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## The impact of social aid on poverty during the COVID-19 pandemic Empirical evidence from Indonesia

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## The impact of social aid on poverty during the COVID-19 pandemic: Empirical evidence from Indonesia

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### Abstract

The primary goal of this study is to investigate the impact of social aid expenditures on the proportion of poor people in Indonesian provinces, as well as the additional impact of the COVID-19 pandemic on poverty levels, with a particular emphasis on the interaction between social assistance spending and the pandemic's effects. Focusing on 34 provincial governments in Indonesia from 2004 to 2022, the data were analyzed using the two-step GMM system. The results of this study indicate that social aid expenditures negatively and significantly impact the proportion of Indonesia's population living in poverty. This demonstrates that a rise in social aid expenditures lowers Indonesia's proportion of the impoverished population. The observed negative impact suggests a real decrease in the poverty rate as social aid expenditures rise. In the meantime, this study discovers a positive and noteworthy impact of the COVID-19 variable. This indicates that compared to the time prior to the COVID-19 pandemic, a larger percentage of Indonesians lived in poverty during the pandemic. Furthermore, social aid expenditures were unable to reduce the number of poor people in Indonesia during the COVID-19 period.

**Keywords:** health crisis, household, government spending, social security, redistributive policy, subsidies, welfare programs, budget

**JEL Classification:** E62, H31, H51

**Received on:** 11<sup>th</sup> of September, 2023

**Accepted on:** 26<sup>th</sup> of October, 2023

**Published on:**

### Introduction

Social aid expenditures play a crucial role in poverty reduction efforts. These expenditures offer a safety net and opportunities for social mobility through unemployment benefits, food assistance, affordable housing, and educational support. Additionally, they contribute to economic growth by reinvesting funds within local communities, generating job opportunities, and reducing economic inequality. Consequently, social aid is vital in addressing poverty and fostering a more equitable society.

Amid the COVID-19 pandemic, the significance of social aid expenditures has grown even more pronounced. Economic disruptions, including widespread job losses and business closures, have pushed many individuals and families into financial hardship. As a result, social aid programs, including direct cash transfers, unemployment benefits, and food assistance, have provided essential support, preventing a deeper slide into poverty and stabilizing local economies by injecting funds into communities. This has contributed to a swifter and more equitable recovery from the pandemic's socioeconomic impact.

According to the Indonesian Central Statistics Agency (BPS, 2021), the COVID-19 pandemic has exacerbated poverty levels. In September 2020, there was an increase of 2.76 million impoverished individuals, bringing the total to 27.55 million. Notably, urban poverty has risen faster than rural poverty, with the proportion of impoverished people in cities increasing by 1.32% compared to 0.60% in rural areas since September 2019.

Indonesia's constitutional mandates, legal framework, and social assistance expenditures have played a vital role in upholding the principles of social justice and welfare, especially during the COVID-19 pandemic. Articles 33 and 34 of the 1945 Indonesian Constitution require the state to protect the nation and promote social justice for all. Moreover, Act 11/2009 mandates social assistance distribution as a government strategy for social welfare. Finance Minister Regulation (PMK) number 181/2012 defines social assistance as the central/regional government transferring money, goods, or services to society to protect it from social risk, improve economic capability, and promote social welfare. These constitutional and legal provisions underscore the importance of targeted social aid in poverty reduction, particularly during the pandemic. They reflect Indonesia's commitment to social justice and welfare principles while stabilizing its socio-economic fabric in an unprecedented crisis.

## 1. Literature review

The incidence of poverty and inequality is theoretically linked to a range of factors. One example pertains to the allocation of funds toward public infrastructure, specifically in healthcare and public education. Individuals experiencing suboptimal health conditions cannot effectively fulfill their roles and responsibilities, consequently negatively impacting their overall well-being. In contrast, individuals with good health generally exhibit greater levels of human capital and productivity than those with poor health. The health crisis (COVID-19 pandemic) has had an impact on the health of the world's population. According to Castro-Leal (1999), this is because the welfare of households is closely linked to their health status. Therefore, an improvement in the health of the workforce and increased investment in infrastructure exhibit a negative correlation with the poverty level.

Gupta et al. (2002) demonstrated a positive correlation between higher public expenditure on education and healthcare and various beneficial outcomes. Expressly, their findings indicated that increased investment in these sectors led to improvements in school access and academic achievement and decreased mortality rates among infants and children. The educational regression models exhibit robustness across various specifications, whereas the association between healthcare expenditure and mortality rates displays diminished strength.

69 Gomanee et al. (2005) demonstrated that the provision of aid positively correlates with increased levels of human development, as measured by the Human Development Index. Additionally, the study found a negative association between aid and infant mortality rates, both serving as indicators of overall societal well-being. In instances where quantiles exhibit disparities, the efficacy of aid is more pronounced in countries situated below the median of the welfare distribution, specifically those characterized by lower levels of human development. To the extent that there is a correlation between aggregate welfare and poverty, there is evidence suggesting that aid can have a beneficial impact on reducing poverty, particularly in countries with lower levels of human development indicators.

49 According to Barrientos (2019), three significant factors are expected to influence the progress of social assistance in the Asia-Pacific region. Many people agree that tax-transfer systems are the best way for the government to promote fairness. However, the way they are set up now only does little to improve balance or reduce poverty. In this area, social assistance is a key part of making tax-transfer programs work better for everyone. Also, the fact that social aid is now available worldwide has made its role as a social resource much more critical. However, in the context of Asia and the Pacific, its predominant role remains that of providing protection. Future advancements will heavily rely on reevaluating and adjusting the protective and social investment functions of social assistance. 79 Furthermore, the enhancement of social assistance necessitates the mobilization of resources and the establishment of sustainable and stable financing mechanisms. The allocation of resources toward social aid programs has the potential to serve as a crucial instrument in the efforts to alleviate poverty and mitigate income inequality.

76 Governmental social aid expenditure encompasses monetary transfers, provision of goods, and rendering of services to individuals experiencing poverty. The primary objective of such assistance is to safeguard these individuals from potential social risks and enhance their overall well-being. According to Baird et al. (2014), Akresh et al. (2016), and Robertson et al. (2013), conditional transfers tend to have a greater influence on social aid expenditure compared to unconditional transfers. Chong et al. (2009) indicated a limited association between foreign aid and the enhancement

of income distribution, particularly when considering the quality of institutions. This suggests that foreign aid may not effectively contribute to economic growth or the promotion of democratic institutions.

The empirical evidence from high-income countries indicates a stronger correlation between life expectancy and social expenditures when comparing countries within the OECD countries. This suggests a potential link between social spending and health outcomes. Conversely, Reynolds and Avendano (2018) showed that the United States' comparatively lesser allocation of financial resources toward social policy might potentially contribute to fewer positive trends observed in life expectancy.

According to Caminada and Goudswaard (2001), income inequality in the Netherlands grew between 1981 and 1997, primarily due to disparities in principal income distribution and a decrease in social assistance payments, which resulted from a social security reform. This reduction highlights the role of social security in mitigating income inequality. However, in a comparative analysis, it becomes evident that the impact of social security on the Gini coefficient in Latin American nations is considerably lower compared to developed countries. According to Lustig et al. (2014), direct taxes exhibit progressivity, but their redistributive effect is limited due to their relatively low proportion relative to GDP. Cash transfers have a progressive nature in absolute terms, except in Bolivia, where they lack a specific focus on impoverished individuals. In Bolivia and Brazil, the impact of indirect taxes outweighed the poverty-alleviating effects of cash transfers. When considering in-kind transfers in education and health, valued at government costs, it becomes apparent that these transfers have a greater impact in reducing inequality across all countries compared to cash transfers. This difference in impact is due to the relative magnitude of these transfers.

Mahler and Jesuit (2004) highlight the role of social security in reducing the value of the Gini coefficient in nations in Latin America by almost 15%. However, targeted transfer payments for education and health have a more significant potential to mitigate inequality than general cash transfer payments. As discussed by Fernald et al. (2008), conditional cash transfer programs require families to meet specific health, nutrition, or education criteria to receive the transfer. These programs can positively affect child well-being, enhancing breaking the cycle and human capital of intergenerational poverty. It is crucial to monitor the allocation and utilization of transferred funds and acknowledge that cash transfers can have long-lasting impacts on chronic poverty by alleviating liquidity constraints and enabling investments in productive endeavors (Farrington & Slater, 2006; Lloyd-Sherlock, 2006).

Furthermore, He and Sato (2013) emphasize the significant role of social security programs in developed countries, reducing the Gini coefficient by 74.6%. Plotnick (1979) highlights the allocation

of benefits from social welfare programs, indicating a pro-poor bias between 1965 and 1976. The study also delves into income-tested benefits, program dynamics among impoverished individuals, and the disparities between federal and state-local assistance. It provides insights into the enduring presence of poverty despite social assistance provision and speculates on future trajectories of social welfare expenditure.

73 In the realm of social security policies and their impact on poverty alleviation, empirical studies employing household-level micro-data have shed light on the nuanced and varied effects across different countries and households. Dreze and Khera (2017) point out that research in India highlights five critical initiatives within the social security system – school meals, childcare services, security pensions, employment guarantees, and food subsidies – as having a substantial influence on overall individual welfare. Yusri (2022) showed that the Special Autonomy Fund (SAF) emerged as a significant driver of poverty reduction, improved access to safe sanitation, and enhanced senior secondary school enrollment from 2002 to 2018 in Aceh Province, Indonesia. However, it did not exhibit a strong correlation with the provision of safe water. In Vietnam, social security measures such as pensions and social assistance have proven impactful in bolstering farmers' expenditures, especially in non-food items, and effectively reducing poverty among this demographic (Cuong, 2013).

Further afield, Devereux (2002) examined the impact of social safety nets on the enduring prevalence of poverty in nations situated in southern Africa, with positive outcomes from pension programs in Namibia, cash subsidies distributed to Mozambique's urban poor, and public employment intervention in Zambia. Yu and Li (2021) showed that an extensive analysis of China's social security expenditure from 1978 to 2018 reveals a positive but limited relationship between the income disparity and social security expenditure between rural and urban residents, with most of the variation attributed to inherent factors. However, it also indicates a notable negative association between social security expenditure and rural poverty incidence, suggesting a significant role in mitigating absolute poverty in rural areas. Additionally, Chriest and Niles (2018) investigate how social capital influences how individuals in rural towns in the United States react to extreme weather, emphasizing how communities with more social capital successfully improve communal food security following such catastrophes. These findings underscore the pivotal role of rural communities in managing the consequences of natural disasters and unforeseen challenges (Luo et al., 2020).

In recent years, the global landscape has witnessed significant shifts in poverty rates, with the ongoing COVID-19 pandemic serving as a pivotal factor in shaping these trends. Ha (2023) highlights a prevalent pattern of rising poverty rates across various countries during the initial months of the

pandemic, followed by a partial recovery in September. This fluctuation in poverty rates displays notable heterogeneity among nations, with Italy experiencing the most pronounced impact and France witnessing the least. Furthermore, the pandemic has exacerbated regional poverty-level disparities in Italy and Spain. Menta (2021) showed the notion of a general increase in poverty rates during the early stages of the pandemic, with Italy being significantly affected and France relatively less so.

Shifting the focus to Indonesia, Suryahadi et al. (2020) discerned that under the most optimistic scenarios, the rate of poverty will climb from 9.2% in September 2019 to 9.7% by the end of 2020, leading to an additional 1.3 million people falling into poverty. In a less favorable scenario, the poverty rate could surge to 16.6%, closely resembling the level recorded in 2004 at 16.7%. This projection implies that an additional 19.7 million individuals may find themselves in poverty, effectively erasing Indonesia's progress in poverty reduction. Consequently, Indonesia faces the imperative of bolstering its social protection initiatives to extend assistance to newly impoverished individuals and those already grappling with poverty. This multifaceted challenge underscores the crucial role of social safety nets in addressing the far-reaching impacts of the pandemic on poverty and inequality.

Focusing on the critical intersection of government spending, aid, social grants, and their impact on poverty reduction across various regions, recent studies have shed light on the multifaceted dynamics at play. Anderson et al. (2018) underscore that increased government spending may not consistently translate into significant reductions in income poverty within low- and middle-income nations, highlighting the nuanced nature of fiscal policy's redistributive role in these contexts compared to OECD countries. Moreover, they note varying effects across regions, with Sub-Saharan African countries exhibiting a less negative relationship between government spending and poverty than Eastern Europe and Central Asia. Kiendrebeogo et al. (2017) offer insights into the consequences of financial crises, revealing that such crises can lead to substantial increases in poverty rates and gaps. However, their impact is mitigated in countries with higher levels of social spending, underscoring the critical role of social protection during crisis periods. De Matteis (2013) emphasizes the effectiveness of aid in poverty reduction and economic growth when a poverty-focused perspective drives it.

The debate on aid fungibility is addressed by Gomance et al. (2003) and Mosley et al. (2004), who stress that aid's positive impact on welfare hinges on its ability to boost pro-poor expenditures. Arndt et al. (2015) delve into how aid contributes to economic growth, highlighting its role in enhancing human capital and physical accumulation. Meanwhile, Zwane et al. (2022) present evidence of the efficacy of social grants in improving household welfare in South Africa, with a particularly pronounced impact on women. Shifting the focus to Indonesia, Firmansyah and Solikin



(2019) demonstrate the significant positive impact of social assistance on poverty alleviation and inequality reduction, with Rastra emerging as the most effective program. However, distribution challenges necessitate improvements to ensure efficient aid delivery. Additionally, Handayani et al. (2022) reveal the intricate relationship between regional expenditures and poverty rates in Central Java, with spending on health, education, and social protection negatively influencing poverty rates, while economic sector spending exhibits a positive but significant effect.

Regarding COVID-19, several studies showed the negative impacts caused by COVID-19 (Achmad et al., 2023; Maria et al., 2022; Riadi et al., 2022b; Yudaruddin, 2023a, 2023b; Lestari et al., 2021; Zainurossalamia et al., 2022; Ulfah et al., 2022; Riadi et al., 2022a). Specifically related to poverty, research on the impact of COVID-19 on poverty has been conducted by numerous scholars across different regions, providing valuable insights into the multifaceted challenges posed by the pandemic. For instance, studies have been conducted in Indonesia (Suryahadi et al., 2020), South America (Bassey et al., 2023), Brazil (Nazareno & de Castro Galvao, 2023; da Rosa et al., 2021), Europe (Menta, 2021; Ha, 2023; Gungor, 2021), Africa (Bargain & Aminjonov, 2021), Bangladesh (Rönkkö et al., 2022), China (Luo et al., 2020), the United States (Topcu, 2022; Bargain & Aminjonov, 2021; Meehan & Shanks, 2023), and globally (Valensisi, 2020). These studies offer valuable insights into the complex and evolving relationship between the pandemic and poverty dynamics.

According to Nazareno and de Castro Galvao (2023), emergency aid emerged as a crucial mechanism for supporting individuals with the greatest need during the pandemic, acting as a compensatory measure for household income. However, the study also found that emergency aid had a statistically significant correlation with decreased labor force participation within families, increasing joblessness. Yet, during the time period that was looked at, emergency aid had a negligible effect on family unemployment and participation in the labor force. This suggests that it had a small effect on these factors. Similarly, da Rosa et al. (2021) noted that Brazil's initial distribution of economic assistance favored states with higher populations and lower socioeconomic status, particularly in the Northeast region. In contrast, the final distribution of economic assistance predominantly benefited states in the more developed Southeast and South regions, indicating regional disparities in support allocation.

Shifting the focus to Poland, Kochaniak et al. (2023) examined the effectiveness of government programs in stabilizing enterprise revenues, particularly within the context of micro-entities receiving support. Their study revealed that despite the assistance provided, these micro-entities faced sustained fluctuations in revenue, primarily due to a deteriorating economic



environment. As a result, the beneficiaries experienced long-term declines in profitability and liquidity, challenges in accessing financial markets, and redundancies in employment, highlighting the need for more targeted and comprehensive support measures to address their specific needs.

The literature review emphasizes the importance of targeted government spending, aid allocation, and social safety nets in addressing poverty and inequality. The COVID-19 pandemic has further highlighted the need for robust social protection initiatives. Therefore, the purpose of this study is to investigate the influence of social aid spending on the proportion of impoverished people in Indonesian provinces. This study also to investigate the influence of the COVID-19 pandemic on the percentage of the impoverished population. The following hypotheses are developed:

*H1: With higher social aid expenditures, the percentage of the poor population will decrease.*

*H2: The COVID-19 pandemic has increased the percentage of the poor population.*

*H3: Social aid expenditure reduced the percentage of the poor population during the COVID-19 pandemic.*

## 2. Method

Focusing on 34 provincial governments in Indonesia, this study aims to examine the impact of social aid expenditure on the percentage of poor population in provinces in Indonesia. Furthermore, this study also investigates the impact of the COVID-19 pandemic on the percentage of the poor population. In addition, this study explores the impact of social aid expenditure on the percentage of the poor population during the COVID-19 pandemic by interaction between social aid expenditure and COVID-19. This study collects data from the Financial Statistics of Provincial Governments for 2004–2022 sourced from the Indonesian Central Bureau of Statistics. Dependent, independent, and control variables are presented in Table 1.

**Table 1.** Dependent and independent variables

Variables	Abbreviation	Definition and measure	Expected Sign
Dependent			
Poor Population	POP	Percentage of Poor Population (%)	
Independent			
Social Aids Expenditure	SAE	Social Aids Expenditure per Province (billion Rupiah)	–
COVID-19	COV	This dummy variable has a value of 1 if the first year of the COVID-19 pandemic (2020–2022), or 0 otherwise	+
Human Development Index	HDI	Human Development Index per province	–

Gross Regional Domestic Product	GRDP	Gross Regional Domestic Product per Province (billion Rupiah)	—
Unemployment	UNE	Unemployment per Province (%)	+
Java and Bali Islands	JAVA	This dummy variable has a value of 1 if the provinces are located on the islands of Java and Bali, or 0 otherwise	+

The association between social aid expenditure, COVID-19, and poor population was evaluated using a regression analysis. This study also used control variables (Kheir, 2019; Pham & Riedel, 2019; Firmansyah & Solikin, 2019; Handayani et al., 2022; Musviyanti et al., 2022), including Human Development Index (HDI), Unemployment (UNE), Gross Regional Domestic Product (GRDP), and Java and Bali Islands (JAVA). The regression equation is as follows:

$$POP_{i,t} = \alpha_{i,t} + \beta_1 SAE_{i,t} + \beta_2 COVID_t + \beta_3 HDI_{i,t} + \beta_4 GRDP_{i,t} + \beta_5 UNE_{i,t} + \beta_6 JAVA_{i,t} + \varepsilon_{i,t}, \quad (1)$$

$$PO_{i,t} = \alpha_{i,t} + \beta_1 SAE_{i,t} + \beta_2 COVID_t + \beta_3 SAE \cdot COVID_{i,t} + \beta_4 HDI_{i,t} + \beta_5 GRDP_{i,t} + \beta_6 UNE_{i,t} + \beta_7 JAVA_{i,t} + \varepsilon_{i,t}. \quad (2)$$

This study was analyzed using the two-step system GMM (Generalized Methods of Moments) estimator. The GMM estimator in two steps is a sophisticated econometric tool that is commonly used in panel data analysis (Blundell & Bond, 1998; Arellano & Bover, 1995). It involves two key diagnostic tools, namely the AR(2) test and the Hansen-J test, which play pivotal roles in ensuring the accuracy and reliability of the estimation process. In the first step, the GMM estimator utilizes moment conditions, often based on instruments, to obtain initial parameter estimates. The AR(2) test is then applied to assess the presence of autocorrelation in the error terms, helping diagnose potential model misspecification and biased coefficient estimates. Subsequently, the Hansen-J test evaluates the validity of the moment conditions and the over-identifying restrictions in the model, ensuring that the chosen instruments are appropriate and that the model is correctly specified. Together, these components of the two-step system GMM framework enable researchers to estimate parameters in dynamic panel models while rigorously evaluating the model's assumptions and diagnostic properties, ultimately enhancing the robustness and accuracy of the econometric analysis.

### 3. Results

The descriptive statistics for the main variables in the dataset are provided in Table 2. There are 536 observations for the percentage of the poor population (POP), with a mean value of 12.35% and a standard deviation of 6.71%, indicating some variation in poverty rates across the provinces. Social aid expenditure (SAE) per province is based on 486 observations, and it has a mean of 2.55 billion Rupiah but a relatively high standard deviation of 16.65 billion Rupiah, suggesting substantial disparity in social aid spending. The dummy variable for the COVID-19 pandemic (COV) shows a

mean of 0.19, indicating that provinces, on average, experienced the pandemic in 19% of the observed years. Human Development Index (HDI) per province, derived from 538 observations, has a mean of 70.93, with a standard deviation of 3.58, signifying moderate variability in human development levels. Gross Regional Domestic Product (GRDP) per province, based on 537 observations, has a notably higher mean of 198,511 billion Rupiah, but with a substantial standard deviation of 338,976 billion Rupiah, indicating significant economic disparities. Unemployment (UNE) per province, with 536 observations, demonstrates a mean of 5.87% and a standard deviation of 2.29%, indicating some variation in unemployment rates. Finally, the dummy variable denoting provinces located on the Java and Bali Islands (JAVA) has a mean of 0.21, suggesting that, on average, 21% of the provinces in the dataset are situated on these islands.

**Table 2.** Descriptive statistics for all variables

Variables	Obs.	Mean	Std. dev	P25	Media	P75
POP	536	12.347	6.7077	6.965	11.055	16.05
SAE	486	2.5478	16.653	0.0067	0.0361	0.1106
COV	544	0.1875	0.3907	0.0000	0.0000	0.0000
HDI	538	70.933	3.5777	68.81	70.96	72.96
GRDP	537	198,511	338,976	27,593.09	79,536.08	172,205.6
UNE	536	5.8709	2.2872	4.165	5.385	7.065
JAVA	544	0.2059	0.4047	0.0000	0.0000	0.0000

*Note:* POP = Poor Population; SAE = Social Aids Expenditure; COV = COVID-19; HDI = Human Development Index; GRDP = Gross Regional Domestic Product; UNE = Unemployment; JAVA = Java and Bali Islands.

The correlation matrix presented in Table 3 allows for the assessment of the presence of multicollinearity among the independent variables. When two or more independent factors in a regression model are strongly linked, this is called multicollinearity. It can make the coefficient values less stable and make the model harder to understand. However, in this case, the correlation coefficients between the variables do not exhibit high levels of collinearity. The highest correlation observed is 0.5669 between GRDP (Gross Regional Domestic Product) and JAVA (the dummy variable for provinces located on Java and Bali Islands). While this correlation is relatively moderate, it is not excessively high to raise multicollinearity concerns, especially considering that values below 0.7 are typically non-problematic. Moreover, the variance inflation factor (VIF) values for all variables are well below the commonly used threshold of 10, further confirming the absence of severe multicollinearity. Therefore, based on the correlation matrix and VIF values, the study can conclude that multicollinearity is not a significant issue in this analysis, ensuring the reliability of regression results.

**Table 3.** Correlation matrix

Variables	SAE	COV	HDI	GRDP	UNE	JAVA	VIF
SAE	1.0000	—	—	—	—	—	1.07
COV	0.1120	1.0000	—	—	—	—	1.07
HDI	0.1217	0.0742	1.0000	—	—	—	1.24
GRDP	0.2315	0.1670	0.2542	1.0000	—	—	1.61
UNE	0.0218	−0.0910	0.2665	0.1356	1.0000	—	1.00
JAVA	0.0889	−0.0025	0.3707	0.5669	0.1774	1.0000	1.64

*Note:*  $n = 486$ . POP = Poor Population; SAE = Social Aids Expenditure; COV = COVID-19; HDI = Human Development Index; GRDP = Gross Regional Domestic Product; UNE = Unemployment; JAVA = Java and Bali Islands.

Table 4 presents the analysis regarding the impact of social aid expenditure on the percentage of the poor population in Indonesia. In addition, it also shows the impact of the COVID-19 pandemic variables and control variables on the percentage of the poor population in Indonesia. Using the two-step GMM approach, this study finds a negative and significant impact on social aid expenditure on the percentage of the poor population in Indonesia. This can be seen from the negative value of the SAE variable coefficient ( $\beta_1 = -0.000102$ ) and probability ( $0.002 < 0.05$ ). This shows that an increase in social aid expenditure reduces the percentage of the poor population in Indonesia, thus supporting hypothesis 1 ( $H1$ ).

Meanwhile, this study found that the impact of the COVID-19 variable was positive and significant, which can be seen from the positive value of the COV variable coefficient ( $\beta_2 = 0.780375$ ) and probability ( $0.000 < 0.05$ ). This means that during the COVID-19 pandemic, the percentage of the poor population in Indonesia was higher than in the period before the COVID-19 pandemic. Therefore, these results support hypothesis 2 ( $H2$ ).

**Table 4.** Social aid expenditure and poor population

Explanatory variables	Dependent variables: POP			
	Coef.	Corrected std. err	z	P >  z
POP (−1)	1.021343***	0.024175	42.3	0.000
SAE	−0.000102***	0.000032	−3.15	0.002
COV	0.780375***	0.087514	8.92	0.000
HDI	0.048857	0.030429	1.61	0.108
GRDP	2.22e−07	1.36e−07	1.63	0.103
UNE	−0.041670*	0.025252	−1.65	0.099
JAVA	0.064554	0.171425	0.38	0.706
CONSTANTA	−4.225668*	2.442759	−1.73	0.084
Number of groups	34			
Number of instruments	10			
Wald chi2	67295.11			

Prob. > chi2	0.0000
Arellano-Bond test for AR(1)	0.001
Arellano-Bond test for AR(2)	0.327
Sargan test	0.546
Hansen test	0.515
Number of Obs.	453

Note: \* sig. at 10%, \*\* sig. at 5%, and \*\*\* sig. at 1%. POP = Poor Population; SAE = Social Aids Expenditure; COV = COVID-19; HDI = Human Development Index; GRDP = Gross Regional Domestic Product; UNE = Unemployment; JAVA = Java and Bali Islands.

Table 5 presents the interaction analysis between social aid expenditure and COVID-19. The specific aim is to examine how social aid expenditure impacts the percentage of the poor population during the COVID-19 pandemic. The study results indicate a statistically significant and positive influence of the interaction variable involving social aid spending and COVID-19 on the proportion of the impoverished population. This is evident from the positive coefficient value of the SAE\*COV variable ( $\beta_2 = 1.55e-10$ ) and the associated probability value ( $0.046 < 0.05$ ). This implies that an increase in social aid expenditure is correlated with a subsequent increase in the poor population during the COVID-19 pandemic. These results do not lend support to hypothesis 3 (H3).

**Table 5.** Social aids expenditure, COVID-19, and poor population

Explanatory variables	Dependent variables: POP			
	Coef.	Corrected std. err	z	P >  z
POP (-1)	1.01934***	0.02405	42.4	0.000
SAE	-0.15538**	0.07773	-2.00	0.046
COV	0.73440***	0.08456	8.69	0.000
SAE·COV	1.55e-10**	7.77e-11	2.00	0.046
HDI	0.04707	0.03007	1.57	0.117
GRDP	2.21e-07*	1.20e-07	1.84	0.066
UNE	-0.04264*	0.02547	-1.67	0.094
JAVA	0.03200	0.17809	0.18	0.857
CONSTANTA	-4.06055*	2.41030	-1.68	0.092
Number of groups	34			
Number of instruments	11			
Wald chi2	56960.69			
Prob. > chi2	0.0000			
Arellano-Bond test for AR(1)	0.001			
Arellano-Bond test for AR(2)	0.324			
Sargan test	0.528			
Hansen test	0.475			
Number of Obs.	453			

Note: \*sig. at 10%, \*\*sig. at 5%, and \*\*\*sig. at 1%. POP = Poor Population; SAE = Social Aids Expenditure; COV = COVID-19; HDI = Human Development Index; GRDP = Gross Regional Domestic Product; UNE = Unemployment; JAVA = Java and Bali Islands.

#### 4. Discussion

This study finds a negative and significant impact on social aid expenditure on the percentage of the poor population in Indonesia. This shows that an increase in social aid expenditure reduces the percentage of the poor population in Indonesia. This finding is consistent with Anderson et al. (2018), Kiendrebeogo et al. (2017), De Matteis (2013), Gomanee et al. (2003), Mosley et al. (2004), Zwane et al. (2022), Firmansyah and Solikin (2019), and Handayani et al. (2022). The negative impact observed implies that as social aid expenditure grows, there is a tangible decline in the poverty rate. This can be attributed to the fact that these programs directly benefit low-income and vulnerable segments of the population, providing them with financial support and access to essential services. This result carries profound implications for poverty alleviation strategies in Indonesia. A well-targeted increase in funding for social assistance programs, such as cash transfers, food subsidies, or other forms of support, can effectively contribute to lifting people out of poverty and improving their living conditions.

Furthermore, the study underscores the importance of well-designed and efficiently executed social aid policies. A strategic and targeted approach to allocating resources is essential. Identifying and reaching the most disadvantaged and marginalized groups within the population is crucial for maximizing the impact of social aid expenditure.

Meanwhile, this study finds that the impact of the COVID-19 variable is positive and significant. This means that during the COVID-19 pandemic, the percentage of the poor population in Indonesia was higher than in the period before the COVID-19 pandemic. In other words, the pandemic had a detrimental effect on poverty levels in Indonesia, leading to an increase in the proportion of the population living in poverty. This result is consistent with Suryahadi et al. (2020), Bassey et al. (2023), Nazareno and de Castro Galvao (2023), da Rosa et al. (2021), Menta (2021), Ha (2023), Gungor (2021), Bargain and Aminjonov (2021), Luo et al. (2020), Topcu (2022), Meehan and Shanks (2023), Rönkkö et al. (2022), and Valensisi (2020). This finding underscores the economic and social challenges posed by the COVID-19 pandemic, as it had a measurable impact on the well-being of vulnerable communities. Factors such as job losses, reduced economic activity, and disruptions in livelihoods likely contributed to this increase in poverty during the pandemic.

However, different results were shown from the impact of the interaction variable between social aid expenditure and COVID-19 on the percentage of the poor population. The findings of the



analysis reveal a positive and significant impact of the interaction variable between social aid expenditure and COVID-19 on the percentage of the poor population. This result is opposite from the findings of Nazareno and de Castro Galvao (2023), da Rosa et al. (2021), and Kochaniak et al. (2023). One way to interpret this finding is that while social aid expenditure is typically intended to alleviate poverty and support vulnerable populations, the impact appears to be different during the unique circumstances of a pandemic. Other factors related to the pandemic, such as job losses, economic disruptions, or changes in the distribution of resources, may outweigh the mitigating effects of social aid spending.

## Conclusion

This study aims to examine the interplay between social assistance spending, the COVID-19 pandemic, and poverty levels among Indonesian provinces. Using the two-step system GMM, this study analyzes data from 34 provincial governments in Indonesia from 2004 to 2022. The results showed that social aid expenditures have a negative and significant effect on the percentage of Indonesia's poor population. This study reveals that the COVID-19 variable has a positive and statistically significant impact. On the other hand, the impact of the interaction variable between social aid expenditure and COVID-19 on the proportion of the poor population yielded different outcomes. The analysis results indicate that the interaction variable between social aid expenditure and COVID-19 has a positive and statistically significant effect on the proportion of the poor population.

The findings of this study hold significant policy implications for Indonesia's provincial governments. Firstly, the observed negative and significant impact of increased social aid expenditures on reducing the proportion of the poor population underscores the importance of continued investment in social aid programs as a means of poverty alleviation. This suggests that well-targeted and adequately funded social aid initiatives can effectively improve the living standards of vulnerable populations. Secondly, the positive and statistically significant impact of the COVID-19 variable on poverty rates highlights the severe socio-economic consequences of the pandemic. It underscores the necessity for proactive measures and robust safety nets to address the pandemic's adverse effects on income and employment. However, the most intriguing result arises from the interaction analysis, which reveals that the joint effect of social aid expenditure and COVID-19 on the proportion of the poor population is positive and significant. This implies that, during the pandemic, the impact of social aid spending may not have been sufficient to counterbalance the economic hardships and increased poverty resulting from COVID-19. Therefore, policymakers should consider both the ongoing commitment to social aid programs and additional targeted interventions during crises like pandemics to effectively mitigate socioeconomic disparities and protect vulnerable

communities. This study highlights the importance of a multifaceted approach to addressing poverty that considers the unique challenges posed by external shocks like the COVID-19 pandemic.

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