Poverty and Inequality in Yogyakarta: Insights from a Comprehensive Study

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Abstract. Poverty and income inequality are big challenges in Yogyakarta, causing problems at the national level. Using poverty line and Gini index construction and a non-parametric binary logistic regression approach, this study investigated the inequality level in each district/city and investigated the determinants of poverty among households. Data from the National Social and Economic Survey of Households (Susenas) in 2021 and 2022 were used. This study result revealed that living in urban areas, married household head, and receiving government assistance through conditional cash transfer (CCT) increases poverty likelihood. Meanwhile, other variables such as the age of the household head, having health insurance, good education level, higher expenditure level of education, health, and insurance, being an active smoker, and owning a house asset decrease the poverty likelihood among households.

Keywords: poverty, inequality, logistic model, households.

1 Introduction

Poverty and inequality is a complex phenomenon that occurs in third-world countries. Poverty intensity correlates with how income inequality reduces living standards [1][2]. The Special Region of Yogyakarta (DIY) is one of the areas facing this problem. This implies that a community or household cannot meet their basic needs. The domino effect caused by these conditions is the beginning of multidimensional problems or spillover effects at the national level. According to [3][4], the increase in the new poverty rate is affected by the accelerated economic growth rate without regard to income inequality.

Poverty is a complex issue encompassing income inequality, education, living conditions, infrastructure, and health vulnerability in individuals or [5][6]. To grasp the concept of poverty, we must delve into the vital indicator of household poverty, which is greatly influenced by income inequality. DIY is one of the provinces with poverty and inequality problems. Among its areas, Kulonprogo Regency had the highest poverty rate, while the City of Yogyakarta had the lowest compared to other regions.
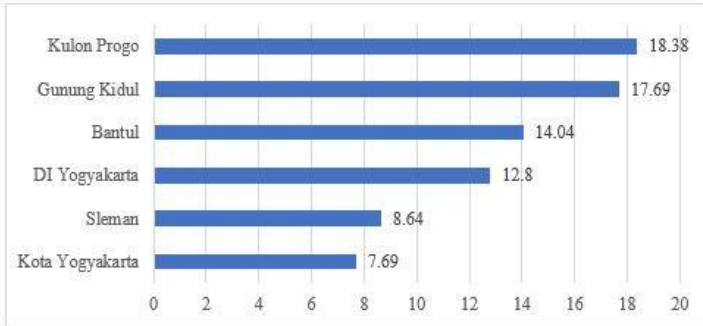
Figure 1. Poverty Rate in the DIY, 2022

Inequality, an economic phenomenon, denotes a disparity between income and household prospects within a given geographical area. The empirical analysis presented in Figure 1.2 concerning the DIY reveals a progressive increment in inequality levels over time, transitioning from 0.423 in the base year to 0.439 in 2022. However, it is noteworthy that the apex of the Gini coefficient, as observed in 2021, stands at 0.441. Following these findings, the prevailing degree of inequality within the DIY is situated at a moderate level, albeit meriting heightened attention from regional authorities for further scrutiny and policy interventions.
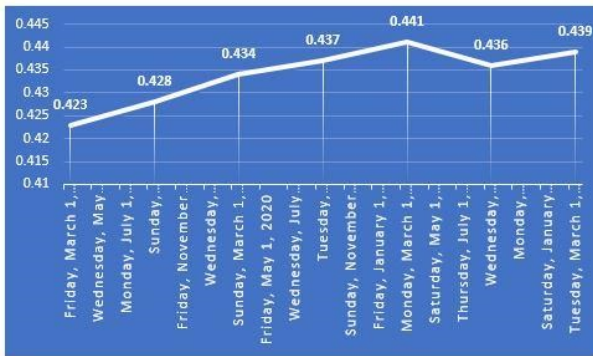

Figure 2. Inequality Rate for the DIY 2019 – 2022.

Every poor resident has the right to easy access to local government facilities under the government program's statutory provisions. This is directly related to the first sustainable development goal of poverty alleviation [7]. This study was conducted based on empirical studies that discussed poverty alleviation and income inequality between districts/cities of the DIY [8][9] In particular, the first study aims to describe poverty and inequality in the DIY. Second, the analysis of the model of socioeconomic characteristics of households on the poverty line. Third, policy analysis in reducing poverty and inequality in the DIY. This study's analytical tool is constructing a poverty line and Gini index for each district/city and using a non-parametric binary logistic regression approach.

2 Literature Review

2.1 Poverty and Welfare

Based on the theory put forward by [10]suggests that the diversity of a population or household can be reflected in the existence of income inequality and welfare dimensions. In line with [11] inequality correlates with various welfare aspects, such as health, education, employment, and socio-cultural conditions. The concept that needs to be built to prepare the community is fulfilling essential services and needs and investing in Human Resources (HR) to produce quality residents [12]The high rate of inequality affects the level of welfare. This is because suppressing poverty inequality and increasing welfare is the ultimate goal of economic development programs.

Poverty is related to inequality and vulnerability, but they are not the same. Inequality examines how things like income and consumption are spread across the population. Suppose it is believed that the well-being of individuals depends on their economic position with other people in society. In that case, an analysis of inequality is needed in the context of poverty. Being vulnerable means risking poverty in the future, even if one is not currently poor. Vulnerability is often associated with "shock" effects such as drought, falling agricultural prices, or financial crises. Because it influences people's investment decisions, production habits, coping mechanisms, and how they perceive their situation, vulnerability is essential to well-being [13]

2.2 Household Economy

Economic actors are all people (individuals and institutions) who carry out economic activities, which include the production, distribution, and consumption of goods and services at all levels of society. Economic actors interact with each other in carrying out economic activities according to the variety of transactions carried out. They become the driving force of economic activity.

The family household is the smallest economic unit, owns the factors of production, owns the land, and provides labor. These economic actors can be entrepreneurs, shareholders, owners, and company partners. Household interaction with other sectors is carried out by buying and selling. In economic activity, households play two roles, namely as consumers and service providers of factors of production. As consumers, these economic actors buy goods and services companies produce to meet their needs. Family households also play a role as service providers for factors of production, such as labor. HR services from family households are empowered by companies, governments, and foreign communities to produce goods and services.

Apart from labor, households have other factors of production, such as land and capital. From these factors of production, households receive income, such as wages or salaries. This income is used to meet the household needs of the family. In addition, some revenue is paid to the Government through taxes. Simply put, family households are assumed to have the following characteristics: Family households are owners of all factors of production, such as labor, land, capital, and entrepreneurship.

Total family household income comes from compensation for the factors of production they have. Compensation is obtained through wages, rent, interest, and profits. The main activity

of the family household is consumption. That is why they are also referred to as consumer households. Family households spend their total income to buy goods and services firms produce. If family households save a portion of their income, that savings will flow to firms through investment.

2.3 Human Development

The state of human resources often measures the success of development. To eradicate poverty, it is important to empower households. [14] suggest that this is achieved by providing access to opportunities, skills, and knowledge that can maximize potential. Therefore, it is essential to gather comprehensive information about households' social and economic characteristics. The Government can also encourage the improvement of household quality through programs that offer specialized training to enhance skills.

According to a study by [15], human development significantly impacts various aspects of society, such as education, the economy, health, profits, and consumer behavior. As a result, governments have implemented measures such as the Human Development Index (IPM) to monitor and improve the quality of human development. To achieve optimal human development, an all-encompassing approach must be taken to prioritize individual capabilities. Ultimately, human development aims to improve the well-being of society as a whole.

The UNDP has established human development standards and related them to the development of abilities [16] Each person possesses unique abilities that are influenced by various factors. Human development programs aim to enhance individual abilities and improve the standard of living.

2.4 Social Safety Net

Research on social safety nets has been carried out by previous researchers abroad and in Indonesia. In the case of Indonesia, a study by [17] identified the impact of providing social assistance (Bansos) on households in Bangka Belitung Province. The results obtained are very significant for household welfare, more specifically, that Social Assistance from the Government affects spending, especially on food expenses, business capital, and buying cell phone credit. This indicates that providing social assistance benefits poor and vulnerable households. A recent study by [18] analyzed the effects of the Family Hope Program (PKH) on rural Aceh households' welfare. The study results show that PKH can significantly reduce household poverty by 0.02 percent. Poverty reduction occurs through meeting household consumption and other needs; in other words, most of the PKH assistance received is used for household economic needs.

Still, in the same program, namely PKH, several other studies also obtained favorable results. [19] concluded that PKH can improve welfare. These results can be seen through improving people's living standards, health services, and education in rural areas. The education channel is the strongest because people feel education is quite a heavy burden for them. PKH can indirectly be a poverty chain breaker through better education. However, research in Pesisir Selatan Regency found quite different results where PKH was not effective enough in improving the social and economic standard of living in poor households [20]

[21] studied the effectiveness of social assistance during the COVID-19 pandemic. They found that around 65 percent of social assistance was adequate and in line with usage targets, thereby increasing the welfare of households affected by the pandemic. More comprehensive research was conducted by Rizki Zul Arfandi and Sumiyarti (2022), who conducted a study of

the impact of the JPS program, including Food Assistance (BPNT), Smart Indonesia Program (PIP), and PKH on poverty alleviation in Indonesia using data from the 2019 Susenas. In this research, the results show that program policies in Indonesia generally reduce poverty and inequality. PIP is the program that can produce the highest reduction in poverty and inequality.

Meanwhile, PKH has the highest effectiveness in alleviating poverty, and BPNT is the lowest in helping reduce poverty. However, this research highlighted the existence of inaccurate targeting of JPS program recipients. If the JPS program is distributed appropriately and well, the results will be more optimal for household welfare.

3 Research Method

3.1 Data

The model used in this study was adopted from research conducted by Dewi and Rachmawatie, 2020; Liyanto et al., 2022; and Ramadhani and Munandar, 2019. The goal is to determine the behavior of the socioeconomic characteristics of poor households in the DIY to alleviate poverty, where the results of this study can help government policymakers to ensure that assistance programs for people experiencing poverty can be properly targeted.

This study uses secondary data from the BPS-Statistics Indonesia, namely, National Social Economic Survey of Households (Susenas) data and the consumption module in 2021 and 2022. The study's parameters were determined by comparing two populations: poor and non-poor households. The Susenas data provide all variables used in this study, namely the household expenditure to assess the household category (poor/not poor), the location where the households lived, gender, age, education, and marital status of the household head, whether the household received safety nets program or not, income, and credit access.

3.2 Estimation Strategy

To assess the behavioral determinant of household on household economic status, this study employs the logistic regression model, which can be drawn as the equation below:

$$P(y) = \beta_0 + \beta_1 Urban + \beta_2 Agegroup + \beta_3 Marstat + \beta_3 Educ + \beta_4 House + \beta_5 BPJS$$
$$+ \beta_6 CCT + \beta_7 BPNT + \beta_8 EducOOP + \beta_9 HealthOOP$$
$$+ \beta_{10} InsuranceOOP + \beta_{11} Activesmoker + \varepsilon_t$$

Where P(y) denotes the household economic status with value one representing poor and 0 being otherwise, *Urban* is the location where the household lived. *Agegroup*, *Marstat,* and *Educ* denote the age, education level, and marital status of the household head. The *BPJS, CCT,* and *BPNT* are variable government programs in the form of cash and non-cash. The *EducOOP*, *HealthOOP*, and *InsuranceOOP* each represent expenses independently for education, health, and insurance. The *activesmooker* variable indicates the smoking status of the head of the household.

4 Finding And Discussion

4.1 Poverty Overview in Daerah Istimewa Yogyakarta

Poverty is a multidimensional social and economic problem. Based on this, it can be interpreted that this problem needs to be interpreted from various points of view. An absolute, relative, cultural, or structural approach can cause the direction of poverty conditions, unlike the opinion of Henry (2022) and Hoyt et al. (2023), who said that in efforts to eradicate poverty from year to year, aid is always sought. However, every year, the poor population also increases. Based on this, we will show several socioeconomic conditions of the DIY based on absolute and extreme poverty.
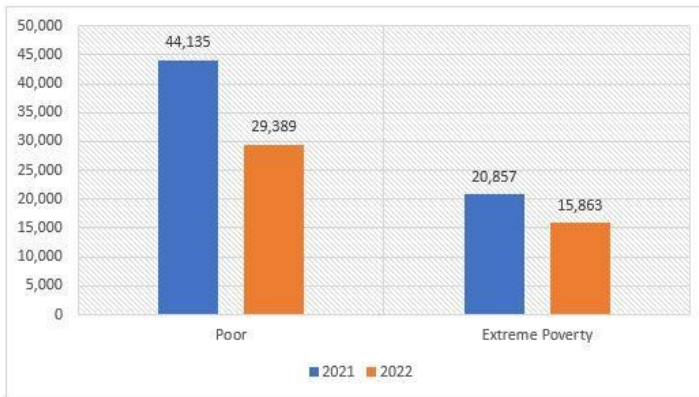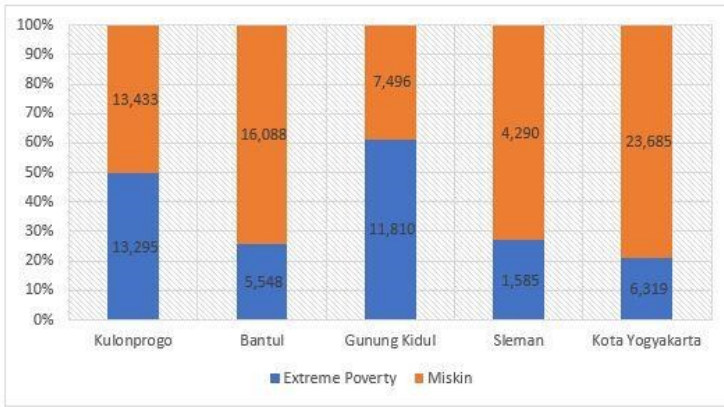

Source: Estimated using the 2021 & 2022 SUSENAS.

Figure 3. Poverty and Extreme Poverty Rate in DIY 2021 – 2022.

The number of households in poor is expected to decrease by 52.74% from 2021 to 2022. The number of households in extreme poverty also decreased by 46.02% from 2021 to 2022.

Immediate attention is needed. We will conduct a comprehensive poverty profile using SUSENAS data to understand the situation better.
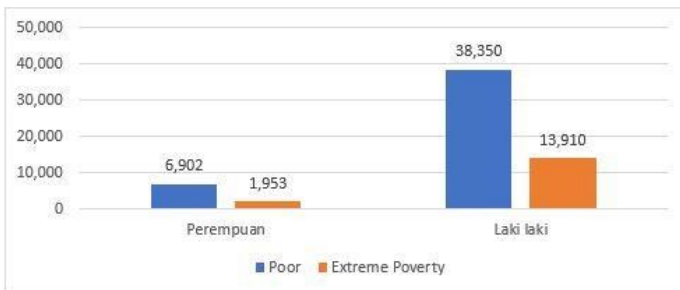

Source: Estimated using the 2022 SUSENAS.

Figure 4. Poverty Levels and Extreme Poverty Aggregation at Regency City Level in DIY

According to the latest SUSENAS data, which includes both regencies and cities, it is clear that poverty rates are highest in Yogyakarta City, followed by Bantul and Kulonprogo Regencies. A closer examination reveals that households in Yogyakarta City are particularly vulnerable to poverty. Regarding extreme poverty, Kulonprogo and Gunungkidul Regencies have the highest rates. TNP2K's 2022 research identifies Kulonprogo Regency as a priority area for tackling extreme poverty [21]. Therefore, the provincial and regional governments must take action and address this pressing issue.

Empowering women is crucial for sustainable development's fifth goal of gender equality. In DIY, 6,902 female-headed households are in extreme poverty out of 1,953 below the poverty line. Priority must be given to these households as they are more vulnerable to the impact of poverty [22]

Source: Estimated using the 2022 SUSENAS.

Figure 5. Levels of Poverty and Extreme Poverty Based on Gender, Head of Household in DIY

To better understand poverty in Yogyakarta, we should look at the correlation between government aid and poverty. Households without health insurance spend more on healthcare than those with insurance. More impoverished households opt for BPJS PBI insurance, indicating limited access to healthcare [23]
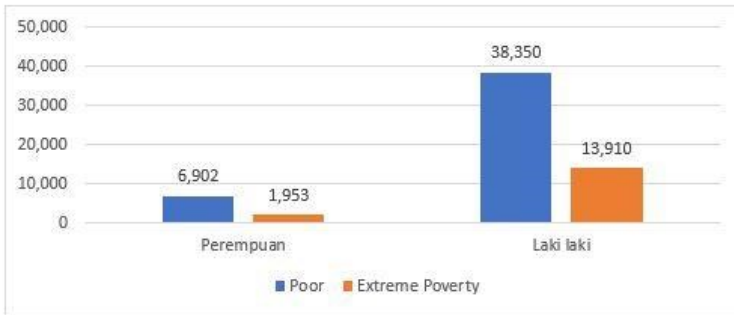

Source: Estimated using SUSENAS 2022.

Figure 6. Poverty and Extreme Poverty Rates Based on PKH Program Beneficiaries in DIY

Simply examining the accessibility of JKN fails to gauge poverty in the DIY fully. It is also vital to take into account the accessibility of households to the PKH program (Family Hope Program). This program was established by the social ministry in 2007 in 7 provinces to aid poverty alleviation under the Millennium Development Goals (MDS) objectives. The program has shown success in all provinces of Indonesia up until 2012, bringing relief to underprivileged households. However, evaluations and innovations are still necessary to ensure continued success. Through evaluation, which involves assessment, scoring, and evaluation, information that measures the effectiveness of the policy outcome can be produced. As [24] suggests, evaluating a policy or program allows for addressing any arising issues.

Upon analyzing household access to PKH, it was determined that 36.37% of impoverished households in the DIY had received assistance through the program. Additionally, 52% of households experiencing extreme poverty have benefited from PKH. The program's success in mitigating poverty in the area is attributed to the diligent efforts of the regional and provincial governments. Regrettably, despite these concerted efforts, poverty rates and levels of extreme poverty have risen between 2021 and 2022.
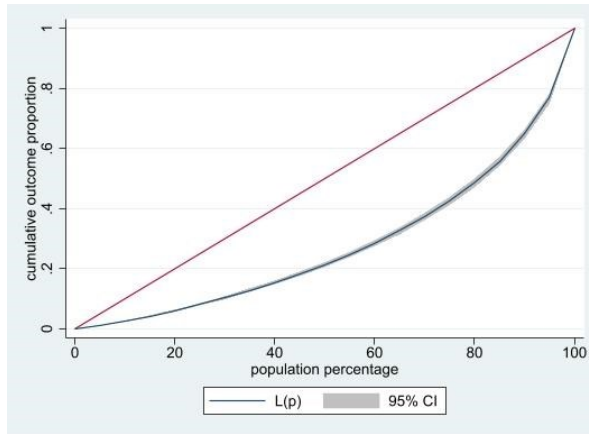
R102	GE(-1)	GE(0)	GE(1)	GE(2)	Gini
Kulon Progo	0.25712	0.23373	0.26073	0.37661	0.38109
Bantul	0.41735	0.36757	0.44416	0.85718	0.47294
Gunungkidul	0.19219	0.18576	0.22558	0.40719	0.33694
Sleman	0.36468	0.29527	0.30186	0.40357	0.42089
Kota Yogyakarta	0.49213	0.34937	0.34464	0.50415	0.44398

Source: Estimated using SUSENAS 2022.

Figure 7. Lorenz Curve & Gini Index of DIY

Only those below the poverty line are considered when assessing poverty, whereas measuring inequality involves analyzing the entire population. Inequality can be evaluated using multiple factors, including non-monetary considerations like land ownership and assets. The Gini Index, a tool utilized to measure income distribution, is derived from the Lorenz Curve. The Gini Index (G) represents the ratio between the area of concentration between the Lorenz Curve and the diagonal line to half the rectangle where the Lorenz Curve is situated (maximum concentration).

Upon analyzing the Gini curve of the DIY, it is feasible to standardize the outcomes by Regency/City. The analysis reveals that the Bantul Regency recorded the highest level of inequality in 2022. Assuming a household expenditure level of IDR 1,000,000 for two households in Bantul, we can estimate the expenditure inequality as IDR 472,940.

4.2 Determinant between Household Economical Status on Social Economics Behavior

Our objective is to determine the β coefficient through the testing phase partially. Previous testing stages revealed that every predictor variable impacts the response variable.

During this partial test, we will carefully observe and analyze the individual effect of each predictor variable on the response variable.

Table 1. Estimation result of poor household

VARIABLES	(1) P0	(2) P1	(3) P2	(4) PPP	(5) Poor Food	(6) Poor Non-Food
Urban	1.199***	0.0609***	0.0258***	-0.967***	-0.114	-0.313***
	(0.105)	(0.00477)	(0.00233)	(0.246)	(0.0777)	(0.120)
Agegroup	0.105	0.0129**	0.00526*	-0.0692	-0.277***	0.0940
	(0.121)	(0.00590)	(0.00288)	(0.290)	(0.0989)	(0.143)
Marstat	1.304***	0.0476***	0.0194***	1.148***	0.645***	1.269***
	(0.125)	(0.00521)	(0.00254)	(0.395)	(0.0889)	(0.170)
NHS	-0.178***	-0.00309	-0.00150	-0.142	-0.0971***	-0.295***
	(0.0436)	(0.00199)	(0.000973)	(0.123)	(0.0331)	(0.0581)
CCT	0.743***	0.0433***	0.0171***	0.958***	0.207*	0.762***
	(0.124)	(0.00669)	(0.00327)	(0.290)	(0.108)	(0.144)
BPNT	0.404***	0.0263***	0.0111***	0.509*	0.234**	0.472***
	(0.122)	(0.00631)	(0.00308)	(0.308)	(0.102)	(0.142)
No_school	-0.0648	-0.0120*	-0.00608*	-0.612**	0.386***	-0.0817
	(0.139)	(0.00725)	(0.00354)	(0.310)	(0.120)	(0.154)
Elementary_School	-0.241	-0.0182**	-0.00614	-0.407	0.282**	-0.264
	(0.151)	(0.00766)	(0.00374)	(0.351)	(0.127)	(0.174)
Junior_Highschool	-0.144	-0.0317***	-0.0122***	-0.237	0.287**	-0.545***
	(0.146)	(0.00724)	(0.00354)	(0.352)	(0.121)	(0.181)
High_School	-0.734*	-0.0659***	-0.0274***	Base	0.231	-1.032
	(0.379)	(0.0132)	(0.00647)		(0.224)	(0.752)
Bachelor_Degree	-0.577***	-0.0575***	-0.0226***	-0.235	0.356**	-0.728**
	(0.220)	(0.00889)	(0.00434)	(0.572)	(0.150)	(0.313)
Master_Degree	Base	-0.0715***	-0.0270***	Base	0.462	Base
		(0.0177)	(0.00865)		(0.301)	
Doctoral_Degree	Base	-0.0547	-0.0205	Base	-0.0395	Base
		(0.0453)	(0.0221)		(0.849)	
HealthOOP	-2.15e-07***	-2.10e-09***	-8.16e-10**	-1.18e-06	7.84e-09	-9.39e-07***
	(6.55e-08)	(7.60e-10)	(3.71e-10)	(7.24e-07)	(1.24e-08)	(2.64e-07)
EducOOP	-1.96e-07***	-3.71e-10**	-1.52e-10*	-2.71e-07**	-6.36e-09	-4.07e-07***
	(2.84e-08)	(1.78e-10)	(8.68e-11)	(1.35e-07)	(4.59e-09)	(7.31e-08)

InsuranceExp	-9.44e-07***	-2.47e-09***	-8.88e-10***	-1.08e-06***	-5.83e-08***	-1.88e-06***
	(8.58e-08)	(5.92e-10)	(2.89e-10)	(3.07e-07)	(2.05e-08)	(1.76e-07)
Activesmoker	-0.406***	-0.0145***	-0.00557***	-0.187	-0.0365	0.121
	(0.0930)	(0.00431)	(0.00210)	(0.235)	(0.0705)	(0.116)
Housing_Ownership	-0.208*	-0.0268***	-0.0153***	-0.0920	-0.311***	-0.285*
	(0.116)	(0.00548)	(0.00268)	(0.373)	(0.0903)	(0.158)
Constant	-1.730***	0.00116	0.000903	-2.795***	0.00490	-0.838*
	(0.361)	(0.0171)	(0.00835)	(0.950)	(0.284)	(0.450)
Observations	3,832	3,904	3,904	3,712	3,904	3,832
R-squared		0.127	0.094			
R-squared by hand	0.223	0.127	0.0936	0.162	0.0320	0.262
Log Lik	-1602			-342.7	-2572	-1072

Source: Estimated using the SUSENAS 2022.

Standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

According to the findings presented in Table 1, it is evident that urban households significantly impacted poverty levels, depth, and severity in the DIY. However, urban households have a negative influence when it comes to extreme food poverty. This suggests that the Government's poverty alleviation efforts are effective for extremely poor households struggling to meet their food needs.

The heads of households in their productive age play a crucial role in poverty reduction. This was denoted by positive sign estimation on the P1 and P2 categories. Nonetheless, they positively impact food poverty since the heads of these households have access to alternative employment opportunities to support their families. Consequently, the more productive the household head is, the better they are at fulfilling their family's food requirements [27].

The marital status of the household head is a critical factor in determining the extent of poverty. The income and expenditure levels of married and unmarried individuals differ significantly. Married households generally have higher expenses as they are responsible for providing for their families. Furthermore, marital status also impacts extreme food and non-food poverty. Unfortunately, many household heads cannot adequately support their families, increasing extreme food and non-food poverty [28].

Health insurance ownership significantly reduces the tendency of households to fall into poverty levels, poverty depth, poverty severity, extreme poverty, and food poverty and efficiently reduces non-food poverty rates by 29.5%. It can be assumed that the health insurance program from the government is on target, supporting the accelerated poverty alleviation program [25][26]

The PKH program is a form of conditional cash transfer that makes it easier for poor households to access education, health, and social welfare service facilities. Based on the estimation results of the six models, the PKH program significantly influences the increase in household poverty likelihood. The PKH program in the DIY can still not become a catalyst for poverty alleviation. Apart from that, the analysis shows leaks in implementing the PKH

program, where households who access this program are included in the poor mentality. In line with research conducted by[29][30][31] stated that one of the problems for policymakers is deadweight loss.

Upon analyzing the correlation between education levels and poverty, it has been discovered that households led by highly educated individuals are more likely to alleviate poverty. This finding is congruous with the research conducted by [32][33][34] which propose that improving access to education in underserved areas can mitigate poverty. Furthermore, studies by reveal that education fosters emotional well-being and enhances household decision-making abilities.

The expenditure on health, education, and insurance was found to be a significant factor in reducing the probability of being poor. Households can significantly reduce their poverty rate if they allocate some of their spending towards insurance. Different types of insurance, such as health and education, can effectively support households in meeting their needs [35]. By having insurance, every household can reduce the risk of falling into extreme poverty, whether food or non-food-related.

According to the estimation results, it was found that those who smoke regularly have a higher likelihood of avoiding poverty. As a result, households with high cigarette consumption may not be classified as impoverished. This is due to the potential for serious health problems, associated medical expenses resulting from smoking, and the possibility of engaging in self-destructive behavior. To avoid inefficiencies in health assistance programs, policymakers should refrain from including households with active smokers in poverty determination criteria.[37][38] Furthermore, asset ownership has a negative impact on poverty among households. This result resonates with other studies by[39] and [40]stated that households with physical assets received some rent from these assets and they did not pay for such assets, thus reducing cash outflow. This supported the school of thought that asset ownership should lead to reduced poverty

5 Conclusion

This study aims to investigate the determinants of poverty among households in DIY. Overall, this current study revealed several findings. Households who lived in urban areas, married household heads, and received CCT from the government were found to be increasing the probability of being poor. Meanwhile, other variables such as the age of the household head, having health insurance, good education level, higher expenditure level of education, health, and insurance, being an active smoker, and owning a house asset decrease the poverty likelihood among households. Based on this result, Policymakers in Yogyakarta should focus on targeted poverty alleviation for urban households, especially those led by married individuals who receive conditional cash transfers. Programs for job creation and skill development, along with better access to health insurance and education, are key. Encouraging investment in education, health, and insurance can also help. Other measures like excluding smokers from poverty determination and promoting asset ownership may also be useful.

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