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Table of Contents

Effects of Decentralized Health Care Financing on Maternal Care in Indonesia

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Abstract — We exploit variation in the design of sub-national health care financing initiatives in Indonesian districts to assess the effects of these local schemes on maternal care from 2004 to 2010. The analysis is based on a district pseudo-panel, combining data from a unique survey among District Health Offices with the Indonesian Demographic and Health Surveys, the national socioeconomic household surveys, and the village census. Our results show that these district schemes contribute to an increase in antenatal care visits and the probability of receiving basic recommended antenatal care services, and a decrease in home births, especially for households that fall outside the target group of the national health insurance programs. The variation in scheme design is a source of impact heterogeneity. Including antenatal and delivery services explicitly in benefit packages and contracting local rather than national health care providers increases the positive effects on maternal care.

Key words: Health Care Financing, Decentralization, Maternal Health Care, Indonesia.
***JEL* codes:** I13, I18.

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1 Introduction

Maternal health is of great concern in Indonesia. The country is not only lagging behind in regional comparisons but will also miss its Millennium Development Goal (MDG) on maternal mortality (MDG5). Despite high utilization of antenatal care (ANC) services and high rates of skilled birth attendance, maternal mortality has remained stubbornly above 200 per 100,000 live births in the past decade. This is about twice as high as the MDG target set at 102 per 100,000 live births and also represents one of the highest maternal mortality rates in Southeast Asia.

Child mortality in Indonesia, on the other hand, has been declining. Under five mortality dropped from 81 per 1,000 live births in 1990 to 40 per 1,000 live births in 2010 which is not so far off from the MDG-target of 32 per 1,000 live births (UNICEF, 2012). While there has been progress in reducing under five mortality, most child deaths now occur in the first 12 months of life (32 per 1,000); especially in the neonatal period (19 per 1,000), i.e. the first months after birth. According to UNICEF (2012), with adequate care, most of these neonatal deaths are preventable (see also Ekman et al., 2008). Moreover, neonatal mortality in Indonesia is subject to geographic variation, with rural areas clearly lagging behind. This is symptomatic of lower access to and utilization of preventive care in these areas. Neonatal mortality rates among Indonesian children who do not receive antenatal care are about 5 times higher than mortality rates of children benefiting from these services (UNICEF, 2012).

With maternal and child mortality being an integral part of the MDGs, developing countries have been experimenting with different types of interventions to increase access and utilization of maternal care services, including, for example, subsidies, vouchers or conditional cash transfer programs (CCTs). However, evidence on the effectiveness of these interventions is still scarce and the debate on how best to promote access and utilization is still ongoing (see

Broghi et al., 2006; Kruk et al. 2007; Comfort et al., 2013; Dzakpasu et al., 2014). For example, De Alegri et al. (2012) show that in Burkina Faso a 80% subsidy on delivery services increased the number of institutional deliveries from 49 to 84% over a 5 year period. Bangladesh, Cambodia and Kenya, have been experimenting with vouchers for maternity care. While studies have found generally positive effects of vouchers on institutional deliveries, these schemes appear to be less successful in promoting and improving antenatal care (see e.g. Achmed and Khan, 2011; Bellows et al., 2011; Obare et al., 2013; Van de Poel et al., 2014). Explanations for this failure of vouchers to enhance the uptake of maternal care services include lack of information and awareness of the voucher scheme and a lack of trust that the services are indeed delivered free of charge (see Obare et al., 2013). Other countries, such as Afghanistan, India and Nepal, have introduced conditional cash transfer programs to influence maternal health related behaviors. In the case of Nepal, for example, Powell-Jackson and Hanson (2012) find only modest effects, with the CCT increasing the likelihood of delivery by a skilled attendant by 4.2 percentage points. In Afghanistan, Lin and Salehi (2013) find increases in service utilization of about 8 percentage points due to the CCT. In India, Lim et al. (2010) find stronger effects on in-facility births and also a positive effect of the *Janani Suraksha Yojana* (JSY) scheme on antenatal care. The authors also show that the JSY is associated with a 2 to 4 percent reduction in neonatal and perinatal deaths. Still, despite these studies, the effect of subsidies, vouchers, or CCTs on mortality and other health outcomes has not yet been well documented and understood (Glassman et al., 2013).

While subsidies, vouchers and CCTs are targeted at maternal health services specifically, health insurance programs typically aim at improving access to a broader range of health services, of which maternal health is only one aspect. Indeed, it may be argued that if insurance is sufficient to improve access to maternal health care services, other interventions such as vouchers and CCTs

may not be needed. So far, studies that have investigated the effect of insurance on the utilization of maternal health services specifically are scarce and do not establish a causal relationship (for a systematic review see Comfort et al., 2013). For example, Mensah et al. (2010) assess the effects of the national health insurance scheme in Ghana, while Long et al. (2010) study the New Co-operative Medical System in China. Both these cross-section based studies document improved access to maternal health care which they attribute to insurance. In Ghana, Mensah et al. (2010) argue that health insurance leads to an increase in the likelihood of using ANC by 13 to 15 percentage points; an increase in facility based deliveries by 12 to 18 percentage points, and an increase in births assisted by a trained professional by 14 percentage points. While the authors note less complications during births, they do not find substantial improvements in the quality of ANC services used, i.e. on blood and urine testing. In China, Long et al. (2010) find increases in antenatal care and an increase in facility based deliveries from 45 to 80%. In a follow-up study the authors argue that health insurance coverage may also facilitate the overuse of non-medical caesarian sections with insured women being 1.3 times more likely to have a caesarian (Long et al., 2012).

Large scale insurance schemes as in Ghana and China are still rare in developing country contexts. In many countries health insurance schemes remain fragmented and often operate only at a community level (Lagomarsino et al., 2012). The advantage of community or regional schemes which operate at a decentralized level is that they are arguably much closer to the target population and therefore also better positioned to respond to the needs of the population (see e.g. Skoufias et al, 2011). Conversely, local schemes may suffer from a lack of financial and human resources, and limited administrative capacity and technical expertise. So far, however, there is little empirical evidence on the performance of decentralized insurance schemes particularly with respect to maternal and child health care.

The current policy context in Indonesia offers a unique opportunity to study the effects of such decentralized health care financing schemes. Since Indonesia's fiscal and political decentralization in 2001, district governments have increasingly engaged in local health insurance programs. This development has been mainly driven by coverage gaps in national health insurance programs and local political factors. But despite a common motivation and institutional context, these schemes vary greatly in scope and design (Gani et al., 2008; 2009; Budiyati et al. 2013).

Against this background, this paper explicitly investigates how district health care financing schemes in Indonesia affect access to maternal health care services. In contrast to earlier studies we provide, arguably, a more robust identification strategy. We also pay particular attention to the differences in local policy design and their influence on service delivery. The paper adds to the scant literature on the effects of health care financing and access to maternal care. In addition, this is one of the few studies that also investigates differences in institutional and policy design within a single country context (see e.g. Faguet, 2004; Akin et al, 2007; Galiani et al, 2008).

The study combines data from a unique survey of District Health Offices (DHOs) – which are responsible for the implementation of the district health policies – with the Indonesian Demographic and Health Surveys (IDHS) from 2007 and 2012, the annual Indonesian Socio-economic Survey (Susenas), and the Village Infrastructure Survey (Podes). The DHO survey provides detailed information on the design of the local schemes, such as the year of implementation, benefits package, premiums and co-payments, institutional arrangements, management and provider contracting. Our identification strategy exploits variation in local health financing reforms across districts and year of birth of children under 5 years of age. Using district-level fixed effects specifications, we find that local health care financing initiatives increase antenatal care visits and to a lesser extent decrease the percentage of home births, especially for households

that fall outside the target group for the national (subsidized) health insurance programs. Improvements in ANC are also observed in terms of the depth of antenatal services provided. We also see an increase in caesarean sections among women in the wealthiest quartile, but no effect on the number of births attended by a trained professional. The variation in design features of the schemes appears to be a source of impact heterogeneity. The observed positive effects of local health care financing schemes is driven by those schemes that explicitly include ANC in the benefit package. Furthermore, contracting local rather than national health care providers increases the positive effects on maternal care.

The remainder of this paper is structured as follows. Section 2 provides a brief background on the policy context. Section 3 presents the data and key variables. Section 4 outlines the empirical strategy. The results are discussed in Section 5 and Section 6 concludes.

2 Context

Indonesia embarked on a far reaching decentralization reform in 2001, granting a substantial degree of political and fiscal autonomy to district governments which are now to a large extent responsible for public service delivery. With this relative autonomy, district governments in Indonesia have gradually implemented local health care financing schemes, collectively known as *Jamkesda* (*Jamanan Kesehatan Daerah* – Regional Health Insurance). The first local insurance schemes emerged soon after decentralization was realized, but the proliferation of the *Jamkesda* schemes accelerated after 2005 in the wake of the nationwide subsidized social health insurance for the informal sector and the poor.

While social health insurance has been established in Indonesia for decades, this has been exclusively available to the formal sector, i.e. the public service, military and police, and the formal private sector. Prior to 2005 the main health

care financing policy instrument for the poor was the Health Card program (a remnant from the 1998 Asian Financial Crisis social safety net) that provided targeted health care fee waivers at public providers to about 10 percent of the population. In 2005 the *Askeskin* (*Asuransi Kesehatan untuk Keluarga Miskin* – Health Insurance for Poor Families) program was introduced, as a first step towards a long term objective of universal health insurance coverage in Indonesia. In 2008 the program was expanded under the name *Jamkesmas* (*Jaminan Kesehatan Masyarakat* – Public Health Insurance) to cover not only the poor but also the near poor. Households enrolled in these programs were entitled to a comprehensive health care package at public and selected private providers. The premiums were fully subsidized by the government.

About 10 to 15 percent of the population in Indonesia is covered by formal sector health insurance schemes. The *Askeskin* and *Jamkesmas* reforms expanded insurance coverage by a further 30 percent of the population. The reforms, however, still excluded a large part of the population in the informal sector. These households were not considered sufficiently destitute to be targeted for the subsidized insurance, while also having no access to formal sector social health insurance or private insurance. Many district governments acknowledged this coverage gap of the national schemes and responded by establishing local health care financing schemes – the *Jamkesda* – to particularly target those left out.

The local health care financing schemes were not only motivated by existing coverage gaps; many were also driven by political opportunity (see e.g. Aspinal, 2014). With the introduction of direct elections for district regents (rural districts) and mayors (municipalities) in 2005, free health care became a prominent feature in election campaigning. As a consequence, the number of local health care financing schemes increased significantly after 2005 when the first district elections were held. In light of their local nature, *Jamkesda* schemes vary greatly in scope and design (Gani et. al, 2008; 2009). This applies,

for example, to the benefits that are covered by the schemes, the health care providers contracted, the management structure, and the legal endorsement (see Budiyati et al., 2013 for details).

As of January 1^{st}, 2014, the *Jamkesmas* program and the formal sector social health insurance schemes have been consolidated in a new national health insurance (*Jaminan Kesehatan Nasional* (JKN)). The new national scheme combines the beneficiaries of the former *Jamkesmas* and the formal sector programmes, with the objective of reaching universal coverage by 2019. In the first year, however, progress with voluntary enrolment for the non-subsidised informal sector has been slow, with only 2.5% of the non-covered population enrolling (WHO, 2015). Currently it remains unclear if and how the existing local health insurance schemes will be incorporated into the new national policy by 2019.

3 Data

3.1 Data Sources

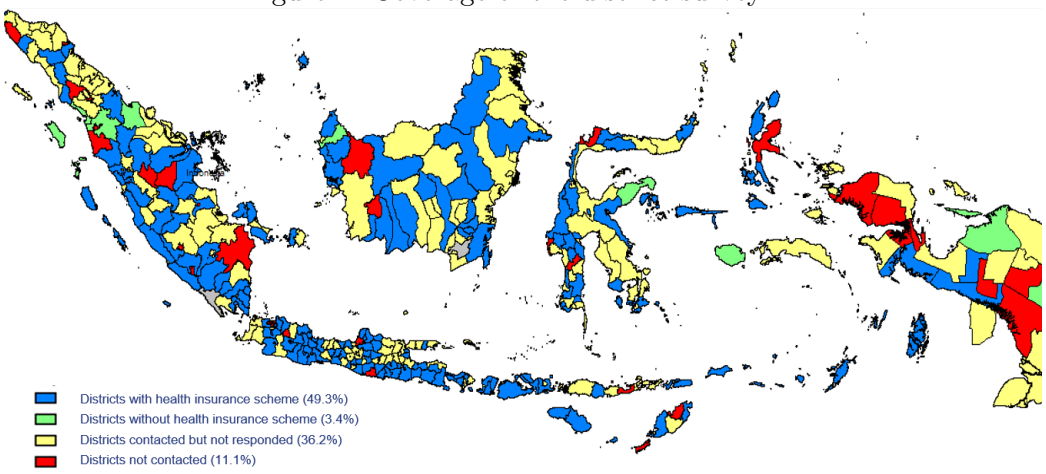
For the empirical analysis we construct a district pseudo-panel for the period 2004-2010 combining data from 4 sources: (i) a unique survey conducted among District Health Offices (ii) the Indonesian Demographic and Health Surveys (IDHS) for 2007 and 2012, (iii) the annual Indonesian Socio-economic Survey (Susenas) for 2003-2009, and (iv) the Village Census (Podes) for 2003, 2006 and 2008.

The DHO survey was conducted through a combination of mail questionnaires and phone interviews with DHOs from December 2011 to April 2012. The DHOs are responsible for the implementation of the health policies of district governments, which include the *Jamkesda* schemes. The survey collected detailed information on these local schemes, including timing of implementation, benefit packages, intended beneficiaries and coverage, funding source, health

service providers contracted and institutional design (legal endorsement and management).[1]

Out of a total of 442 districts that were contacted, 262 districts responded (60 percent).[2] Figure 1 shows the geographic spread of the districts and their status in the DHO survey. Red areas are districts which were not contacted due to missing contact details. Yellow areas are districts which were contacted but did not respond. The blue and green areas are districts which responded to the survey. Green areas are districts which were not running a local health care financing scheme at the time of the survey. The districts that responded cover approximately 58 percent of the Indonesian population in 2010. The non-response rate is a cause of concern with regard to sample selection bias and the generalizability of the district survey. However, consistent with Budiyati et al. (2013), and as will be discussed later, we find no evidence of sample selection bias affecting our estimation results (see Section 4 for details).

Figure 1: Coverage of the district survey



The IDHS is a nationally representative survey that provides detailed information on households, individual health behavior and other characteristics. The main survey respondents are women aged 15-49. For the analysis we rely

[1] For a detailed description of the survey see Budiyati et al. (2013).

[2] Indonesia was made up of 497 districts at the time the DHO survey was conducted. 55 districts could not be contacted for the DHO survey because no contact details could be obtained for these districts.

on information gathered on children aged between 0 and 5 years of age. Due to the random sampling process of the IDHS data not all districts are represented in each survey wave. Combined, the two IDHS surveys sampled children from 234 of the 262 districts that responded to the DHO Survey.

The Susenas is a socio-economic survey conducted annually among a cross-section of approximately 200,000 households. The survey is representative at the district level and includes basic information on health care but is less detailed than the IDHS. For the purpose of our analysis, we use the Susenas to obtain information on the average health insurance coverage rates in districts. The Podes village census is conducted every two to three years and provides information on all rural villages and urban precincts in Indonesia, including details on infrastructure and availability of health care providers.

We merge the data from the DHO Survey to the pooled IDHS survey data based on a district identifier. Additional information on district characteristics and infrastructure are obtained from the Susenas and Podes, which have been collapsed to the district level.

The combined data set comprises of a total of 10,856 observations of children aged between 0 and 5 years, with year of birth ranging from 2004 to 2010, spread over 234 districts and two survey years. The combined data allows us to match the year of birth of the children to the presence and design characteristics of a *Jamkesda* scheme in that specific year. That is, the data constitutes a district pseudo-panel with variation in outcome variables and *Jamkesda* policy by year of birth and district. Due to inconsistencies in the *Susenas* questionnaires, we can get a complete set of consistent control variables only for children with year of birth from 2004 onward. The period under study ends in 2010 because of the introduction of the *Jampersal* (*Jaminan Persalinan* – Universal Delivery Care) program in 2011. This program provides free delivery assistance as well as free ante- and postnatal services for women that are not covered by other health insurance programs, including *Jamkesda*. Extending the analysis to 2011

might confound the *Jamkesda* impact estimates. The *Jampersal* program was discontinued in 2014 with the introduction of the national health insurance program (JKN). So far, there is limited evidence of the effect of *Jampersal*.[3]

Table 1 shows descriptive characteristics for the pooled data. Our sample of children is gender balanced, with a male share of around 51 percent. The average age of mothers at the birth of the child included in the sample is 28 years, and mothers' education averages about 9 years. The mothers in the sample have on average 2.5 children, and 97 percent are married. The sampled children come from predominantly male headed households with on average 5.5 members. Just over half of the children live in rural areas.

With respect to the district features, we see substantial variation in key infrastructure characteristics. Over the three Podes surveys, about 62 percent of households are connected to the electricity grid, 24 percent of villages obtain drinking water through manual or electric pumps, and 64 percent are accessible by an asphalt road. With respect to health services, only 42 percent of villages have a doctor, while midwives and traditional birth assistants are found in 82 and 86 percent of the villages.

The vast majority of the *Jamkesda* schemes were rolled out between 2007 and 2010, following the introduction and expansion of the national social health insurance programs for the poor (i.e. *Askeskin* and subsequently *Jamkesmas*), and with the first directly elected district heads having taken office. By 2011 just over 97 percent of districts in our sample had introduced a *Jamkesda* scheme (Figure 2).

The districts also show a large degree of variation in *Jamkesda* design char-

[3] Achadi et al. (2014) conducted an assessment of the program in 2 locations – Garut and Depok – in 2013 and show that even in the third year of implementation, awareness about the program was low: 30% of the target population, i.e. women of child bearing age, were not aware of the program in the two districts. Furthermore, provider involvement in the two districts was low due to dissatisfaction with the fee structure and reimbursement from central government. There is also evidence of mis-targeting, as the use of *Jampersal* was higher among those women which were already covered by insurance. Finally, the study shows that *Jampersal* only had effects in Garut where institutional delivery coverage was still low (Achadi et al., 2014).

Table 1: Descriptive statistics of individual data and district characteristics

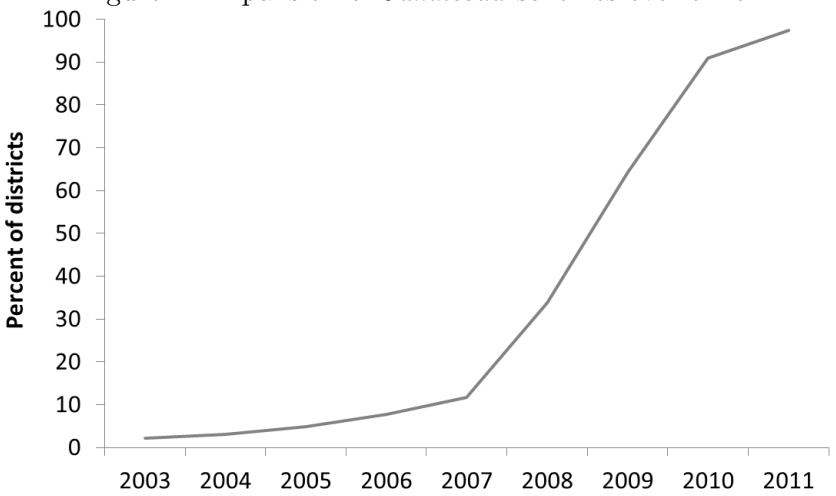
	Mean	SD
Panel A: Individual level data (IDHS; N=10,856)		
Child male (=1)	0.51	
Mother age at birth (years)	27.93	6.24
Mother years of education	8.89	4
Married (=1)	0.97	0.18
Number of children born	2.5	
Rural (=1)	0.58	0.49
Head male (=1)	0.93	
Number of HH members	5.46	2.2
Quartile 1, poorest (=1)	0.21	
Quartile 2	0.25	
Quartile 3	0.26	
Quartile 4, wealthiest (=1)	0.28	
Panel B: District information (Podes, Susenas; N=2000)		
% subsidized SHI	0.14	0.16
% formal sector SHI	0.1	0.07
% private HI	0.05	0.09
% other HI	0.01	0.02
% of electrified HH in district	0.62	0.27
% of villages with water from pump	0.24	0.26
% of villages with water from well	0.47	0.28
% of villages with asphalt road	0.64	0.27
% of villages with male village head	0.96	0.05
% of villages with doctor	0.43	0.34
% of villages with midwife	0.82	0.17
% of villages with traditional birth assistant	0.86	0.2

Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008).

acteristics (Table 2). About 35 percent of the districts have *Jamkesda* schemes that cover prenatal and maternity care services, while 25 percent cover delivery services. Almost all the districts cover services provided at the local health centre (92 percent), and district and province/national hospitals (88 respectively 82 percent). Only a quarter also contracted private hospitals, mainly for referrals. Closing the coverage gap left by national insurance programs and achieving universal coverage is an objective of about a third of the schemes in our sample.

Variation in institutional and operational design are discussed in more detail

Figure 2: Expansion of *Jamkesda* schemes over time



in Budiyati et al. (2013). They report that membership cards as proof of eligibility are used in only 26 percent of the districts, while 29 percent of districts have outsourced management of their *Jamkesda* program to a private insurer. The remainder is managed by the DHO, in most cases through special divisions or technical units. In 20 percent of the districts *Jamkesda* schemes have been endorsed by both the district head and the local parliament, which provides the strongest legal basis for the schemes as these cannot be abolished or amended without approval from the local parliament.

Table 2: Design characteristics of *Jamkesda* schemes

	Percent of districts
Service coverage	
Antenatal care	34.6
Delivery assistance	24.9
Provider characteristics	
Village health centre	91.9
District public hospital	88
Province or national public hospital	81.6
Hospital in other district or province	40.6
Private hospital	25.2
Population coverage	
Universal coverage as objective	32.9

Source: DHO survey 2011/2012. The table shows characteristics for the DHO survey subsample of 234 districts that also appear in the IDHS 2007 and 2012 surveys.

3.2 Outcome variables

Our empirical analysis of maternal and child health care concentrates on four measures: the number of antenatal care visits, the place of delivery (i.e. whether a child was born at home), delivery assistance (i.e. whether the birth was attended by a trained professional, i.e. a village midwife or doctor), and the mode of delivery (i.e. whether the child was born by caesarian section). Before we explore the effect of the *Jamkesda* on these outcomes more systematically, Table 3 provides an overview of the development of these indicators from 2004 to 2010.[4]

The average number of antenatal visits increases, from an average of well below 7 visits, by about 0.5 visits between 2004 and 2010. Births at home declined from 58 percent in 2004 to 39 percent in 2010, while births assisted by a trained professional increase from 29 to 46 percent. With an increasing share of births at a health facility, the number of caesarean sections also increases from 6 percent in 2004 to 14 percent in 2010.

[4]Table A1 in the supplemental appendix shows the evolution of the outcome measures disaggregated by region and wealth status.

Table 3: Evolution of outcome measures over time

	2004	2005	2006	2007	2008	2009	2010
Number of antenatal care visits	6.8	6.68	6.7	6.83	7.45	7.38	7.3
Delivery at home (=1)	0.58	0.55	0.51	0.47	0.45	0.4	0.39
Birth assisted by trained professional (=1)	0.29	0.3	0.32	0.59	0.41	0.43	0.46
Caesarean (=1)	0.06	0.06	0.08	0.09	0.11	0.12	0.14

Source: IDHS (2007, 2012).

The antenatal care outcome measures only the frequency of visits. With an average of more than 4 visits, Indonesia does exceed the minimum standards set out by the World Health Organization (WHO). However, the quality of the antenatal care received is of particular concern. The Ministry of Health of Indonesia recommends that quality antenatal care should include the following components: (i) height and weight measurements, (ii) blood pressure measurement, (iii) iron tablets, (iv) tetanus toxoid immunization, (v) abdominal examination, (vi) testing of blood and urine samples and (vii) information on the signs of pregnancy complications. Table 4 shows descriptive statistics for each of the components. For a number of individual components there is evidence of improvement over time. However, in 2010 for only 14 percent of the children born do mothers report having received the complete set of recommended services.

Table 4: Antenatal services received and evolution over time

	2004	2005	2006	2007	2008	2009	2010
Weight measurement (=1)	0.69	0.81	0.86	0.75	0.71	0.79	0.85
Height measurement (=1)	0.35	0.33	0.36	0.36	0.48	0.5	0.47
Blood pressure measurement (=1)	0.91	0.91	0.92	0.92	0.95	0.95	0.95
Testing of blood and urine samples (=1)	0.4	0.38	0.39	0.4	0.47	0.47	0.44
Iron tablets (=1)	0.8	0.78	0.8	0.79	0.76	0.75	0.74
Tetanus toxoid immunization (=1)	0.79	0.76	0.78	0.75	0.78	0.76	0.76
Information of signs of pregnancy complications (=1)	0.41	0.39	0.4	0.44	0.55	0.54	0.53
Basic recommended services a) (=1)	0.19	0.18	0.21	0.21	0.27	0.28	0.27
Complete set of recommended services received (=1)	0.1	0.08	0.09	0.1	0.13	0.15	0.14

Notes: Data on abdominal examinations is not consistently available in the DHS survey rounds. a) Basic recommended services include measurement of weight, height and blood pressure, and testing of blood and urine samples.
Source: IDHS (2007, 2012).

4 Empirical Approach

In order to assess the effect of the *Jamkesda* schemes on maternal and child health care services we use a linear district fixed effects specification:[5]

$$Y_{ikt} = \alpha + \beta Jamkesda_{kt-1} + D'_{kt-1}\gamma + X'_{ikt}\theta + \delta_t + \mu_k + \varepsilon_{ikt} \qquad (1)$$

where Y_{ikt} represents one of the four outcome variables for child i in district k at year of birth t.

The main variable of interest is $Jamkesda_{kt-1}$, which is a dummy variable indicating whether a district has been operating a local health care financing scheme in the calendar year prior to the year of birth. We choose this lagged specification because the specific month in which *Jamkesda* schemes are introduced varies greatly and for many districts will not overlap with the IDHS recall period in the same year. Moreover, the use of antenatal care and any perceptions or decisions with regard to the mode of delivery and birth assistance are expected to be determined mostly in the months preceding the birth of a child, possibly overlapping with the previous calendar year. The coefficient β can be interpreted as the average impact of the *Jamkesda* program after controlling for the coverage effects of an array of national schemes covered by the vector γ. The district indicators D'_{kt} include the share of the district population covered by each of the following programs: subsidized social health insurance *Askeskin* and *Jamkesmas*, the health card program, public sector health insurance, for-

[5]Linear models could be mis-specified for the binary and censored outcomes. Nevertheless we apply a linear specification in order to control for district fixed effects and to not lose observations for districts with few DHS observations and limited variation in the outcome variables. We did estimate fixed effects Poisson (for antenatal care) and logit models (for home births, assisted deliveries and caesarean sections) as an alternative. These yielded qualitatively similar results. In addition, we apply the trimmed estimator suggested by Horrace and Oaxaca (2006), who argue that the potential bias in linear probability models increases with the proportion of predicted probabilities that falls outside the zero to one interval. They suggest a trimming estimator by dropping those observations outside the interval and re-estimating the linear model for the remaining sample. For the binary outcome variables 82 to 91 percent of predicted probabilities fall within the unit interval, while less than 1 percent of the sample shows predicted antenatal visits smaller than zero. Finally, the Horrace and Oaxaca trimmed estimator yields similar coefficients to the linear regressions for the unrestricted sample. Therefore, we present linear probability models in the paper.

mal private sector social health insurance, private health insurance and other schemes. We further control for other basic district characteristics, such as the share of the population, the level of electrification, the main source of drinking water, road access, and the availability of trained health staff. The vector X'_{ikt} controls for child-, mother- and household characteristics. 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 the *Jamkesda* schemes we probe the heterogeneity in design characteristics S that relate to the population and service coverage dimensions of the Universal Health Coverage (UHC) framework (World Health Organization, 2010):

$$Y_{ikt} = \alpha + \beta Jamkesda_{kt-1} + S'_{kt-1}\lambda + D'_{kt-1}\gamma + X'_{ikt}\theta + \delta_t + \mu_k + \varepsilon_{ikt} \quad (2)$$

The vector S_{kt} includes a dummy variable indicating if the program objective is to cover all the non-insured or not, the maternal health services covered by the benefit packages (antenatal care and delivery assistance) of the district schemes, and the type of providers contracted. Note that by design $S_{kt} = 0$ if $Jamkesda_{kt} = 0$.

Equations (1) and (2) will yield unbiased estimates of *Jamkesda* in the absence of unobserved confounding factors. The district fixed effects eliminate any time invariant factors such as topography, institutions and endowments, while inclusion of individual and district level characteristics should minimize bias due to time variant omitted variables.

The main confounding factor that we do not control for in equations (1) and (2) is potential change in district public policy that coincides with the introduction of the *Jamkesda* schemes. Policy reforms are rarely isolated events and it is not unlikely that local health care financing initiatives are part of a

larger reform agenda of local governments. In the specific case of the *Jamkesda*, indeed, Budiyati et al. (2013) show that the timing of local elections are a strong predictor of the timing of introducing *Jamkesda*.[6] If these elections led to broader reforms then they may influence the outcome variables other than through *Jamkesda*. We test for this source of violation of the parallel trends assumption by including a dummy variable indicating whether a district has a directly elected mayor or regent. The timing of the first direct elections for district heads differs across districts, as they are determined by the time of expiry of the appointed incumbents' term in office after 2005. If our estimates are confounded by the influence of local elections and multiple policy reforms, then the results are expected to be sensitive to including the direct election variable.

To further investigate the presence of non-parallel trends, we estimate placebo regressions where we assess correlation between the outcome variables and next year's adoption of a *Jamkesda* scheme (see Table A2 in the supplemental appendix for detailed results). These regressions are identical to equation (1) except that we include $Jamkesda_{kt+1}$ instead of $Jamkesda_{kt-1}$. Statistical significance of the β coefficients would be evidence of confounding trends.

Moreover, we also test whether the estimated effects are driven by fertility delays in expectation of the introduction of a *Jamkesda* scheme (see Table A3 for detailed results).[7]

Finally, we address the potential sample selection bias due to the non-response in the DHO survey (see Table A4). We estimate a selection probit, for the probability that a child observed in the IDHS sub-sample can be matched to the DHO survey districts. An inverse Mills ratio is constructed from these estimates and included as an additional control variable in the district fixed

[6] In fact, the timing of local elections are a stronger predictor of the timing of *Jamkesda* than are the socioeconomic and demographic composition of the district population, coverage of national health insurance programs, average out-of-pocket health care spending by households and health care utilization patterns in districts (Budiyati et al., 2013).

[7] We do not find any systematic influence of the schemes, neither on desired fertility nor on actual births.

effects regression. The probit includes the same D'_{kt} and X'_{ikt} control variables as in equation (1). To support identification of the selection model, we include the DHO survey enumerator ID for each district as an additional explanatory variable in the selection equation. We argue that the enumerator interview skills may influence the DHO non-response probability, while there is no reason to expect that these skills are related to the outcome variables in the IDHS surveys of 2007 and 2012.[8]

5 Results

Table 5 presents the average effects of the *Jamkesda* scheme based on the econometric specifications described above. Column (1) shows the β coefficients in the base specification without covariates, column (2) shows the coefficients controlling for year fixed effects and individual characteristics, and column (3) is the full specification that also accounts for district characteristics. Columns (4) and (5) present estimates that are sensitive to the timing of local elections and sample selection, respectively.

The results in column (1) show that there is a positive correlation between the presence of a *Jamkesda* scheme and maternal care. That is, the number of antenatal care visits and the probability of receiving professionally trained birth assistance are higher, and the probability of delivering at home is lower in the presence of *Jamkesda*. However, this association seems to be mostly spurious correlation or driven by selection effects. As we add year fixed effects and control variables the correlation becomes weaker, especially when household characteristics are included.

The results in column (3) suggest that on average, the introduction of the *Jamkesda* schemes led to an increase in antenatal care utilization of 0.27 visits,

[8]The enumerators were assigned as primary contact to a specific set of districts, with non-response rates per enumerator varying from 19 to 65 percent. There is no purposive spatial pattern in district allocation to enumerators, as each enumerator covered various regions of Indonesia to share the burden of long distance connection problems and different time zones within the team.

which is about 4 percent of the average number of visits in 2004 and about half of the total increase in antenatal care observed between 2004 and 2010. While the effect on antenatal care is positive, there are no substantial effects of *Jamkesda* on home deliveries, births assisted by a trained professional or birth by caesarean section. The coefficients are small compared to the initial correlation shown in column (1) and imprecise.

The sensitivity analysis, columns (4) and (5), show that the estimates are robust, strengthening the interpretation of the results of the main specification (column (3)) as causal effects. We find no evidence of confounding policy effects through directly elected district heads, as the results reported in column (4) and column (3) are marginally different for all outcomes. Moreover, the placebo regressions show no evidence of other non-parallel trends. The coefficients for $Jamkesda_{kt+1}$ are very small and not statistically significant.[9] The results are also not sensitive to including the sample selection term that corrects for the DHO survey non-response (column (5)). The enumerator ID code appears a strong predictor of sample selection, yet the results in columns (3) and (5) are almost identical.[10] This suggests that sample selection bias does not affect the generalizability of our results. It could be that any bias from non-random survey responses has been absorbed by the district fixed effects.

[9]The placebo regression results are reported in the supplemental appendix (see Table A2).
[10]Detailed estimates are provided in the supplemental appendix (see Table A4).

Table 5: Effect of the *Jamkesda* schemes

	(1)	(2)	(3)	(4)	(5)
Number of antenatal care visits	0.679**	0.222	0.273*	0.268*	0.272*
	(0.114)	(0.140)	(0.132)	(0.132)	(0.132)
Delivery at home (=1)	-0.119**	-0.027	-0.018	-0.017	-0.018
	(0.016)	(0.019)	(0.019)	(0.019)	(0.019)
Birth assisted by trained professional (=1)	0.0382+	-0.001	-0.006	-0.007	-0.006
	(0.020)	(0.024)	(0.024)	(0.025)	(0.024)
Caesarean (=1)	0.0649**	0.02	0.019	0.02	0.019
	(0.011)	(0.013)	(0.013)	(0.013)	(0.013)
Controls					
District fixed effects	Yes	Yes	Yes	Yes	Yes
Year dummies, household characteristics	No	Yes	Yes	Yes	Yes
District characteristics	No	No	Yes	Yes	Yes
Direct elections district regent/mayor	No	No	No	Yes	No
Sample selection term	No	No	No	No	Yes

Notes: Control variables omitted for convenience. Standard errors clustered at district level in parenthesis.
Statistical significance:** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.
Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008), DHO survey 2011/2012.

Previous research has indicated that different regions in Indonesia are exposed to different health problems (UNICEF, 2012). We therefore investigate the heterogeneity of the *Jamkesda* effects with respect to the rural-urban divide and across regions (i.e. Java and Bali compared to other islands) and wealth status. The results presented in Table 6 indicate that the increase in antenatal care visits is mainly driven by increased access on Java and Bali, relatively populous and wealthy islands compared to other regions. The density and variety of health care providers is greatest on Java and Bali, and this may have been important for facilitating the effects of health insurance. For the other outcome variables we observe no region-specific differences.

Effect heterogeneity by wealth status is presented in Table 7. The increase in antenatal care is pronounced among the third quartile of the wealth distribution. This also coincides with the target population of most *Jamkesda* schemes, as this group is not expected to be eligible for the subsidized social health insurance programs, while at the same time likely to be active in the informal sector and lacking access to formal sector health insurance. The estimated effect for the third quartile is sizeable and accounts for the total increase in antenatal care observed for this group between 2004 and 2010. We observe the same pattern for births at home, with the largest decrease for the third quartile. Here the effects are also still considerable, with the decrease in home births accounting for about one third of the decrease observed for this quartile over time (see Table A1 in the supplemental appendix). Births by caesarean, on the other hand, increase only for the wealthiest quartile.

Table 6: Effect of the *Jamkesda* schemes by rural/urban locations

	All	Rural	Urban	Java & Bali	Other islands
Number of antenatal care visits	0.273*	0.187	0.235	0.655*	0.108
	(0.132)	(0.180)	(0.208)	(0.300)	(0.149)
Delivery at home (=1)	-0.018	-0.023	0.017	0.001	-0.019
	(0.019)	(0.027)	(0.025)	(0.037)	(0.022)
Birth assisted by trained professional (=1)	-0.006	-0.026	-0.007	0.03	-0.027
	(0.024)	(0.032)	(0.032)	(0.039)	(0.029)
Caesarean (=1)	0.0192	0.009	0.029	0.042	0.008
	(0.013)	(0.017)	(0.022)	(0.032)	(0.014)

Notes: Specification similar to column (3) of Table 5. Control variables include demographic and household characteristics, district characteristics, and district fixed effects regression. Control variables omitted for convenience. Standard errors clustered at district level in parenthesis.
Statistical significance:** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.
Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008), DHO survey 2011/2012.

Table 7: Effect of the *Jamkesda* schemes by wealth quartile

	All	Quartile 1 (poorest)	Quartile 2	Quartile 3	Quartile 4 (wealthiest)
Number of antenatal care visits	0.273*	0.467	0.0246	0.612*	-0.045
	(0.132)	(0.351)	(0.246)	(0.244)	(0.205)
Delivery at home (=1)	-0.018	0.042	-0.034	-0.082**	0.022
	(0.019)	(0.030)	(0.036)	(0.032)	(0.027)
Birth assisted by trained professional (=1)	-0.006	-0.036	0.005	0.023	0.018
	(0.024)	(0.043)	(0.045)	(0.046)	(0.039)
Caesarean (=1)	0.0192	0.009	-0.024	0.04	0.052+
	(0.013)	(0.016)	(0.026)	(0.028)	(0.030)

Notes: Specification similar to column (3) of Table 5. Control variables include demographic and household characteristics, district characteristics, and district fixed effects regression. Control variables omitted for convenience. Standard errors clustered at district level in parenthesis.
Statistical significance:** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.
Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008), DHO survey 2011/2012.

Turning to the individual components comprising antenatal care visits we see that *Jamkesda* is responsible for an increase in women reporting height measurements and testing of blood and urine samples (Table 8). The *Jamkesda* schemes have led to a statistically significant and large, seven percentage point increase (roughly 24 to 37 percent of average annual service provision) in the provision of basic recommended antenatal services. This represents a large increase over time since during the period from 2004 to 2010 basic recommended services increased by 8 percentage points (see Table 4). The *Jamkesda* is also associated with an increase in the share of pregnant women that receive a complete set of recommended services. The point estimate reflects an 11 to 20 percent increase relative to the annual averages. However, this effect is not sufficiently precise to yield a statistically significant effect.

Consistent with the increase of the number of antenatal visits, the effect on the provision of basic recommended antenatal services is observed mainly for the third quartile, rural areas and Java and Bali (Tables 8 and 9). For the other islands the impact estimate is also statistically significant, but slightly smaller.

Table 8: Effect of the *Jamkesda* schemes on quality of antenatal care by location

	All	Rural	Urban	Java & Bali	Other islands
Weight measurement (=1)	0.019	0.033	0	0.005	0.016
	(0.016)	(0.023)	(0.022)	(0.031)	(0.019)
Height measurement (=1)	0.059*	0.0713*	0.054	0.014	0.063*
	(0.026)	(0.031)	(0.041)	(0.050)	(0.029)
Blood pressure measurement (=1)	-0.009	-0.007	0.003	-0.027	-0.003
	(0.012)	(0.019)	(0.011)	(0.020)	(0.015)
Testing of blood and urine samples (=1)	0.070**	0.0794**	0.064+	0.094*	0.058*
	(0.021)	(0.027)	(0.034)	(0.042)	(0.023)
Iron tablets (=1)	0.015	-0.005	0.026	-0.006	0.018
	(0.019)	(0.030)	(0.024)	(0.033)	(0.024)
Tetanus toxoid immunization (=1)	-0.007	-0.019	0.01	0.031	-0.026
	(0.021)	(0.030)	(0.031)	(0.037)	(0.027)
Information of signs of pregnancy complications (=1)	0.004	0.0608+	-0.048	-0.058	0.028
	(0.024)	(0.031)	(0.038)	(0.042)	(0.028)
Basic recommended services a) (=1)	0.067**	0.090**	0.047	0.087*	0.051*
	(0.021)	(0.028)	(0.034)	(0.042)	(0.023)
Complete set of recommended services received (=1)	0.016	0.037+	0.005	0.007	0.018
	(0.017)	(0.021)	(0.029)	(0.035)	(0.019)

Notes: Specification similar to column (3) of Table 5. Control variables include demographic and household characteristics, district characteristics, and district fixed effects regression. Control variables omitted for convenience. Standard errors clustered at district level in parenthesis. a) Basic recommended services include measurement of weight, height and blood pressure, and testing of blood and urine samples.
Statistical significance:** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.
Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008), DHO survey 2011/2012.

Table 9: Effect of the *Jamkesda* schemes on quality of antenatal care by wealth quartile

	All	Quartile 1 (poorest)	Quartile 2	Quartile 3	Quartile 4 (wealthiest)
Weight measurement (=1)	0.019	0.074	-0.032	0.048	-0.021
	(0.016)	(0.048)	(0.028)	(0.029)	(0.024)
Height measurement (=1)	0.059*	0.141*	0.026	0.03	0.034
	(0.026)	(0.055)	(0.047)	(0.036)	(0.059)
Blood pressure measurement (=1)	-0.009	-0.007	-0.022	0.014	-0.006
	(0.012)	(0.043)	(0.021)	(0.016)	(0.012)
Testing of blood and urine samples (=1)	0.070**	0.032	0.087+	0.059	0.065
	(0.021)	(0.048)	(0.047)	(0.041)	(0.046)
Iron tablets (=1)	0.015	-0.011	0.036	0.007	0.054*
	(0.019)	(0.053)	(0.044)	(0.033)	(0.027)
Tetanus toxoid immunization (=1)	-0.007	0.055	-0.054	0.024	-0.031
	(0.021)	(0.051)	(0.037)	(0.036)	(0.034)
Information of signs of pregnancy complications (=1)	0.004	0.032	0.088+	-0.053	-0.029
	(0.024)	(0.052)	(0.047)	(0.042)	(0.048)
Basic recommended services a) (=1)	0.066**	0.025	0.03	0.100**	0.055
	(0.021)	(0.043)	(0.043)	(0.037)	(0.045)
Complete set of recommended services received (=1)	0.016	-0.007	0.007	0.032	0.004
	(0.017)	(0.031)	(0.031)	(0.032)	(0.038)

Notes: Specification similar to column (3) of Table 5. Control variables include demographic and household characteristics, district characteristics, and district fixed effects regression. Control variables omitted for convenience. Standard errors clustered at district level in parenthesis. a) Basic recommended services include measurement of weight, height and blood pressure, and testing of blood and urine samples.
Statistical significance:** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.
Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008), DHO survey 2011/2012.

The influence of the *Jamkesda* schemes' design characteristics on maternal care outcomes are presented in Table 10. The benefits packages seem to affect the utilization of maternal care. Including prenatal and maternity care in the benefit package has a positive and statistically significant effect on the number of antenatal care visits and reduces caesarean sections.[11] Schemes that cover costs of delivery assistance are associated with a reduction in births at home and an increasing likelihood of births being attended by a skilled professional and birth by caesarean section, but these estimates are not precise. Including the benefits packages in the specification renders the *Jamkesda* coefficient statistically insignificant. This implies that the *Jamkesda* effect emanates entirely from the district schemes that have given greater priority to antenatal and delivery services. While perhaps an obvious point, it also suggests that such services need to be included in benefit packages if such schemes purport to influence maternal health outcomes.[12]

Variation in health care provider contracting shows mixed results. Including coverage at village health centres seems to favour antenatal care, which is a service that is typically offered in these centres or offered by providers that are directly related to the community centres, such a village midwives. However, while the coefficient is large, so are the standard errors, and the estimates are statistically insignificant. Village health centres are less inclined to deliver by caesarean section, for which we see a statistically significant decrease. Contracting district hospitals is also associated with higher antenatal care, as well as a reduction in births at home. However, once again the effect on antenatal care is not precise. For contracts with provincial and national hospital we see a different result, as this reduces the *Jamkesda* impacts on both antenatal care visits and professional assistance at birth. Referrals to higher level hospitals

[11] It also has a positive effect on the probability of receiving the basic recommended antenatal care services.

[12] Including the benefits packages in the specification on the specific ANC services, i.e. weight and high measurement, blood and urine samples etc. also renders the *Jamkesda* coefficient insignificant and shows that the effects are entirely driven by schemes which cover maternal care services. The results are not shown but available from the authors upon request.

are not (or rarely) expected to involve antenatal care or deliveries. In addition, maternal care providers such as villages midwives or maternity centres are part of local health systems and networks in which village health centres and district hospitals have a key coordinating role. Contracting higher level providers such as province and national hospitals is likely to shift resources away from these networks and weaken the link of *Jamkesda* schemes with maternal care providers, and perhaps reduces it's impact on maternal care. Finally, we see no effect of contracting private providers.

Perhaps surprisingly, schemes that aim to completely fill the coverage gap are less effective in increasing antenatal care. A possible explanation could be that universal coverage will spread resources thin, which may outweigh the effect of expanding insurance coverage.

6 Conclusion

We investigated the effect of local, district level health care financing schemes – collectively known as *Jamkesda* – on access and utilization of maternal care in Indonesia. The district pseudo-panel and district fixed effects identification strategy used in this paper yields causal evidence and contributes to the thus far mainly cross-section based empirical literature which has investigated the effect of health care financing policies on maternal health care. Furthermore, decentralized public health policy in Indonesia, and the subsequent variation in health financing across districts, allowed us to investigate differences in the design of these different schemes within a single country context.

Overall, we found limited effects of the *Jamkesda* on maternal care. Limited in the sense that these schemes only affect antenatal care services but not in-facility births or assisted births. Despite the already high level of antenatal care visits, the local health care financing schemes contributed to an increase in antenatal care utilization by 0.27 visits, which is about half of the total increase

Table 10: Effect of *Jamkesda* design characteristics

	Number of ANC visits	Delivery at home	Birth assisted by trained professional	Caesarean
Jamkesda	0.064	0.003	0.018	0.137*
	(0.592)	(0.064)	(0.093)	(0.064)
Service coverage				
Antenatal care (=1)	0.762**	0.052	-0.029	-0.035+
	(0.292)	(0.040)	(0.041)	(0.020)
Delivery assistance (=1)	-0.225	-0.079	0.061	0.031
	(0.316)	(0.050)	(0.056)	(0.025)
Provider characteristics				
Village health centre (=1)	0.36	0.022	0.007	-0.099+
	(0.437)	(0.052)	(0.057)	(0.059)
District public hospital (=1)	0.485	-0.114*	0.079	0.027
	(0.346)	(0.048)	(0.074)	(0.035)
Province/national public hospital (=1)	-0.739*	0.06	-0.104*	-0.039
	(0.316)	(0.046)	(0.046)	(0.031)
Hospital in other district/province (=1)	0.107	0.019	0.003	-0.004
	(0.198)	(0.031)	(0.042)	(0.024)
Private hospital (=1)	-0.091	0.011	-0.031	-0.029
	(0.210)	(0.031)	(0.042)	(0.026)
Further characteristics				
Universal coverage (=1)	-0.608*	-0.017	-0.015	0.008
	(0.235)	(0.031)	(0.044)	(0.020)
Controls				
District fixed effects	Yes	Yes	Yes	Yes
Year dummies, household characteristics	Yes	Yes	Yes	Yes
District characteristics	Yes	Yes	Yes	Yes
Number of observations	9,135	10,761	7,490	10,776
Adjusted R-squared	0.142	0.16	0.128	0.053

Notes: Control variables omitted for convenience. Standard errors clustered at district level in parenthesis.
Statistical significance:** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.
Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008), DHO survey 2011/2012.

observed between 2004 and 2010. Furthermore, we also found evidence that the *Jamkesda* contributed to improvements in the depth of antenatal care. The *Jamkesda* led to a 7 percentage point increase in the use of basic recommended antenatal care services. This effect is sizeable because quality of antenatal care services is still low and in 2010 only 27 percent of the women reported that they had received the full minimum service package comprising of measurement of weight, height, blood pressure and the testing of urine and blood samples.

Further investigation into these findings showed that the results are subject to considerable heterogeneity. The overall effect of increased access to ANC is mainly driven by increased access on Java and Bali, which are relatively populous and wealthy islands. The density and variety of health care providers is greatest on Java and Bali, which may be an important factor in facilitating the effect. Disaggregating the results by wealth we saw that the increase in antenatal care was the highest for households in the third quartile of the wealth distribution. For this group we also saw a decline in home births due to the *Jamkesda*. The positive effect of the *Jamkesda* on households in the third quartile suggests that the local health care financing schemes helped close the coverage gap as this group was unlikely to be covered by the subsidized social health insurance for the poor, while at the same time also unlikely to benefit from formal sector health insurance.

Looking into the different features of the district schemes, we saw that the overall effect of the *Jamkesda* was mainly driven by schemes that explicitly cover antenatal care. This suggests that health insurance schemes might not have an effect on maternal care unless such services are covered in the benefit package. We also saw that schemes that aimed for full coverage were less effective in improving maternal care, probably because of limited local resources to cover the full breadth of services to a larger target population.

Our findings highlight potential risks for the JKN – the new national health insurance scheme in Indonesia. First, if the JKN aims to improve maternal care these services need to be explicitly covered, particularly in light of the discontinuation of the *Jampersal* – the universal delivery program – since the introduction of the new policy. Second, previous studies on the *Jampersal* have stressed that beneficiaries need to be aware of the services on offer and their entitlements. Local governments in this context might be able to play a role in increasing local awareness. Likewise, the local health care financing schemes could be used to motivate particularly those engaged in the informal

sector to voluntarily enrol in the national scheme. Within the current context in Indonesia, it still remains to be seen how these schemes will be used and integrated under the new national health insurance introduced in 2014.

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Supplemental Appendix

Table A1
Evolution of outcome measures (2004-2010) by region and wealth

	Number of antenatal care visits		Delivery at home (=1)		Birth assisted by trained professional (=1)		Caesarean (=1)	
	2004	2010	2004	2010	2004	2010	2004	2010
Java & Bali	8.00	8.45	0.35	0.18	0.41	0.58	0.09	0.17
Other Islands	6.08	6.83	0.71	0.48	0.24	0.41	0.04	0.12
Quartile 1 (poorest)	4.75	5.50	0.91	0.77	0.14	0.10	0.01	0.04
Quartile 2	6.35	7.17	0.73	0.45	0.22	0.38	0.03	0.09
Quartile 3	7.02	7.57	0.53	0.29	0.32	0.55	0.06	0.14
Quartile 4 (wealthiest)	8.56	8.67	0.23	0.12	0.56	0.78	0.11	0.26

Source: IDHS (2007, 2012).

Table A2
Placebo regressions: Effect of next year's *Jamkesda* schemes

	Impact regressions	Placebo regressions
Number of antenatal care visits	0.273*	-0.034
	(0.132)	(0.124)
Delivery at home (=1)	-0.018	-0.002
	(0.019)	(0.014)
Birth assisted by trained professional (=1)	-0.006	-0.004
	(0.024)	(0.020)
Caesarean (=1)	0.019	-0.010
	(0.013)	(0.011)

Notes: Specification similar to column (3) of Table 3. Control variables include demographic and household characteristics, district characteristics, and district fixed effects regression. Control variables omitted for convenience. Standard errors clustered at district level in parenthesis.
Statistical significance: ** p<0.01, * p<0.05, + p<0.10.
Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008), DHO survey 2011/2012.

Table A3
Effect of the *Jamkesda* schemes on actual births and the desired number of children

	Birth	Desired number of children
Jamkesda (=1)	0.005	-0.0491
	(0.013)	(0.049)
N	60,607	49,891
R^2	0.279	0.093

Notes: Specification similar to column (3) of Table 3. Control variables include demographic and household characteristics, district characteristics, and district fixed effects regression. Control variables omitted for convenience. Standard errors clustered at district level in parenthesis.
Statistical significance: ** p<0.01, * p<0.05, + p<0.10.
Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008), DHO survey 2011/2012.

Table A4
Sample selection probit estimates: Probability that a child lives in a district that was included in the DHO survey

	(1)	(2)
Enumerator ID code	0.055**	0.055**
	(0.003)	(0.003)
Pregnancy complications	-0.058	-0.048
	(0.035)	(0.035)
Birth complications		-0.052**
		(0.018)
Child male (=1)	-0.018	-0.017
	(0.018)	(0.018)
Mother characteristics		
Age at birth	0.007**	0.008**
	(0.002)	(0.002)
Years of education	-0.008**	-0.008**
	(0.003)	(0.003)
Married (=1)	-0.026	-0.026
	(0.051)	(0.051)
Number of children born	-0.031**	-0.032**
	(0.008)	(0.008)
Household characteristics		
Rural (=1)	0.126**	0.125**
	(0.024)	(0.024)
Head male (=1)	-0.025	-0.025
	(0.036)	(0.036)
Number of HH members	-0.016**	-0.016**
	(0.004)	(0.004)
Quartile 1 (poorest)	0.036	0.038
	(0.027)	(0.027)
Quartile 2	0.070*	0.072*
	(0.029)	(0.029)
Quartile 3	0.194**	0.194**
	(0.034)	(0.034)
Quartile 4 (wealthiest)	(ref)	(ref)
District characteristics		
Percent of population subsidized social health insurance	-0.286**	-0.283**
	(0.089)	(0.089)
Percent of population formal sector social health insurance	0.831**	0.835**
	(0.179)	(0.179)
Percent of population private health insurance	0.602**	0.597**
	(0.145)	(0.145)
Percent of population other health insurance	0.472	0.493
	(0.383)	(0.383)
District population as share of national population	35.92**	36.23**
	(3.61)	(3.61)
Percent of households with electricity connection	0.321**	0.328**
	(0.076)	(0.076)
Percent of villages with water from pump	-1.341**	-1.342**
	(0.061)	(0.061)
Percent of villages with water from well	-0.058	-0.059
	(0.043)	(0.043)
Percent of villages with asphalt road	0.692**	0.693**
	(0.051)	(0.051)
Percent of villages with male village head	0.478**	0.479**
	(0.186)	(0.186)

Table continues next page.

Table A4 (cont.)

	(1)	(2)
Percent of villages with doctor	-0.190**	-0.190**
	(0.052)	(0.052)
Percent of villages with midwife	-0.029	-0.029
	(0.076)	(0.076)
Percent of villages with traditional birth assistant	0.083	0.084
	(0.058)	(0.058)
Year dummy variables		
2004	0.054	0.061
	(0.067)	(0.067)
2005	0.059	0.0668
	(0.068)	(0.068)
2006	0.070	0.076
	(0.067)	(0.067)
2007	0.010	0.014
	(0.047)	(0.047)
2008	-0.010	-0.009
	(0.048)	(0.048)
2009	-0.060+	-0.060+
	(0.036)	(0.036)
2010	(ref)	(ref)
Constant	-1.176**	-1.165**
	(0.230)	(0.230)
Number of observations	21,328	21,328
Pseudo R-squared	0.052	0.052

Notes: Standard errors clustered at district level in parenthesis.
Statistical significance: ** p<0.01, * p<0.05, + p<0.10.
Source: IDHS (2007, 2012), Susenas (2003-2009), Podes (2003, 2006, 2008), DHO survey 2011/2012.