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Sub-national health care financing reforms in Indonesia

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Abstract

Indonesia has seen an emergence of local health care financing schemes over the last decade, implemented and operated by district governments. Often motivated by the local political context and characterized by a large degree of heterogeneity in scope and design, the common objective of the district schemes is to address the coverage gaps for the informal sector left by national social health insurance programs. This paper investigates the effect of these local health care financing schemes on access to health care and financial protection. Using data from a unique survey among District Health Offices, combined with data from the annual National Socioeconomic Surveys, the study is based on a fixed effects analysis for a panel of 262 districts over the period 2004–10, exploiting variation in local health financing reforms across districts in terms of type of reform and timing of implementation. Although the schemes had a modest impact on average, they do seem to have provided some contribution to closing the coverage gap, by increasing outpatient utilization for households in the middle quintiles that tend to fall just outside the target population of the national subsidized programs. However, there seems to be little effect on hospitalization or financial protection, indicating the limitations of local health care financing policies. In addition, we see effect heterogeneity across districts due to differences in design features.

Keywords: Decentralization, health care utilization, health financing, health insurance, Indonesia, local government

Key Messages

- Indonesia has seen a proliferation of subnational health care financing schemes.
- To asses these schemes, we use data from a unique survey of District Health Offices.
- The schemes increase outpatient utilization for rural areas and the 'missing middle', but we find little effects for hospitalization or financial protection.
- Variation in scheme design features leads to effect heterogeneity between districts.

Introduction

Over the last decade, Indonesia has experienced an emergence of local health care financing schemes, implemented and operated by district governments. These local health policies have generally been inspired by two far-reaching policy reforms at the national level. First, Indonesia's decentralization in 2001 increased political and fiscal autonomy of districts and transferred the responsibility for public service delivery and public spending for a large part to district governments (e.g. Kruse et al. 2012). Within this decentralized setting, a second national policy that stirred local health financing reform was the introduction of subsidized social health insurance for the poor in 2005. This preliminary step to meeting Indonesia's ambitions for Universal Health Coverage (UHC) still left many households without health coverage, as a large part of the informal sector falls outside the poorest segment of the population that is eligible for subsidized premiums, while also having no access to the formal sector social health insurance programs.

In response to this coverage gap, many district governments, relying on their relative autonomy, designed local health care financing schemes. Collectively known as *Jamkesda* (*Jaminan Kesehatan Daerah—Regional Health Insurance*), these schemes typically aim to address the non-insured population. However, despite the common institutional background, motivation and objectives, the *Jamkesda* schemes show a great deal of variation in the design, such as coverage, benefit packages and provider contracting (Gani et al. 2008 2009).

The empirical evidence on health care financing schemes in Indonesia generally shows that targeted fee waivers and subsidised health insurance schemes for the informal sector are associated with an increase in health care utilization for the poor but have little effects on out-of-pocket spending (e.g. Pradhan et al. 2007; Johar 2009; Sparrow et al. 2013). However, there is no evidence on the effects of sub-national health care financing.

Potentially, on one hand, decentralization of health spending to sub-national level can improve the performance of health systems and service delivery, as local governments are closer to the target population and better placed to identify local needs. On the other hand, service delivery may suffer as local governments may be more limited in terms of resources, and technical and administrative capacity as compared with the national government.[1] In line with these contrasting theoretical predictions, the international empirical evidence yields equivocal results. For example, a number of studies find that decentralization is associated with a more equitable distribution of health care resources (Bossert et al. 2003), health outcomes (Costa-Font and Gil 2009; Jiménez-Rubio 2011) and improved access to health services (Regmi et al. 2010), but the effects of decentralization appear to vary by income level of countries and regions (Khaleghian 2004; Soto et al. 2010). For Indonesia, decentralization has not shown clear improvements to health system performance (Heywood and Choi 2010), although causal effects are hard to establish. If anything, it seems that decentralization has exacerbated regional disparities in health outcomes, which Hodge et al. (2015) attribute to weak capacity in disadvantaged regions.

This paper investigates the effectiveness of the *Jamkesda* health care financing schemes in improving access to health care and providing financial protection from illness for the district populations. In addition, we assess how differences in local policy design influence the effectiveness and impact of local health care reforms.

1 For an extensive review of the decentralization literature see Gadenne and Singhal (2014).

Using data from a unique district survey, the study is based on a fixed effects analysis for a panel of 245 districts over the period 2004–10, exploiting variation in local health financing reforms across districts in terms of type of reform and timing of implementation. The district survey provides detailed information on the design of local schemes, such as benefit packages, premiums and co-payments, institutional arrangement, management structure and provider payment mechanisms. To create the panel, the district survey data are combined with several rounds of the annual National Socioeconomic Survey, which is representative at the district level and provide information on health care utilization and out-of-pocket spending.

Although the *Jamkesda* schemes have had a limited impact on average, they do seem to have provided some contribution to closing the coverage gap by increasing utilization of public outpatient care especially for households in the middle quintiles. These are the households most likely to be ineligible for any of the national social health insurance schemes. However, there seems little effect on hospitalization or financial protection, pointing to the limitations of local health care financing policies. In addition, there is a variation in scheme effectiveness across districts due to differences in design features. The more effective *Jamkesda* schemes typically contracted both public and private providers, and placed priority with providers under the authority of the district rather than provincial and national hospitals.

Social health insurance in Indonesia

National health insurance schemes

Social health insurance has been well established for the formal sector economy in Indonesia for several decades, with mandatory enrolment for civil servants, military and the policy, and employees in the private formal sector.[2] However, with around 60% of the workforce active in the informal sector, the vast majority of the population had no access to these social insurance schemes, at least prior to the recent UHC reforms in January 2014. Up to 2005, the main health care financing scheme for the poor was the so-called health card, which entitled targeted households to user fee waivers public health care providers (e.g. Pradhan et al. 2007).

In 2004, Indonesia defined its ambitions for comprehensive UHC with the passage of the law on National Social Security. At present, the government's goal is to achieve full UHC by 2019. A first step towards this aim was made with the implementation of subsidized social health insurance for the poor in 2005 (e.g. Sparrow et al. 2013). Initially introduced as *Askeskin* (*Asuransi Kesehatan untuk Keluarga Miskin—Health Insurance for Poor Families*), the program was expanded in 2008 under the name *Jamkesmas* (*Jaminan Kesehatan Masyarakat—Public Health Insurance*), aiming to cover the poor and near-poor. Enrolled households received comprehensive coverage for public health care and for some contracted services at private providers, with premiums fully subsidized by the government. Nevertheless, despite a strong increase in insurance coverage in the first decade of the decentralization era, the share of total health care spending borne by household out-of-pocket spending has not decreased and remains just below 50% (Figure 1).

2 Firms with more than 10 employees or a turnover of at least 1 million Rupiah turn per month are obliged to either enrol their employees in social health insurance or offer private health insurance.

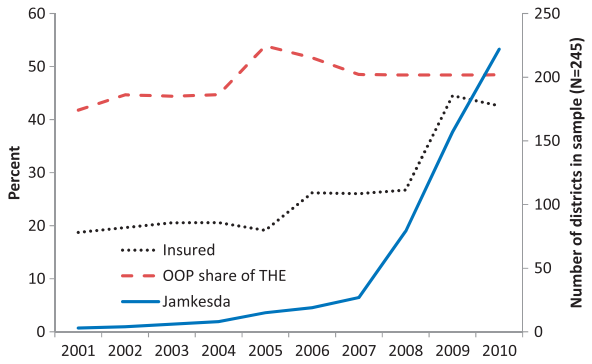

Figure 1. Health coverage, OOP share of total health expenditure and proliferation of *Jamkesda* programs, 2001–10. *Source*: *Susenas* surveys, WHO Global Health Expenditure Database and *Jamkesda* district survey

The final phase in the reforms that are to complete the transition to UHC started in January 2014. The existing social health schemes for the formal and informal sector were consolidated and scaled up in one nationwide social health insurance, as part of the larger national social security system (e.g. Sato and Damayanti 2015). This new single payer national health insurance (NHI) program is based on mandatory contributions for formal sector workers, subsidized premiums targeted to the poorest and near-poor in the informal sector.

The missing middle in Indonesia

The *Jamkesmas* program aimed to target about 76 million individuals, roughly 30% of the population. With a further 25 million covered by the formal sector schemes, this still left more than half the population without any form of health insurance (Figure 1). This coverage gap mainly concerns the informal sector, which spans well beyond the 30% poorest population. As a result many households positioned in the middle quintiles did not have access to private insurance or formal sector social health insurance. In addition, the *Jamkesmas* program experienced substantial leakage to the non-poor (Harimurti et al. 2013).

Moreover, it remains questionable whether the target of 76.4 million was sufficient to cover the poor and near-poor, as defining eligible target groups using consumption poverty based measures is a contentious exercise in itself. This is partly due to the arbitrary nature of setting poverty lines and the sensitivity of the poverty headcount to the choice of poverty line, given the shape of the income distribution. To illustrate, the national poverty line estimated by BPS based on minimum caloric intake yields a headcount of 13.3% in 2010, while the 1.25$ and 2$ a day (PPP) indicators measure a headcount of 18.1 and 46.1%, respectively.[3]

This, combined with imperfect targeting and under-coverage of the informal sector, left a coverage gap with a substantial share of (perceived) potentially eligible households uncovered. Under the current reforms for achieving UHC by 2019, it remains unclear how this coverage gap will be addressed. Informal sector households that cannot be enrolled through formal sector payroll contributions but also fall outside the poorest segment that is eligible for subsidized premiums are required to self-enrol into the nationwide social health insurance (Aspinal 2014). However, the existing international evidence suggests that it is extremely difficult to get this "missing middle" group to enrol voluntarily, without providing strong incentives to do so (see, e.g. Capuno et al. 2014; Wagstaff et al. 2014; Bredenkamp et al. 2015).

3 World Development Indicators: http://data.worldbank.org/indicator/SI.POV.NAHC, http://data.worldbank.org/indicator/SI.POV.DDAY, http://data.worldbank.org/indicator/SI.POV.2DAY.

Sub-national health care financing policies: Jamkesda

A response to this gap in coverage by the national programs has come from district governments, acknowledging local demand for health coverage but also recognizing political opportunity. Indonesia's decentralization reforms shaped a new local political context by introducing elections for district governments that pre-decentralization were appointed by the central government. Promises for free health care have become a regular feature in district election campaigns, resulting in a spectacular increase of local health care financing schemes across the country since 2007, commonly known as *Jamkesda* schemes (Aspinall and Warburton 2013).

Since decentralization in 2001, public health spending and service delivery in Indonesia have been partly decentralized to district governments, which have a large degree of autonomy in setting public health policy (e.g. Kruse et al. 2012). Districts relied on this autonomy in designing and implementing *Jamkesda* schemes. Together with variation in financial and human resources, this process led to substantial differences in the design and details of local schemes between districts (Gani et al. 2008 2009).

Methods

Data

The main data source for this study is a survey of District Health Offices (DHOs), which are responsible for implementing district health policy. Detailed information on district health policies, including *Jamkesda* schemes, is not available at the Ministry of Health in Jakarta. Therefore, we contacted districts directly, the main challenge being the geographic spread of the 497 districts over 33 provinces in Indonesia. We conducted a district survey through a combination of questionnaires by mail and phone call interviews with DHOs and other institutions that are involved with managing local health financing schemes (more details of the district survey are provided in the Supplementary Appendix).

The research team was able to contact respondents in 442 districts, while 55 districts were unreachable because contact details were not available or incomplete. Of the 442 districts that were contacted, 262 districts completed the questionnaire by mail or phone, and 180 districts did not provide information. Figure 2 shows the geographic spread of responding districts and the non-response, with 49% of all districts reported to have a *Jamkesda* program and 3% reported not to have one. For 36% of the districts, we did not receive sufficient information, while 11% could not be contacted. The districts included in the sample represent approximately 58% of the Indonesian population in 2010. Although this partial coverage raises concerns about the generalizability of the data, we show in the subsequent sections that our results are not affected by sample selection bias.

Information on health care utilization and out-of-pocket (OOP) spending comes from the annual Indonesian National Socioeconomic Survey (*Susenas*) from 2004 to 2010, conducted by Statistics Indonesia (BPS). These repeated cross section household surveys are representative at the district level, collecting data on outpatient visits in the previous month and hospitalization days in the last year by type of provider, as well as health care spending, coverage by various health insurance schemes, and an array of

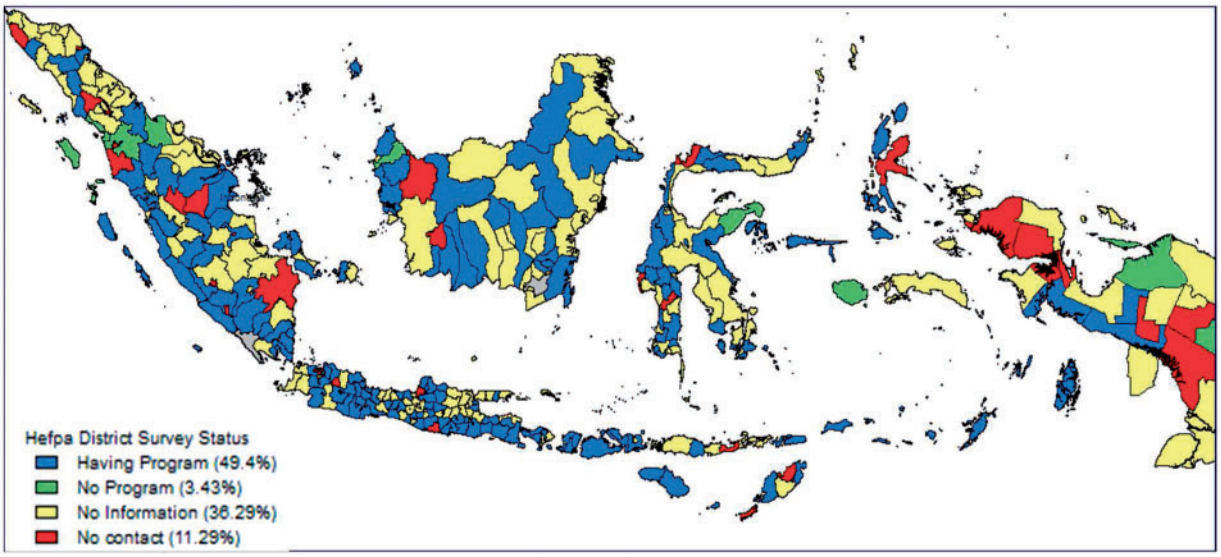

Figure 2. Coverage of the district survey

socioeconomic and demographic characteristics. The study period of our analysis is limited by the consistency of the *Susenas* data over time: inpatient utilization is not recorded in the core questionnaire in 2003, while in 2011, the survey moved from annual to quarterly samples. We combine the two data sources to form a panel for 262 districts, with seven annual waves over the period 2004–10.[4] Descriptive statistics of the *Susenas* variables are provided in Table 1.

The response rate of the district survey raises concerns of sample selection bias and generalizing our results to the larger archipelago if non-response is not random. Since the *Susenas* data are available for all Indonesian districts for each year, we can assess the scope for potential sample selection bias. Table 1 compares districts that responded to the survey and those that did not, with the last two columns showing the difference and the *t*-test *P* values. The differences are small but for some characteristics they are statistically significant. Average outpatient utilization is similar between the responsive and non-responsive districts, but the private share is higher in districts that responded to the survey. On an average, responsive districts have higher OOP health spending and private health insurance coverage, and lower social health insurance for the formal public sector. Non-responsive districts have, on an average, larger and younger households. Differences in hospitalization rates, social health insurance coverage for the informal sector and formal private sector, per capita household consumption, adult literacy and the rural population share are not statistically significant. Despite some of these differences, we find no evidence that sample selection bias affects our estimation results. Details will be discussed further in the next section.

Empirical approach

We test for the effects of the *Jamkesda* program using a straightforward districts fixed effects specification

$$y_{kt} = \alpha + \beta Jamkesda_{kt-1} + HC_{kt}'\gamma + X'_{kt}\theta + \delta_t + \mu_k + \varepsilon_{kt} \quad (1)$$

The outcome variables are (i) the average number of outpatient visits per person in the last month, (ii) the average number of hospitalization days per person in the last year and (iii) the average OOP budget share, for district k in year t. The main variable of interest, $Jamkesda_{kt-1}$, is a dummy variable indicating whether a district was operating a local health care financing scheme in the previous calendar year. We include this lagged variable because the outcome data is typically collected early in the year, and the introduction of *Jamkesda* in the current year might not overlap with the survey recall period. The DHO survey reports large variation in the month of introducing *Jamkesda*. The β coefficients can then be interpreted as the average impact of having a *Jamkesda* scheme in a district, on top of the effects of coverage by an array of nationwide schemes, captured by the vector of coefficients γ. The set of health coverage indicators HC_{kt} includes the share of the district population covered by each of the following programs: subsidized social health insurance (*Askeskin* 2006–7 and *Jamkesmas* 2008–10), the health card program (2004–5), public sector social health insurance, formal private sector social health insurance, private health insurance and other schemes. The control variables X_{kt} include the rural and female population shares, average age, average households size and the adult literacy rate.[5] Time invariant district characteristics are controlled for by including district fixed effects μ_k, while δ_t controls for year fixed effects.

In addition to analysing the average effects of having a *Jamkesda* program, we also probe the impact heterogeneity and diversity across districts, and in particular the role of the *Jamkesda* design characteristics. We do this by including a vector of indicator

4 The sample of districts that responded to the district survey forms a balanced panel of 262 districts, except for 13 districts that have missing *Susenas* data in 2005. Among these, the districts in the province of Aceh were not surveyed in 2005 due to the tsunami disaster of December 2004. The other districts are the regencies Sorong Selatan and Maybrat in West Papua and Boven Digoel and Waropen in Papua province.

5 We also considered including average household expenditure per capita as measure of welfare level, but leave this out of our preferred specification because household expenditure is potentially endogenous to the outcome variables. However, the results are robust to including household expenditure.

Table 1. Descriptive statistics household survey data and sample selection, 2004–10.

Variable	Districts in survey sample	Non response districts	Difference	*P*-value
Outpatient utilization public	0.105	0.113	−0.008	0.001
Outpatient utilization private	0.090	0.081	0.009	0.000
Outpatient utilization total	0.195	0.194	0.001	0.739
Inpatient utilization public	0.075	0.075	0.001	0.710
Inpatient utilization private	0.033	0.031	0.002	0.238
Inpatient utilization total	0.111	0.109	0.002	0.487
OOP share	0.017	0.016	0.001	0.000
OOP spending per capita	10972	9999	973	0.000
Total consumption per capita	532299	530279	2020	0.802
Askeskin/Jamkesmas (2006–10)	0.136	0.142	−0.005	0.350
Health card (2004–5)	0.036	0.038	−0.002	0.394
Askes/Asabri	0.069	0.074	−0.004	0.015
Jamsostek	0.025	0.024	0.002	0.206
Private health insurance	0.042	0.037	0.005	0.044
Other health insurance	0.009	0.010	−0.001	0.148
Age	28.012	27.281	0.730	0.000
Female share	0.496	0.497	−0.001	0.230
Household size	4.780	4.886	−0.106	0.000
Literacy rate	0.762	0.759	0.003	0.506
Rural share	0.657	0.649	0.008	0.449
Number of observations	1,821	1,618		

Source: *Susenas* household surveys 2004–10.

variables for *Jamkesda* design features C_{kt}, relating to program beneficiaries, institutions, contracted providers and benefit packages

$$y_{kt} = \alpha + \beta^0 Jamkesda_{kt-1} + C'_{kt-1}\beta^C + HC'_{kt}\gamma + X'_{kt}\theta + \delta_t + \mu_k + \varepsilon_{kt} \quad (2)$$

Note that, by construction, the C_{kt} dummy variables take value zero if there is no *Jamkesda* scheme in a district. So by also including the *Jamkesda* dummy variable, the vector of coefficients β^C can be interpreted as a decomposition of the average *Jamkesda* impact estimate by the contributions of the design features and β^0 as the remaining effect of *Jamkesda* that is not explained by C_{kt}.

We focus on *Jamkesda* design features recorded in the DHO survey that relate to the UHC dimensions of population coverage and service coverage:

1. Program beneficiaries (program objective is to cover all the non-insured).
2. Contracted providers (village health centres, district hospitals, vertical hospitals, horizontal hospitals and private hospitals).
3. Benefit packages, for which we define four categories of services: (i) basic services (prenatal and maternity care, family planning, emergency services and accidents), (i) advanced services (specialists, blood transfusion, advanced treatments and diagnostic services, intensive care, surgery, haemodialysis, congenital disease, thalassemia), (iii) costs of medicine and (iv) additional services (dental care, hearing and optical aids, mobility aid, mental disorders, social services and natural disasters).

Given that covered services are fully subsidized by the *Jamkesda* schemes, the data do not record any variation in the third dimension of UHC, the direct cost of health services, other than the presence of the *Jamkesda* scheme itself.

The specification in Equations (1) and (2) will yield unbiased estimates if there is no reverse causality of the outcome variables with respect to the implementation of *Jamkesda* and if there are no omitted factors driving both. Reverse causality is unlikely, as local health financing schemes take time to materialize, having to traverse local political and operational processes. We would, therefore, not expect the adoption of *Jamkesda* to be a function of health care utilization or OOP spending in the same year. On one hand, using lagged *Jamkesda* further allays concerns of reverse causality. Unobserved confounding factors, on the other hand, cannot be assumed away. But we would expect these to be typically time invariant factors, such as district governance, institutions and endowments, which are controlled for by the district fixed effects.

However, a time-variant development that we need to consider explicitly is the introduction of direct elections for district regents and mayors, which play an important role in the emergence of *Jamkesda* schemes. These elections could trigger other policy reforms coinciding with the *Jamkesda* schemes, hence potentially confounding our estimates. We, therefore, assess the sensitivity of the results to including a dummy variable that indicates the timing of the first direct election for district head. The timing of these elections differs across districts, as they are determined by the time of expiry of the appointed incumbent's term in office. If our estimates are confounded by multiple policy reforms then we expect the results to be sensitive to the election variable. Since the direct local elections are a key determinant of local health policy, it is a potential 'bad control'. We, therefore, include it only as robustness check and leave it out of the main specification.

A remaining problem could be that the political and institutional determinants driving the establishment of *Jamkesda* could also lead to different trends in the outcome variables. For example, the quality of local governance and bureaucracy will determine the sustainability and effectiveness of local health financing policies, as well as long-term investment in the quality of public health care. In this case, time invariant omitted variables could still violate the fixed effects identifying assumptions by introducing divergent district trends. However, we can test for divergent trends by estimating placebo regressions

$$y_{kt} = \alpha + \beta Jamkesda_{kt+1} + \delta_t + \mu_k + \varepsilon_{kt} \quad (3)$$

If there are divergent trends then we would expect current outcomes to be correlated with future implementation of *Jamkesda*

Table 2. Coverage objectives of *Jamkesda*

Target beneficiaries	Percent of districts
Whole community	2.9
Non-insured poor and non-poor	28.2
Non-insured poor and public servants	2.9
Non-insured poor	66.1
Identification of beneficiaries	
Membership cards only	26.2
Membership card or evidence of poverty	41.4
No mechanism for identifying beneficiaries	32.4

Source: *Jamkesda* district survey.

programs, after controlling for fixed effects and a common time trend. The placebo test then implies the null hypothesis $\beta = 0$, which, if rejected, would provide evidence of divergent trends.

Finally, we test whether our results are affected by sample selection bias due to incomplete coverage of the Indonesian districts. We first define a district responding to our survey by a binary indicator s_k which we model as a function of all control variables HC_{kt} and X_{kt} that are included in Equations (1) and (2)

$$P(s_k = 1) = F\left(\alpha + HC_k'\gamma + X_k'\theta + \varphi ID_k + u_k\right) \quad (4)$$

Since s_k does not vary over time, we take the control variables at their 2010 values, the year closest to the district survey. We then apply two strategies for dealing with sample selection. First, we construct an inverse Mills ratio λ_k based on probit estimates of Equation (4). Under the assumption that u_k and $\bar{\varepsilon}_k$ have a joint normal distribution, we include λ_k in Equations (1) and (2) interacted with year fixed effects. To aid identification, we also include the ID codes of the enumerators (ID_k) in the selection equation, based on the hypothesis that the probability that a district responds to the survey is partly based on the enumerators' interaction and communication skills during the introduction and interview phase of the survey. There is no reason to expect that the enumerator ID is correlated with the outcome variables in the *Susenas* surveys, given that there is no purposive spatial pattern in district allocation to enumerators. For the second approach, the regressions are weighted by $\frac{1}{\hat{p}_k}$, the inverse of the predicted probabilities from the selection probit (4). If there is no sample selection bias due to the districts' non-response, then the estimated effects of *Jamkesda* should not be sensitive to these two robustness tests.

Results and discussion

Jamkesda design characteristics

By 2010, 91% of the districts in our sample had implemented a *Jamkesda* scheme (Figure 1). Most of these were implemented after the introduction of *Askeskin*, especially between 2007 and 2010. About 3% of districts in the sample already operated a *Jamkesda* scheme before 2005.

For the districts in our survey sample that operate a *Jamkesda* scheme, Table 2 confirms that the coverage gap has generally been a common objective of district governments. Almost 70% of the districts in our sample that implemented a *Jamkesda* scheme by 2010 address under-coverage of the poor by targeting non-insured poor households, while more than a quarter of districts aimed to close the coverage gap completely. About 3% of districts targeted the full population.

Table 3. Institutional design of *Jamkesda*

Legal endorsement	Percent of districts
District regulation: mayor/district head and district parliament	20.0
Mayor/district head regulation or decree	72.2
No specific regulation	7.8
Management and administration	
Local government	
No special division created	2.8
Special division under DHO	48.2
Technical unit under DHO	10.2
External implementing agency	9.8
Cooperation with insurance company	
PT Askes	27.8
Other	1.2

Source: *Jamkesda* district survey.

Membership cards were allocated to beneficiaries in 68% of the districts (Table 2). However, only 26% of districts actually used the cards as exclusive proof of eligibility, while 41% of districts also allowed other evidence of poverty, such as poverty letters provided by the village head. A third of districts in the sample did not define procedures for identifying eligibility.

The local legal endorsement of the *Jamkesda* schemes reflects their political and legal support and sustainability. The types of legal endorsement are shown in Table 3. The strongest legal basis for a program at the district level is a district regulation (*perda*), which has been adopted for 20% of the sampled *Jamkesda* schemes. A district regulation requires support from the head of the district government (the regent in a rural district or the mayor in a municipality) and has to be passed by the district parliament (DPRD). Policies based on a local regulation are not easily changed or abolished by a district government, as this again requires approval from the local parliament. The vast majority (72%) of districts, however, opted for a policy regulation or decree based solely on the local government's authority (*perkada* or *kepkada*), and about 8% of districts had no specific regulation in place for *Jamkesda* schemes.

Most *Jamkesda* schemes were managed under the auspices of the local government (Table 3), either by a division under the DHO (48%), technical units of the DHO (10%) or an implementing agency created specifically for *Jamkesda* (10%). About 3% of *Jamkesda* schemes were not assigned to a specific administrator, but are directly managed by the local government. In contrast, for almost 30% of *Jamkesda* schemes, the management and administration was outsourced to insurance companies. Most of these districts had a contract with PT Askes, the state owned insurance company that managed the social health insurance for civil servants. Three districts in our sample worked with a private insurer.

The *Jamkesda* schemes were not exclusively funded by district government budgets (Table 4). Although all the schemes are managed or outsourced by district governments, only about 39% operated on district funding alone while half of all schemes also received financial support from the provinces. Cross subsidising the poor with premiums from non-poor participants was observed for <4% of *Jamkesda* schemes.

Almost all *Jamkesda* schemes covered services provided by local health centres (87%) and public district hospitals (82%), as shown in Table 5. Referral to province level hospitals and national

hospitals is covered by 69 and 14% of *Jamkesda* schemes, respectively. Many *Jamkesda* schemes also covered referrals to specific providers in other districts or provinces (76%), while 23% had contracted private hospitals.

The benefit packages generally covered outpatient and inpatient care similar to the national *Jamkesmas* program, but still we see quite some variation across districts (Table 6). The variation is even greater when we look at coverage of specific services.

Table 4. Financing of *Jamkesda*

Source of financing	Percent of districts
District budget	39.3
Province budget	6.6
Budget sharing between districts and provinces	50.4
Cross subsidization	3.6

Source: *Jamkesda* district survey.

Table 5. Health care providers contracted under *Jamkesda*

Provider	Percent of districts
Village health centre	86.5
District public hospital	80.8
Province public hospital	69.0
National public hospital	14.3
Hospital in other district or province	75.9
Private hospital	23.3

Source: *Jamkesda* district survey.

Average impact of Jamkesda programs

The estimated impact of the *Jamkesda* programs is shown in Table 7 for the full population, by region and by quintile. The table summarizes the estimated β coefficients from Equation (1) for each type of health care, leaving out other covariates for convenience (the full results are reported in the Supplementary Appendix).

Introducing a *Jamkesda* scheme increases the overall outpatient utilization for a district population by 0.013 outpatient visits per capita in the last month. This translates to an average increase of about 8% compared with 2004 utilization levels. Separating outpatient care at public and private providers shows that most of this gain is observed with public providers, where the Jamkesda schemes increased outpatient care by 0.010 visits.

We find, however, no evidence of average impact for hospitalization or OOP health spending. This could imply that despite the extensive benefit packages offered by some districts, coverage of relative high cost inpatient care lies beyond the means of local health care financing schemes (at least, on average), or that there remain barriers to hospitalization that are not overcome by *Jamkesda*. We also find no evidence of substitution effects between the private and public sector.

Most of the impact on outpatient utilization is concentrated with the third and fourth quintiles, for which the impact coefficient reflects an increase of 0.014 and 0.017 outpatient visits per person per month. This increase seems to be evenly distributed between public and private care, although the impact estimates by type of care are

Table 6. Benefit packages of *Jamkesda* schemes

Services	Coverage (percent of districts)			Coverage *Jamkesmas*
	Not	Full	Limited	
General				
Outpatient care at village health centre	13.1	83.3	1.6	Full
Inpatient care at village health centre	10.2	81.6	6.1	Full
Outpatient care at hospital	9.0	85.3	3.7	Full
Inpatient care at hospital	4.9	85.3	7.8	Full
Specific services				
Specialist	8.6	80.8	8.6	Full
Blood transfusion	11.8	74.7	7.3	Full
Emergency services	2.4	88.2	3.3	Full
Advanced services	47.8	30.6	13.9	Full
Diagnostic services	3.7	80.4	10.6	Full
Intensive care	6.9	78.4	6.9	Full
Surgery	6.1	43.3	43.3	Full
Haemodialysis	39.2	38.8	18.4	Full
Mental disorders	22.4	66.1	5.7	Full
Dental care	6.1	4.9	85.7	Limited
Hearing and optical aids	65.3	3.3	26.1	Limited
Mobility aid	73.1	4.1	17.6	Limited
Pharmaceuticals	4.5	7.8	84.1	Limited
Prenatal and maternity care	56.3	36.7	4.1	Not
Delivery assistance	62.0	24.9	10.6	Not
Family planning	65.3	25.7	6.1	Not
HIV/AIDS treatment	59.6	28.6	4.1	Not
Congenital disease	43.7	41.6	6.9	Not
Thalasemia	58.8	32.7	4.9	Not
Accidents	19.2	54.3	18.8	Not
Social services	91.0	2.9	1.2	Not
Natural disasters	82.0	12.7	0.8	Not

Source: *Jamkesda* district survey.

not precise. The effects for the middle quintiles are interesting, since this group can be considered as not only largely ineligible for *Jamkesmas* but also likely to earn income from the informal sector. That is, the incomplete coverage for this group is the main motivation and target for the *Jamkesda* programs in most districts. We do not find effects for the poorest and wealthiest quintiles, which are the groups that are most likely covered by the nationwide subsided and formal sector programs, respectively.

Table 7. Impact of *Jamkesda* programs, by population sub-group

	Outpatient utilization			Inpatient utilization			OOP
	All	Public	Private	All	Public	Private	share
All	0.0126*	0.0096**	0.0030	−0.0004	−0.0003	0.0006	−0.0002
	[0.0056]	[0.0034]	[0.0037]	[0.0052]	[0.0041]	[0.0025]	[0.0003]
Municipality	0.0019	−0.0006	0.0025	0.0075	−0.0033	0.0133	−0.0009
	[0.0086]	[0.0063]	[0.0049]	[0.0146]	[0.0105]	[0.0080]	[0.0009]
Rural district	0.0156*	0.0121**	0.0035	−0.0006	0.0014	−0.0016	−0.0001
	[0.0066]	[0.0040]	[0.0044]	[0.0058]	[0.0046]	[0.0026]	[0.0003]
Java/Bali	−0.0029	−0.0025	−0.0004	−0.0104	−0.0073	0.0011	0.0003
	[0.0076]	[0.0043]	[0.0058]	[0.0092]	[0.0070]	[0.0049]	[0.0006]
Non-Java/Bali	0.0198**	0.0140**	0.0058	0.0048	0.0024	0.0018	−0.0002
	[0.0071]	[0.0044]	[0.0045]	[0.0065]	[0.0051]	[0.0030]	[0.0003]
Quintile 1	0.0037	0.0033	0.0003	−0.0063	−0.0050	0.0008	0.0001
	[0.0089]	[0.0075]	[0.0038]	[0.0074]	[0.0070]	[0.0020]	[0.0004]
Quintile 2	0.0130	0.0064	0.0067	−0.0064	−0.0043	−0.0012	−0.0006
	[0.0133]	[0.0068]	[0.0084]	[0.0094]	[0.0077]	[0.0036]	[0.0004]
Quintile 3	0.0138+	0.0072	0.0067	−0.0010	−0.0013	0.0004	0.0001
	[0.0072]	[0.0050]	[0.0046]	[0.0088]	[0.0079]	[0.0041]	[0.0004]
Quintile 4	0.0170+	0.0081	0.0088	−0.0030	−0.0015	0.0001	0.0003
	[0.0088]	[0.0058]	[0.0054]	[0.0102]	[0.0082]	[0.0049]	[0.0007]
Quintile 5	0.0083	−0.0002	0.0085	0.0149	0.0032	0.0114	−0.0014
	[0.0089]	[0.0060]	[0.0066]	[0.0197]	[0.0173]	[0.0080]	[0.0009]

Notes: District fixed effects regressions. Control variables are omitted for convenience. Number of observations is 1808. Standard errors in brackets are clustered at the district level. *Statistical significance*: + 10%, *5%, **1%.

Table 8. Effect of *Jamkesda* design characteristics

	Outpatient utilization			Inpatient utilization			OOP
	All	Public	Private	All	Public	Private	share
Jamkesda	0.0012	−0.0007	0.0019	0.0024	−0.0123	0.0146	−0.0001
	[0.0297]	[0.0165]	[0.0189]	[0.0239]	[0.0157]	[0.0184]	[0.0013]
Full population covered	−0.0048	−0.0029	−0.0019	−0.0007	0.0125	−0.0146**	−0.0007
	[0.0091]	[0.0067]	[0.0050]	[0.0100]	[0.0082]	[0.0048]	[0.0004]
Providers contracted							
Village health centre	−0.0111	0.0026	−0.0137	−0.0130	−0.0048	−0.0066	0.0001
	[0.0259]	[0.0124]	[0.0177]	[0.0201]	[0.0119]	[0.0168]	[0.0009]
District hospital	0.0328*	0.0159	0.0170+	0.0012	0.0185+	−0.0152+	−0.0001
	[0.0160]	[0.0106]	[0.0087]	[0.0141]	[0.0097]	[0.0088]	[0.0007]
Vertical hospital	−0.0117	−0.0172	0.0055	−0.0271*	−0.0121	−0.0134	−0.0006
	[0.0143]	[0.0105]	[0.0089]	[0.0127]	[0.0093]	[0.0090]	[0.0005]
Horizontal hospital	−0.0069	−0.0023	−0.0046	−0.0004	−0.0048	0.0039	−0.0005
	[0.0100]	[0.0067]	[0.0059]	[0.0085]	[0.0068]	[0.0048]	[0.0004]
Private hospital	0.0122	0.0133+	−0.0012	0.0042	−0.0024	0.0095+	0.0013**
	[0.0105]	[0.0071]	[0.0060]	[0.0090]	[0.0069]	[0.0051]	[0.0005]
Benefit package							
Basic	0.0287	0.0091	0.0195	0.0075	0.0076	−0.0015	0.0014+
	[0.0179]	[0.0095]	[0.0126]	[0.0178]	[0.0161]	[0.0076]	[0.0008]
Advanced	−0.0148	0.0020	−0.0168	0.0111	−0.0046	0.0160	−0.0007
	[0.0197]	[0.0136]	[0.0125]	[0.0255]	[0.0196]	[0.0128]	[0.0011]
Medicine	0.0132	0.0094	0.0037	0.0060	0.0070	−0.0016	−0.0004
	[0.0172]	[0.0094]	[0.0097]	[0.0242]	[0.0177]	[0.0101]	[0.0008]
Additional	−0.0125	−0.0062	−0.0063	0.0163	0.0077	0.0049	−0.0003
	[0.0171]	[0.0086]	[0.0121]	[0.0102]	[0.0080]	[0.0059]	[0.0004]

Notes: District fixed effects regressions. Control variables are omitted for convenience. Number of observations is 1,808. Standard errors in brackets are clustered at the district level. *Statistical significance*: + 10%; *5%; **1%.

Table 9. Placebo regressions: correlation of outcome variables with future adoption of *Jamkesda* programs

	Outpatient utilization			Inpatient utilization			OOP
	All	Public	Private	All	Public	Private	share
Jamkesda in district next year	−0.0036	−0.0019	−0.0017	−0.0004	0.0029	−0.0026	0.0001
	[0.0052]	[0.0039]	[0.0030]	[0.0052]	[0.0037]	[0.0027]	[0.0004]
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other control variables	No	No	No	No	No	No	No
Number of observations	1448	1448	1448	1448	1448	1448	1448
Number of districts	245	245	245	245	245	245	245
R-squared	0.38	0.15	0.43	0.33	0.29	0.15	0.30

Notes: District fixed effects regressions. Standard errors in brackets are clustered at the district level. *Statistical significance*: + 10%, *5%, **1%.

Table 10. Robustness and sample selection tests

	Outpatient utilization			Inpatient utilization			OOP
	All	Public	Private	All	Public	Private	share
Main specification	0.0126*	0.0096**	0.0030	−0.0004	−0.0003	0.0006	−0.0002
	[0.0056]	[0.0034]	[0.0037]	[0.0052]	[0.0041]	[0.0025]	[0.0003]
Specification							
Controlling for direct elected district regent/mayor	0.0122*	0.0090**	0.0032	−0.0005	−0.0006	0.0009	−0.0002
	[0.0056]	[0.0034]	[0.0037]	[0.0053]	[0.0042]	[0.0025]	[0.0003]
No controls (year dummies only)	0.0166**	0.0118**	0.0048	0.0030	0.0021	0.0014	−0.0001
	[0.0057]	[0.0036]	[0.0037]	[0.0057]	[0.0046]	[0.0026]	[0.0003]
Sample selection tests							
Including selection terms $\lambda_k \times \delta_t$	0.0123*	0.0092**	0.0031	−0.0004	−0.0003	0.0007	−0.0002
	[0.0055]	[0.0034]	[0.0037]	[0.0052]	[0.0041]	[0.0025]	[0.0003]
Inverse probability weighting	0.0147*	0.0106**	0.0041	0.0006	−0.0005	0.0015	−0.0002
	[0.0059]	[0.0035]	[0.0039]	[0.0054]	[0.0043]	[0.0025]	[0.0003]
Number of observations	1808	1808	1808	1808	1808	1808	1808
Number of districts	262	262	262	262	262	262	262

Notes: The table shows the estimated effect of *Jamkesda* schemes for different specifications. District fixed effects regressions. Control variables are omitted for convenience. Standard errors in brackets are clustered at the district level. *Statistical significance*: + 10%; *5%; **1%.

The impacts on outpatient care are only observed outside Java and Bali and in rural districts, and not municipalities. These regions typically have a lower density and variety in health care providers, and where supply side readiness is relatively low (Bappenas 2014).

To summarize, the average effects of *Jamkesda* schemes are limited. But where we do find an effect, it is mainly for the 'missing middle' groups that have limited access to national schemes, and in relatively rural and more remote areas with that are presumably more constrained in the variety and supply of health care.

Impact heterogeneity: the role of Jamkesda design characteristics

The results for the analysis of impact heterogeneity and the *Jamkesda* design features are summarized in Table 8, again omitting coefficients of the covariates. Starting with the *Jamkesda* characteristics relating to program beneficiaries, we find no evidence that schemes that aim to completely fill the coverage gap, by providing coverage to the either full population or the non-insured, improve health care utilization relative to *Jamkesda* schemes that cover only part of the gap left by national programs. In fact, we see a reduction in private hospitalization that seems to be largely offset by an increase in public inpatient utilization. While the latter is not statistically significant, the absence of a net decrease in hospitalization suggests a substitution effect from private to public inpatient care.

The variation across districts in the choice of providers contracted for the *Jamkesda* schemes seems to be an important source of impact heterogeneity. Contracting district public hospitals increases outpatient care and shifts hospitalization from private to the public providers. Conversely, contracting private hospitals sees an increase in private inpatient utilization. The utilization of public outpatient care is also higher in districts that have contracted private providers, presumably because referrals from community health centres are typically required in order to access private care under a *Jamkesda* scheme. Out-of-pocket spending does tend to increase when private care is covered, suggesting that the full cost of private care is often beyond local health care financing schemes. Schemes that cover referrals to province or national hospitals see a relative decrease in the *Jamkesda* effect on outpatient and inpatient care, although only the latter is statistically significant. This could reflect the limitations of local health care financing, which seems

most effective if it places priority on local providers that provide the bulk of health care to district populations. Covering advanced services offered at higher level hospitals increase pressure on local resources, potentially crowding out the supply of basic services, even if benefit packages are kept constant. The coefficients for contracting community health centres are not statistically significant; most likely because the low cost of care at public health centres is hardly a barrier to health care. Overall, these results reflect the referral function of local health centres and also show that the choice of provider contracting can lead to substitution between private and public care.

Including basic services and purchasing medicines in the benefit packages is positively associated with utilization of outpatient, while including advanced services shows a negative association. However, these associations cannot be established as causal effects. While the coefficients are substantial so are the standard errors, yielding imprecise estimates.

Robustness

The placebo regression results, presented in Table 9, suggest that the fixed effects approach is sufficient for eliminating any bias from unobserved district characteristics. There is no evidence of divergence in trends as the null is not rejected for any of the outcome variables. The coefficients are very small and not statistically significant.

Moreover, we find no evidence of omitted variable bias (Table 10). First, including the direct election variable does not change the results. In other words, despite being a strong predictor of the introduction of *Jamkesda* schemes, it has no additional explanatory power with respect to health care utilization.[6] Second, even control variables such as demographics and coverage of other insurance schemes do little to the *Jamkesda* impact estimates. A specification with only year and district fixed effects yields *Jamkesda* coefficients that are slightly larger but not statistically significantly different from the main specification. This suggests that *Jamkesda* policy is mainly driven by fixed district characteristics, endowments and political context, rather than changes.

The results in Table 10 also suggest that the partial coverage of the district survey does not affect the generalizability of our results. We find no evidence of sample selection bias as the results are robust to inverse probability weighting or including a sample selection term. The coefficients remain statistically significant and of similar sign, and are within one standard error of the main specification estimates.

6 District fixed effect regressions that control for the same X and HC variables as in model (1) indicate that the presence of a direct elected district regent or mayor is a stronger predictor of having a *Jamkesda* scheme in the district than the socioeconomic and demographic composition of the district population, and coverage by most national health insurance programs. Besides local elections, only the coverage of social health insurance for civil servants and private insurance appear statistically significant. We also added lagged average household out-of-pocket health care spending and health care utilization patterns in districts as controls but these are also not statistically significant. Results are not presented here but included in the Supplementary Appendix (Table 12).

Conclusion

In this paper, we investigated the heterogeneity and effectiveness of district health care financing schemes in Indonesia for the period 2004–10. Using a unique survey of District Health Offices we find variation in the design characteristics of the schemes, reflecting the combination of relative autonomy of districts and large degree of heterogeneity in resources. While the *Jamkesda* schemes generally aim to address the coverage gap of the 'missing middle', they differ in their political sustainability, targeting mechanism, management structure, provider contracting and benefit package.

Overall, the *Jamkesda* schemes seem to have had a modest effect on the access to health care, with an impact on an average utilization only for outpatient care. When we look beyond national averages at impact heterogeneity, the local schemes seem to have increased outpatient utilization mainly for the middle quintiles that tend to fall just outside the target population of the national subsidized programs. In contrast, we find no evidence that *Jamkesda* increased access to hospitalization or improved financial protection.

There results further suggest that there is variation in effectiveness across districts due to differences in design features. The *Jamkesda* schemes generally improved access to care if the schemes contracted both public and private providers (with referrals through the community health centres) and placed priority with district hospitals rather than provincial and national hospitals. Our results cannot confirm any differential impacts due to the variation of benefit packages.

These results reflect the ambiguous conclusions from the international literature. On one hand, our findings suggest that district governments are able to reach their populations and identify local policy priorities where national programs have found this difficult. Local health financing policies can indeed play a role in meeting the missing middle coverage gap and improve access to public health care in remote and rural areas, at least with respect to basic outpatient services. However, the results also reflect the limited scope of local health financing schemes, as they are hampered by regional disparities in resources and quality of public service. For instance, financial constraints affect the size of the risk pool and hence the scope for providing UHC while human resource constraints, and technical and administrative capacity affect the quality, design and implementation of Jamkesda schemes.

To date, it remains unclear whether and how the *Jamkesda* schemes will fit in Indonesia's new national social health insurance program. But in their present form, these local schemes hardly seem a solution to providing comprehensive coverage to Indonesia's informal sector, which has been recognized as one of the key challenges faced by the new national insurance. This would suggest that, at least for the smaller districts, further integration with the NHI would seem to be beneficial. Nevertheless, the *Jamkesda* schemes do present achievements that the NHI can potentially draw on, as local governments have mobilised considerable resources for health care financing and have been able to reach a large share of the non-insured informal sector, a group which has remained elusive for the national government.

Supplementary data

Supplementary data are available at *HEAPOL* online.

Ethical clearance: Ethical clearance was obtained from the Ethics Committee of the International Institute of Social Studies, Erasmus University Rotterdam. The empirical analysis is based on publicly

available national survey data and interviews with district health offices. Informed consent was obtained for all interviews conducted.

Conflict of interest statement. None declared.

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