central government, however it can be said that the budget allocation had increased. This shows the government's commitment to improve people's welfare. The following is SAF for health and sanitation in Aceh Province for the last 10 years (Figure 2).



Source: Ministry of Finance, RI

Figure 2. Special Allocation Fund for Health and Sanitation in Aceh Province of 2010-2019

The government will strive to increase the SAF to improve maternal and child health services. The Aceh government program in the health sector is in line with one of the Sustainable Development Goals (SDGs) goals, namely improving maternal health and reducing child mortality. Health expenditure has a negative and significant effect on children's health in Sub-Saharan Africa (Ashiabi, 2013), and an increase in health expenditure will reduce under-five mortality, where an increase of 1 percent in total health expenditures will reduce the under-five mortality rate by 3.9 percent (Kilanko, 2019). However, different results explain that health expenditure does not have a significant effect on child mortality (Bokhari, et al., 2007). A strong relationship between sanitation and child mortality, where improved sanitation has contributed nearly 10% to the reduction in child mortality from 1990 to 2015 (Headey & Palloni, 2019). The sanitation independently contributes to child mortality, that is by increasing access to sanitation, child mortality can be reduced (Cheng et al., 2012), while different results show that their analysis cannot find evidence that supports the existence of a relationship between sanitation and child mortality (Abou-Ali, 2003).

The expenditure of SAF from 2010 to 2019 was not able to significantly reduce the under-five mortality rate, even stagnated from 2017 to 2019. Besides, there are still many districts/cities that have not been able to achieve the under-five mortality target in 2019. The purpose of this study is to determine the relationship and effect of the SAF for health and sanitation on under-five mortality rate in 23 districts/cities of Aceh Province.

1.2 Literature Review

1.2.1 Children's Health

Children health is carried out to prepare healthy and smart young generations and also to reduce child mortality. The degree of children's health is indicated by the neonatal mortality rate, infant mortality rate and under-five mortality rate. In the Aceh Health Profile 2019 explains that the neonatal mortality rate is the death that occurs before the baby is one month old or 29 days per 1,000 live births in the same year, while the infant mortality rate is a number that shows the

number of infant deaths aged 0-11 months from every 1,000 live births in a given year. Furthermore, the under-five mortality rate is the number of children who die before reaching the age of 5 years, expressed as a rate per 1,000 live births (Wulandari and Laksono, 2019). Efforts to maintain neonatal, infant and under-five mortality rates can be suppressed through government policies, namely government expenditures such as SAF for health and sanitation.

1.2.2 Filmer's Theory

Filmer's theory (Filmer and Pritchett, 1997) explains that the causes of child death are influenced by demand and supply factors. Household and individual characteristics such as education, income, parental knowledge and sanitation are part of the demand factors where if education, income, parental knowledge and sanitation are getting better, the child's health status will be better, this is indicated by a decrease in child mortality. When viewed from the supply factor, the cause of child mortality is government policy. The government policy is to provide government spending, one of which is in the form of a special allocation fund.

1.2.3 Special Allocation Fund (SAF)

SAF are funds that come from state budget and are allocated to certain regions to fund certain activities with national priorities. According to the Law of the Republic of Indonesia Number 33 of 2004 concerning the balance between the central government and local governments, it explains that the SAF are funds that come from state budget revenues allocated to certain regions with the aim of helping to fund special activities which are regional affairs and in accordance with national priorities. SAF are used for the construction, procurement, repair and improvement of facilities and infrastructure for basic public services to improve the welfare of the community.

1.2.4 Health Services for Children Under-Five Years

In the Aceh Health Profile 2019, health services for children under-five years are health services for children aged 0-59 months according to standards including health services for healthy children and health services for sick children. Health children services are growth and development monitoring services using Maternal and Child Health book and growth and development screening, including health services for infants aged 0-11 months, health services for children aged 12-23 months and health services for children aged 24-59 months. Meanwhile, health services for sick children under five are services for children under-five using an integrated management of childhood illness (Oktarina and Sugiharto, 2015).

2. Method

2.1 Sources and Types of Data

This study uses secondary data from 23 districts/cities in Aceh Province, using time series data from 2010-2019. The data obtained from government agencies, including the Ministry of Finance for data on special allocation funds, namely SAF for health and sanitation. Data on under-five mortality rates and the number of midwives were obtained from the Aceh Provincial health office and data on mean years of schooling and per capita income were obtained from the Central Statistics Agency.

2.2 Data Analysis Method

Data analysis method used in this research is panel data regression analysis. The common equation for the panel regression model is described (Asteriou & Stephen, 2011) as follows:

$$Y_{it} = \alpha + \beta X_{it} + u_{it} \quad (1)$$

In the fixed effect model the intercept varies between individuals but the individual intercept does not vary over time so that the equation of this model is as follows:

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + u_{it} \quad (2)$$

Meanwhile, the random effect model is used to estimate the disturbance variable may be interrelated between time and between individuals. The equation for this model is:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + (v_i + u_{it}) \quad (3)$$

Based on the common equation above, it is formulated for the model in this study as follows:

$$LU5MR_{it} = \alpha + \beta_1 LHEALT_{it} + \beta_2 LSAN_{it} + \beta_3 LMYS_{it} + \beta_4 LPCAP_{it} + \beta_5 LWIF_{it} + u_{it} \quad (4)$$

Description:

L = Logarithm

U5MR = Under-five mortality rate, namely the number of children who die before reaching the age of 5 per 1,000 live births in one year.

HEALT = Special allocation funds in the health sector, namely funds allocated for basic health services, referral health services in order to improve the public health status in units of billions of rupiah.

SAN = Special allocation fund in the sanitation sector, namely funds allocated for the development of sanitation services in units of billions of rupiah.

MYS = The mean years of schooling, namely the length of time to take formal education in units of years.

PCAP = Income per capita, namely the gross regional domestic product based on the prevailing prices for the total population in millions of rupiah

WIF = Midwife, namely a woman who has completed midwifery education to practice midwifery in individual units.

α = Constant; β = Coefficient; i = Place; t = Time; u = Error Term

Panel data regression model estimation can be done through three approaches, including: Common Effect Model is an approach that assumes that the intercept of all cross section objects is the same in various time periods, Fixed Effect Model assumes that there is an intercept

between individuals but the coefficient (slope) of the independent variable remain the same between individuals or over time, the Random Effect Model estimates panel data on disturbance variables that may be interrelated over time and between individuals.

To select the most appropriate model from the three models, the Chow Test, Hausman Test and Lagrange Multiplier Test is carried out. The Chow test to determine the most appropriate fixed effect or common effect model to use in estimating panel data, the Hausman Test to select whether the fixed effect or random effect model is most appropriate for panel data regression and the Lagrange Multiplier Test to determine whether a random effect model or common effect method is better used in estimating panel data.

2.3 Classic Assumption Test

Before the panel regression analysis was carried out, the feasibility test of the data was carried out, including the normality test, heteroscedasticity test and multicollinearity test (Asteriou & Stephen, 2011). The normality test is carried out by using the Jarque Bera test to see whether the probability is greater or less than 0.05, if the probability is greater than 0.05 then the data is normally distributed. Heteroscedasticity test is to keep the regression model from unequal variance from the residuals of one observation to another, if the probability value $> \alpha$ (0.05) then heteroscedasticity does not occur. The multicollinearity test aims to test whether there is a correlation between the independent variables, it is said that there is no multicollinearity if the correlation coefficient value is < 0.8 .

2.4 Hypothesis Testing

The t test basically shows how far the influence of one independent variable on the dependent variable by assuming the other independent variables are constant, if the probability of t is greater than 0.05, then there is no influence from the independent variable on the dependent variable. The F test shows whether all the independent variables included in the model have a simultaneous influence on the dependent variable, if the probability is greater than 0.05, then there is no influence from the independent variable on the dependent variable. The coefficient of determination (R^2) is a coefficient value that gives meaning as a contribution to the influence of the independent variable (X) on the dependent variable (Y) (Silvia, 2020 and Miller, 1995).

3. Results

3.1 Overview of Research Variables

Table 1 shows the growth of SAF in the health sector and SAF in the sanitation sector has increased from 2015 to 2019 at rate of 15.94% and 14.48%, respectively. The increase in SAF for the health and sanitation sector shows the seriousness of the government in improving the welfare of the community, especially in the health sector.

Table 1. Growth of Mean Years of Schooling, Income Per Capita, Number of Midwives, Special Allocation Funds for Health and Sanitation in Aceh Province 2015-2019

Years	SAF for Health	SAF for Sanitation	MYS	Income per Capita	Midwives
2015	125,412,634	65,154,280	8.77	25,808	10,366
2016	125,489,816	65,809,165	8.86	26,852	9,837
2017	168,328,310	70,796,394	8.98	28,097	10,948
2018	218,064,713	103,178,054	9.09	29,521	10,865
2019	226,572,371	111,924,676	9.18	30,571	10,873
Growth Rate (%)	15.94	14.48	1.15	4.33	1.20

Source: Directorate General of Fiscal Balance, Aceh Provincial Health Office, Central Statistic Agency.

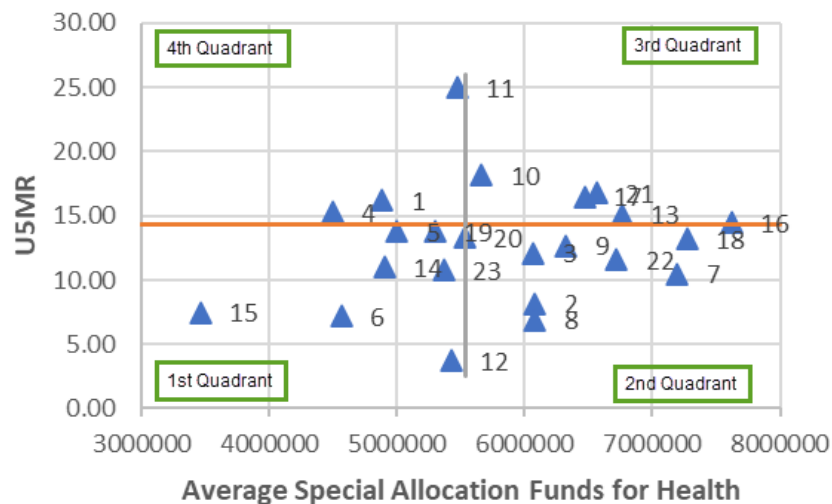
The mean years of schooling in Aceh Province for 2015-2019 is still low at junior high school education level at rate of 1.15% p.a., where in 2015, it reached 2nd year of junior high school while in 2019, it reached 3rd year of junior high school. Income per Capita from 2015 - 2019 has increased at rate of 4.33% p.a. The number of midwives fluctuated from 2015-2019 with a growth at rate of 1.2% p.a but it can be concluded that the number of midwives has exceeded the required number. This can be seen from the ratio of midwives in 2019, which is 202 midwives per 100,000 population, while the national target is 100 people per 100,000 population.

3.2 The Relationship Between Special Allocation Fund for the Health Sector and U5MR

Figure 3 describes the relationship between the special allocation funds for health and under-five mortality rate in 23 districts/cities in Aceh Province. The horizontal line shows the average of SAF for health from 2010 to 2019 and the vertical line shows the average under-five mortality rate from 2010 to 2019. This graph consists of 4 quadrants where the 1st Quadrant shows areas with a low average SAF for health and a low average under-five mortality rate, the 2nd Quadrant shows areas with high average SAF for health and a low average under-five mortality rate. Furthermore, the 3rd Quadrant shows the regions with a high average SAF for health and a high average under-five mortality rate. Finally, the 4th Quadrant shows the regions with a low average SAF for health and a high average under-five mortality rate.

In the 1st Quadrant, there are eight regions with low SAF for health and low under-five mortality rate, namely Central Aceh, Southeast Aceh, Banda Aceh, Langsa, Lhokseumawe, Gayo Lues, Aceh Tamiang and Subulussalam. This condition shows that these regions have a good capacity in managing SAF in the health sector so that under-five mortality rate is low. The special allocation fund for health is closely related to under-five mortality because this fund aims to improve public health, especially the health of children under five. In the 2nd Quadrant there are seven regions with high SAF for health and low under-five mortality rate, namely Aceh Besar,

Aceh Selatan, Aceh Timur, Aceh Utara, Bireuen, Aceh Barat Daya and Pidie Jaya. It can be concluded that budget management in these areas is good so that under-five mortality rate can be decreased.



Description:

- 1. Aceh Barat 2. Aceh Besar 3. Aceh Selatan 4. Aceh Singkil
- 5. Aceh Tengah 6. Aceh Tenggara 7. Aceh Timur 8. Aceh Utara
- 9. Bireuen 10. Pidie 11. Simeulue 12. Banda Aceh
- 13. Sabang 14. Langsa 15. Lhokseumawe 16. Nagan Raya
- 17. Aceh Jaya 18. Aceh Barat Daya 19. Gayo Lues 20. Aceh Tamiang
- 21. Bener Meriah 22. Pidie Jaya 23. Subulussalam

Source: Ministry of Finance and Health Office Aceh 2010-2019 (processed)

Figure 3. The Relationship Between Special Allocation Fund for the Health Sector and U5MR

In the 3rd Quadrant, there are five regions with high SAF for health and high under-five mortality rate, namely Pidie, Sabang, Nagan Raya, Aceh Jaya and Bener Meriah. The condition of these regions shows the inability to manage SAF in health sector to reduce under-five mortality rate so that under-five mortality rate is still high. The 4th Quadrant, there are three regions with low SAF for health and high under-five mortality rate, namely West Aceh, Aceh Singkil, Simeulue, this shows that these regions need high allocation funds for health sector to reduce under-five mortality rate.

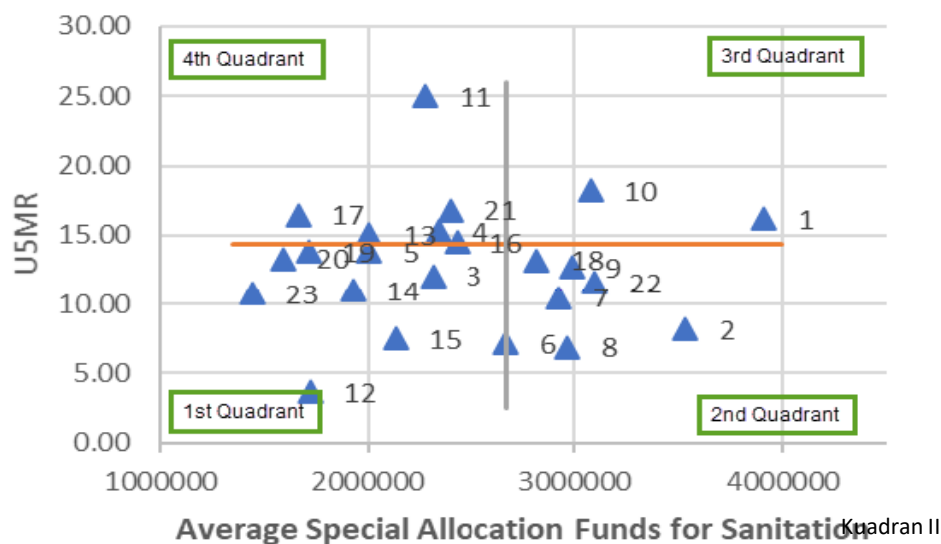
3.3 The Relationship Between Allocation Fund for Sanitation Sector and U5MR

Figure 4 illustrates the relationship between allocation funds for sanitation and under-five mortality rate in 23 districts/cities in Aceh Province. The horizontal line shows the average allocation for sanitation sector from 2010 to 2019 and the vertical line shows the average under-five mortality rate from 2010 to 2019. This graph consists of 4 quadrants where the 1st Quadrant shows areas with a low average special allocation fund for sanitation and a low average of under-five mortality rate. The 2nd Quadrant shows the regions with a high average allocation fund for sanitation and a low average under-five mortality rate. Furthermore, the 3rd Quadrant shows the

regions with a high average allocation funds for sanitation and a high average under-five mortality rate. Finally, the 4th Quadrant shows the regions with low average allocation funds for sanitation health and a high average under-five mortality rate.

In the 1st quadrant, there are nine regions with low allocation funds for sanitation and low under-five mortality rate, namely South Aceh, Central Aceh, Southeast Aceh, Banda Aceh, Langsa, Lhokseumawe, Gayo Lues, Aceh Tamiang and Subulussalam. This condition shows that the region has a good capacity in managing the SAF in the sanitation sector so that under-five mortality rate is low. In the 2nd Quadrant there are six regions with high allocation funds for sanitation but low under-five mortality rate, namely Aceh Besar, Aceh Timur, Aceh Utara, Bireuen, Aceh Barat Daya and Pidie Jaya. It can be concluded that budget management in these areas is good so that it can reduce under-five mortality rate.

In the 3rd Quadrant, there are two regions with high allocation funds for sanitation and high under-five mortality rate, namely West Aceh and Pidie. The conditions in these two regions show the inability to manage the SAF in sanitation sector to reduce under-five mortality rate so that under-five mortality rate is still high. In the 4th Quadrant, there are six regions with low allocation funds for low sanitation and high under-five mortality rate, namely Aceh Singkil, Simeulue, Sabang, Nagan Raya, Aceh Jaya and Bener Meriah, this shows that these regions need more allocation fund for sanitation to lower under-five mortality rate.



Description:

1. Aceh Barat 2. Aceh Besar 3. Aceh Selatan 4. Aceh Singkil
5. Aceh Tengah 6. Aceh Tenggara 7. Aceh Timur 8. Aceh Utara
9. Bireuen 10. Pidie 11. Simeulue 12. Banda Aceh
13. Sabang 14. Langsa 15. Lhokseumawe 16. Nagan Raya
17. Aceh Jaya 18. Aceh Barat Daya 19. Gayo Lues 20. Aceh Tamiang
21. Bener Meriah 22. Pidie Jaya 23. Subulussalam

Source: Ministry of Finance and Health Office Aceh 2010-2019 (processed)

Figure 4. The Relationship Between the Special Allocation Fund for the Sanitation Sector and U5MR

3.4 Testing the Panel Regression Model for Under-Five Mortality Rates

The panel regression model for the under-five mortality rate obtained through three approaches, namely the Common Effect Model, Fixed Effect Model and Random Effect Model which were processed using eviews 10. The regression results are shown in Table 2.

Table 2. Panel Regression Estimation Common Effect Model, Fixed Effect Model and Random Effect Model

<i>Common Effect Model</i>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.920324	1.199648	5.768628	0.0000
LHEALT	-0.111895	0.075703	-1.478074	0.1408
LSAN	0.173759	0.056428	3.079282	0.0023
LMYS	-1.224329	0.292193	-4.190135	0.0000
LPCAP	-0.156937	0.105391	-1.489094	0.1379
LWIF	-0.182168	0.048976	-3.719543	0.0003
<i>Fixed Effect Model</i>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.538662	0.887073	7.371053	0.0000
LHEALT	-0.134228	0.042615	-3.149787	0.0019
LSAN	0.092636	0.037233	2.487997	0.0137
LMYS	-3.411864	0.669002	-5.099935	0.0000
LPCAP	0.493257	0.104786	4.707302	0.0000
LWIF	-0.166552	0.056389	-2.953629	0.0035
<i>Random Effect Model</i>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.216441	1.093010	5.687451	0.0000
LHEALT	-0.180725	0.056471	-3.200326	0.0016
LSAN	0.096385	0.048476	1.988293	0.0480
LMYS	-2.391360	0.524343	-4.560683	0.0000
LPCAP	0.376060	0.125207	3.003512	0.0030
LWIF	-0.172666	0.065219	-2.647491	0.0087

Source: Data Processing Results, 2021 (processed)

Table 2 shows that the FEM and REM models provide the same estimation results, namely that all independent variables are significant because the probability value is <0.05. Of the five independent variables, there are three variables that are in line with the theory, namely the SAF variable in the health sector, the mean years of schooling, and the number of midwives. Meanwhile, the SAF variables in the sanitation sector and the Gross Regional Domestic Per Capita Income are not in line with the theory which states that if the SAF in the sanitation sector and the Gross Regional Domestic Product Per Capita increase, the under-five mortality will increase. The estimation results of the CEM model show that there are three significant

independent variables, namely SAF in the sanitation sector, the mean years of schooling, and the number of midwives. Two of these variables, namely the mean years of schooling and the number of midwives, show results that are consistent with theory, while the SAF in the sanitation sector is not in line with the theory. In theory, it is because if the SAF in the sanitation sector increases, the under-five mortality will also increase. From the estimation results of the CEM model, there are also two independent variables that are not significant, namely SAF in the health sector and Gross Regional Domestic Product Per Capita.

Selecting the most appropriate model from the three panel regression models is done by using Chow Test, Hausman Test and Lagrange Multiplier Test.

Table 3. Chow Test and Hausman Test Results

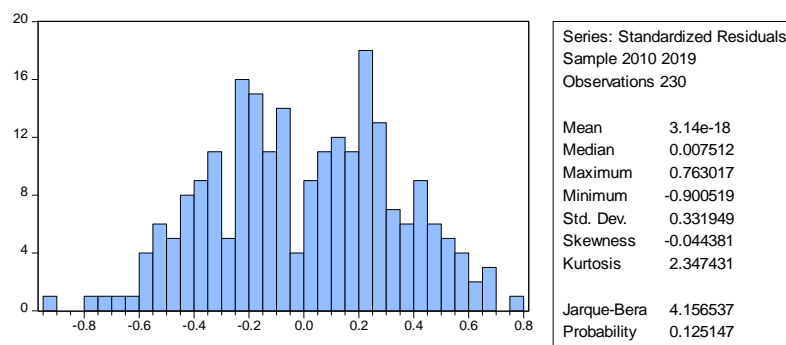
Test	Statistic	d.f.	Prob	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Chow	19.1463 15	(22,20 2)	0.000 0	-	-	-
Hausman	-	-	-	13.987561	5	0.015 7

Source: Data Processing Results, 2021 (processed)

The Chow test results show that the Fixed Effect Model is the chosen model because the cross section prob value $F < \alpha$ (0.05) is 0.0000. The Hausman test results also show that the Fixed Effect Model is the best model because the Chi-Square prob value $< \alpha$ (0.05) is 0.0157. Because the Chow test and Hausman test have the same results, there is no need to do the Lagrange Multiplier test.

3.5 Classic Assumption Test

The classical assumption tests carried out in this study were the normality test, heteroscedasticity test and multicollinearity test. The normality test is shown in Figure 5.



Source: Data Processing Results, 2021 (processed)

Figure 5. Normality Test

The results of the normality test obtained Jarque Bera probability value of 0.125147 greater than 0.05, so it can be concluded that the data in this study were normally distributed. The

heteroscedasticity test is shown in Table 4. The heteroscedasticity test shows that the probability value of five independent variables in this study is > 0.05, which means that there is no heteroscedasticity. The multicollinearity test is shown in Table 5.

Table 4. Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LHEALT	0.257582	0.138153	1.864464	0.0637
LSAN	0.073699	0.115150	0.640023	0.5229
LMYS	-1.954565	2.034218	-0.960843	0.3378
LPCAP	0.154792	0.309521	0.500102	0.6175
LWIF	0.150311	0.188781	0.796220	0.4268

Source: Data Processing Results, 2021 (processed)

Table 5. Multicollinearity Test

	LHEALT	LSAN	LMYS	LPCAP	LWIF
LHEALT	1	0.471584	0.099355	0.205433	0.053018
LSAN	0.471584	1	0.255297	0.435805	0.168563
LMYS	0.099355	0.255297	1	0.631860	-0.108952
LPCAP	0.205433	0.435805	0.631860	1	0.009564
LWIF	0.053018	0.168563	-0.108952	0.009564	1

Source: Data Processing Results, 2021 (processed)

The correlation coefficient value of each independent variable in this study is < 0.8, which means there is no multicollinearity.

3.6 Panel Regression Analysis for Under-Five Mortality Rate Model

Table 6. Estimation Results of Under-Five Mortality Rate Model Panel Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.538662	0.887073	7.371053	0.0000
LHEALT	-0.134228	0.042615	-3.149787	0.0019
LSAN	0.092636	0.037233	2.487997	0.0137
LMYS	-3.411864	0.669002	-5.099935	0.0000
LPCAP	0.493257	0.104786	4.707302	0.0000
LWIF	-0.166552	0.056389	-2.953629	0.0035
R-squared	0.715871	F-statistic	18.84984	
Adjusted R-squared	0.677894	Prob(F-statistic)	0.000000	

Source: Data Processing Results, 2021 (processed)

Table 6 shows the results of the Fixed Effect Model regression in which simultaneously SAF for health, SAF for sanitation, mean years of schooling, income per capita and the number of

midwives have a significant effect on under-five mortality, where the probability value F of 0.00000 which is smaller than 0.05. Table 6 shows that the coefficient of determination (R^2) is 67.78 percent, which means that SAF for health, SAF for sanitation, mean years of schooling, income per capita and the number of midwives is able to explain the under-five mortality rate of 67.78 percent, while the rest of 32.22 percent is explained by variables outside of this study.

To examine the effect of the independent variable on the dependent variable is by analyzing each parameter coefficient of the independent variable. The SAF for health have a negative coefficient value of 0.134, this indicates that allocation funds for health have a negative effect where each increase in SAF for health by 1 percent will reduce the under-five mortality rate by 0.134 percent with a probability of 0.0019 or a significance of 98 percent. The SAF for sanitation has a coefficient value of 0.092 which indicates that the SAF for sanitation has a positive effect, where each 1 percent increase in the SAF for sanitation will increase the under-five mortality rate by 0.092 percent with a probability of 0.0137 or a significance of 98 percent. The mean years of schooling has a coefficient value of -3.412 which indicates that the mean years school has a negative effect where each 1 percent increase in the mean years of schooling will reduce the under-five mortality rate by 3.412 percent with a probability of 0.0000 or a significance of 100 percent. Income per capita has a coefficient value of 0.493 which shows that it has a positive effect where any increase in income per capita of 1 percent will increase under-five mortality by 0.493 percent with a probability of 0.0000 or a significance of 100 percent. The number of midwives has a coefficient value of -0.166 which indicates that the number of midwives has a negative effect where any increase of midwives of 1 percent will reduce the under-five mortality rate by 0.166 percent with a probability value of 0.0035 or a significance of 99 percent.

4. Discussion

The results showed that the SAF for health has a negative and significant effect on under-five mortality rate because the SAF allocation in the health sector has been right on target, namely for the construction of PUSKESMAS (public health centers) and the provision of other health facilities. The number of PUSKESMAS in Aceh province (2018-2019) has increased from 348 to 359 PUSKESMAS. The results of this study are in line with research that health expenditure has a negative and significant effect on children's health in Sub-Saharan Africa (Ashiabi, 2013). The same research results were also obtained which explained that an increase in health expenditure would reduce the under-five mortality rate, where 1 percent increase in total health expenditure would reduce the under-five mortality rate by 3.9 percent (Kilanko, 2019).

The SAF for sanitation has a positive effect on under-five mortality because the government has not succeeded in realizing access to proper sanitation for the people of Aceh, this can be seen from the achievement of access to proper sanitation in Aceh Province in 2019 by 78 percent while the 2015-2019 Medium Term National Development Plan target is 100 percent. This is in line with the results of children under five in Nigeria with improper sanitation facilities can increase the risk of child mortality (Ezeh et al., 2014). In addition, SAF in the sanitation sector is not directed at individual activities such as educational activities or outreach activities to promote attitude towards clean and healthy living habits. For example, the habit of washing hands before eating and after defecating is in order to reduce the risk of spreading the disease to toddlers. In 2019, diseases caused by poor sanitation include diarrhea, which is 4.2 percent of the

cases of under-five deaths in Aceh Province. These results are in line with the results of publications from other studies (Semba, et al., 2011).

The mean years of schooling has a negative and significant effect on under-five mortality rate. This is in line with the other research that a significant reduction in under-five mortality was reported in children born to mothers with higher levels of education (Yaya et al., 2018 and Van Malderen et al., 2019). The level of education can influence a person to behave and think in providing nutritious food intake for toddlers. Low level of education indicates the quality of human capital is still low (Sartiyah & Suriani, 2020), it can influence on thinking patterns in community especially on personal and family health.

Income per capita have a positive and significant effect on under-five mortality rate. This is because income per capita does not represent low-income residents. The under-five mortality cases mostly occurred in people with low income. Low income causes people to ignore the quality of the nutritional content of food (French, et al, 2019), which causes malnutrition for under-five child and will affect children's health on the next stage (Dean, 2017).

The number of midwives has a coefficient value of -0.166 which indicates that the number of midwives has a negative effect where any increase of midwives of 1 percent will reduce the under-five mortality rate by 0.166 percent with a probability value of 0.0035 or a significance of 99 percent. This is also found in other research (Liang et al., 2019 and Wang et al., 2016) that the addition of one health worker can reduce children under-five mortality rate. Based on data from the Aceh health office, the number of midwives in Aceh Province in 2019 was 10,873 with a ratio of 202 midwives per 100,000 population. This ratio exceeds that of the national target ratio of 100 per 100,000 population so that this can provide services that comply with public health standards and have an impact on reducing the mortality rate for under-five children in Aceh Province.

5. Conclusion and Suggestion

5.1 Conclusion

Simultaneously, SAF for health and sanitation, the mean yeras school, income per capita and the number of midwives have a significant effect on under-five mortality. Partially SAF for sanitation and income per capita have a positive and significant effect on under-five mortality rate, means that SAF for sanitation and income per capita is not able to reduce under-five mortality rate because SAF for sanitation has not been properly used to reduce under-five mortality rate, while the income per capita does not represent low-income people. SAF for health, the mean yeras school, and the number of midwives have a negative and significant effect on under-five mortality rate, this is in accordance with the theory where SAF for health, the mean yeras school, and the number of midwives is able to reduce under-five mortality.

5.2 Suggestion

The government should allocate funds in the sanitation sector for individual activities such as educational activities or activities to promote a clean and healthy lifestyle. Besides, the use of the budget is expected to be more effective and efficient so that low-income people get adequate health services so that under-five mortality rate declines. For further research, it is advisable to

conduct direct research to households that have cases of under-five mortality in order to obtain more realistic results.

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