Evaluating Health Insurance Inequality in Indonesia using Concentration Curve and Index

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Abstract: Equality in access to health services is one of main concerns in improving the public's well-being. In Indonesia, the public administration has tried to achieve this equality by establishing National Health Insurance (NHI) in early 2014, replacing the older system of public health insurance. The data used in this study is the Indonesian Family Life Survey, which took place 1 year after NHI implementation. This study has assessed the inequality in public and private health insurance for public and private health using a Concentration and Kakwani Index. Furthermore, the sample used was decomposed in to a sub-sample to get more detailed information. This study found that there is some degree of inequality in public health insurance, but it is more pro-poor than private health insurance. However, there is evidence from the decomposed results that shows that there is some room for improving the inequality.

1 INTRODUCTION

In 2005, 58th World Health Assembly underlines the need of Universal Health Coverage, to ensure health financing for every people. Indonesian government already reach out this issue a year before, by enacting Law No. 40/2004 about National Social Security System. This law is the very foundation to achieve NHI (National Health Insurance) in Indonesia. The Indonesian government choose insurance approach rather than market one, prior to the experiences in cross-country that successfully implemented in United States of America and China (World Health Organization, 2010)

In 2014, the Indonesian government's effort towards achieving universal coverage in health insurance has entered a new stage in the implementation of NHI. It is now in the first stage of managing the participants, giving priority to important elements of the public worker sector including people who already have Health Insurance and Workers Social Insurance, and the poor. The next stage is to give access to all people in Indonesia, which is targeted to be achieved in 2019 (Indonesian Ministry of Health, 2013).

Earlier evaluations of Indonesian health insurance have already been conducted by Hidayat, Thabrany (2004) and Pradhan, Saadah (2007) for the period of crisis from 1997-1998. Another evaluation was conducted by Vidyattama, Miranti (2014) post-NHI implementation. These works used the same factor to assess inequality, which is the access and utilization for health insurance. The results from these works show that the access for health insurance is already pro-poor, but there is some degree of leakage for public health insurance utilisation.

This implementation of NHI surely helps the poor in Indonesia. However, it still needs further evaluation. One way to do this evaluation is using a concentration curve and index. Kakwani (1977) used this method to assess the progressivity of tax. Later on, these methods were implemented in the health economics context by Wagstaff, Paci (1991) and Kakwani, Wagstaff (1997), which together with the Kakwani index is handy for evaluating progressivity.

Why do the evaluation? Does it help to make a change to inequality? These questions have been answered by Wagstaff van Doorslaer (2003) using the decomposition method. In their works, they noted that the decomposing method could answer the three problems that arise in health inequality. First, the inequality of some of the variables might stem from inequality in the other variables. Second, there is evidence that inequality is changing over time (Victoria, et al., 2000; Schalick, et al., 2000), and one should answer to the factors driving this.

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The third the most obvious problem in relation to the evaluation is that we need more information to make a better-designed policy.

Two decomposing factors that are relevant to inequality are the health care type and health care provider type. Between public and private health care providers, Gertler (2007) noted that there is evidence of inequality that stems from different access to high-quality outpatient care caused by different treatments from the public and private health care providers. An important factor that needs to be taken note of in relation to this problem is the preference of the poor. It was noted by Gertler (2007) that they prefer public-provided health care.

As for health care type, we began with a price comparison between inpatient and outpatient care. Adam and Evans (2006) worked out that when comparing between the two, the results show that the ratio between inpatient cost compared to outpatient cost could range from 2 to 12 times higher. This suggests that the inequality might be more severe in inpatient care than outpatient care. But in the same study, Adam and Evans (2006) also showed that this factor might be related to the facilities in the hospital. If the hospital could afford more technology that would make for better outpatient care, this would generate a higher outpatient cost.

From that point of view, this article will evaluate inequality using a concentration curve, concentration index, and Kakwani index. Using data from the fifth wave of IFLS (Indonesian Family Life Survey), this article evaluates the inequality approximately 1 year after entering the first stage of NHI. Later, this article decomposed the obtained concentration index to get more detailed information. The decomposing factor used has also been provided in this data set.

Different from the previous works, the factors evaluated in this article relate to the claimed benefit of insurance. It is used for the claimed benefit to get a better insight in to the benefit value of insurance. It is also extending the utilisation findings in the previous works that still use the number of insurance claims, and not the value of them.

2 METHODS

Different to the Lorenz curve, the concentration curve could explain the inequality by connecting economic inequality with other living standard variables (O' Donnell, 2008). In this article, the living standard variable is the claimed benefits of health insurance. The claimed benefit will be plotted against the cumulative population proportion in they-axis and cumulative wealth proportion in the x-axis sorted from poor to rich. In the Lorenz curve, it plots the shares of the claimed benefit against quantiles of the living standards variable.

From the obtained concentration curve, the concentration index was calculated. The concentration index formally could be defined as being twice the area of the concentration curve and line of equality. A convenient regression to calculate concentration index was demonstrated by Kakwani, Wagstaff (1997) obtained by the following formula:

$$2\sigma_r^2\left(\frac{h_i}{\mu}\right) = \alpha + \beta r_i + \varepsilon_i \quad (1)$$

where σ_r^2 is variance of the rank used,h is claimed benefit, and r is the rank obtained from the wealth ranking which could be easily obtained through the computation of the concentration curve.

To obtain the standard error of the concentration index, Kakwani (1997) derived the standard error for the individual level data. Their formula resulted from applying the delta method used by Rao (1965). Specifically, the formula used was:

$$var(\hat{C}) = \frac{1}{n}\left[\frac{1}{n}\sum_{i=1}^{n} a_i^2 - (1-C)^2\right] \quad (2)$$

for $a_i^2 = \frac{h_i}{\mu}(2r_i - 1 - C) + 2 - q_{i-1} - q_i$, and $q_i = \frac{1}{\mu n}\left(\sum_{j=1}^{i} h_j\right)$, where n is the sample size, and q is the concentration curve ordinate.

After the concentration index was obtained, we calculated the Kakwani index. This index is useful to see whether or not the variable is progressive or regressive in respect to its ATP (Ability to Pay) measurement. In this case, we will use the Lorenz curve (O'Donnell, 2008). As used by Kakwani (1977), the Kakwani index in this article has been formulated as:

$$\pi_{kakwani} = C_h - G_h \quad (3)$$

where G shows the Gini index which representing ATP.

To obtain a more detailed result, the samples were decomposed using a method demonstrated by Wagstaff, van Doorslaer (2003). The decomposing factor used in this article is the type of health care (outpatient or inpatient) and the type of healthcare centre provider (public or private healthcare centre). Technically, the formula used for decomposing is to

treat the concentration index for claimed benefit as having a linear relationship to the concentration index of the regressor. Specifically:

$$h = \alpha + \sum_k \beta_k x_k + \varepsilon \quad (4)$$

where h is the claimed benefit, and k represents the number of regressors used. From this linear relation, the concentration index can be written as:

$$C_h = \sum_k (\beta_k \bar{x}_k / \mu) C_k + C_\varepsilon / \mu \quad (5)$$

where residual component captured by ε.

The data used in this article is the fifth wave of IFLS. This survey was conducted in 16,204 households in Indonesia, representing 83% of the Indonesian population (Strauss, 2016). This dataset is useful when explaining the claimed benefit of health insurance, complemented with other information about health insurance, which is not provided by other datasets for Indonesia.

3 RESULTS

Figure 1 and Table 1 (see Appendix) show the results for the total and sub-sample of the claimed benefit. The results of the total sample show that there is a moderate value of inequality. However, the results from the sub-sample show the inequality difference between public and private insurance. It shows that the inequality between public insurance is lower than that of the private insurance. These results are also consistent with the Kakwani index, which shows that public insurance is more regressive than private insurance.

Results from the decomposition show that the type of healthcare is more elastic in public insurance. In public insurance, the type of health care contributes a positive concentration to the total value. This means that outpatient care creates more inequality than inpatient care. This result also happens in private insurance, but with a higher contribution to inequality.

The results also show that the type of healthcare provider is more elastic in private insurance than in public insurance. In public insurance, the type of healthcare provider contributes a negative concentration to the total value. This means that publicly-provided health care creates more equality than privately provided care. The magnitude of this "pro-poor" result is very low. Different results happen in private insurance, which shows that public health care centres treat private insurance in a "pro-rich" way.

4 DISCUSSION

Public insurance shows lower inequality than private insurance. This result immediately suggests that public insurance is not implemented as intended, but if we compare it to the results in private insurance, then it is more pro-poor. The Kakwani index for either of the sub-samples also supports this finding. Public insurance is more regressive than private insurance, which means that it is more pro-poor in the perspective of ATP.

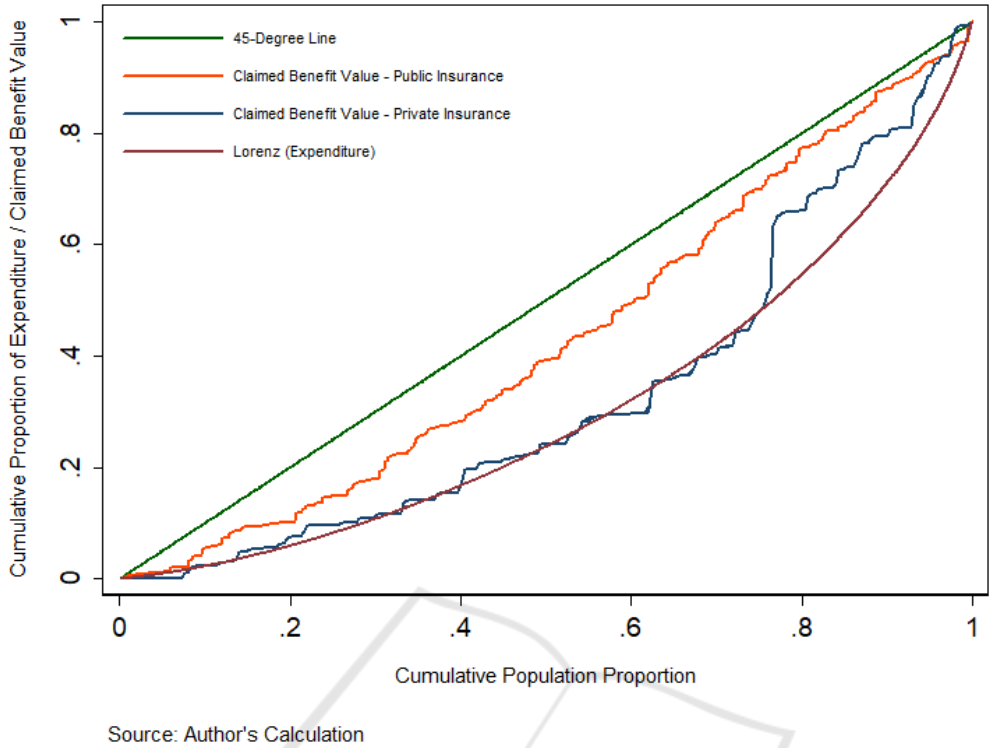

Figure 1: Concentration Curve of Claimed Insurance Benefit and Lorenz Curve in Indonesia

Table 1: Concentration and Kakwani Index

	Insurance Provider		
	Total	*Public*	*Private*
Gini Index	0.3893	0.3799	0.3817
	(0.0078)	(.0094)	(0.0142)
Concentration Index	0.2314	0.1439	0.3449
	(0.0398)	(0.0437)	(0.0523)
Kakwani Index	-0.1579	-0.2360	-0.0368
N	1203	954	249

Table 2: Decomposition of The Concentration Index

	Public Insurance			*Private Insurance*		
	Elasticities	*Concentration Index*	*Contribution*	*Elasticities*	*Concentration Index*	*Contribution*
Type of Health Care (Outpatient = 1)	-1.9199	-0.0161	0.0309	-1.4340	-0.0590	0.0846
Type of Health Care Center (Public Health Care Center = 1)	0.0900	-0.0649	-0.0058	-0.1217	-0.1696	0.0206
Residual	-	-	0.1188	-	-	0.2397
Total	-	-	0.1439	-	-	0.3449

Findings from the decomposition method show that outpatient care is one of the sources of inequality that happens in public insurance implementation in Indonesia. This inequality could be caused by the growing service of healthcare as noted by Adam and Evans (2006), which expands

the choice to use inpatient service in-house. Experience from Vietnam in 1998 also shows that outpatient care subsidies tend to be more inequal than the inpatient one (O'Donnell, 2008). Diseases that are included in this category also usually happen to charge at very high price, which normally can only be accessed by the rich.

Results from the decomposition also show that public healthcare centres could reduce inequality in their insurance benefits. The low magnitude suggests that public healthcare centres are still not significant in relation to reducing inequality. This needs to be evaluated since the poor prefer to use public healthcare centres, rather than private healthcare centres (Barber, 2007). Still, results from the private insurance sample show that public healthcare centres are more pro-poor while treating public insurance holders more than the private ones.

5 CONCLUSIONS

The overall results show that 1 year after NHI implementation, the public insurance shows a lower degree of inequality compared to the private one. This has made public insurance a pro-poor instrument for health equality, but contribution of outpatient care as a possible source of inequality in public insurance should be regulated by the government.

The decomposition result from the healthcare provider shows that public healthcare centres are more pro-poor when treating via public insurance. This result supports the preference of the poor that they would rather choose public healthcare centres over a private one. Since the magnitude of "pro-poor" is still low, there is still some room for public healthcare centres to improve the service to public insurance holders.

Although there is still some room for improvement, if these results already show that public insurance are implemented as intended, and showing a good promise. These results need to be monitored after full universal coverage takes place to prepare for any changes in future condition.

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