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## The Effect of Local Government's Elderly Social Assistance on Health Spending of Poor Elderly in Indonesia

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### *Abstract*

This research examines the effect of the local government's elderly social assistance program on out-of-pocket (OOP) health spending for the poor elderly group in Indonesia. The data used is March 2020 Susenas data using counterfactual analysis. Because the requirement to be able to carry out a counterfactual analysis is that the subjects of the study must have the same/balanced characteristics, the data used is limited to the elderly in the bottom 40 percent of the economic group. Moreover, the randomization technique is also carried out using the Propensity Score Matching-Nearest-Neighbors (PSM-NN) method, namely constructing data with similar characteristics into two groups: the group that received treatment and the group that did not receive treatment. The results of this study indicate that the poor elderly group who receive elderly social assistance from the local government has a higher OOP health spending of 28.3 percent compared to the poor elderly group who do not receive assistance. The high spending on OOP was mainly due to increased spending on curative.

**Keywords:** Elderly Poverty; Health literacy; Curative; Out-of-pocket (OOP); Local Government's Elderly Social Assistance Program; Elderly Social Protection; Propensity Score Matching-Nearest-Neighbors (PSM-NN); preventive; Curative.

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## 1. Introduction

Indonesia is the fourth country with the highest number of elderly in Asia after China, India, and Japan (World Bank, 2022). In 2021, the number of Indonesia's elderly population reached 10.82 percent of the total population of Indonesia, or around 29.3 million people (BPS, 2021). The World Bank estimated that by 2050 the number of Indonesian elderly would reach 69.8 million, or 21.1 percent of Indonesia's population (World Bank, 2021). However, due to declining working capacity and health, this group is more vulnerable to falling into poverty than other age groups. In 2019, the poverty rate of elderly in Indonesia reached 11.1 percent, the highest among other age groups (TNP2KP, 2019). Social protection programs for the elderly, both contribution schemes and non-contribution schemes (poor elderly), are very important in efforts to reduce the poverty rate of the elderly. Expanding the coverage of participants or existing social protection benefits can significantly reduce the poverty rate of the elderly (Kidd, et al., 2019).

National-level social protection for the elderly in Indonesia is considered to have low coverage by some. In 2021, social protection for the elderly only covered 4.7 elderly or around 18 percent of Indonesia's total elderly population. The social protection consists of the Jaminan Hari Tua/JHT Badan Penyelenggara Jaminan Sosial Ketenagakerjaan/BPJSTK contribution program for 356,600 participants and ASN/TNI/Polri pension benefits for 3.2 million participants. Meanwhile, programs for the poor (non-contributory) groups consist of the PKH Program for the elderly for 1,100,000 people and a program for neglected elderly (ASLUT) for 35,000 people. The low coverage of social assistance for the elderly from the state budget/APBN is mainly due to the limited fiscal space in the APBN. Meanwhile, at the local government level, social assistance for the elderly also has a very limited scope. Based on the March 2020 Susenas data, all local governments have social assistance programs for the elderly. However, in a very small proportion.

The next question is, when the elderly is given cash assistance, what is the additional income used for? Based on consumer theory in microeconomics, individuals will choose for goods and services based on the most rational reasons, namely to provide maximum satisfaction (Pindyck & Rubinfeld, 2018). When entering the elderly, one of the biggest expenditures that must be incurred by the elderly is health expenditure as the productivity, and health of the elderly decline. Nationally, 43.22 percent of the elderly experience health problems and 22.48 percent of the elderly experience illness (BPS, 2021). National Health Accounts Indonesia/NHAI data (2019) shows that the highest proportion of health spending in Indonesia still comes from Out-of-Pocket (OOP) funding (32.1 percent), higher than social health insurance funding which only reached 23.1 percent. Meanwhile, poverty is significantly related to OOP spending (Kim & Richardson, 2014).

Based on the explanation above, this study tries to see the effect of local government elderly social assistance on elderly OOP health spending. Because the target of social assistance recipients is the lowest economic group and also as an effort to reduce selection bias, the focus of the unit of analysis to be studied is the elderly in the bottom 40 economic groups.

This research aims to determine the magnitude of the impact of the local government's elderly assistance program on oop health spending for the poor elderly group in indonesia. This study is very important because Indonesia is one of the countries that has

the highest number of elderly in Asia with the highest poverty rate compared to other age groups. However, until now, the government's attention to the elderly group is relatively low compared to other age groups. This research expected to be able to provide input/recommendations (based on empirical evidence) to both central and regional governments regarding policies that need to be pursued, especially in improving the quality of life of the elderly in Indonesia.

## **2. Methods**

Based on previous studies, the high poverty rate for elderly in Indonesia is caused by: (i) 85 percent of elderly in Indonesia does not have economic/income security (Kidd, et al., 2019); (ii) the amount of benefits from social protection programs in Indonesia is still too low to produce effective protection (Ramesh, 2014); and (iii) the pension program in Indonesia is still lacking to provide protection for the poor and vulnerable elderly, where the number of elderly covered by the Social Assistance for the Displaced Elderly (ASLUT) is very small while pension insurance through the National Social Security System (SJSN) takes at least 20 years to produce coverage tall one; as well as the level of education, health, the labor participation rate in the elderly, and retirement benefits (Priebe & Howell, 2014).

To solve the low coverage of pension benefits for the elderly, many countries have introduced social pensions to complement to formal sector pensions as income support for the elderly group (Priebe & Howell, 2014). Priebe and Howell (2014) simulated the potential effects of social retirement at 10 percent, 15 percent, 20 percent, and universal retirement on the poverty rate of the elderly (2012 Susenas data). The results show that with social assistance of IDR 200,000 per month provided to 5 percent of the elderly 60 years and over, the poverty rate for the elderly will decrease from 12.35 percent to 9.76 percent.

The increasing number of elderly causes demands for family-and community-based elderly services to increase (Gu, et al., 2020). Community-based elderly services have a very important role considering that institutional-based services have limited capacity and require high costs.

### **2.1 Out-of-pocket Health Spending (OOP)**

The definition of Out-of-pocket (OOP) health spending according to WHO is any expenditure by households, including gratuities and payments in kind, to health workers, pharmacies, therapists, or other goods and services that aim to restore or improve a person's health status or community groups. A common indicator used to measure whether a household has high OOP health spending is when the proportion of expenditure exceeds 10 percent of household income or below 10 percent for low-income families (Cunningham 2009; Schoen et al. 2010, 2014; Collins et al. al. 2014 in Baird 2016). OOP health spending can increase if household members must receive health care or services but do not have financial protection against high health costs or do not have access to health insurance (Jalali, et al., 2021).

Research on providing local government social assistance to the elderly in Indonesia is still very limited, especially when it is associated with OOP health spending on the elderly. Agnes, et al., (2021) found that, the highest OOP health spending was in areas where insurance claims were the highest, namely Java and Bali, which were 180 percent larger than the provinces in the east. This because the provision of health services in eastern Indonesia

is much more limited than the provision of health services in western Indonesia. Meanwhile Sparrow, et al., (2013) found that the ratio of OOP health spending to total spending in the richest group was higher (2.4 percent) than in the poorest group (1.4 percent)

### **2.3 Health Literacy**

Health literacy is a person's capacity to obtain, process, and understand basic health information and services needed to make the right health decisions (Hardie, et al., 2011; Howard, et al., 2005). They found that someone who has good health literacy is associated with having a lower total health expenditure, especially in spending on emergency departments and outpatient care. Meanwhile, someone who has a low health literacy score, generally uses more health services, especially for more chronic diseases. Increasing health literacy is an effective strategy for improving health status and reducing the use of expensive hospital and emergency services among elderly patients (Cho, et al., 2008).

## **3. Data and Method**

This research used cross-sectional data from the 2020 National Socioeconomic Survey (Susenas). The unit of analysis used is household members who have reached old age. The definition of elderly based on Law Number 13 of 1998 concerning Elderly Welfare, someone who has reached 60 years and over. Based on the results of cleaning data, from 1,258,328 observations of people/individuals of all ages, there were 121,961 elderly data which became the unit of analysis in this study. However, because the data analysis focused on the elderly in the bottom 40 economic groups, the number of analysis units remaining was 51,195 elderly.

The dependent variable used in this study is the ratio of out-of-pocket spending to total spending for the elderly population. The main independent variable used is the local government's elderly social assistance. Meanwhile, the control variables used in this study divided into four groups, namely individual characteristics, program characteristics, geographic characteristics, and asset ownership characteristics. Determination of these control variables is a combination of various previous studies by adjusting the availability of existing data.

We used descriptive analysis to provide an overview of the condition of the elderly population in Indonesia. Meanwhile, we used counterfactual analysis to see the causality relationship between the local government's elderly social assistance received by the elderly and the elderly's OOP health spending. What is meant by counterfactual in the context of this study is to compare the actual condition of OOP health spending for the elderly when they receive intervention/treatment from local government elderly social assistance and when they do not receive the intervention. To carry out a counterfactual analysis, research subjects must have the same characteristics (Cunningham, 2020).

However, one of the problems in using observational data, in this case, Susenas data, is that there are differences in the characteristics of the subjects or samples that receive treatment and those that do not or confounding. Although the data used is limited to the elderly in the bottom 40 percent of the economic group, the characteristics of the elderly observed are still heterogeneous, ranging from age, marital status, education level, health status, occupation, domicile, assets owned, government programs obtained and so on. To

overcome this problem, the method used is Propensity Score Matching (PSM) (Austin, 2011).

PSM is a data randomization approach by constructing data with similar characteristics into two groups, namely the treatment group and the untreated group (Austin, 2011). Bias will reduce if the results of the propensity score comparison between the treatment group and the control group have values as close as possible (Rosenbaum & Rubin, 1983). In this study, the sample divided into two groups: (i) the group that received local government social assistance (treated) and the control group, namely those that did not receive local government elderly social assistance.

Based on Yanovitzk, et al., (2005), the steps in conducting PSM analysis are:

1. Determining the covariates that will used as confounding variables to estimate the value of the propensity score. The covariates used in this study are variables that affect the sample's chances of receiving local government elderly social assistance (treatment), namely: age, gender, job, marriage, education, health status, receiving the PKH program, retirement, JHT, and home ownership, all of which made in dummy form;
2. Calculating the propensity score to produce a balanced score. Propensity is said to have a balanced score if the distribution of the covariate calculations is the same between the samples that get treatment and the samples that do not get treatment (Austin, 2011);
3. Perform matching analysis. The matching method used in this study was the nearest neighbor that, each sample in the group that received local government assistance, matched to the sample in the control group that had the closest propensity score (Katchova, 2013). Sample data in the control group that does not have values that match or approach the values in the treatment group will not use;
4. Calculating the value of the balance covariate and average treatment of treated (ATT). The covariate balance test carried out to check the covariate balance in the confounding variables between the treatment and control groups. ATT performed to estimate the effect of treatment on the treatment group by comparing the average difference in the results between the treatment and control groups for all samples.

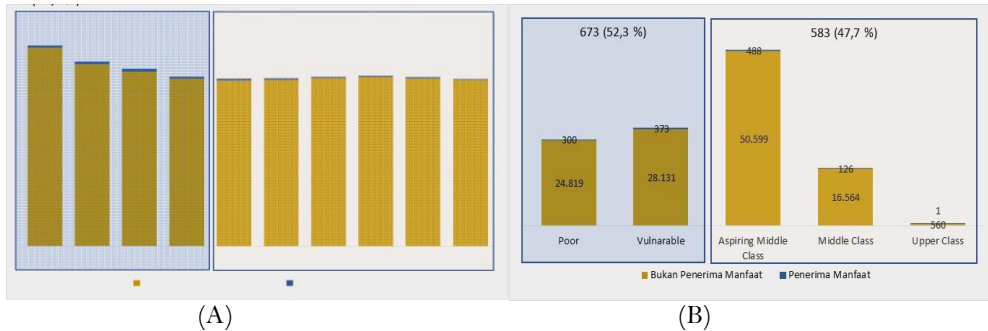
In addition, the propensity score matching in this study will be combined with a regression adjustment. To solve the problem of bias caused by the observed differences in the baseline covariate residuals between the two groups, propensity score matching combined with regression adjustments (Imbens, 2004; Rubin & Thomas, 2000; Austin, 2011).

## **4. Result and Discussion**

### **4.1 Descriptive**

Figure 1 shows the beneficiaries of local government social assistance spread across all economic groups, from the poorest (decile 1) to the richest (decile 10). Of the total who received social assistance from the local government, only 646 respondents, or 50.4 percent, came from the bottom 40 percent of the economic group (decile 1 to decile 4). The low number of beneficiaries coming from the poorest 40 percent group indicates a high exclusion errors and inclusion errors of the program. Inclusion error means that community groups that should not be the target of the program receive the program. On the other hand,

exclusion error means the group that should have received the program but did not get the program.



**Figure 1.** Distribution of Recipients of Local Government's Elderly Social Assistance in 2020. Figure (a) is based on ten deciles, Figure (b) is based on World Bank population grouping

**Source:** Susenas March 2020

In addition, it found that there was a significant difference (using the t-test) between the average OOP health expenditure ratio for the elderly beneficiary group (2.0 percent) compared to the non-beneficiary group (1.7 percent). Table 1 shows that the average ratio of OOP health spending among the elderly in the bottom 40 percent of the economy is smaller (1.7 percent of total spending in a year) compared to the average OOP health spending in the economic group above 40 percent (3.5 percent). It is in line with research by Sparrow, et al., (2013), which showed that in 2006 the ratio of OOP health spending to the total spending of the richest economic group was greater (2.4 percent) than the poorest group (1.4 percent). In addition, OOP health spending for the elderly in western Indonesia is almost twice as large as OOP health spending for respondents from eastern Indonesia, both in nominal terms and in ratio to total spending per month. It is in line with research conducted by Agnes, et al., (2021), which shows that the eastern provinces of Indonesia, apart from having a small population, also have small expenditures, including health expenditures, even though their scores for health needs are high. Likewise, between cities and rural areas. It is due to the fact that the provision of health services in eastern Indonesia is far more limited than the provision of health services in western Indonesia (Pratiwi B Agnes, et al., 2021)

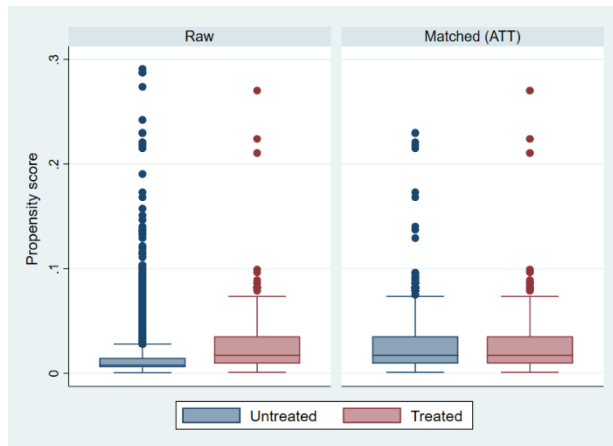
**Table 1.** Comparison of Average Out-of-Pocket Spending by Economic Group and Geographical Location, Susenas March 2020

Variabel	Obs	Mean	Std. Dev.	Min	Max
<b>Kelompok Ekonomi</b>					
<b>Economic Group Decyl 1-4</b>					
Amount of Out-of-Pocket Expenditure per Year (Rp)	51.195	95.788	166.925,1	1,000	2.359.668
Ratio of Out-of-Pocket Spending to Total Spending per Year (%)		1,732	27,678	0,001	31,912
<b>Economic Group Decyl 5-10</b>					
Amount of Out-of-Pocket Expenditure per Year (Rp)	70.766	800.170	3.489.758	1,000	240.000.000
Ratio of Out-of-Pocket Spending to Total Spending per Year (%)		3,506	5,998	0,000	48,398
<b>Letak Geografis</b>					
<b>Province of Western Indonesia</b>					
Amount of Out-of-Pocket Expenditure per Year (Rp)	39.660	105.549	177.653	1	2.359.668
Ratio of Out-of-Pocket Spending to Total Spending per Year (%)		1,901	2,937	0,001	31,912
<b>Province of Eastern Indonesia</b>					
Amount of Out-of-Pocket Expenditure per Year (Rp)	11.535	62.227	117.056	1	1.685.501
Ratio of Out-of-Pocket Spending to Total Spending per Year (%)		1,149	1,975	0,001	23,042
<b>City</b>					
Amount of Out-of-Pocket Expenditure per Year (Rp)	16.439	108.714	181921.1	1	2.359.668
Ratio of Out-of-Pocket Spending to Total Spending per Year (%)		1,917	2,948	0,001	31,572
<b>Village</b>					
Amount of Out-of-Pocket Expenditure per Year (Rp)	34.756	89.674	158.978	1	2.355.501
Ratio of Out-of-Pocket Spending to Total Spending per Year (%)		1,644	2,674	0,001	31,912

Source: Susenas Maret 2020, data telah diolah

#### 4.2 Counterfactual Analysis

Figure 2 shows that the data meets the requirements for a balanced score. Propensity is said to have a balanced score if the distribution of the calculation of the basic covariates between samples that receive treatment and samples that do not receive the same treatment (Austin, 2011).



**Figure 2.** Propensity Score Using the Nearest Neighbors Matching Model

Based on the estimation results using the Propensity Score Nearest-Neighbor Matching (PSM-NN) model combined with regression adjustment, all models consistently

show that the local government's elderly social assistance programs have a positive impact on the OOP health expenditure ratio for the elderly in the lowest 40 percent economic group.

**Table 2.** Estimating the Impact of Local Government's Elderly Social Assistance on the

Method	Dependent Variable: Ratio of Out-of-Pocket Spending to Total Spending			
	1	2	3	4
<b>1. Ordinary Least Square (OLS)</b>				
Local Government Elderly Social Assistance Beneficiaries				
(1= Beneficiaries, 0= Non-Beneficiaries)	0.147 (0.130)	0.149 (0.127)	0.171* (0.082)	0.221** (0.022)
<b>2. Propensity-Score Nearest-Neighbor Matching (PSM-NN)-ATT</b>				
Local Government Elderly Social Assistance Beneficiaries				
(1= Beneficiaries, 0= Non-Beneficiaries)	0.235** (0.023)	0.211** (0.043)	0.230** (0.031)	0.283*** (0.007)
<b>3. Multivariate-D istance Nearest-Neighbor Matching-ATT</b>				
Local Government Elderly Social Assistance Beneficiaries				
(1= Beneficiaries, 0= Non-Beneficiaries)	0.232** (0.025)	0.212** (0.042)	0.230** (0.030)	0.280*** (0.008)
Control Variables				
Individual Characteristics	Yes	Yes	Yes	Yes
Program Characteristics	No	Yes	Yes	Yes
Asset Owner Characteristics	No	No	Yes	Yes
Geographic Characteristics	No	No	No	Yes

Standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

An estimation coefficient of a 28.3 percent indicates that the elderly in the bottom 40 percent of the economy who receive elderly social assistance from the local government has 28.3 percent higher OOP health expenditure ratio than the elderly group who do not receive elderly social assistance. If we look at the existing data structure, the high OOP health spending among beneficiary groups is caused by the following:

1. The average OOP expenditure for curative in the group receiving local government elderly social assistance was significantly higher, namely 85.3 percent of the total OOP expenditure, compared to the group that did not receive benefits (82.3 percent).

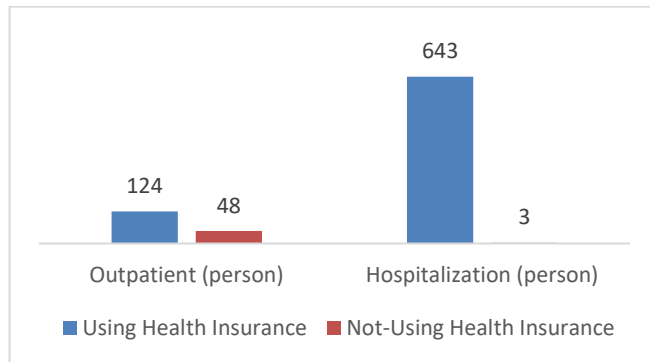


**Table 3.** Comparison of Preventive and Curative OOP Health Spending Data between the Beneficiary of local Government’s Elderly Social Assistance Group and Non-Beneficiary Groups (Rupiah), Susenas March 2020

	<b>Receiving Local Government Elderly</b>				<b>t-test 5 % (Pr T &gt; t )</b>
	Yes	total OOP	No	total OOP	
Preventive_OOP	16.458	14,7	16.878	17,7	0.7118
Curative_OOP	95.850	85,3	78.698	82,3	0.2230**
Total OOP	112.308		95.576		
Obs	646		50.549		

Source: Susenas Maret 2020

- Of the total elderly who receive elderly social assistance and are currently outpatients, only 72 percent use health insurance, while 28 percent do not use their health insurance. In spite of the data shows that 89.5 percent of the beneficiary group has health insurance (BPJS Kesehatan/Jamkesda).



**Figure 3.** Comparison of the Number of Elderly Using *Social Health Insurance* and *Do Not Using* in Outpatients and Inpatients Cases in the Group of Elderly Social Assistance Recipients

Source: Susenas March 2020

To test the robustness of the estimation results of the main model, namely the Propensity Score Nearest-Neighbor Matching (PSM-NN), another estimation is performed using Multivariate-Distance Nearest-Neighbor Matching (MDM-NN). In addition, the results of the Ordinary Least Square (OLS) estimation also presented in order to see the effectiveness of the main model in minimizing confounding variable bias. The MDM-NN model shows the same directions and coefficients as the main PSM-NN model. Thus, it can be said that the estimation results of the main PSM-NN model are robust, with an impact of 28.3 percent. It also means that the matching method is the right step in overcoming the potential for biased estimation results, as often appears in OLS models.

## 5. Conclusion and Recommendation

Based on the results of counterfactual analysis, it found that the local government's elderly social assistance programs had a positive effect on the ratio of OOP health spending on the elderly (to their total spending) in the lowest 40 percent economic group. By using the PSM-NN model, an estimated coefficient of 28.3 percent at a significance level of one percent. It means that the elderly group that receives the local government's elderly social assistance program has a ratio of OOP health spending greater 28.3 percent compared to the elderly group that does not receive treatment.

The social assistance provided by the local government to the elderly, apart from functioning as financial protection for OOP health cost shocks should be directed at a larger impact/outcome, in this case, improving overall health outcomes for the elderly. However, based on existing data, the increase in beneficiary OOP health spending was more due to an increase in medical/curative costs. The high cost of curative and low cost of prevention shows the low level of health literacy in the beneficiary group. Someone who has inadequate health literacy will incur higher medical/health costs and use inefficient health services, especially in the use of emergency services. Based on previous research, increasing health literacy is the most effective direct approach to improve health status, especially in reducing hospitalization and use of the elderly emergency unit.

OOP health spending is said to be good if it is the preference of income and individuals. An increase in OOP health spending can have a negative impact on a person/household if they have to get health services but do not have financial protection against high health costs or do not have access to health insurance. In this study, it can conclude that the increase in OOP health spending is a preference for the elderly because 89.5 percent of beneficiaries have social health insurance, both JKN/Jamkesda. It could be because the existing social health insurance requires a long bureaucracy, so the elderly prefer to spend out-of-pocket rather than using health insurance. Patients will choose to spend on OOP health spending, especially for outpatient care, if the costs are affordable and of good enough quality, and to avoid queues or long administrative processes.

Meanwhile, based on the results of the descriptive analysis, shows several things. First, the exclusion error and inclusion error rates for the local government's elderly social assistance program are still very high, namely, only 50.2 percent of recipients come from the bottom 40 percent of the economic group, while more are enjoyed by the middle and upper economic groups. The high exclusion error and inclusion error indicate several possibilities, namely, the weakness of the Integrated Social Welfare Data (DTKS) collection and updating mechanism, not all local governments actively assist in the data updating process, limited funds and human resources, and different requirements for program beneficiaries in every province. The second, there is a significant difference in average out-of-pocket spending between the provinces of western Indonesia (1.9 percent) and eastern Indonesia (1.1 percent), as well as between urban areas (1.9 percent) and rural (1.6 percent).

Based on the findings obtained, several policies can implement are:

1. The central and regional governments need to increase health literacy among the community, especially increasing public awareness in broad prevention efforts.
2. Efforts to increase health literacy in the elderly can utilize existing communities or non-governmental organizations such as Social Welfare Institutions (LKS) or elderly Integrated Healthcare Center (Posyandu). The number of LKS in Indonesia up to

2020 has reached 893 institutions, and almost every sub-district/village has an elderly posyandu. The LKS and posyandu have cadres or assistants who's their roles can be maximized, especially in prevention efforts.

3. The data shows that the coverage of this local government's elderly social assistance program is still very limited. Therefore, the government needs to strengthen existing programs, including increasing the coverage of local government elderly social assistance programs, considering that the elderly are the most vulnerable and poor group and also that Indonesia is facing an aging population.
4. To overcome the high inclusion errors and exclusion errors of beneficiaries, the central and regional governments need to jointly improve the data collection and updating of DTKS and take firm action against local governments that do not actively update fair data.
5. To overcome differences in average health spending between provinces in western Indonesia and provinces in eastern Indonesia, as well as in rural and urban areas, the government needs to continue to improve health services, especially fulfilling the supply side, namely fulfilling health infrastructure in the regions eastern Indonesia and in rural areas.

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