

THE SUSTAINABILITY OF PUBLIC HEALTH FINANCING IN INDONESIA

KESINAMBUNGAN PEMBIAYAAN KESEHATAN PUBLIK DI INDONESIA

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ABSTRAK

Dengan disahkannya UU No.40/2004 tentang SJSN, salah satu upaya pemerintah adalah memberikan perlindungan kesehatan bagi seluruh rakyat Indonesia. Hal ini berdampak pada peningkatan belanja kesehatan publik. Kondisi ini sebaiknya diikuti dengan peningkatan pendapatan, sehingga dapat diperoleh sumber pembiayaan yang berkesinambungan. Penelitian ini menyajikan besarnya elastisitas PDB per kapita regional pada pengeluaran kesehatan per kapita masyarakat di Indonesia. Studi ini menggunakan data panel dari 2007–2009 dan dibagi dalam dua cakupan analisis, yaitu: sebanyak 35 negara dan 33 provinsi di Indonesia. Penelitian ini menerapkan metode OLS dan Fixed Effect Model. Hasil penelitian menunjukkan bahwa elastisitas pendapatan pengeluaran kesehatan per kapita masyarakat sangat tinggi dan bisa ditafsirkan menjadi sangat sensitif terhadap perubahan pendapatan negara terutama untuk kasus Indonesia sehingga keberlanjutan rencana pembiayaan skema asuransi kesehatan masyarakat di bawah Sistem Jaminan Sosial Nasional cukup memprihatinkan.

Kata kunci: *Belanja kesehatan publik, Elastisitas pendapatan, Asuransi kesehatan*

ABSTRACT

The Government of Indonesia has ratified Indonesian Bills No.40/2004 regarding National Social Security System. It said that the government should extend national health insurance coverage. As a result, this may lead to a higher public health expenditure which should be followed by a financing sustainability. This paper presents the magnitude of per capita regional GDP elasticity on per capita public health care expenditure in Indonesia. Using panel data from 2007 to 2009 which cover 35 countries and 33 provinces in Indonesia, the OLS and Fixed Effects Models were applied in this study. The regression results show that the income elasticity of per capita public health expenditure is very high and could be interpreted as highly sensitive to income changes, especially Indonesia. Thus, this finding provides a policy implication that such a high level of the estimated elasticity reflects a deep concern about the financing sustainability of the health insurance scheme under the National Social Security System.

Keywords: Public health care expenditure, Income elasticity, Health insurance

INTRODUCTION

Backgrounds

In recent decades, a growing concern about the development of social and economic conditions in the world has been seen. As part of both

conditions, health is important in the development process of human capital. Per capita income is one of many factors that brings population into longer and healthier lives through better access to technological advance in health care services.

Lately, almost all developed countries, which have implemented social security and established universal health coverage, focus more on equity, quality and efficiency of public health provision reforms.¹ Otherwise, developing countries face the budget constraint to attain universal health insurance coverage. However, there is a strong movement in the Asia Pacific region to provide health services to a greater proportion of the population. In Indonesia, the government has ratified Indonesian Bills No. 40/2004 regarding National Social Security System (SJSN). Many discussions and encouragements from the public push the government to realize it. Meanwhile, it is not implemented yet due to the lack of preparation of how it could be financed and how the social security funds should be managed. SJSN is basically a state program that provides social protection and welfare for all Indonesian population, including health, pensions, old-age savings, worker compensation and death benefits. The health insurance for the poor will be the first priority that is guaranteed by the government. In 2007, the Government of Indonesia has taken bold steps to provide insurance that covers about 76.4 million poor and near poor, financed through the government budget. Nevertheless, more than half of the population is not covered by insurance.² Under the scheme of health insurance for the poor (*Askeskin*), the total annual budget for 2005 was set at Rp3.9 trillion (approximately US\$400 million), which was initially financed through the reductions in energy subsidy,³ and declined to Rp1.7 trillion for 2007 due to government fiscal capacity.

In the process of extending the insurance coverage, developing countries in the Asia Pacific region, including Indonesia, face the challenge for creating an efficient health financing system that balances the role of revenue collection, pooling of individual risks and funding the provision of health services.⁴ In addition, the *Technical Briefs for Policy-Makers: Designing Health Financing Systems to Reduce Catastrophic Health Expenditure* which is published by WHO,⁵ states that policy makers need to consider not only how to extend population coverage through pre-payment mechanisms, but also the equity, efficiency, and sustainability of health financing systems.

Within the Asia region, Indonesia is enjoying a good long-term record of economic growth. A positive expectation, such as managed inflation and bureaucracy reform gave more confidence to Indonesia. Moody's raised Indonesia's sovereign rating to Baa3, the second lower investment grade, from Ba1 on January 2012. In addition, according to the Master Plan of Indonesia 2011–2005, President Yudhoyono mentioned that Indonesia can transform into a developed nation by the end of the 21st century. In the early stages of the century, Indonesia will become an emerging economy like Brazil, Russia, India, and China (BRICs). As Indonesia becomes a more developed country, it would be that Indonesia's income elasticity of public health expenditure (PHE) becomes even higher. This is a bit different from developed countries' experiences which their people are well educated to basic health knowledge.

This study is organized into the following four sections. The first section describes the background, the objective, an overview of Indonesian's public health insurance financing scheme, reviews of previous studies on health care expenditures and the organization of this study. The second section explains types of data and methods which are used to estimate the econometric models. Afterwards, the third section presents the regression results and provides discussions. Lastly, conclusions of this study will be explained at the end.

Problem Statements

To attain the universal coverage scheme and sustainable financing framework, implementing public health insurance for all citizens creates a fiscal impact. The approach of this study to focus on public health financing sustainability is presented by the magnitude of per capita regional GDP elasticity on per capita public health care expenditure in Indonesia. To the best of author's knowledge, many previous empirical studies explain the magnitude of income elasticity of health care expenditure using developed countries as their sample of observation, but only a few for developing countries. For example, Pammolli et al.,⁶ examined the development of health care expenditure in 15 the European Union countries for the period 1980–2003. They confirmed a

positive correlation with small elasticity at the micro (individual) level, while become larger when using the aggregate data at the national or global scale. This result directly shows the sustainability problem in providing sufficient public health financing at the aggregate level.

Research Objectives

According to the development of public health programs in Indonesia, this study provides policy makers with a suggestion about the National Social Security System which is highly desired by the Congress, even though Indonesian's social security has not been implemented yet until now. Therefore, this paper attempts to indicate the impact of income on public health expenditure using country level data as an aggregate level and province-level data for Indonesian case.

Literature Review

Health insurance in Indonesia

The National Social Security System is designed to provide social protection and welfare for all the people of Indonesia. The program is expected to help residents to cope with serious illness, accident, job loss, old age, or retirement. The financing scheme is derived from both workers and employers. It is determined by percentage of wages or certain nominal contributions which are reviewed periodically. The contributions for the poor will be paid by the government. Health insurance program is given a top priority, as set out in Law No.40/2004 regarding the National Social Security System.⁷

Socio-economic development has progressed through improvements in public welfare. In the last decade, Indonesia has implemented various social security programs, such as Health Insurance (*Askes*), Armed Forces Insurance (*Asabri*), Workers' Social Security (*Jamsostek*), Health Insurance for Poor People (*Askeskin*) and Health Insurance for People (*Jamkesmas*). Furthermore, some municipalities also attempt to arrange that kind of program, such as Jakarta with Jakarta Health Card (*Kartu Jakarta Sehat*).

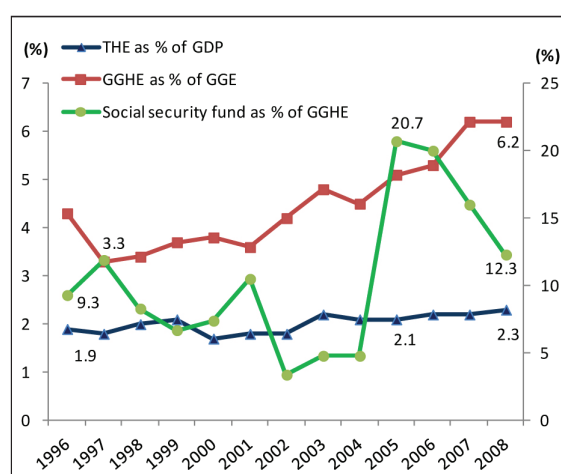
Public health expenditure

The trends of health care spending ratios can be seen in Figure 1. Overall, total health expenditure (THE) as a percentage of GDP shows an increasing trend. This share grew up to 2.3% in 2008. Meanwhile, the trend of general government health expenditure (GGHE) shows a significant increase as a percentage of total or general government expenditure (GGE), from 4.3% in 1996 to 6.2% in 2008.

However, the ratio of social security spending as a share of government health spending (GGHE) does not show any particular pattern. The social security program including health insurance for the poor is categorized as a social expenditure. Since social spending is only temporary spending, so the ratio of social security expenditures to GGHE fluctuated for the last decade.

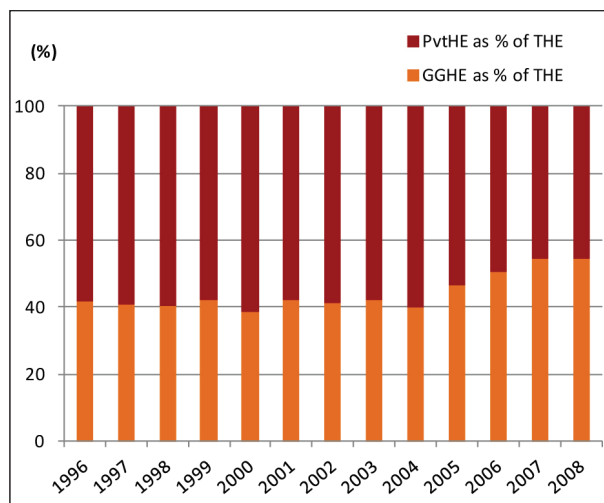
In addition, there has been a change in the proportion of health expenditure carried out by the public and private sectors since 2005, as shown in Figure 2. Before 2004, the role of government in the provision of health care amounted to only 40%, but then has expanded to be more than 50%.

That increasing percentage indicates that the government gives better attention to the health sector as a way to increase the people's welfare. In the meantime, the increasing income tends to be followed by higher PHE. Figure 3 shows the relationship between per capita public health expenditure and per capita GDP in Indonesia over the periode 1995–2009.



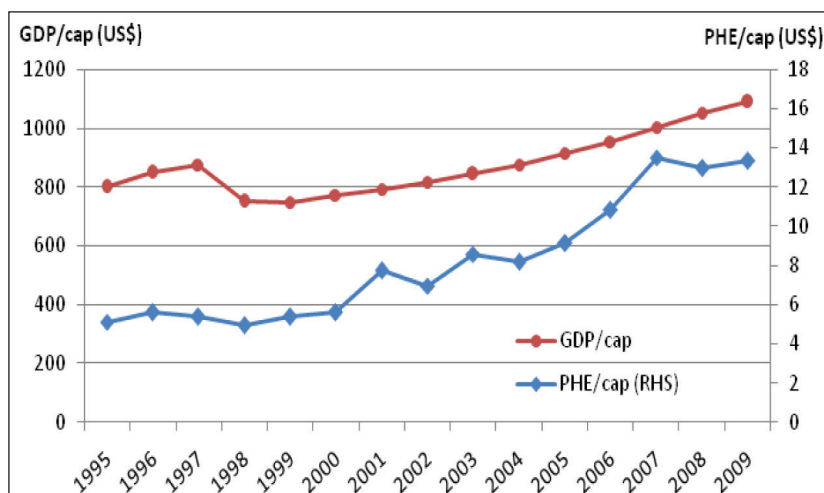
Source: WHO National Health Accounts database, August 2011

Figure 1. Health Expenditure Ratio in Indonesia, 1996–2008



Source: WHO National Health Accounts database, August 2011

Figure 2. Health Expenditure Share, Public vs Private, 1996–2008



Source: World Bank Data, March 2012

Figure 3. Relationship Between PHE/Capita And GDP/Capita, Indonesia, 1995–2009

Income Elasticity of Health Care Expenditure

Baumol (1967) in Pammolli et al.,⁶ found a positive correlation between health care expenditure (HCE) and GDP. His result also showed that growth of HCE is more affected by the availability of medical technologies than inflation rate and predicted that the productivity of health care sectors are lower than the rest of economy, while the growth rate of health care labor compensation seemed roughly the same as that of all labor sectors. Thus, the relative price of health care

services would rise as the labor income increases. The imbalance between productivity growth and nominal wage growth was identified as the main determinant of increasing HCE. Later, this difference is called as “Baumol” variable. On the other hand, Gerdtham and Johnson (2000) in Hartwig⁸ recognize that the reverse causality problem in Baumol’s model might appear and the results tend to be biased and inconsistent. A higher spending on the health sector can encourage physicians or a government to provide better services, such as prevention and promotion, which

enlighten people in their health awareness. As a consequence, healthier population may become more productive and earn higher income. Hence, they warn researchers not to take GDP as the only one explanatory variable.

Moreover, Hartwig⁸ and Pammolli et.al.⁶ found ‘Baumol variable’, which is very close to one, as a highly significant variable explaining HCE growth as well as other additional explanatory variables, such as demographic conditions, economic characteristics, institutional background and technological progress. A one percent increases in productivity with respect to wages is associated with one percent increase in nominal HCE. Many factors can affect the increasing health expenditure, including changes in disease structure, technological advance and preference changes.⁹ Forecasting and simulation of long run analysis using US data from 1975 to 2004 showed an increase in health spending as a share of income that may lead to a significant expansion of public sector financing.¹⁰

Most previous studies found that the income elasticity of health expenditure is greater than one. This upward bias is due to lack of attention to unobserved country-specific factors that may correlated with income and health expenditure or unobserved time-variant variable.¹¹ Gbesemete and Gerdtham¹² identified a positive impact of increasing per capita income on rising per capita health expenditure. The observation took 30 African countries in 1984 and the coefficient estimate was equal to one and statistically significant at confentional level.

In contrast, using cross-sectional data of 18 countries in OECD, Parkin et.al.¹³ found the elasticity of aggregate health care spending with respect to real GDP, which are deflated by PPP index, was 0.9. Furthermore, the following research, which took a sample of 15 OECD countries from 1990 to 1998, was conducted by Sen¹⁴ also found that the income elasticity laid between 0.21 to 0.51. He tried to overcome the omitted variable by employing unobserved country and year specific dummies using two way fixed effects model, Weighted Least Square (WLS), Generalized Least Square (GLS), and Instrumental Variable (IV) methods.

Another study was conducted by Sidorenko and Butler⁴. One of their findings was that the share of public health expenditure to the total health expenditure increased a bit faster than per capita national income, yet the growth of this expenditure share would diminish at a higher level of income. The size of estimated income elasticity may be different because of differences in data sets, time frames, and methodologies. When the elasticity of health care expenditure is estimated, a caution of interpreting the income elasticity should be taken into account, whether health as “luxury good” or “necessity good”. This is because public health expenditure is exogenous in the sense that a government can set its level exogenously. The actual health expenditure may not perfectly reflect the optimal health consumption for a country. However, recognizing the income elasticity of health expenditure is important to achieve public finance sustainability.⁶

Pammolli et al.⁶ examined the development of health care expenditure in 15 European Union countries for period 1980–2003. The idea of the study is that the growth of health care expenditure in all OECD countries had increased higher than its GDP for the past 30 years. They obtained a positive correlation with a small elasticity at the micro (individual) level, and becoming larger when using the aggregate data at national level. This result directly shows a sustainability problem in providing sufficient public health financing at the aggregate level.

Research Hypothesis

In brief, the expected result of this research is to identify a positive impact of per capita regional GDP on per capita public health expenditure at country-level. Then, identify a positive impact of per capita regional GDP on per capita public health expenditure in Indonesia using province-level data with income elasticity above 1.0. This could be interpreted as highly sensitive to income changes. In other words, government increases public health expenditure as income increases and the level of the estimated elasticity reflects a deep concern about the sustainability of increasing health-care cost.

RESEARCH METHOD

Using qualitative and quantitative analysis, this study employs different data sets and methodologies using OLS and Fixed-Effects models. The study sample is 35 countries all over the world for the period 2007–2009. The reason for choosing those countries is to get a broader overview of sustainability of public health care financing. Subsequently, for the Indonesia case, this study uses province-level data which cover 33 provinces from 2007–2009. The data are obtained from the WHO National Health Accounts Database, World Bank, and Ministry of Health of Indonesia, and Statistics Beaureau of Indonesia (*BPS*).

To capture the role of national income on public health expenditure within countries and provinces in this study, a Fixed Effect Model (FEM) is employed instead of a Random Effect Model. It is based on two reasons. First, the Hausman Test results. Probability $F\text{-value} > \alpha$ or the Hausman test-value $> \chi^2_{\text{table}}$, to the extent that the null hypothesis is rejected and Fixed Effect Model is chosen. Second, unobserved variables (such as basic health education) are likely to correlate with both GDP and health care expenditure.

The econometric model in this study modifies the model from Pammolli et.al.⁶ which explains the elasticity and sustainability of income in response to the health spending using Pooled Mean Group (PMG) model. Employing the Fixed-Effects Model (FEM) estimation, this study uses the model structure as follows:

Equation (1): country level panel data

$$\ln PHE_{it} = \alpha_0 + \alpha_1 \ln GDP_{it} + \theta \times X_{it} + \gamma \times cdum + \varepsilon_{it}$$

Equation (2): province level panel data

$$\ln PHE_{jt} = \alpha_0 + \alpha_1 \ln GRDP_{jt} + \theta \times X_{jt} + \gamma \times cdum + \varepsilon_{jt}$$

where i, j and t indicate each country, province and year, respectively. α_0 defines constant variable, α_1 denotes the income elasticity of public health expenditure, θ is a set of coefficient estimates for each vector control variables, and γ denotes difference intercept for each dummy variable (country and province dummy). Even so, this study will not report those dummy coefficients to save a space. The estimated coefficient of regional income elasticity is interpreted as aggregate.

Table 1. Variables and Data

Variable	Unit	Definition	Source (country, prov)
PHE_cap (dependent)	current US\$	Deflated per capita public health expenditure	WB, MoF IDN
GDP_cap	current US\$	GDP (constant 2000) divided by midyear population	WB, BPS
POP65	% of total population	Population ages 65 and above as a percentage of the total population.	WB, BPS
LEXP	years	Life expectancy at birth: the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life	WB, BPS
FERTIL	total birth per woman	Total fertility rate	WB, MoH
FLPR	% of total labor participation	Female labor participation rate: female population ages 15 and older that is economically active	WB, -
DEBRAT	(% of GDP)	Debt to GDP ratio	WB, -

Source: Analyzed Data

Meanwhile, X is a set of control variables. Table 1 defines the data.

RESULTS AND DISCUSSIONS

In general, this study measures three categories of effects on public health expenditure: income, ageing and national budget constraint. Unfortunately for Indonesia case, the study is conducted using province level data. For this reason, we drop the budget constraint variable since provinces or municipalities can not issue any government bond. Moreover, female labor participation rate is also dropped because data are not provided at the province-level.

Before discussing about Indonesia case, this study considers the 35 countries case first. The result of the Equation (1) is shown in Table 2. This table provides the coefficient estimate and t-statistic for each variable by using OLS regression and country fixed-effect.

The regression result shows a positive effect of per capita income on per capita public health expenditure and the result is statistically significant for all of the countries sample observation. OLS regression produces a biased result since the unobserved time-invariant variables correlated with per capita PHE and per capita GDP, such as basic health expenditure. Thus, a Fixed Effects (FE) model is used to overcome such problem. In comparison, FE model describes the elasticity

of income for developing countries group which is less elastic than all 35 countries as a whole. In contrast, developed countries group has a higher elasticity of income than all 35 countries as a whole.

This finding implies that sustainability of health financing can be seen through its lower income elasticity of public health expenditure. In particular, by controlling unobserved time-invariant variables, holding every other variable fixed, 1% increase in per capita income developing countries is associated with 0.2% increase in public health expenditure. However, 1% increase in per capita income of developed countries is associated with 0.8% increase in public health expenditure. Moreover, health care services can be said as a necessity good in developing countries, while a luxurious in developed countries. People in developed countries put more concern on their health condition than in developing countries.

The coefficient estimates of POP65 and LEXP are also statistically significant for per capita PHE. Increased population aged 65 (and above) and life expectancy are interpreted as a higher population ageing. There is no significant difference between elasticity of POP65 and LEXP among the groups. After controlling unobserved

time-invariant variables, this study finds a positive impact of POP65 on per capita PHE as well as LEXP on per capita PHE. The ageing of population increases the burden of public health expenditure since the elderly make a higher use of health care benefit. The elderly are financed by those who are working. This kind of difficulties come from a pay-as-you-go (PAYG) system.

The coefficient sign of fertility rate is found positive and statistically significant under FE model for both developing and developed country groups. On the other hand, it is not statistically significant when the data are taken as an aggregate. There seems to be no relationship between fertility rate and per capita public health expenditure.

Besides, the result shows that female labor participation rate (FLPR) has a positive sign on its estimated coefficient, but statistically insignificant. This is maybe because of high turnover of female ages 15 and older that is economically active in working places. Thus, FLPR does not imply an increase in public health spending, except in developing countries.

In addition, based on theory, implementing a durable budgetary reform requires a reduction of

Table 2. The Determinants of Public Per Capita Health Expenditure, Country-Level, 2007–2009

Variables	35 countries		17 developing countries		18 developed countries	
	OLS	Fixed Effect	OLS	Fixed Effect	OLS	Fixed Effect
log GDP_cap	1.3447*** (.0294)	.6345*** (.0864)	1.4590*** (.0745)	.1634* (.1657)	1.1683*** (.0398)	.8314*** (.0854)
POP65	0.0446*** (.0079)	.0114 (.0097)	.0064 (.0205)	.1853*** (.0418)	.0771*** (.0066)	.0032 (.0079)
log LEXP	-1.466*** (.4240)	7.4416*** (.7578)	-1.1275 (.9435)	8.9632*** (1.3776)	-.7946 (.7752)	5.3868*** (.8322)
log FERTIL	.0172 (.01039)	.0453 (.0989)	-.3370 (.2598)	.4362* (.2557)	.2759** (.1069)	.1791* (.1055)
FLPR	.0016 (.0016)	-.0003 (.0037)	.0021 (.0027)	-.0173** (.0075)	.0039* (.0022)	.0064 (.0040)
DEBTRAT (lagged)	-.0003 (.0006)	-.0007** (.0036)	-0.0059** (.0021)	-.0020** (.0009)	-.0015*** (.0005)	-.0001* (.0003)
Constant	-.6081 (1.7494)	-32.0400*** (2.6818)	-2.6632 (3.8735)	-36.1623*** (5.1323)	-2.4343 (3.1184)	-25.056*** (3.1208)

Note: Statistically significant at: *** 1% level, ** 5% level, * 10% level.

Standard errors in parentheses.

Source: Analyzed Primary Data

budget deficit and debt share. Overall, the result shows a negative sign and statistically significant for the estimated coefficient of debt to GDP ratio (DEBTRAT). It is noticeable that a compressed level of debt to GDP ratio this year boosts a higher level of public health expenditure next year. This is because a lower public debt corresponds to a lower interest payment. Consequently, financial sustainability is important to support wider coverage of the social expenditure, especially on the health sector. Afterwards, when health indicators improve, market labor conditions are able to promote a higher economic growth reflected by the reduction of a budget deficit and the debt to GDP ratio. Maintaining a lower cost of financing and higher income leads to a sustainable financing scheme.

Next, for the effect of national income on public health expenditure in Indonesia, the regression result is reported in Table 3. Using panel data at province-level from 2007 to 2009, the coefficient estimate of per capita regional income has also the positive sign for per capita PHE. The Fixed-Effect Model perfectly controls the unobserved time-invariant province characteristics which may correlate with both regional income and public health spending, such as basic health education as mentioned before. By using province-dummy variables, the income elasticity of public health expenditure is very high and statistically significant.

To illustrate, holding every other variables fixed, if per capita GRDP increase by 1%, per capita public health expenditure would approximately increase more than 4%. This huge elasticity indicates that health budget sustainability in Indonesia is a very big concern. A temporary shock in economy which affects regional per capita income to decrease is expected to reduce the health budget in a large amount. In contrast, when the economy booms (because of more productive labor), their awareness of health increase, then a higher demand of taking health benefits may increase the government burden on public health expenditure.

The vector control variables that are modified from the previous regression become insignificant even the signs of LEXP and FERTIL are consistent with the previous expectation. Probably, this is because of a short time period of observations. Therefore, there are only small changes in demographic variation within provinces in this three-years period of observations.

CONCLUSION

This study investigates the magnitude of income elasticity on public health expenditure in Indonesia using province-level panel data which cover 33 provinces for the period 2007 to 2009. The empirical results show that the income elasticity of public health expenditure in Indonesia is very high, above 1.0. It can be interpreted that the

Table 3. Determinants of Public Per Capita Health Expenditure, Province-Level, Indonesia, 2007–2009

Variables	OLS	Fixed-Effect
log GRDP_cap	.008 (.2343)	4.5355*** (1.6077)
POP65	-.2544** (.1142)	-.2884 (.2363)
log LEXP	4.8402 (3.2194)	17.3805 (19.2229)
log FERTIL	.1946 (.1170)	-42.9565 (27.8459)
Constant	-9.28923 (13.1540)	-98.7395 (85.4709)

Note: Statistically significant at: *** 1% level, ** 5% level, * 10% level. Standard errors in parentheses.

Source: Analyzed Primary Data

public health care expenditure sensitivity in response to income changes would be very high in Indonesia.

On the other hand, this study also presents the magnitude of income elasticity on public health expenditure at the country-level, which are 0.2 for developing countries and 0.8 for developed countries. This finding implies that people in developed countries put their concern on health more than people in developing countries and that expensive medical technologies are more easily available in developed countries than in emerging countries. Developed countries take the insurance benefit more often and easily. However, the government of developed countries face the sustainability problem in providing advanced health services. Health care services bear a nature of “luxury” in developed countries in the sense that health insurance makes people insensitive to medical costs and it turns out that medical expenses at the national level are larger relative to the level of GDP per capita.

These findings provide evidence to warn the Government of Indonesia about the increasing pace of public health expenditure relative to regional income if the health insurance scheme reform under the National Social Security is implemented.

This study has some limitations due to Indonesia’s data availability, to the extent that demographic changes in three years of observations may not be clearly seen enough. Besides, the reverse causality and omitted variables problems that might correlate with both public health expenditure and regional income are not addressed. Further research is needed to control those problems.

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