Social health insurance improves women's healthcare use: Evidence from Indonesia

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Abstract

To improve the poor's access to healthcare services, the Indonesian government introduced *Askeskin*, a subsidized social health insurance for the poor. We examine the effects of this social health insurance on women's use of healthcare—maternal, preventive, and curative healthcare—services. Using propensity- score- and difference-in-differences matching strategies, we find the insurance increases the use of public facilities for maternal healthcare, discourages the use of midwives' services, and increases the use of contraception; it does not seem to increase the use of preventive and curative care, however.

Keywords: Social health Insurance; maternal healthcare; women's preventive and curative healthcare; Indonesia; South East Asia

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Introduction

Poor health may keep the poor trapped in poverty. More than one billion of the world's poor cannot afford healthcare services; each year, catastrophic health payments (direct outlays of cash) force 100 million people into poverty (WHO, 2010). In Kenya and South Africa, for example, out-of-pocket health payments drive 100 and 290 thousand households, respectively, below the poverty line each year (ILO, 2008a). In Indonesia, the country we study in this paper, out-of pocket-payments of one in two people in the poorest quintile are catastrophic (Sparrow et al., 2012).

Poor health may lead to poverty because poor households cannot smooth their consumption when they face adverse income shocks (Baland and Robinson, 2000; Jacoby and Skoufias, 1997; Jensen 2000). To pay for healthcare services, the poor may have to sell their household assets, or pull their children out of school and send them to work; the poor may also have to stop working to support ailing household members. Moreover, healthcare services are expensive, which prevents many of the poor from using them and, in turn, prolongs their ill-health. In Indonesia, for example, because many people cannot afford healthcare services, out-of-pocket health payments are less than two percent of total household spending on average (Sparrow et al., 2012).

These expensive healthcare services hit women in developing countries hard. For example, women have higher risks of malnutrition, exposure to chronic diseases, and mortality rates during health emergencies because they

lack, among others, education and access to resources such as land and savings (United Nations, 2009), which are worsened by gender attitudes that relegate women to second-class status. (In most patriarchal societies, men control household resources and expenditure.) Women in developing countries may not have a say on their own health matters: In Burkina Faso and Nepal, for example, 75 and 51 percent women, respectively, say that their husbands alone decide their health needs (United Nations, 2009).

Women's reproductive health, in particular, is vulnerable to high healthcare costs. Medicines, contraceptives, transportation costs, and user fees for advanced procedures can so expensive so that it may push some women and their households into poverty (UN, 2009). Moreover, men (who make most of household decisions) may be reluctant to use household resources on women's healthcare needs, which causes women to underuse healthcare services. In Indonesia, for example, 53 percent of women give birth at home and only one in ten give birth at public hospitals or health centers (IDHS, 2007), which leads to high mortality rates (because these women receive inadequate treatment and care). Indonesia's maternal mortality ratio in 2010 was 210 deaths per 100,000 live births—higher than the figures in its Southeast Asian neighboring countries (World Bank, 2015).

To improve the poor's access to healthcare services, the government of Indonesia introduced *Askeskin*, a subsidized social health insurance for Indonesia's informal sector in 2005 (ILO, 2008b), which covered about 76.4 million people in 2007. *Askeskin* covered outpatient care at public hospitals

and health centers, which include women's healthcare services such as obstetric services, immunizations, and contraceptive treatments; it also had mobile health services and special services for remote areas.

In this paper, we examine the effects of *Askeskin* on how women use maternal, preventive, and curative healthcare services. We use propensity score matching and generalized difference-in-differences matching strategies to control for unobserved time-invariant determinants of healthcare use. We find that *Askeskin* induces women to have birth deliveries and antenatal checkups at public facilities, discourages them from getting help from midwives, and makes them more likely to use contraceptives. We also find some evidence that *Askeskin* increases, not decreases, delivery care expenditure, particularly the expenditure of women in rural areas. We do not find evidence that *Askeskin* increases women's preventive and curative healthcare use, however.

We contribute to the literature in three ways. One, we provide some evidence of the effects of a social health insurance on maternal and women's preventive and curative care use, which complements papers in the literature that examine the effects of social health insurance on general healthcare use.[1]

[1] Some of the papers that examine the effects of social health insurance are in the US, China, Vietnam, Colombia, West Africa, and Thailand (Baicker et al. (2013); Wagstaff et al., (2009); Wagstaff (2010); Miller et al., (2013); Smith and Sulzbach (2008); and Liabsuetrakul and Oumudee (2011). We are not aware of papers that examine the effects *Askeskin* on maternal and women's preventive and curative

Two, we analyze Indonesia, a middle-income country, whose social and cultural environments differ from those of other developing countries and the effects of social health insurance on women's healthcare use may, therefore, also differ. Three, unlike some papers in the literature, we control for supply side characteristics of maternal healthcare services in our estimations, which we hope makes our estimates of the effects of the social health insurance more likely to be unbiased.

The paper proceeds as follows. The next section describes the social health insurance and healthcare service providers in Indonesia. Then we describe the empirical strategy and data, and discuss the results and extensions. The last section concludes.

Social health insurance in Indonesia

Few Indonesians had social health insurance in the early 2000s—only one in ten before 2005 (ILO, 2008b). At the time, Indonesia had two health insurance schemes for the formal sector—*Askes* (health insurance for civil servants) and *Jamsostek* (health insurance for private sector employees)—but, health insurance for the informal sector was limited (ILO, 2008b).

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healthcare use. Sparrow et al. (2012) examines the effects of *Askeskin*, but on general healthcare use only.

Kartu Sehat

The 1997 financial crisis shrank Indonesia's economy by fifteen percent in 1998 and increased poverty rates by eight percent (Somanathan, 2008). It also reduced household's utilization of healthcare services and healthcare expenditure: Outpatient utilization rates dropped from 0.193 visits per month in 1997 to 0.142 in 1998. Lacks of funds and drugs also lowered the quality of public healthcare, disrupted services, and lowered utilization rates (Frankenberg et al., 1999; Sparrow et al., 2008).

To improve social protection for the poor, as part of social safety net programs, the Indonesian government introduced *Kartu Sehat* in 1998, financed by the government and the Asian Development Bank (Pradhan et al., 2007).[2] The most vulnerable households in each community were identified based on a set of poverty indicators developed by the national family planning board (BKKBN). Each eligible household was then issued a health card by village- and municipality-level committees. The card entitled the owner and his or her family members to a full fee waiver at public healthcare providers (private sector providers were not included in the program). Health facilities that offered free healthcare services received funds from the government to compensate their expenses (Pradhan et al., 2007; Somanathan, 2008; Johar, 2009).

[2] *Kartu Sehat* literally means Health Card. It existed before the 1997 crisis, but its coverage and use were negligible.

The program had several problems. One, the allocated budget for compensation depended on the number of health cards that were distributed by regional governments, not the actual use of the health card, which caused an arbitrary relationship between *Kartu Sehat* use and service providers' compensation (Pradhan et al., 2007). Two, the program was decentralized in which district administrators, village officials, and public health providers distributed the health cards. Targeting, therefore, relied on local knowledge where community members and local health officials defined eligibility criteria according to their own judgment, which caused an uneven distribution of funds across communities (Pradhan et al., 2007; Sparrow, 2008). Three, the criteria used by BKKBN to measure household income might not appropriately capture the effects of the economic crisis on the poor (Sparrow, 2008).

Askeskin

The government discontinued *Kartu Sehat* in 2004 and replaced it with *Askeskin* in 2005, a social health insurance scheme for workers in the informal sector who had no access to formal insurance. [3] The government targeted 36.1 million people in the first phase of its implementation from January to May 2005; in the second phase from June to December 2005, the government increased the target to 60 million. By mid-2007, the program covered about

[3] *Askeskin* stands for *Asuransi Kesehatan untuk Masyarakat Miskin*, which means Health Insurance for the Poor.

76.4 million people. *Askeskin* covered free outpatient primary care in local health centers and sub-centers and free treatment at third class public hospitals. It included women's healthcare services such as an obstetric package, immunization program, mobile health services, special services for remote areas, and medicines. Only a third of the private healthcare providers accepted *Askeskin* insurance, however (ILO, 2008b; Sparrow et al., 2012). The government fully subsidized *Askeskin* premiums: Monthly premiums per member were set at Rp 5000 (about US$ 0.55 in 2005 dollars) and the allocated annual budget for 2005 was about Rp 3.9 trillion (about US$ 40 million). *Askeskin* was managed by Askes, a state-owned health insurance provider. Askes distributed health cards to *Askeskin* recipients and the government paid the premiums on behalf of insurance recipients. Askes then reimbursed hospitals and health centers for services they provided to card holders. Therefore, unlike *Kartu Sehat*, *Askeskin* was directly linked to utilization.

Askeskin also had several problems. One, although *Askeskin* offered individual coverage, the targeting was done at household level (if a household was selected as a recipient, each member of the household received a card). Two, travel distance and costs in Indonesia remain barriers to healthcare utilization, which caused some members of recipient households to refuse it (Arifanto et al., 2005).[4] Three, many people believed that *Askeskin* covered

[4] Recipients also had to pay the costs of printing their photographs on the health cards, which discouraged some people from accepting *Askeskin*.

low quality healthcare services; some did not even believe they would receive healthcare services for free (ILO, 2008b). Four, *Askeskin* had uneven distribution across regions in Indonesia like that of *Kartu Sehat* (ILO, 2008b). Five, delays in *Askeskin* coverage complicated its implementation because the government initially allowed *Askeskin* recipients to use the previously introduced *Kartu Sehat* to claim *Askeskin* benefits (Arifianto et al, 2005; Ministry of Health, 2005).[5]

Empirical strategy and data

Empirical strategy

We use matching strategies to examine the effects of *Askeskin* on women's healthcare use. We want to compare the use of healthcare services of *Askeskin* recipients and their use had they not been recipients, but because the allocation of *Askeskin* was not random, a comparison of women with and without *Askeskin* would provide biased estimates. Therefore, we match *Askeskin* recipients with non-recipients using the government's eligibility criteria for *Askeskin* recipients. Then, we compare recipients' with non-recipients' utilization rates to get an unbiased estimate of the effects of *Askeskin*.

[5] The government also initially allowed the use of *surat miskin*, a letter written by a village head that states that somebody is poor, to claim *Askeskin* benefits.

We do the matching as follows.[6] Using a probit model, we estimate each individual's propensity score, the probability of being an *Askeskin* recipient as a function of his or her observed characteristics $\boldsymbol{X}$, i.e., $P(\boldsymbol{X}) = \Pr(D = 1|\boldsymbol{X})$ where D equals one if an individual is an *Askeskin* recipient and zero otherwise. (The observed characteristics include the criteria used by the government to select *Askeskin* recipients.) To ensure high quality matches, we use observations in the common support only (Heckman, Ichimura, and Todd, 1977)—we drop *Askeskin* recipients whose propensity scores are higher than the maximum or less than the minimum of the propensity scores of non-recipients. Then, we match each *Askeskin* recipient with non-recipients whose observed characteristics are similar using the propensity scores (Rosenbaum and Rubin, 1983).[7] To make sure that the matched samples are comparable, we use a specification in which observed characteristics between the recipients and non-recipients are balanced. Finally, we compare utilization rates of *Askeskin* recipients and non-recipients to get the estimates of the effects of *Askeskin* on women's healthcare use, $\hat{\alpha}$, as follows:

$$\hat{\alpha} = \frac{1}{N_T}\left[\sum_{i\in T} Y_i^T - \sum_{j\in C} \omega(i,j) Y_j^C\right] \quad (1)$$

where set T includes *Askeskin* recipients, set C includes non-recipients, N_T is the number of *Askeskin* recipients, Y_i^T and Y_j^C are recipients' and non-recipients' outcomes, respectively, and $\omega(i,j)$ is the weight we use to

[6] We use PSMATCH2 in Stata to do the matching.

[7] Rosenbaum and Rubin (1983) show that, under some assumptions, matching on *P(X)* is as good as matching on *X*.

calculate the average of non-recipients' outcomes, which is a function of the propensity scores.[8]

Because unobserved latent health status and individual health-preferences may also affect whether an individual an *Askeskin* recipient and her healthcare use, which may make the estimates in equation (1) biased, we also use difference-in-differences (DD) matching estimators as follows:

$$\widehat{\alpha^{DD}} = \frac{1}{N_T}\left[\sum_{i\in T}(Y_{i2}^{T} - Y_{i1}^{T}) - \sum_{j\in C}\omega(i,j)\left(Y_{j2}^{C} - Y_{j1}^{C}\right)\right] \quad (2)$$

where Y_{it}^{T} and Y_{it}^{C} are outcomes for *Askeskin* recipients and non-recipients, respectively, at time $t = \{1,2\}$. Using this empirical strategy, therefore, we control for observed- and unobserved time-invariant determinants of healthcare use.

Data

We use the Indonesia Family Life Survey (IFLS), a longitudinal survey of a representative sample of the Indonesian population done by the RAND Corporation.[9] To ensure that we use only past characteristics as covariates, we get pre-treatment characteristics from, IFLS-3, the third wave of the survey, which was done in 2000 (i.e., before *Askeskin* was introduced). We get outcome variables from, IFLS-4, the fourth wave of the survey, which was done in 2007 (i.e., after *Askeskin* was introduced).

[8] We use kernel matching, Epanechnikov kernel with a 0.06 bandwidth.

[9] See Strauss et al. (2009) for a description of the survey.

To estimate the effects of *Askeskin* on maternal healthcare use, we include a sample of ever-married women between the ages of 15 and 45; for preventive and curative care, we include all adult women older than 15. For the maternal healthcare use, the sample sizes range from 1,200 to 5,000, which depend on the measure of outcomes we use. The sample sizes for preventive care are about 6,000; for curative care, they are about 3,500.

We define *Askeskin*, the treatment variable, as an indicator equals one if a woman was an *Askeskin* recipient in the year 2005 and zero otherwise. Because the eligibility criteria used by the government in later years might differ, to get good matches, we exclude women who received *Askeskin* for the first time in 2006 or later.

We use four measures of maternal healthcare utilization: place for delivery, place for antenatal check-up, contraceptive use, and delivery care expenses. For place for delivery and antenatal checkup, we use two measures: *public facility*, an indicator equals one if a woman used a public hospital or community health centre/sub health centers and zero otherwise, and *village midwife*, an indicator equals one if a woman got help from village midwife and zero otherwise.[10] *Contraceptive use* is an indicator equals one if a woman was using any form of contraception to prevent a pregnancy at the time of interview. *Delivery care expenses* is the logarithm of the rupiah value spent on healthcare during child delivery.

[10] Health centers include community health clinics (puskesmas), sub-community health clinic (posyandu), delivery hospital, and village delivery post (polindes).

We include three and five measures of preventive and curative care, respectively. Preventive care measures include whether a woman received a checkup for blood pressure, cholesterol, or blood sugar. Curative care measures include whether a woman who was previously diagnosed with hypertension, arthritis, diabetes, asthma, or cancer is currently taking medication to manage the condition. All are dummy variables.

For specifications in which we use place for delivery, place for antenatal check-up, and delivery expenditure as measures of outcome, we limit the sample to women who experienced a pregnancy during the years 2006-2007/08. Similarly, in specifications in which we use preventive care use as measures of outcomes, we limit the sample to women who received a medical check-up during the years 2006-2007/08.

Covariates we use to match *Askeskin* recipients with non-recipients are the eligibility criteria that the village- or community-level committees used to identify *Askeskin* recipients (ILO, 2008b). They are socio-demographic characteristics of the head of the household (sex, employment status, education, and religion of household head); household composition (total number of household members, number of children than are less than five years old, and number of children more than five years old); housing characteristics (whether the house is self owned, whether a household has electricity, whether a household has piped water for drinking, availability of toilet facilities, materials house floor is made of); and asset ownership that

indicate a household's socio economic status (ownership of a refrigerator, electric or gas stove, and television).

We also include other household characteristics to make sure that the treated- and control group are comparable. We include three indicators on whether the households ever utilized a *village poverty letter*, whether they previously owned a health card, and whether they ever received assistance in the form of food or other goods by governments or non-government organizations.[11] We also include variables that measure the households' familiarity with health care facilities. (This knowledge is important because it captures unobserved effects of social networks on health care demand. According to Weerdt and Dercon (2006), social networks help households and individuals locate health care providers by sharing referrals.) IFLS-3 has questions on whether household heads have any knowledge of where the nearest public and private hospitals and healthcare centers are located. Inclusion of these variables will reduce omitted variable problems associated with social networks, a factor that is hard to quantify (Johar, 2009). In specifications that measure maternal healthcare utilization, we also include community-level supply side variables that measure the availability and quality of maternal healthcare services: whether a community has a midwife, delivery posts, or monthly weighing posts; the number of family planning

[11] The former variable indicates a household's poverty status and increases a household's probability to receive *Askeskin*.

posts in a community; and the number of beds in the community delivery post. We also include a set of provincial dummies to control province-specific observed- and unobserved characteristics that may affect *Askeskin* eligibility.

Table 1, which presents the summary statistics, shows Askeskin recipients are more likely to use public facilities and less likely to use midwives for both birth delivery and antenatal check-up; are more likely to use contraceptives; have lower delivery care costs; and are less likely to use services for preventive care. On curative care use, *Askeskin* recipients and non-recipients do not seem to differ much, however.

<Insert Table 1 here>

The characteristics of *Askeskin* recipients and non-recipients seem to differ, which is unsurprising because *Askeskin* was targeted to the poor. About 58 percent of women in the treated group were headed by females compared to 53 percent in the control group; the mean number of years of education of household heads is about two years less in the treatment group; and the household head in the treated group is more likely to be Muslim. The employment statuses of the household head do not seem to differ, however.

The composition of households in the control and treated groups does not seem to differ. The average number of household members, number of children less than five years of age, and number of children older than five years of age is about six, one, and one, respectively for both groups.

Askeskin recipients are more likely to live in rural areas and are less likely to live in high quality housing. They are about 7, 20, 34, and 18 percentage points less likely to have electricity, piped water for drinking, own toilet facilities and tiled flooring, respectively. Similarly, they are about sixteen percentage points more likely to live in homes with dirt floors, indicating sub-standard housing.

The *Askeskin* recipients are poor as their socio-economic status and knowledge of health planning facilities show. They own fewer household appliances: They are about 19, 9 and 21 percentage points less likely to own a refrigerator, electric or gas stove, and television, respectively. *Askeskin* recipients are also more likely to have received a letter for poor and government assistance, and previously owned a health card. They are more likely to be in households whose heads do now know much about family planning services.

Results

Basic results

Panel A of Table 2, which presents the estimates of the effects of *Askeskin* on the place for birth deliveries, shows *Askeskin* encourages women to use public health facilities and discourages them from seeking help from midwives. *Askeskin* increases the use of public facilities by seventeen percentage points, which equals an 85 percent increase given that the baseline rate is twenty

percent (the matching estimate in column 1); after we control for time-invariant unobservable characteristics using kernel DID (column 2), the estimate is similar: twenty percentage points or about 98 percent. *Askeskin* also reduces the use of midwives, by twenty percentage points or 65 percent as the matching estimate in column 1 indicates, which is similar to the estimate using DID matching in column 2: fifteen percentage points or 48 percent. These estimates are economically large; they are also statistically significant.

Panel B, which presents the results for antenatal check-up, are similar: *Askeskin* makes women more likely to use public facilities and less likely to use midwives' services. The matching estimate for public health facility in columns 1 is about 25 percentage points (89 percent); the kernel DID estimate in column 2 is also large, sixteen percentage points (57 percent). As women become more likely to use public facilities for antenatal check-up, they move away from midwives' services: The effects are negative and economically large, 8-14 percentage points, though the matching estimate (column 1) is significant only at ten percent level while the kernel DID estimate (column 2) is statistically insignificant.

Panel C shows *Askeskin* improves women's contraceptive use. The estimates in columns 1-2 are similar, about seven percentage points or twelve percent. They are statistically significant at the five percent level.

Panel D shows *Askeskin* increases, not decreases, healthcare expenses by 48 percent, at least when we use the kernel DID matching estimate, though the estimate is statistically significant only at the ten percent level. *Askeskin*

reduces delivery care expenditure by 48 percent, however, when we use the matching estimate in column 1.

<Insert Table 2 here>

Table 3, which presents the matching estimates of the effects of *Askeskin* on preventive and curative care, does not show *Askeskin* matters. All estimates are economically small, most are less than one percentage point; they are also statistically insignificant (with standard errors larger than the estimates) except the effects of *Askeskin* on whether the women checked their blood sugar. We should cautiously interpret these estimates, however, because we do not control for time-invariant unobservable factors (IFLS-3 has no information on preventive- and curative care use).

<Insert Table 3 here>

The effect of *Askeskin* by sub-sample

We now discuss the results by sub-sample: by the location of the women (urban vs. rural areas) and their age group (15-45 years old and older than 45).

Table 4 shows that the signs of the estimates in the basic results are robust by urban or rural area, but we find the estimates of the effects of *Askeskin* are statistically significant for the birth delivery and antenatal check-ups in urban areas and they are significant for contraceptive use and expenditure in rural areas. *Askeskin* increases the use of public health facilities in urban areas by about 30 percentage points (column 4); it does it in rural

areas, but the estimates are statistically insignificant (column 2). *Askeskin* reduces the use of midwife's services, though the estimates are statistically insignificant (the estimate of the effect of *Askeskin* on the use of midwife's services for antenatal check-ups is marginally significant). *Askeskin* increases contraceptive use in rural areas by nine percentage points; it does so in urban areas but the estimates are statistically insignificant. *Askeskin* increases health expenses in rural areas by 80 percent; it lowers them in urban areas though the kernel DID estimate is statistically insignificant. We should cautiously interpret the statistical insignificance of these estimates, however, because we may lack the statistical power to reject the null hypotheses in some specifications (when the sample size is only 500).

<Insert Table 4 here>

Table 5 also shows that the signs of estimates in the basic results are robust by age group, but we find the estimates of the effects of *Askeskin* are statistically significant for some measures of outcomes of older women, those who are 45 years old or older. Some estimates are statistically insignificant, though again they are possibly because of the lack of statistical power (the sample size may be as low as 436).

<Insert Table 5 here>

We also estimate the effects of *Askeskin* on preventive and curative care by the location of the women and their age group (like those in Table 3): *Askeskin* does not seem to improve the use of preventive and curative care.

The estimates are small, most are less than one percentage point; they are also statistically insignificant at the conventional level of significance. (We do not present the results for brevity.)

Concluding remarks

Askeskin, the social health insurance that the Government of Indonesia introduced to improve the poor's access to healthcare services, increases the use of public facilities for maternal healthcare use, discourages the use of midwives services, and increases the use of contraception; but it does not seem to increase the use of preventive and curative care. These results are robust to where the women live (in rural or urban areas) and whether they are young or old, though the estimates are statistically insignificant in some specifications, probably because the sample size is small.

Our findings agree with the literature on the effects of social health insurance on healthcare use in general. Wagstaff et al. (2009), for example, find subsidized health insurance in rural China increases outpatient and inpatient utilization; Smith and Sulzbach (2008) find community based health insurance increases the use of maternal care services in West Africa. Our results for preventive and curative care are also similar to the findings of Baicker et al. (2013) who do not find Medicaid improves the intake of medication for chronic conditions in the US.

These results suggest some policy implications. One, social health insurance, because it increases maternal healthcare use, may help to reduce maternal mortality in developing countries like Indonesia where most of maternal deaths occur just before, during, or after delivery (World Bank, 2010). Much of these deaths can be prevented if, due to social health insurance, women have better access to emergency obstetric care. Two, social health insurance, through its effects on contraceptive use, also help to limit unwanted pregnancies, promote better family planning (and reduce the need for abortions), and lower the number of maternal deaths. Three, social health insurance is insufficient to promote preventive and curative care use; governments may also need to complement health insurance with educational programs that promote the use of preventive and curative care.

To increase maternal healthcare use in rural areas, the government of Indonesia may also need to allow social health insurance to cover midwives' services. Ensor et al. (2008), for example, show that village midwives in Indonesia are less likely to serve *Askeskin* recipients because its reimbursements are unreliable. (They get 60 percent of their earnings from private fees.) People in rural areas have to pay transportation costs when they visit public health facilities in cities, costs that some of them cannot afford (Johar, 2009). Instead, they could seek out help from village midwives if the insurance also covers midwives' services.

Askeskin seems to matter more for women who live in urban areas, which could be caused by non-existence of hospitals in rural areas and

socialization problems. Social health insurance helps the poor in rural areas only if they can afford transportation costs to nearby cities or the government expands the network of health clinics to rural areas; allowing social health insurance to cover midwives' services would help too. (Most hospitals and clinics in Indonesia are in urban and semi-urban areas.) Promoting social health insurance through campaigns would help too because recipients may not know how insurance operates and what the benefits of the insurance are (ILO, 2008b).

It is unclear whether *Askeskin* provides its recipients financial protection from catastrophic payments: *Askeskin* may increase delivery care expenditure, particularly for women who live in rural areas.[12] The matching estimates for delivery expenditure is negative and statistically significant, but the kernel DID is positive though statistically significant at the ten percent level; in fact, *Askeskin increases* delivery expenditure of women who live in rural areas. Evidence in the empirical literature on the effects of insurance on delivery costs is also mixed: Wagstaff and Lindelow (2008), for example, find insurance reduces cost of deliveries in China, but it does not the out of pocket spending; Wagstaff (2010) does not find insurance reduce the out of pocket spending in Vietnam.

[12] *Askeskin* and delivery care expenditure positively correlate because an increase in the use of more expensive care at hospitals, and the increase in other related costs such as transportation costs, which are not covered by *Askeskin*.

In this paper, we consider the effects of *Askeskin* during its first year of operation when it has various problems: confusion on rights and obligations of patients and service providers and a lack of understanding of how the program operates. Still we find social health insurance improve the use of maternal health care, which means that social health insurance that governments implement carefully would bring larger benefits for the poor or even improve the use of preventive and curative care (unlike our findings in this paper). These issues could perhaps be addressed in future research.

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Table 1: Summary statistics

Variables	Means Control (No *Askeskin*)	 Treatment (*Askeskin*)	 All
Outcome Variables			
A: Place for delivery:			
Public hospital or health centre	0.200 (0.400)	0.281 (0.453)	0.203 (0.402)
Village midwife	0.314 (0.464)	0.109 (0.314)	0.308 (0.462)
B: Place for antenatal check-up			
Public hospital or health centre	0.280 (0.449)	0.565 (0.499)	0.287 (0.452)
Village midwife	0.504 (0.544)	0.377 (0.517)	0.501 (0.543)
C: *Contraceptive use* Using contraception	0.585 (0.492)	0.641 (0.480)	0.587 (0.492)
D: *Expenditure* Delivery expenses (log)	13.092 (1.228)	12.133 (1.191)	13.068 (1.235)
E: *Preventive Care*			
Checked blood pressure	0.827 (0.377)	0.801 (0.399)	0.826 (0.378)
Checked cholesterol	0.048 (0.214)	0.034 (0.181)	0.048 (0.213)

Table 1: Summary Statistics (continued)

Variables	Means Control (No *Askeskin*)	 Treatment (*Askeskin*)	 All
Checked blood sugar	0.044 (0.204)	0.014 (0.177)	0.042 (0.201)
F: *Curative Care*			
Hypertension	0.168 (0.374)	0.146 (0.354)	0.167 (0.373)
Arthritis	0.103 (0.304)	0.068 (0.252)	0.101 (0.301)
Diabetes	0.025 (0.158)	0.034 (0.181)	0.026 (0.160)
Asthma	0.023 (0.149)	0.023 (0.152)	0.022 (0.149)
Cancer	0.005 (0.068)	0.007 (0.088)	0.005 (0.069)
Household head's characteristics			
Female head of household	0.529 (0.499)	0.575 (0.495)	0.543 (.498)
Education	6.419 (4.175)	4.441 (3.259)	6.420 (4.454)
Employment	0.767 (0.422)	0.773 (0.418)	0.726 (0.445)
Muslim head of household	0.894 (0.306)	0.947 (0.223)	0.874 (0.331)

Table 1: Summary Statistics (continued)

Variables	Means Control (No *Askeskin*)	 Treatment (*Askeskin*)	 All
Number of children less than five years old	1.282 (1.282)	1.455 (1.374)	1.081 (1.264)
Number of children older than five years old	1.182 (1.463)	0.931 (1.242)	1.172 (1.489)
Characteristics of house			
Urban location	0.465 (0.498)	0.312 (0.464)	0.498 (0.500)
House self owned	0.788 (0.413)	0.829 (0.376)	0.760 (0.438)
Has electricity	0.903 (0.294)	0.829 (0.376)	0.907 (0.290)
Has piped water for drinking	0.551 (0.497)	0.349 (0.477)	0.564 (0.495)
Has own toilet facilities	0.650 (0.476)	0.331 (0.471)	0.657 (0.474)
Floor made of ceramic/tiles	0.386 (0.486)	0.207 (0.406)	0.407 (0.491)
Dirt floor	0.119 (0.324)	0.278 (0.449)	0.118 (0.322)

Table 1: Summary Statistics (continued)

Variables	Means		
	Control (No *Askeskin*)	Treatment (*Askeskin*)	All
Household asset ownership/socio economic status			
Owns Refrigerator	0.283	0.089	0.308
	(0.450)	(0.286)	(0.461)
Owns electric/gas stove	0.120	0.025	0.140
	(0.325)	(0.155)	(0.347)
Owns television	0.614	0.359	0.593
	(0.486)	(0.480)	(0.491)
Has letter for poor	0.051	0.099	0.051
	(0.221)	(0.299)	(0.221)
Received government assistance	0.035	0.046	0.036
	(0.184)	(0.210)	(0.188)
Owned previous health card	0.184	0.362	0.176
	(0.387)	(0.481)	(0.380)
Knowledge of health care facilities			
Knows where nearest public hospital is located	0.732	0.647	0.726
	(0.442)	(0.478)	(0.445)
Knows where the nearest private hospital is located	0.491	0.365	0.503
	(0.499)	(0.482)	(0.500)
Knows where the nearest public clinic is located	0.936	0.928	0.905
	(0.244)	(0.257)	(0.292)
Knows where the nearest private clinic is located	0.177	0.086	0.188
	(0.381)	(0.281)	(0.391)

Table 1: Summary Statistics (continued)

	Means		
			0.159 (0.366)
Variables	Control (No *Askeskin*)	Treatment (*Askeskin*)	All
No. of family planning posts	0.744 (3.646)	0.522 (1.535)	0.967 (4.169)
No. of sub family planning posts	3.651 (16.369)	4.273 (17.179)	5.041 (19.862)
No. of Posyandu	1.726 (4.417)	1.856 (3.993)	2.108 (4.756)
No. of beds at Polindes	0.092 (0.418)	0.149 (0.560)	0.107 (0.459)

Notes: The numbers in parentheses are standard deviations. The number of observations of women with no *Askeskin* is about 7000; those with *Askeskin* is about 400.

Table 2: The effect of *Askeskin* on maternal health care utilization

Outcome	ATT (1)	Kernel DID (2)
A: Place for delivery		
Public facilities	0.169**	0.197**
	(0.074)	(0.071)
Village midwife	-0.202***	-0.153**
	(0.044)	(0.039)
B: Place for antenatal check up		
Public facilities	0.250***	0.160**
	(0.077)	(0.074)
Village midwife	-0.145*	-0.083
	(0.082)	(0.071)
C: Contraceptive use		
Using contraception	0.074**	0.072**
	(0.034)	(0.032)
D: Delivery expenditure		
Expenses (log)	-0.485**	0.419*
	(0.239)	(0.226)

Notes: Bootstrap standard errors with 100 replications are in parentheses. The number of observations in columns 1-2 is about 1130, 1400, 5300, 1100 in panels A-D respectively; in column 3 it is 3600, 3700, 6000 and 2550, respectively. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: The effect of *Askeskin* on preventive and curative care

Outcome	ATT (1)
A: Preventive care	
Checked blood pressure	0.001 (0.023)
Checked cholesterol	-0.008 (0.011)
Checked blood sugar	-0.022** (0.007)
B: Curative care -used medication for:	
Hypertension	-0.017 (0.023)
Arthritis	-0.017 (0.016)
Diabetes	0.009 (0.011)
Asthma	0.006 (0.010)
Cancer	0.009 (0.007)

Notes: Bootstrap standard errors with 100 replications are in parentheses. The number of observations is 6200 and 3500 in Panels A and B, respectively. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: The effect of *Askeskin* on maternal healthcare utilization by location

	ATT	Kernel DID	ATT	Kernel DID
	Rural		Urban	
	(1)	(2)	(3)	(4)
A: Place for delivery				
Public facility	0.047	0.123	0.271*	0.313**
	(0.082)	(0.079)	(0.139)	(0.125)
Village midwife	-0.148**	-0.070	-	-
	(0.072)	(0.061)		
B: Place for antenatal checkup				
Public facility	0.147*	0.094	0.339**	0.292**
	(0.102)	(0.095)	(0.133)	(0.120)
Village midwife	-0.120	-0.022	-0.231**	-0.199*
	(0.116)	(0.093)	(0.125)	(0.107)
C:Contraceptive use				
Using contraception	0.083**	0.086**	0.087	0.031
	(0.040)	(0.039)	(0.063)	(0.059)
D: Delivery expenditure				
Expenses (log)	-0.077	0.810**	-1.072**	-0.299
	(0.311)	(0.288)	(0.407)	(0.364)

Notes: Bootstrap standard errors with 100 replications are in parentheses. The number of observations for the rural sample is about 620, 730, 3500 and 500 in Panels A-D respectively; 500, 630, 2750, and 448 in Panels A-D, respectively in the urban sample. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Effect of *Askeskin* on maternal health care utilization by age group

Outcome	ATT	Kernel DID	ATT	Kernel DID
	15-30		30-45	
	(1)	(2)	(3)	(4)
A: Place for delivery				
Public hospital or health centre	0.216*	0.180	0.068	0.135
	(0.123)	(0.110)	(0.115)	(0.098)
Village midwife	-0.125	-0.130	-0.145**	-0.141**
	(0.102)	(0.074)	(0.075)	(0.049)
B: Place for antenatal checkup				
Public hospital or health centre	0.217*	0.132	0.309**	0.151
	(0.128)	(0.115)	(0.136)	(0.109)
Village midwife	-0.181	-0.071	-0.158	-0.026
	(0.149)	(0.110)	(0.141)	(0.107)
C:Contraceptive use				
Using contraception	0.057	0.061	0.070*	0.073*
	(0.071)	(0.068)	(0.040)	(0.039)
D: Delivery expenses (log)	-0.582	0.245	-0.665*	0.474
	(0.395)	(0.366)	(0.418)	(0.315)

Notes: Bootstrap standard errors with 100 replications are in parentheses. The number of observations for the younger sample is about 700, 880, 2000, 670 in Panels A-D respectively; and 500, 550, 3600, 436 for the older sample in Panels A-D, respectively. *** p<0.01, ** p<0.05, * p<0.1.