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## Indonesian Health System Performance Assessment: The Association between Health Insurance Expansion with Health Status and Health Care Access

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### Abstract

This paper analyzes health outcomes and inequality in Indonesia, and the links to intermediate factors and inputs. Between 1997-2015, the country's health performance indicators had improved and became more equal. This achievement could potentially be correlated with improvement in health care access, which might be a result of the Indonesian government's policy to expand health insurance coverage, mainly to the most impoverished population. By 2020, the Indonesian government operates national social health insurance, the *Jaminan Kesehatan Nasional* (JKN), which covers about 83% of the country's population, including the poor and vulnerable. This paper uses the Control Knob Framework and focuses on the health insurance expansion as the *financing knob* adjustment that was conducted by the government. The analysis starts with the improvement of health status indicators and tracks back its association with health care access and health insurance coverage expansion. This paper finds that health status improvement in Indonesia between 1997-2015 was correlated with health care access increase. The decline in the infant mortality rate (IMR) and the under-five mortality rate (U5MR) between 1997-2015 were associated with an increase in health care utilization, including the use of trained birth attendants and diphtheria-pertussis-tetanus (DPT) immunization. This paper then observes a strong correlation between the expansion of health care access and health insurance coverage. In terms of equality, the article sees a weaker, but evident, correlation between health insurance equalization across different population groups with more equitable health care access and health outcomes. The findings of this paper justify the effectiveness of the financing knob (expanding and equalizing health insurance coverage) in increasing access to care (outpatient and inpatient care, trained birth attendants, immunization) and improving health status (IMR and U5MR). This study is among the firsts to utilize Control Knob Framework as an analytical tool for health insurance assessment. The study recommends the government to combine health insurance expansion with other progressive policy, such as financial support to poor patients to cover the non-medical expenses of attending health care, to optimize the effectiveness of the interventions.

**Keywords:** Control Knob Framework; inequity; social health insurance; Indonesia; *Jaminan Kesehatan Nasional* (JKN)

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## I. Introduction

Before the Asian Financial Crisis in 1997, health insurance coverage was almost only exclusively available for civil servants and private formal-sector employees in Indonesia. These higher-income population groups traditionally accounted for less than one-third of the country's total population (*Badan Pusat Statistik* (BPS), 2003). The rest lower-income population belonged to the informal sector economy, lacking any type of health insurance coverage. This situation created inequality in health care access in Indonesia. For instance, in 1997, only 22% of birth deliveries within the poorest 20% population were assisted by a trained birth attendant, less than one-fourth of the figure of the wealthiest 20% population (World Health Organization (WHO), 2016). As expected, this then led to health status inequality, wherein 1997, the poorest 20% population's infant mortality rate (IMR) was 78.2 per 1000 live births, or 3.3 times higher compared to the IMR in the richest 20% population (WHO, 2016).

This paper analyzes health inequality in Indonesia, its dynamic, and possible links to intermediate factors and inputs. 15–20 years after 1997, the country's IMR and other health performance indicators had improved and became more equal. This achievement was potentially correlated with improvement in health care access, which might be a result of the Indonesian government's post-crisis insurance policy. In 1998, the government started subsidized health insurance for the poor population. This program was gradually expanded and integrated with other health insurance plans to a national social health insurance scheme in 2014 called the *Jaminan Kesehatan Nasional* (JKN), covering about 83% of the country's population (BPJS Kesehatan, 2020). This paper uses the Control Knob Framework and focuses on the health insurance expansion as the *financing knob* adjustment. The analysis starts from the health status improvement and tracks back its correlation with health care access and health insurance coverage advancements.

This paper finds that health status improvement in Indonesia between 1997–2015 was associated with an increase in health care access. More specifically, the decline in the infant mortality rate (IMR) and the under-five mortality rate (U5MR) between 1997–2015 was associated with an increase in outpatient and inpatient care utilization, the use of trained birth attendants, as well as diphtheria-pertussis-tetanus (DPT) immunization. Furthermore, this paper discovers a strong correlation between the expansion of health care access and growth in health insurance coverage. These two findings then justify the effectiveness of the financing knob in increasing access to care (intermediate indicators) as well as reducing IMR and U5MR (performance indicators). From the equality analysis, the paper observes a weaker, but evident, correlation between health insurance equalization across different populations with more equitable health care access and health outcomes.

While scholars have worked on health status and health insurance analysis in Indonesia, this paper offers a different emphasis on the dynamic of the insurance expansion and its connection to health inequality. This study is also among the first papers to utilize Control Knob Framework as an analytical tool for health insurance assessment. With its findings, this paper aims to contribute to the control knob and health insurance research literature as well as to provide evidence-based advice to Indonesian health financing policymakers.

## II. Methodology and Data Sources

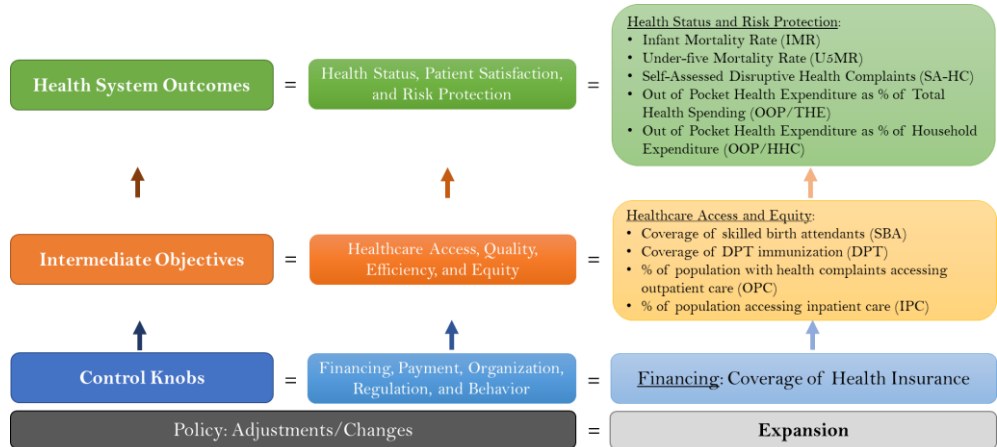
As previously mentioned, this paper used the Control Knobs Framework in explaining Indonesia's health status trajectory during the health insurance expansion era. The framework recognizes five primary control knobs for the government to adjust, as a part of health reform, in achieving a certain level of health outcomes (Sakarishvili, 2009; Roberts, Hsiao, Berman, and Reich, 2012). The five control knobs describe areas that matter significantly in a health system, including financing, payment, organization, regulation, and behavior. Changing either one or more of these knobs would influence health system outcomes within the area of health status, financial protection, and public satisfaction. The changes operate mainly through intermediate objectives, which consist of health care access, quality, efficiency, and equity (Roberts, Hsiao, Berman, and Reich, 2012). While the framework is quite broad, this study established the specific connection between the dynamic of Indonesia's overall health outcomes with health care access and the health financing knob.

In building the argument, this paper analyzed the trends of health status, health care access, and health financing indicators over the period of health insurance expansion. The study conducted general and subgrouped analysis. In the general part, the study evaluated the trends of national-level statistics to find any indication of improvement, regardless of the population group. In the subgrouped section, the analysis looked specifically at statistics for the 20% richest and 20% most impoverished population (quintile 5 and 1 – Q5 and Q1), to enable an equality assessment. For the equality assessment, this study created an equality score for each indicator in each year<sup>5</sup>. Lastly, correlation coefficients were calculated for various combinations between outcome, health care access, and financing knob indicators as well as equality scores<sup>6</sup>.

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<sup>5</sup> The scores were calculated by dividing the Q5 statistics by Q1 statistics and multiply it with 100%. A score of 100% meant Q5 statistic was perfectly equal with Q1 statistic, a score higher than 100% implied Q5 statistic was higher than Q1 statistic, and a score lower than 100% implied Q5 statistic was lower than Q1. To be viewed as “experiencing equality improvement/equalization,” an indicator’s score should be converging to 100% over periods of time, from either above or below 100%.

<sup>6</sup> Following Evans (1996), a categorical system of very strong (|0.80|–|1.00|), strong (|0.60|–|0.79|), moderate (|0.40|–|0.59|), weak (|0.20|–|0.39|), and very weak (|0.00|–|0.19|) correlation coefficient was applied.



**Figure 1.** The Control Knobs Framework Application on the Study

This paper used ten indicators. The set of performance indicators consisted of health status (infant mortality rate (IMR), under-five mortality rate (U5MR), self-assessed disruptive health complaints (SA-HC)) and health financing indicators (out of pocket health expenditure – OOP as a percentage of total health spending (OOP/THE), OOP as a percentage of household expenditure (OOP/HHC)). The set of intermediate (health care access) indicators consisted of maternal and child (coverage of trained birth attendants (SBA) and DPT immunization (DPT)) and general health care access indicators (percentage of people with health complaints accessing outpatient care (OPC) and percentage of the population accessing inpatient care (IPC)). Finally, the financing knob indicators consisted of health insurance coverage. The logical framework on how the indicators in this study fit the Control Knob Framework is illustrated in Figure 1. More details on the indicators and their sources can be found in Table 1.

**Table 1. Summary of Data**

Variable	Definition	Source	Years available
<b>Health system outcomes indicators</b>			
<i>Health status indicators</i>			
IMR	Number of infants (< than 1 year old) deaths/1000 live births	WHO Global Health Data (Estimated from DHS)	1997, 2002, 2007, 2012
U5MR	Number of child < than 5 years old deaths/1000 live births	WHO Global Health Data (Estimated from DHS)	1997, 2002, 2007, 2012
SA-HC	% of the population had health problems that disrupted daily activities	Socio-Economic Household Survey	2003, 2007, 2011, 2015
<i>Financial risk protection indicators</i>			
OOP/THE	Household direct health spending as % of total health spending	World Bank's World Development Indicators	2003, 2007, 2011, 2014
OOP/HHC	Household health spending as % of total household consumption	Socio-Economic Household Survey	2003, 2007, 2011, 2015
<b>Intermediate objectives indicators</b>			

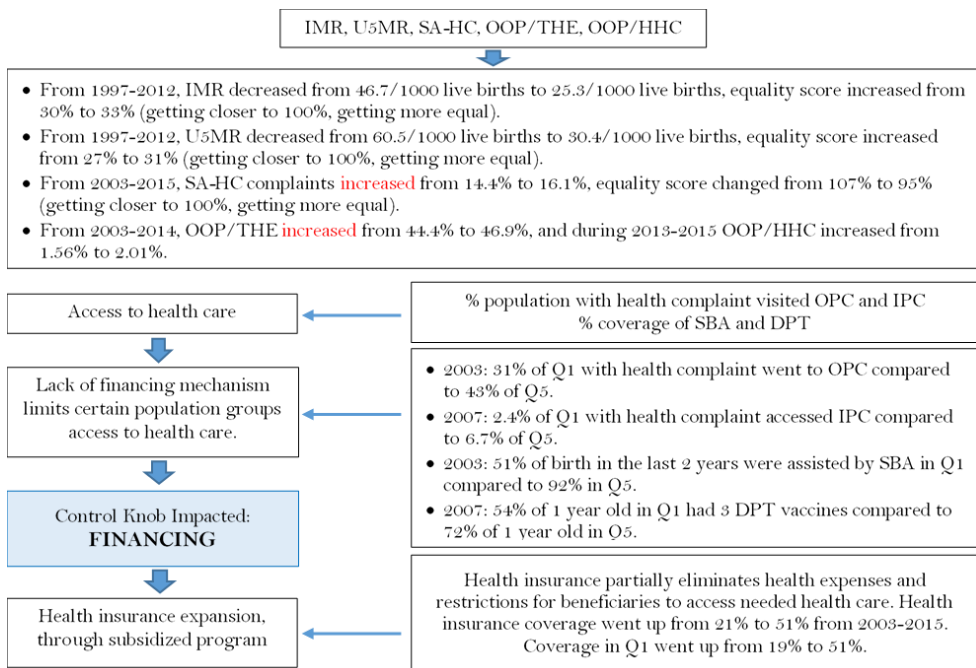
Variable	Definition	Source	Years available
<i>Healthcare access indicators</i>			
OPC	% of the population with health complaints visited outpatient care in the last 1 month	Socio-Economic Household Survey	2003, 2007, 2011, 2015
IPC	% of the population with health complaint visited inpatient care in the last 1 year	Socio-Economic Household Survey	2007, 2011, 2015
SBA	% births assisted by trained birth attendance in the last 2 years	Socio-Economic Household Survey	2003, 2007, 2011, 2015
DPT	% children age 1 year old received at least 3 DPT vaccines	Socio-Economic Household Survey	2007, 2011, 2015
<i>Healthcare equality indicators</i>			
Access inequality	Inequality measures in intermediate indicators (the equality score)	Socio-Economic Household Survey	2003, 2007, 2011, 2015
<b>Control knob</b>			
<i>Control knob linked to the intermediate objectives</i>			
Financing	Government's additional health spending to expand health insurance subsidy		
<i>Policy intervention in adjusting the control knob</i>			
Health insurance expansion	% of the population covered by any type of health insurance	Socio-Economic Household Survey	2003, 2007, 2011, 2015

The choices of the indicators reflected this paper's interest in analyzing Indonesia's general health status with an emphasis on health insurance expansion impact. IMR, U5MR, and SA-HC have been widely used in much research and analysis to represent general health status. Additionally, factors that influence population health (such as access to health care, economic development, and living conditions) also influence infant and child mortality, making them a good indicator for population health (Centers for Disease Control and Prevention (CDC), 2016; Reidpath and Allotey, 2003; United Nations Children's Fund (UNICEF), 2007). Self-assessed health status also has been found to be reliable in predicting health and responsive toward social determinants of health (Doiron, Fiebig, Johar, and Suziedelyte, 2015; Prus, 2011). While OOP/THE has been widely used as a financial protection indicator, the indicator is a macro-level indicator that often does not allow for a sub-group population-level analysis. Additionally, it has been found to be only weakly correlated with financial hardship (Saksena, Smith, and Tediosi, 2014). As a complement, OOP/HHC, a commonly utilized micro-level financial protection measure with a stronger connection with financial hardship, was also included (Saksena, Hsu, and Evans, 2014). The health care access indicators (OPC, IPC, SBA, and DPT) are chosen, not only because these services are covered by the insurance (so positive correlation between them are expected), but also they have been empirically evident to have a negative correlation with IMR, U5MR, and self-assessed health status (Phillips, Blanton, and Hammock, 2005; Moulton et al., 2005; Titaley, Dibley, Agho, Roberts, and Hall, 2008; Babiarz, Mahadevan, Divi, and Miller, 2016; Okwaraji, Cousens, Berhane, Mulholland, Edmond, 2012).

Finally, the decision to pick the indicators was also partially based on program dynamics and data availability. The Indonesian National Socio-Economic Household Survey (SUSENAS) data were the dominant source<sup>7</sup>. The SUSENAS' nature as a household survey enabled the study to analyze specific population groups (Q5 and Q1). The years of 2003, 2007, 2011, and 2015 were specifically chosen to capture the influence of the health insurance program's initial implementation years (1998-2003), first expansion (2004-2005), second expansion (2008), and the latest advancement to the national social health insurance scheme (2013-2014). However, among performance indicators, only SA-HC and OOP/HHC could be extracted from SUSENAS. To improve the analysis of the paper, more outcome indicators were taken from other sources, including the WHO's Global Health Observatory Data for IMR and U5MR, as well as the World Bank's World Development Indicators for OOP/THE. Unfortunately, the data available from these two sources did not overlap with SUSENAS data. WHO data covered only 1997, 2002, 2007, and 2012, while World Bank data covered 2003, 2007, 2011, and 2014. The consequence of these unmatched years will be discussed further in the analysis section.

### III. Results

The overall health system performance analysis is summarized in Figure 2.



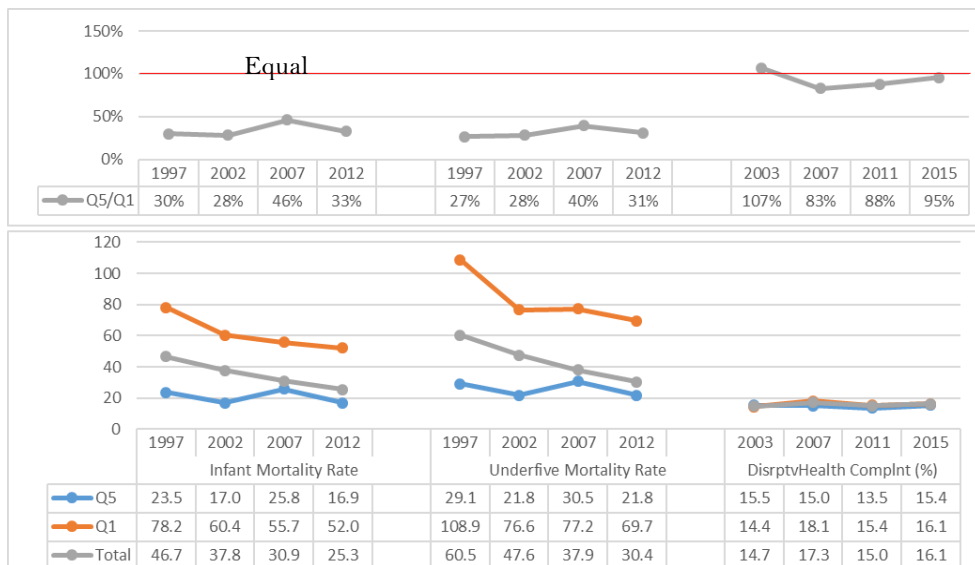
**Figure 2.** Summary, Indonesia Health System Performance Analysis

<sup>7</sup> SUSENAS is an annual household survey covering around 1.2 million people nested in 250 thousand households per year. The survey is nationally representative with more than 94% response rate (BPS, 2014).

During 1997-2012, there have been improvements in Indonesia's health performance indicators. IMR and U5MR decreased from 46.7/1000 live births to 25.3/1000 live births, and from 60.5/1000 live births to 30.4/1000 live births, respectively. The equality score for these two indicators also slightly converged to 100% (30% to 33% and 27% to 31%), indicating a slight trend toward a more equal health status between Q5 and Q1. However, in contrast with the expected pattern, SA-HC, OOP/THE, and OOP/HHC, actually increased during 2003-2014/2015.

For SA-HC, OOP/THE, and OOP/HHC, a careful year-to-year look must be done. SA-HC actually increased first from 14.4% to 18.1% during 2003-2007. It decreased to 15.4% in 2011 and increased slightly to 16.1% in 2015. This indicator's equality score got closer to 100% from 83% in 2007 to 95% in 2015. For financial protection, OOP/THE also jumped first from 44.4% to 49.1% during 2003-2007, before it gradually went down to 46.9% in 2014. While for OOP/HHC, it went up during 2003-2011 from 1.6%-2.3%, before it went down in 2015 to 2%. The equality score for OOP/HHC went up from 152% to 240% during 2003-2011 (getting more unequal, with Q5 spending more), but it converged back to equality by reaching 188% in 2015%.

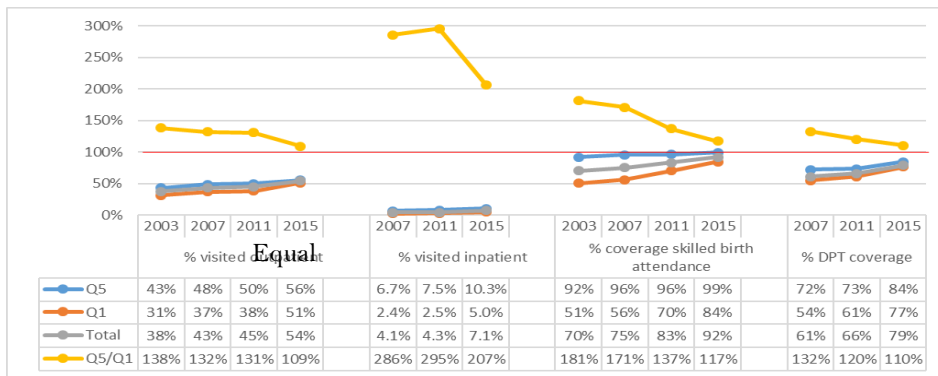
While some indicators need more exploration, there are indications of improvement among health performance indicators from 1997-2015. As shown in Figure 3, at least for IMR and U5MR, the graphs show the general improving trend. It can also be seen that improvement in Q1 contributed significantly to the improvement in overall population figures. This situation implies that inequality in health status, where the disadvantaged population groups have the lowest outcomes, has been one of the main problems in the Indonesian health system. However, the Q1's health status improving trend, then indicates that improvement which leveraged the poorest population's health condition has taken place.



**Figure 3.** Trend of equality score (Q5/Q1 - upper panel) and actual values for IMR, U5MR (1997-2012) and Prevalence of SA-HC (2003-2015)

**Data from database:** Global Health Observatory data (WHO, 2016); SUSENAS 2003, 2007, 2011, and 2015 (BPS, 2003; BPS, 2007; BPS, 2011; BPS, 2015)

While many factors have contributed to Q1's health improvement, better health care access might have played a quite important role. As shown in Figure 4, access to OPC and IPC, as well as coverage of SBA and DPT, have increased from 38%-54% (2003-2015), 4.1-7.1% (2007-2015), 70%-92% (2003-2015), and 61-79% (2007-2015), respectively. These increases were also accompanied by health care access equalizing trends for all indicators, shown by the yellow lines in the graphs that converge to the equality line, and the values of equality scores that decline toward 100%. This implies that, in addition to general access improvement, Q1 has been catching Q5 up in accessing OPC, IPC, SBA, as well as DPT immunization.

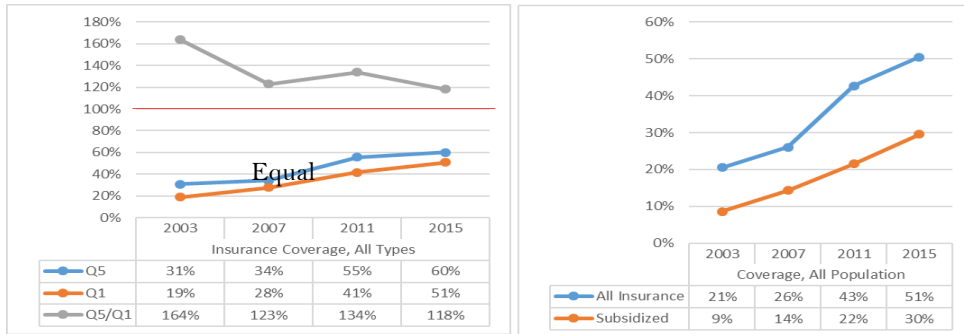


**Figure 4.** Trend of equality score (Q5/Q1 - yellow graphs) and actual values for access to outpatient care, inpatient care, skilled birth attendance, and DPT immunization (2003-2015)

**Data from database:** SUSENAS 2003, 2007, 2011, and 2015 (BPS, 2003; BPS, 2007; BPS, 2011; BPS, 2015)

The improvement of access over time, especially for the population in Q1, then can be associated with health insurance coverage significant increase in 2003-2015. Shown in the right panel Figure 5, health insurance coverage, in general, has increased 30 percentage points during 2003-2015. Subsidized health insurance, which coverage increased more than three times from 9% in 2003 to 30% in 2015, has significantly contributed to this improving trend. From the left panel, it also can be seen that equality in access to health insurance has improved. Q1's health insurance coverage grew faster than coverage among Q5, and the equality score in 2015 was 118%, very close to 100% compared to 2003 (score of 164%).





**Figure 5.** Trend of equality score ( $Q5/Q1$  - grey graph) and actual values for health insurance coverage, all types and subsidized (2003-2015)

**Data from database:** SUSENAS 2003, 2007, 2011, and 2015 (BPS, 2003; BPS, 2007; BPS, 2011; BPS, 2015)

Coefficient correlations (CC) among the indicators then provide more information on how strong these events were correlated statistically. Following Evans (1996) categorization, panel A in Table 2 shows that health insurance has a very strong positive correlation with almost all types of health care access (CC above 0.9, except for IPC, slightly below 0.8), implying that health care access increases with health insurance coverage expansion during 2003-2015. The correlations between health insurance and access equality scores are also consistent with the hypothesized values, meaning that the more equal health insurance coverage is correlated with the more equal health care access. However, the coefficients quite vary, where equality in health insurance is strongly associated with equality in OPC, IPC, and SBA (CC of 0.67-0.8), but only weakly correlated with DPT coverage (CC of 0.26).

In terms of the correlation between health care access and health status, insurance coverage, OPC, IPC, SBA, and DPT are very strongly negatively correlated with IMR and U5MR, implying that access improvements are associated with IMR and U5MR decline. Their correlations with SA-HC are less suggestive, however, with only IPC has the hypothesized value in a feeble degree (CC of -0.05). From the equality aspect, equality improvements in health insurance, SBA, and DPT have a weak-to-strong hypothesized correlation with equality in IMR and U5MR (CC of 0.27-0.62). Also, OPC's equality scores have the hypothesized, but very weak correlation with U5MR's equality, while IPC access' equality is very strongly correlated with equality in SA-HC.

**Table 2.** Correlation between health insurance, health care access, and health status

## A. Control Knob with Intermediate Indicators, Absolute and Equality

		Out-patient (OPC)	In-patient (IPC)	Skilled birth att. (SBA)	DPT	Out-patient (OPC)	In-patient (IPC)	Skilled birth att. (SBA)	DPT
		General population values				Equality measures <sup>8</sup>			
Insurance coverage	H	+	+	+	+	+	+	+	+
	CC	+0.91	+0.78	+0.99	+0.90	+0.71	+0.80	+0.67	+0.26

## B. Control Knob and Intermediate Indicators with Outcome Variables, Absolute and Equality

		General population values						Equality measures <sup>9</sup>					
		IMR		U5MR		Disruptive complaint (SA-HC)		IMR		U5MR		Disruptive complaint (SA-HC)	
		H	CC	H	CC	H	CC	H	CC	H	CC	H	CC
Insurance coverage			0.97		0.97		0.06		0.38		0.59		0.87
Outpatient care (OPC)			0.94		0.94	-	0.37		0.01	-	0.15	-	0.10
Inpatient care (IPC)		-	0.86	-	0.85	-	0.05	-	0.38	-	0.37	-	0.88
Skilled birth attendance (SBA)		-	-0.98	-	-0.97			-	-0.49	-	-0.62		
DPT vaccines		-	0.95	-	0.95			-	0.27	-	0.29		

\*H: hypothesized direction; CC: coefficient correlation; red highlights show inconsistent correlation coefficient values with their hypothesized directions.

Not shown in Table 2, health insurance coverage has inconsistent correlations with financial protection indicators. The spike of OOP/THE between 2003–2007 triggered a positive correlation coefficient between OOP/THE and health insurance. Only by omitting 2003 data, the study could observe a very strong negative correlation between health insurance and OOP/THE (CC of -0.99). The association between health insurance and OOP/HHC is strongly positive (CC of 0.7), suggesting an increasing trend of health

<sup>8</sup> Correlations between insurance and access' equality measures are hypothesized to be positive, because they should move in the same direction from higher than 100% (Q5 higher than Q1) toward 100% (Q5 equal to Q1).

<sup>9</sup> Correlation between insurance/health care access and health status equality measures are hypothesized to be negative. Insurance and access' equality scores approach equality from above 100% (Q5 higher than Q1), while health status equality scores converge to equality from below 100% (Q5 less unhealthy than Q1).

spending proportion within household consumption along with the health insurance expansion. The equality scores correlation is weakly negative (CC of  $-0.22$ ), implying that as access to health insurance is equalizing, OOP/HHC is getting more unequal with higher OOP/HHC among the 20% richest population.

#### IV. Discussion and Policy Implication

This paper tries to establish the connection between health performance dynamics with health care access improvement and health insurance coverage increase in Indonesia. The article starts with a problem statement that Indonesia had a low health performance and unequal health status in 1997-2003. These indicators then improved over the years and achieved a more advanced and equal situation, especially during 2012-2015. Through visual observation and statistical correlation analysis, this paper links this achievement with a significant improvement in health care access, which is associable with the Indonesian government intervention to expand health insurance coverage during 1998-2015. This paper confirms an association between health insurance expansion and improvement in health care access, both for the general population and the poorest group. Further, this study observes a correlation between health care access advancement with health status improvement and between-group equalization, especially for IMR and U5MR. In general, this paper manages to suggest that Indonesia's decision to adjust the financing knob through the expansion of more equitable health insurance improves and equalizes health care access, as well as health status.

While the general message is clear, some details in the findings deserve discussion. For instance, it is striking that the strong correlation between insurance and health care access does not translate to an equally strong correlation between their equality scores. This implies that the equalization of health insurance coverage creates less-than-proportional equalization in health care access, where the 20% wealthiest advances faster in utilization compared to the poorest 20%. The possible explanation for this phenomenon is that the poorest population failed to reap the most benefit from the health insurance subsidy programs, such as Jamkesmas and Jamkesda in 2007-2013 and subsidized *Jaminan Kesehatan Nasional* (JKN) in 2014-2015.

First, this might mean that other than the health expenses itself, which are partially covered by insurance, other obstacles exist, preventing the poor from accessing equal additional health care. For instance, despite being insured, the poor and vulnerable might not be able to pay for transportation expenses. The increased opportunity cost, because they have to leave work or school to attend health care, might also be unaffordable to them. Second, it might also be the case that the insurance benefit does not sufficiently cover health expenses. The insurance might only partially cover the costs, and other items have to be paid out-of-pocket by patients. The analysis of the financial protection indicators' trend might then partly support this argument. The OOP/THE has not changed much between 2003-2014. By 2014 more than 45% of total health spending is still paid out-of-pocket by individuals. Inadequate financial protection like this then maintains the rich-poor gap ability in accessing health services, regardless of the health insurance availability.

The same pattern can also be seen from the health care access-health status association that is much stronger than their equality scores correlation. This finding

suggests that equalization in health care access only equalizes the population health status at a slower rate. This could mean two things; first, health care access alone might not be enough to create health status improvement among the poorest. Other intermediate indicators within the Control Knob Framework and the social-determinants of health should be changed too to generate a more significant impact. Second, partially corresponding to the first point, there might be a problem with health care quality. The health services provided to the 20% poorest, through the subsidized health insurance, might not be in the same quality as those given to the 20% richest. This then preserves the gap in their health status regardless of the equal medical care access.

These two concerns inspire policy advice to be considered by Indonesian public health policymakers. First, combination actions should be taken to adjust several control knobs and influence multiple intermediate indicators simultaneously, to achieve optimal outcomes. For example, the financing knob adjustment may need to be done more extensively. The benefit coverage of the health insurance program (JKN) may need to be widened to reduce the patients' out-of-pocket spending. There is also a need for a program to cover non-medical health expenses, such as transportation costs. Other knobs that can be adjusted include payment and organization. For instance, JKN can apply some strategic purchasing payment to control the quality of health care provided to all patients, regardless of their socio-economic and membership status. In terms of organization knob, some modifications need to be done to encourage more health workers to work where the poor population is concentrated, such as in rural and less-developed regions.

Second, the intensity of each adjustment should be considered in reaching a certain level of results. The next question is then prioritization. With the available budget, which one to do first and more. For instance, would policymakers choose a more extensive coverage of health insurance or a limited one but with a more comprehensive benefit? All for insurance and access, or also significant attention to the quality. The limited budget would require policymakers to choose. However, it is also possible to sequence improvements for several years or even decades. With proper planning, multiple control knobs adjustments to advance various outcomes should be plausible.

Last, it is worth discussing that this paper has some limitations that require improvement through further research. First, due to data limitation, the time points of IMR and U5MR data used in this paper do not fully correspond with the time points of health insurance and health care access data. This limitation creates a temporal order problem, which restricts this paper to suggest a causal connection between those indicators. Second, this paper is lack of financial protection indicators to allow a proper equality analysis. OOP/THE is not commonly provided in the sub-group population level. OOP/HHC is extractable in sub-group levels, but this measure has an ambiguous interpretation. For instance, an increase in OOP/HHC can be interpreted as either good or bad. For the Indonesia case, a small increase may be good since the figure is too small to begin with (almost always below 3% for all population groups)<sup>10</sup>. A little bit bigger proportion may sign a higher prioritization of health investment in the family, or merely a consequence of more

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<sup>10</sup> Some scholars use threshold 5-20% as a sign of catastrophic health expenditure (Su, Kouyate, and Flessa, 2005).

health services utilization due to the insurance effect, which represents an improvement. Further research using OOP/HHC should adequately address this issue and simultaneously employ various financial protection indicators to generate a more holistic understanding.

## V. Conclusion

In conclusion, these paper's findings suggest that adjusting the financing knob is potentially effective in improving access (outpatient, inpatient, skilled birth attendance, and immunization) and health performance (in this case, health status: IMR and U5MR) indicators. However, the findings also alert that adjusting financing knob alone might not be sufficient, especially if the purpose is also to improve health equality. Changing other knobs simultaneously, such as organization and payment to improve health care quality, behavior to improve population awareness of health, and so on, maybe beneficial in achieving higher and more equitable outcomes for every population group.

Furthermore, policymakers should also be aware of the adjustment intensity of each knob. In the context of this paper, an inadequate health insurance benefit might do little to financial protection, which then maintained restriction to health care access for some groups and health status gap between the rich and the poor. Regarding these issues, policymakers should make priorities by considering multiple aspects, including the available budget, political preference, and long-term public health target. In the case of limited resources, a comprehensive long-term sequential plan to adjust various control knobs is needed.

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