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AN IMPACT OF SPECIAL HEALTH ALLOCATION FUNDS ON THE HEALTH LEVEL OF COMMUNITIES IN UNDERDEVELOPED AREAS IN INDONESIA

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ABSTRACT

This study aims to analyze the impact of the allocation of the Special Allocation Fund Of Health on the health status of communities in underdeveloped regions of Indonesia during the period 2019–2023. The research focuses on three key indicators of health status: the Maternal Mortality Rate (MMR), the Infant Mortality Rate (IMR), and the Life Expectancy Rate (LER). The method used is quantitative with a panel data approach on 62 underdeveloped districts based on Presidential Regulation No. 63 of 2020. Secondary data were obtained from regional financial reports, health performance reports, and statistical data from the Central Statistics Agency (BPS) and related ministries. The analysis was conducted using panel data regression with the Chow, Hausman, and Lagrange Multiplier tests. The results of the study indicate that the allocation of Special Allocation Fund of Health has a significant effect in reducing MMR and IMR and increasing HLE. These findings suggest that fiscal policy through Special Allocation Fund of Health contributes positively to improving access, service quality, and health infrastructure in underdeveloped regions. The study recommends that Special Allocation Fund of Health be directed more strategically and accompanied by monitoring and evaluation based on local needs to support the achievement of the Sustainable Development Goals (SDGs) in the health sector.

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INTRODUCTION

Improving public health is a key goal of national development, particularly in disadvantaged areas that continue to face limitations in access to and quality of health services. The Indonesian government has responded to this challenge through the Special Allocation Fund Of Health policy as part of its fiscal instruments to fund the development of health service infrastructure and operations in areas with high needs. Although the Special Allocation Fund of Health budget has seen a significant increase in recent years, disparities in health indicators such as the Maternal Mortality Rate (MMR), Infant Mortality Rate (IMR), and Life Expectancy (LE) remain serious issues in various underdeveloped regions.

This phenomenon can be explained through health economics theory and the concept of social determinants of health, which emphasize the importance of service accessibility, infrastructure availability, and government intervention in improving community health status. Andersen and Newman's (1973) theory explains that predisposing, enabling, and medical need factors are the main determinants of health service utilization. Meanwhile, the concept of social determinants, as proposed by Marmot and Wilkinson (2006), emphasizes the substantial impact of social and economic conditions on individual and community health.

However, there is a gap between theory and practice. Some studies indicate that increased budget allocation or infrastructure improvements do not always correlate directly with improvements in health indicators. For example, the construction of health facilities does not necessarily lead to improved service quality or adequate availability of medical personnel. Methodological gaps are also evident in the limited number of quantitative panel data studies that specifically analyze the impact of the Health Special Allocation Fund on infant mortality, child mortality, and maternal mortality in disadvantaged areas over the most recent period.

Building on this phenomenon, this study aims to analyze the impact of Health Special Allocation Fund allocations on community health levels in 62 underdeveloped districts in Indonesia during the period 2019–2023. The indicators used include MMR, IMR, and LER as representations of the degree of public health. Using a quantitative approach and a panel data regression model, this study seeks to fill the existing empirical gap and provide scientific evidence regarding the effectiveness of fiscal policies in the health sector.

The contribution of this research is not only theoretical in enriching the literature on the relationship between fiscal allocation and public health but also practical in providing insights for policymakers in designing more targeted and impactful health budget distribution strategies, particularly to support the achievement of Sustainable Development Goals (SDGs) in the health sector.

LITERATURE REVIEW

Theoretical Framework

This study employs health economics theory and the concept of social determinants of health as the main framework to explain the relationship between fiscal policy and public health outcomes. Andersen and Newman (1973) argue that access to health services is influenced by predisposing, enabling, and medical need factors, all of which

are particularly relevant in assessing healthcare accessibility in disadvantaged areas (Andersen & Newman, 1973). Additionally, Marmot and Wilkinson (2006) emphasize the significant role of socioeconomic and environmental factors as key determinants of public health status (Marmot & Wilkinson, 2020).

Meanwhile, Arrow (1963) highlights the inherent uncertainty in healthcare provision and the imperfections of the health market, which further reinforce the necessity of government intervention through fiscal instruments such as the Special Allocation Fund (Arrow, 1963). Collectively, these theories suggest that well-designed fiscal policies can enhance access to and the quality of healthcare services, thereby contributing to the reduction of mortality rates.

Previous Empirical Studies

A number of previous studies have investigated the impact of health sector spending on public health indicators. (Owusu et al., 2021) found that increased public health expenditure significantly reduces maternal and infant mortality rates in low- and middle-income countries. Similarly, (Wowor, 2015) revealed that regional health spending in North Sulawesi positively contributed to an increase in life expectancy.

Research by (Sulaeman and Andriyanto, 2021) reported that Special Allocation Fund of Health and small and medium enterprises had a positive impact on the Human Development Index (HDI). In related study, (Maysaroh and Arif, 2022) also found that physical Special Allocation Fund of Health contributes to improvements in both HDI and regional economic growth.A study by (Patadang et al., 2021) showed that increases in Special Allocation Fund of Health have a direct effect on reducing maternal and infant mortality through the development of basic healthcare infrastructure.

(Lestari et al., 2019) emphasized the importance of equitable Special Allocation Fund of Health distribution in reducing regional health disparities. This finding is supported by (Simanjuntak et al., 2024), who observed that increased Special Allocation Fund of Health budgets significantly improved healthcare access and had a positive impact on life expectancy (LE). However, studies by (Buana, 2022) and (Marheni and Triyanto, 2023) caution that infrastructure improvements alone do not necessarily lead to better health outcomes unless accompanied by adequate service quality and sufficient medical human resources.

Relationship Between Variables and Hypothesis Development

Drawing from the theoretical and empirical literature, this study posits a positive relationship between the allocation of Special Allocation Funds Of Health and public health outcomes. Adequate Special Allocation Fund of Health are expected to reduce the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR), as well as increase Life Expectancy (LE). Accordingly, the hypotheses proposed in this study are as follows:

1. **H1**: Special Allocation Funds Of Health have a negative effect on the Maternal Mortality Rate (MMR).
2. **H2**: Special Allocation Funds Of Health have a negative effect on the Infant Mortality Rate (IMR).

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3. **H3**: Special Allocation Funds Of Health have a positive effect on Life Expectancy (LE).

RESEARCH METHOD

This study uses a quantitative approach, which uses numerical data to analyze the relationship between fiscal allocation in the health sector and public health indicators. The quantitative approach allows for systematic hypothesis testing through statistical analysis (Kasiram, 2008; Hermawan, 2018).

The unit of analysis in this study includes 62 districts/cities categorized as disadvantaged areas based on Presidential Regulation No. 63 of 2020. These areas have diverse geographical, social, and economic characteristics and face complex development challenges.

The data used is secondary panel data obtained from official reports published between 2019 and 2023. The data includes:

1. Financial Reports and Management of Special Allocation Fund of Health, sourced from local government and relevant ministry publications, containing information on the amount, distribution, and use of Special Allocation Funds for the health sector.
2. Regional Health Performance Reports, which include data on improvements in health facilities, service availability, and accessibility of health services.
3. Regulatory and Policy Documents, such as national regulations governing the distribution and use of Special Allocation Fund of Health infrastructure development.
4. Health Statistics Data, including maternal mortality rates (MMR), infant mortality rates (IMR), and life expectancy rates (LE), published by BPS and other health institutions.

The sample determination in this study uses a census approach, involving all underdeveloped regions as defined in the regulations. The variables in this study include:

1. Independent variables: Special Allocation Funds of Health
2. Dependent variables: Maternal Mortality Rate (MMR), Infant Mortality Rate (IMR), and Life Expectancy (LE)
3. Control variables: Health services, health infrastructure, and nutrition

The analysis method used is panel data regression. This approach provides a more comprehensive picture of the behavior of the analysis unit over a specific period of time. Data transformation into logarithms is carried out because the data has a large scale and the units between variables are different, so logarithms help to smooth the relationship pattern between variables and interpret the coefficients as elasticity (0 to 1), thus making it easier to interpret the relationship between variables and the regression results are more stable. The multiple linear regression model used is formulated as follows:

$$LogY1it = a1 + \beta 1 LogXit + \beta 2 LogK1it + \beta 3 K2it + \beta 4 K3it + eit$$

$$LogY2it = a2 + \lambda 1 LogXit + \lambda 2 LogK1it + \lambda 3 LogK2it + \lambda 4 LogK3it + eit$$

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$$LogY3it = a3 + \Phi 1 LogXit + \Phi 2 LogK1it + \Phi 3 LogK2it + \Phi 4 LogK3it + eit$$

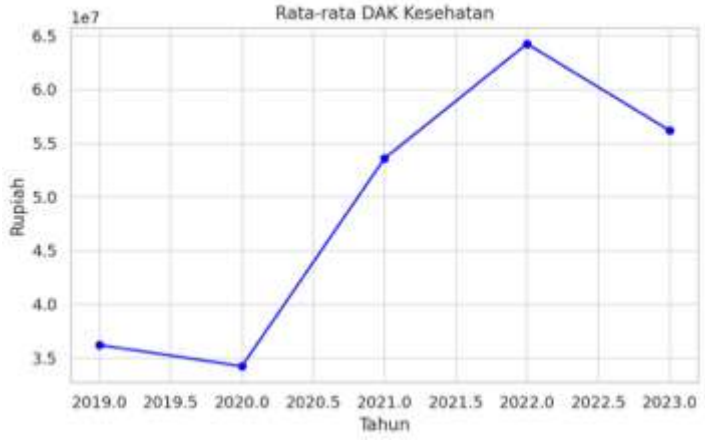
Where:
Y1 = MMR, Y2 = IMR, Y3 = LER
X = Special Allocation Fund of Health
K1 = Health services, K2 = Health infrastructure, K3 = Nutrition
i = district/city, t = year, e = error term
$a1, a2, a3$ = Constants
$\beta 1, \beta 2, \beta 3, \beta 4, \beta 5$ = Regression coefficients for Y1
$\lambda 1, \lambda 2, \lambda 3, \lambda 4, \lambda 5$ = Regression coefficients for Y2
$\Phi 1, \Phi 2, \Phi 3, \Phi 4, \Phi 5$ = Regression coefficients for Y3

Model estimation was performed using three common methods in panel data analysis: Pooled Least Squares (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM). The best model selection was performed using the Chow test, Hausman test, and Lagrange Multiplier (LM) test, followed by classical assumption tests, including multicollinearity and heteroscedasticity tests.

To assess the statistical significance and explanatory power of the model, this study conducted an F test (simultaneous), a t test (partial), and evaluated the coefficient of determination (R-squared).

RESEARCH RESULTS AND DISCUSSION

This study was conducted in 62 districts/cities categorized as disadvantaged areas based on Presidential Regulation No. 63 of 2020 concerning the Determination of Disadvantaged Areas for 2020–2024. Underdeveloped regions are spread across several provinces, such as Papua, West Papua, East Nusa Tenggara, West Sulawesi, and Maluku. These areas have challenging geographical characteristics, limited infrastructure, low quality of public services, and relatively high poverty rates compared to other regions in Indonesia.



Source: Data Processing Results, 2025

Pict 1. Average Special Allocation Fund for Health in Underdeveloped Areas 2019-2023

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Additionally, underdeveloped regions tend to have significant gaps in health indicators, such as high Maternal Mortality Rates (MMR), Infant Mortality Rates (IMR), and low Life Expectancy Rates (LER). Therefore, interventions through the Health Special Allocation Fund are crucial in driving improvements in public health quality in these regions.

This study aims to analyze the impact of the Special Allocation Fund of Health on three key public health indicators, namely the Maternal Mortality Rate (MMR), Infant Mortality Rate (IMR), and Life Expectancy (LE) in 62 districts/cities classified as underdeveloped areas during the period 2019–2023. The approach used in this study is a quantitative approach with a multiple linear regression method based on panel data, which allows for the observation of data developments over time and across regions.

Before conducting the main regression analysis, the researchers first conducted tests to determine the most appropriate panel data estimation model. The three models tested were the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The Chow test results indicated that CEM was more appropriate than FEM, while the Hausman test indicated that REM was more appropriate than FEM. Furthermore, the Lagrange Multiplier (LM) test showed that REM was more appropriate than CEM.

However, after considering aspects of data stability, normality assumptions, and model statistical validity, the Common Effect Model (CEM) was selected as the best model for regression analysis. This model was chosen because it did not exhibit multicollinearity or heteroscedasticity, and it provided the most stable and consistent estimation results among the three models tested.

Model 1: The Effect of Special Allocation Funds Of Health On MMR

Table 1. Results of Hypothesis Testing for Regression Model 1

Variabel	Koefisien	Std. Error	t-Statistic	Prob.	Conclusion
C	0.152540	0.024012	6.352644	0.0000	Significant
Log Special Allocation Fund of Health	-0.138620	0.064826	-2.13833	0.0333	Significant
LogK1	0.239964	0.056396	4.25498	0.0000	Significant
LogK2	0.156977	0.062601	2.50757	0.0127	Significant
LogK3	0.079092	0.058380	1.354796	0.1765	Not Significant

Source: data, 2025

The regression results show that if all variables are zero, the base value of the MMR is estimated to be 0.152540 (in log). Special Allocation Funds for Health have a negative and significant effect on the Maternal Mortality Rate (MMR). This means that the greater the Special Allocation Funds Of Health, the lower the MMR will be. Each 1% increase in Special Allocation Fund of Health is estimated to reduce the MMR by 0.14%.

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However, health services and health infrastructure have a positive and significant effect on the MMR. This means that an increase in these two variables is actually followed by an increase in the MMR, possibly because the services and infrastructure are not yet functioning effectively. Meanwhile, the nutrition variable does not have a significant effect on the MMR in this model.

Model 2: The Effect of Special Allocation Funds Of Health On IMR

The model shows that if all variables are zero, the base value of the IMR log is 1.956. Special Allocation Fund of Health has a negative and significant effect on the Infant Mortality Rate (IMR), meaning that the greater the Special Allocation Fund of Health, the lower the IMR. Every 1% increase in Special Allocation Fund of Health is estimated to reduce the IMR by 0.15%. Conversely, health services and health infrastructure have a positive and significant effect. This means that improvements in both are associated with an increase in the IMR, possibly because their quality or distribution is not yet equitable. Meanwhile, nutrition does not show a significant effect on the IMR in this model.

Table 2. Results of Hypothesis Testing for Regression Model 2

Variable	Koefisien	Std. Error	t-Statistic	Prob.	Conclusion
C	1.95601	0.024933	7.845106	0.0000	Significant
Log Special Allocation Fund of Health	-0.14932	0.067312	-2.21838	0.0273	Significant
LogK1	0.127403	0.058559	2.175658	0.0303	Significant
LogK2	0.140946	0.065002	2.16835	0.0309	Significant
LogK3	0.034714	0.060618	0.572671	0.5673	Not Significant

Source: data, 2025

Model 3: The Effect of Special Allocation Funds Of Health On LER

If all variables are zero, then the log of life expectancy is estimated to be 0.740. Special Allocation Fund of Health has a positive and significant effect on life expectancy, meaning that the greater the Special Allocation Fund of Health, the higher the life expectancy. A 1% increase in Special Allocation Fund of Health is estimated to increase life expectancy by 0.15%. Health and nutrition infrastructure also have a positive and significant effect, indicating that both are crucial in improving life expectancy. Conversely, health services do not show a significant effect, meaning that an increase in the number of services does not necessarily have a direct impact on life expectancy.

The overall results of the study support the initial hypothesis and reinforce previous theories and findings. The three regression models analyzed show that the Special Allocation Fund Of Health is effective in reducing the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR), as well as increasing the Life Expectancy Rate (LER)

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in disadvantaged areas. These findings indicate that fiscal interventions through the Special Allocation Fund of Health can make a real contribution to improving public health.

The decline in MMR and IMR reflects increased access to maternal and child health services. This is in line with research conducted by (Owusu et al., 2021) and (Patadang et al., 2021), who found that government spending in the health sector has a direct impact on reducing mortality rates. Meanwhile, the increase in LER shows that fiscal investment in the health sector has a long-term impact on the quality of life of the community. This finding reinforces the results of research by (Wowor, 2015) and (Simanjuntak et al., 2024), which states that local government spending in the health sector can encourage an increase in life expectancy.

Table 3. Results of Hypothesis Testing for Regression Model 3

Variable	Koefisien	Std. Error	t-Statistic	Prob.	Conclusion
C	0.74048	0.247382	2.99327	0.003	Significant
Log Special Allocation Fund of Health	0.146014	0.067014	2.178847	0.0301	Significant
LogK1	0.026702	0.058299	0.458013	0.6473	Not Significant
LogK2	0.177175	0.064714	2.737809	0.0065	Significant
LogK3	0.237698	0.060350	3.938650	0.0001	Significant

Source: data, 2025

Theoretically, these research results are consistent with the Andersen and Newman (1973) model, which states that access to health services is influenced by enabling factors such as the availability of infrastructure and health services. Additionally, these findings align with Arrow's (1963) theory, which emphasizes the importance of state intervention through fiscal policies to address market failures in healthcare service provision, particularly in resource-constrained areas.

However, the nutrition variable (K3) did not show a significant influence on MMR and IMR. This is likely due to the limited coverage of nutrition data at the district/city level, as well as the fact that the influence of nutrition on health is indirect and only becomes apparent in the long term. Thus, although nutrition is an important factor in public health, its impact is not immediately visible in the MMR and IMR indicators in the short term.

Finally, the effectiveness of the Special Allocation Fund of Health does not solely depend on the size of the allocated budget but also on the quality of its implementation. These findings support the views of (Buana, 2022) and (Marheni and Triyanto, 2023) that increased budget allocation must be accompanied by the readiness of human resources in the health sector, the effectiveness of fund distribution, as well as monitoring and evaluation of program implementation to ensure that the results are truly felt by the community.

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CONCLUSION

This study shows that the Special Allocation Fund Of Health has a significant impact on three key public health indicators in disadvantaged areas in Indonesia. Specifically, the results of the regression analysis indicate that the Special Allocation Fund of Health is able to reduce the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR), as well as increase the Life Expectancy Rate (LER). All three hypotheses proposed in this study were accepted, indicating that fiscal interventions through the Special Allocation Fund of Health are an effective tool in improving public health levels in underdeveloped regions.

Based on these results, several recommendations can be made. First, for the government, the findings of this study can serve as a basis for formulating policies and making decisions related to the allocation and distribution of the Special Allocation Fund of Health, particularly for underdeveloped regions. Second, for future researchers, it is hoped that research on the impact of Special Allocation Fund of Health can be further developed by incorporating additional relevant variables, including the potential for misappropriation or embezzlement of funds as a mediating variable, to make the research results more comprehensive and in-depth.

However, this study has several limitations that need to be noted. First, the study only focused on disadvantaged areas and did not compare the results with non-disadvantaged or developed areas, so it is not yet known whether the impact of Special Allocation Fund of Health is similar or different between regional groups. Such a comparison is actually important to obtain a more comprehensive picture of the effectiveness of this policy. Second, although this study successfully demonstrated the significant impact of the Special Allocation Fund of Health on health indicators, it did not explore further the aspects of implementation, effectiveness of execution, or sustainability of the program. Therefore, further studies are needed to answer these questions and deepen understanding of the impact of fiscal policy in the health sector.

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