Does it Pay to Deliver? An Evaluation of India's Safe Motherhood Program

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Abstract

The paper evaluates an Indian maternal conditional cash transfer scheme. Launched in 2005, the program gives women cash transfers for receiving maternal and child health care services. This paper uses data from India's District Level Household Survey to evaluate the program's impact. Results indicate that the program had a limited overall effect: relative to the broader population, the targeted population experienced a 3 percentage point increase in medically supervised births, but no increase in ante-natal or post-natal care. We do however, find evidence of heterogeneity of impact. Women without any formal education and women in rural areas experience disproportionate gains. *JEL Classification Code:* D04, J13, J18, I15 and I18

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1. Introduction

Conditional cash-transfer (CCT) programs – cash payments to poor households conditional on participation in education, health and/or nutritional programs – have become popular in developing countries (Adato and Hoddinott, 2010; Fiszbein et al., 2009). CCT programs such as *Opportunidades* in Mexico, *Bolsa Familia* in Brazil and *Familias en Acciòn* in Colombia have played a significant role in alleviating poverty and increasing investments in human capital (Schultz, 2004; Glewwe and Kassouf, 2012; De Brauw and Hoddinott, 2011; Schady and Rosero, 2008; Mookherjee and Ray, 2008). Health-focused CCTs have been shown to increase immunizations (Banerjee et al., 2010; Barham and Maluccio, 2009), infant nutrition (Morris et al., 2004; Fernald et al., 2008), and the use of preventive health-inputs (Lagarde et al., 2009; Baird et al., 2010).

In recent years, CCT programs have also begun to focus on maternal and child health (MCH) (Glassman et al., 2013). Typical programs provide women with incentives for utilizing MCH services during pregnancy, childbirth and beyond. Noteworthy programs include El Salvador's *Comunidades Solidarias Rurales* and Nepal's *Aama* (de Brauw and Peterman, 2011; Powell-Jackson and Hanson, 2012). The evidence on these programs suggests that they successfully increase the intake of MCH inputs such as access to skilled birth-attendants and antenatal monitoring. The magnitude of the reported effects however, varies considerably across countries and regions. A recent meta-study provides a range of estimates for a wide range of indicators: 4–37% increases in deliveries by skilled birth attendants, 4–43% increase in delivery in health facilities and 8–20% increase in antenatal care sessions (Glassman et al., 2013). These programs' long-term impacts on women and children's health is largely unknown.

One of the largest and most impactful of these programs is the Indian *Janani Suraksha Yojana* or Safe Motherhood program. Established in 2005, this initiative provides poor women with a financial

incentive for receiving pre-natal care, deliver their children in existing public or private health facilities (or at home with proper medical supervision), and receive timely post-natal check-ups. The overall objective of the program is to reduce maternal and child mortality and accelerate India's progress towards meeting MDGs 4 and 5 (Bhutta et al., 2010; Horton, 2010), as well as improve women's overall access to health care (Osmani and Sen, 2003; Balarajan et al., 2011).

With more than 9.2 million beneficiaries, and a budget of nearly 15 billion rupees, the JSY is one of the largest CCT programs in the world.[1] The program was not implemented in the framework of a randomized controlled trial, so precise estimates of its impact are difficult to find. A recent paper by Lim et al. (2010) argues that the JSY scheme had large effects on health-care utilization as well as mortality rates: 43.5 – 49.2 percentage point increase in hospital deliveries, 36.2 – 39.3 percentage point increase in skilled birth attendance and a 10.9 percentage point increase in antenatal care. We argue that these effects, and others reported in the literature about the JSY thus far, may be overstated due to methodological issues and the failure to correct for either eligibility rules or the non-random nature of program rollout.

This paper provides new estimates of the impact of the JSY program. Our evaluation uses two rounds of the District Level Household Survey (DLHS), a nationally representative household survey. Our paper makes two significant contributions to the existing literature on this scheme. First, we use variation created by the program's complex eligibility rules to demonstrate that it had a limited impact on antenatal care, hospital delivery, and post natal care. We find that relative to the broader population, the targeted population experienced a 3 percentage point increase in medically supervised births and no increase in ante-natal or post-natal care.

Second, we explore the program's impact on poor, less educated and rural women. We define the poor as those who belong the bottom quintile of the wealth distribution using our own asset index. Results indicate that women in these groups may have obtained benefits through the program.

Illiterate women are approximately 8 percentage points more likely to receive ante-natal care, 6 percentage points more likely to deliver in a hospital and 12 percentage points more likely to receive post-natal care under the scheme. Women living in rural areas are 4–7 percentage points more likely to report improved access to medical care in all three indicators. Women in the poorest quintile however, do not benefit from all aspects of the program: they are 2 percentage points more likely to give birth in a hospital, but experience no other benefits. These results suggest that the targeting aspect of the JSY may have been effective, but may still fail to cover the poorest women. We provide several explanations for the program's modest effect on its target population and its success in targeting its intended recipients, and discuss their policy implications.

The remainder of this paper is organized as follows: Section 2 provides some background on maternal and child health in India and an overview of the program. Section 3 describes the data used in our analysis of the program's impact. Section 4 describes our empirical strategy and presents results. Section 5 suggests an explanation for the small effect sizes we find, and finally, section 6 concludes.

2. Background

(a) MCH in India

The government is the primary provider of all health-care services in India. A three-tier design ensures that all households, rural and urban, are theoretically close to a free health facility. Primary health centers in villages provide the first point of contact for individuals entering the system. These are small clinics, generally managed by a single physician and a small staff. Community health centers at the district level provide the next stage of care, and full-scale hospitals at the regional level deal with the most serious problems.

Despite this infrastructure, access to health services remains low; between 2004–2008, 48 percent of Indian women who gave birth received no pre-natal care, 54 percent gave birth in the absence of a trained professional, and only 28 percent received any post-natal care.[2] Furthermore, the quality of services is poor. In their study of health-care in rural Rajasthan, one of India's poorest states, Banerjee et al. (2004) report that centers are often closed, and even when open, lack basic medical supplies such as stethoscopes, blood-pressure instruments, thermometers, or sterilizers. Moreover, on any given day, between one-third and one-half of doctors and nurses are absent (Chaudhury et al., 2006; Banerjee et al., 2004). According to estimates from the DLHS-II survey of 2004, if adequacy is defined as having at least 60 percent of required inputs, then only 46 percent of community health centers have adequate infrastructure, 24 percent have adequate equipment and 14 percent have adequate staff. Moreover, only 58 percent of primary-health centers perform deliveries, only 22 percent provide neo-natal care and 6 percent can terminate risky pregnancies.[3]

The situation varies across states and regions. In 2011, "low-performing" northern states only met around 27 to 50 percent of assessed need for hospital delivery while the southern states managed to meet between 60 and 90 percent of this assessed need.[4] These statistics are highly correlated with maternal and child mortality rates. States such as Kerala, Tamil Nadu, Manipur, and Goa have low infant and maternal mortality rates while states like Uttar Pradesh, Madhya Pradesh, Rajasthan, and Orissa report much higher estimates. Kerala's IMR and MMR are for example, among the lowest in India at 13 and 81 respectively. In contrast, Uttar Pradesh's IMR and MMR stand at 67 and 359 respectively.[5]

Large disparities also exist within states: poorer women, illiterate or unschooled women, as well as women who live in rural areas are substantially less likely to benefit from essential health services, and thus display worse health outcomes (Vora et al., 2009). Those who can afford it often seek care in the private sector even though the quality of services they receive is not always better (Das and

Hammer, 2007). Spending on health accounts for more than half of Indian households who fall into poverty each year (Balarajan et al., 2011).

The quality of health-care in India is also affected by demand. In general, the demand for MCH services lags behind other types of health-care (Datta and Misra, 2000; Horton, 2010). But in India the situation is compounded by other factors: high indirect costs, the practice of informal payments, sociocultural norms, gender inequality and the persistence of poverty among many socially excluded groups (Adato et al., 2011). Low levels of female literacy, the practice of early marriage and child-bearing and strong patriarchal norms play a particularly critical role in restricting women's access to health-care (Osmani and Sen, 2003; Dreze and Sen, 2002). Theses issues have been slow to be recognized by policy-makers. Ganatra et al. (1998) find that women and their families rarely seek care when facing complications in childbirth, while Kim et al. (2010) find that maternal deaths are vastly underreported when they occur.

The Indian government has responded to the situation by promoting the use of demand-side financing (Hunter et al., 2014). A wave of new interventions – most typically cash incentives or voucher schemes – are intended to supplement supply-side efforts and transfer some resources to directly to service users. The programs aim to increase user purchasing power as well as bargaining power (Ensor and Cooper, 2004). A recent review of the evidence however, suggests that the approach may have some limitations. Complicated eligibility criteria, the inability of clients to provide appropriate documentation, the lack of a regulatory framework for private sector providers, and the lack of channels of accountability have all been known to limit their impact on the ground (Hunter et al., 2014). The study also confirms the findings from other parts of the world: CCTs for MCH in India have focused too narrowly on institutional deliveries or other indicators and this has diverted attention from the need to provide a continuum of care before, during, and following pregnancy as well as broader needs such as appropriate nutrition and birth spacing (Hunter et al., 2014). The

findings of our paper largely fit with this argument.

(b) The JSY Program

The Janani Suraksha Yojana (JSY) or "Safe Motherhood Scheme" was launched in 2005 as a key component of the National Rural Health Mission (NRHM). The mission was established to improve the delivery of health-care all over India, with an intensive focus on rural areas of 18 states with the poorest health indicators.[6] The program aimed to link all rural Indians to the formal health-care system via a network of village-based health workers known as "Accredited Social Health Activists" (ASHAs).[7] The JSY program had the specific goal of reducing maternal and neo-natal mortality by promoting institutional delivery among poor pregnant women. The program provides pregnant women as well as ASHA workers with financial incentives to deliver in government-approved health facilities.[8]

The program was constructed to address issues with both demand and supply of maternal health care services. A cash incentive provided to the household was intended to increase the demand for maternal and child health care by lowering the opportunity cost for obtaining these services. Compensation intended to cover the cost of travel for the woman and her family, in addition to compensating any lost wages during the time of delivery and recovery. Cash transfers given to ASHAs are intended to reduce absenteeism and improve overall performance of the health-care workers themselves. Though the program was centrally financed, states were given latitude to implement their own systems of cash disbursement.

Despite the program's large scale and decentralized administration, its core components are common across all states. ASHAs are the first, and most important, point of contact for pregnant women; ASHAs contact each pregnant woman in their jurisdiction, and enroll them in the JSY. A complete list of her responsibilities prior to delivery is to identify pregnant women, assist her in gathering docu-

ments/certifications for the program, organize three antenatal checkups, including obtaining tetanus toxoid injections and iron/folic acid tablets and construct a birth plan that includes a functional public facility, accredited private facility or medical supervision at home. For women who choose to deliver away from home (for example, at their natal home or village), the ASHA worker must provide referrals for care at the remote location. At the time of delivery, ASHA worker must then escort beneficiaries to pre-determined health centers and accompany them until discharge, counsel them on breast-feeding practices, organize immunizations, and visit the beneficiaries within 7 days of delivery to provide post-natal care. They are also encouraged to counsel women on the use of family-planning methods and space their births. In return for these services, the ASHA worker and the mother both receive a cash-transfer. The eligibility rules, transfer amounts and procedures for disbursements of funds are summarized below.

Eligibility Rules

At the time of the program's inception, the Indian government categorized states as either Low Performing (LP) or High Performing (HP). LP states are states where the proportion of the institutional deliveries has been very low in the past.[9] HP states have a stronger record of institutional births. The value of the cash transfer differs across the two types of states, as well as between rural and urban areas.

The initial set of eligibility rules was issued in April 2005. According to these rules, only those women who were of 19 years of age and above, and belonged to below poverty line (henceforth, BPL) families, were eligible for JSY cash benefits. The benefit was limited to the first two live births; assistance was given for a third birth if the mother agreed to a tubectomy following delivery. In response to criticisms that restrictions on eligibility were too stringent, a new set of criteria were

adopted in November 2006.[1] Now all pregnant women in LP states, irrespective of age, poverty status or number of births, are eligible for benefits under the JSY if they deliver in an approved public or private medical facility. Moreover, women from BPL households and all women (irrespective of poverty status) from the Scheduled Castes (SC), Scheduled Tribes (ST), or Backward Caste (OBC) households are also eligible for the benefits under the JSY if they deliver in an approved private medical facility or at home, with medical supervision. Rural beneficiaries receive a larger disbursement of Rs. 1400, while urban beneficiaries are allocated Rs. 1000. This is approximately 8–12 days of paid days off from minimum wage manual labor.[2]

In HP states, only pregnant women between 19 and 45 years of age who belong to BPL households, are eligible for cash assistance. In case of the Scheduled Castes (SC) or Scheduled Tribes (ST) households, all women, irrespective of their poverty status, are eligible for cash assistance provided they are above the age of 19. Cash assistance is limited to two live births, even for women belonging to Scheduled Castes (SC) and Scheduled Tribes (ST). Rural beneficiaries are allocated a transfer of Rs. 700 and urban beneficiaries are allocated Rs. 600.

ASHAs also receive a cash-transfer for each delivery organized in a hospital setting followed by a post natal checkup. They receive Rs. 200 for their services in both HP and LP states, and both rural and urban areas. An ASHA receives her payment in two parts, one after the woman is discharged from the hospital, and the other after she successfully completes a post-natal care visit. Details of all cash transfers are summarized in Table 1, and details of the eligibility guidelines are summarized in Table 2.

It is noteworthy that the woman receives her incentive in one installment, while the ASHA worker receives full payment only after a successful post-natal visit. The design of the program implicitly

[1] Another reason to relax the criteria was the reported difficulty is verifying women's ages and previous number of live births (The Hindu, May 22, 2006).

[2] Minimum wages in India vary from state to state. This calculation is based on Rs. 120 per day, which is the NREGA payment for manual labor that prevailed at the time of the launch of the program.

assumes that the key issue with post-natal care is supply (and not demand). Our findings, presented later in this paper, suggest that this may be too simplistic.

Disbursements of funds

All disbursements to the mother are required to be made at the medical facility where she gives birth, prior to being discharged.[3] Recipients are expected to provide evidence of eligibility in the form of 'Below Poverty Line' (BPL) certificates or Caste Certificates (for SC /ST mothers). If the BPL certification is not available through a legally constituted process, the beneficiary may still be deemed eligible by the local council (such as village council), elected representatives, or revenue authorities, but the delivery is required to take place in a government institution.

The ASHA worker however, is paid differently. In the rural areas of LPS, transportation costs are required to be paid in advance to arrange for logistics. The cash incentive however, is to be paid in two installments. The first installment is paid when the pregnant woman is discharged from the hospital. The remainder of the ASHA's promised compensation for facilitating an institutional delivery may only be disbursed after her post natal visit with the new mother and after the newborn has received the appropriate set of immunizations.

To ensure full transparency, the names of all JSY recipients and the dates of disbursement are required to be posted on a board in the front of the local health facility. Delays in disbursements are required to be recorded and reported.

(c) Past Evaluations of the JSY

The JSY program was not implemented within the framework of a randomized controlled trial. We are not aware of any official scientific monitoring and evaluation framework for evaluating its impact.

[3]If she gives birth at home, the disbursement is to be provided by the health worker prior to her departure. She is not paid separately for pre- or post-natal visits.

Official reports have largely been descriptive, documenting progress in the program's implementation and a growth in institutional deliveries in specific states (Devadasan et al., 2008; Satapathy et al., 2009; Panja et al., 2012; UNFPA, 2009).

The most significant quantitative evaluation of the JSY has been conducted by Lim et al. (2010). This study uses the same dataset as our paper to evaluate health outcomes linked to the JSY. The authors report strong positive effects of the JSY on three metrics: the likelihood that the woman attended at least three antenatal care visits, gave birth in a health facility, and had skilled birth attendants supervise her delivery. The main finding of this study is that the JSY scheme lead to a 43.5 to 49.2 percentage point increase in hospital deliveries as well as a 36.2 to 39.3 percentage point increase in skilled birth attendance. The authors also find the study led to a comparatively modest 10.9 point increase in antenatal care. However, the methods they use present several problems. First, the authors perform individual level matching analysis on a cross-section of women who did and did not receive the JSY cash transfer. In their second specification, the authors use a difference-in-differences approach at the district level, using a sample of births collected in the 12 months before the survey, and the fraction of maternal deaths in the 3 years prior to the survey. In both specifications, the authors interpret the difference between the two groups as the causal effect of the program. This approach is flawed mainly due to the improper definition of treatment: individuals were defined as "treated" if they actually received JSY funds.[10] This definition of treatment presents the problems of selection: women only receive the cash when they give birth in a health facility, and so may not be representative of the targeted population. This will result in an overstatement of the program's effect.

Another evaluation of the JSY has been conducted by Dongre and Kapur (2012), who use a difference-in-differences specification that uses year of birth and state of birth to measure exposure to treatment. This study examines the differences in impact of the program on institutional deliveries

in LP and HP states. The study finds that the scheme led to a marginal increase in the gap between the two groups within 18 months of the launch of the JSY. But from 2007 onwards, the gap has started declining with the LP states witnessing much larger increase in the institutional deliveries. Their estimates suggest that in the year 2008, institutional deliveries were a full 10 points higher in LPS states, even after controlling for individual, household and village characteristics (Dongre and Kapur, 2012). The authors analyze the pre-treatment trends and show that convergence between LP and HP states cannot be an explanation for his results. They also shows that there has not been any differential change in the availability of and access to medical facilities in targeted states after the scheme was launched. This study however, does not fully use the JSY's specific eligibility criteria as a measurement of treatment, and as such, may be capturing the effects of other interventions implemented in a similar fashion as part of the NRHM. While our paper also uses a difference-in-differences specification, we define treatment based on individual-specific eligibility criteria, which gives a more precisely targeted estimate of the program's effect. Further, we explore how well the eligibility criteria succeeded in targeting marginal populations.

A third evaluation was conducted by Mazumdar et al. (2011). This paper also uses the DLHS-II and DLHS-III data. The authors use an instrumental variables model to illustrate that the JSY led to an effective doubling of the rate of women who used delivery services, an increase of about 19.5 percentage points.

The authors use variation in the dates that the JSY was implemented between districts to identify the program's effect. They define the first year of the program as the year in which the proportion of eligible women receiving a facility cash payment was 10 percentage points greater than the 2004/05 level. In the full specification, the authors find that JSY is associated with an 8 percentage point increase in the number of women who deliver in the presence of a health worker, and a 12 percentage point increase of births that occur in a hospital facility. The authors find no significant effect on

utilization of antenatal care services, which they use to justify the parallel trends assumption required for a difference in differences approach.

The main shortcoming of this paper is that it ignores the issues of selection and targeting within populations. The program's guidelines suggest that JSY was intended to be implemented simultaneously across states, though realistically, this is unlikely to have been achieved. We argue that using self-reported benefits as an indicator of implementation is problematic because program placement was not random: areas which implemented the JSY earlier are likely to have characteristics which would affect outcomes of interest. The controls that the authors include (interactions between the year of birth and the share of the district population below the poverty line, the tribal population share, and the district mean of the household wealth asset score) may partially alleviate endogeneity concerns, but do not seem to be sufficient to isolate the causal impact of the JSY scheme. Finally, the authors use the lack of change in utilization of antenatal care as evidence to support the parallel trends assumption. However, antenatal care should not be considered a placebo since the Ministry of Health and Family Welfare explicitly indicates that all women should have at least 3 antenatal care visits (ideally one per trimester) in their guidelines for the implementation of JSY. If the scheme doesn't increase antenatal care, that illustrates a shortcoming of the program, rather than evidence that the JSY variable captures the program effect.

It is noteworthy that most of the studies rely on self-reported measures of receiving JSY benefits. We argue that women who report receipt of JSY may benefit immensely from the program, but may also be the same population that was likely to pursue care in the first place. We believe that the program's actual efficacy may be improved by examining its aggregate effect on its intended population.

3. Data

We use data from the second and third rounds of the District Level Household Survey (DLHS), also known as the Reproductive and Child-Health (RCH) Survey. The survey is administered by the Institute for International Population Studies in Mumbai and its partner organizations. It solicits information on reproductive health, fertility, mortality, and demographic characteristics from households across India. The first round was split into two phases, which collected data from different regions between 1998 and 1999. However, it is not commonly used in analysis due to its inconsistency with other national survey data collected in the same time frame. The second was collected between 2002 and 2004, while the third round followed between 2007 and 2008. Together, the rounds of the survey form a repeated cross section. We use the ever-married women's data from the DLHS-2 and DLHS-3.[4]

The ever-married women's recode of the DLHS-2 solicits information from 507,622 currently married women who have ever had a live birth. We drop 10 observations with unverifiable dates of interview, leaving 507,612 observations. As information on delivery and antenatal care is only solicited for each woman's most recent birth in the three years before the survey, we restrict our attention to women whose last birth occurred after 1999, dropping 216,923 observations. From this sample of 213,172 women, we dropped 2,488 women who resided in the state of Nagaland as it was not surveyed in the RCH3. Finally, we dropped 21 observations with missing or inconsistent ages of children, and another 21 women for whom district codes could not be matched to the RCH3. The DLHS-2 also produced a survey from each of 620,107 households; we used information on asset possession to create an index that measures the relative socio-economic status of each woman, and merged it in with the woman's sample. As 65 observations lacked a unique identifier, they were omitted from the

[4]We omit the first round of the survey due to issues of data quality and the lack of completeness of the pregnancy history.

sample. Lastly, we extracted information from the DLHS-2 survey of 16,030 villages on the accessibility of public goods and services. Our final sample, with information from the household, village, and women's surveys, consisted of 210,663 observations. For this sample, the years of birth for the last-born child are summarized in Table 3.

The DLHS-3 collected information for 643,944 married and unmarried women. To ensure comparability with the second round, we drop 39,140 women who were not married at the time of the survey. The RCH3 did not collect a full birth-history; information was only gathered for births after 2004. Thus, we restrict our sample to include only those women whose most recent birth occurred in this time frame. This leaves us with a sample of 218,058 observations. Like the DLHS-2, the DLHS-3 collects asset information from 720,320 households. We dropped two observations with missing interview dates, and 4176 observations which lack a unique identifying number, leaving us with 716,142 observations. From this sample, we used information on asset possession to construct a wealth index, which we then merged with the sample of currently married women. Data from 22,824 unique villages surveyed by the DLHS-3 was used to measure the level of public service delivery, and was merged with our final sample of 215,048 observations. The dates of the last delivery are summarized in Table 3.

Combining the RCH-2 and RCH-3 yielded a sample of 428,220 currently-married women. After excluding 24 observations with inconsistent child ages, and merging in average district BPL card holder information, our final sample contains 425,708 observations. As our analysis deals only with women who have delivered a child in the 3 years prior to each survey, we exclude women who have not had a child in this time frame. It is important to note that poorer women tend to have higher fertility than their affluent counterparts. Restricting our attention to the most recent birth of each woman prevents us from "double counting" poorer women. But excluding richer women who did not have a child in this time-frame (but may have a child in the future and presumably not receive the

treatment in most cases), we are likely to have a select sample and thus calculate overestimates of the program's impact.

An important shortcoming of our dataset is that information on post natal care is captured with a different set of questions in each round. The RCH-2 asks whether an ANM visited the mother within 2 weeks of her delivery. However, the RCH-3 asks two questions: first, whether the mother received any check-up within 48 hours of delivery, and second, how many days after delivery did the mother receive a post-natal check-up. While we have tried to code the responses appropriately for our analysis, we believe that this inconsistency is responsible for the irregular trend in post-natal care between the two survey waves.

The two surveys differ in other important ways. Limitations of the RCH-2 and RCH-3 make it difficult to analyze the program's impact on mortality. First, while the RCH-2 includes on married women up to the age of 45, the RCH-3 includes unmarried women as well as women aged 45-50. Second, whereas the RCH-2 asked respondents to report "'all births in a lifetime, regardless of whether the child is currently alive or not"', the RCH-3 asked about all pregnancies since January 1, 2004 and separately coded the responses as live births, still births, spontaneous abortions and induced abortions. Finally, the RCH-2 was conducted over three years (2002–2004), making it impossible to calculate accurate estimates of mortality for a particular state, district and year. Given that this survey was conducted immediately before the JSY program, estimates of the program on mortality are unlikely to be reliable.

4. Empirical Methods and Results

The central econometric challenge of identifying the impact of the JSY is that it was not implemented as a randomized control trial. The program was announced all over India at the same time, and was intended to be rolled out throughout the country within a year. There may however, still be

significant variation in the timing and quality of program placement which is correlated with MCH indicators, resulting in a biased estimate of the program's effect. However, as there is no publicly available information regarding how the program was implemented, we make the simplest assumption of exogeneity. We measure the impact of the JSY by exploiting differences created by treatment eligibility before and after the scheme was implemented, controlling for confounding factors. Our approach differs from others (defined previously), by focusing on the intent-to-treat effect and not relying on the actual receipt of JSY benefits.

Our analysis begins with the hypothesis that all else equal, targeted groups should experience greater improvements in health-care utilization, as compared to the non-targeted groups, before and after the program. Our basic regression specification is thus as follows:

$$\mathrm{Y}_{idt} = \alpha + \beta_1 Eligible_{id} + \beta_2 After_t + \beta_3 (Eligible_{id} \times After_t) + \gamma'_{12} X_{id} + \epsilon_{idt}$$

where Y_{id} measures binary outcomes of woman i in district d. We consider three dependent variables: (i) three visits to a JSY-approved health professional during pregnancy for ante-natal care; (ii) birth in a hospital facility or at home under the supervision of a JSY approved birth attendant; and (iii) a visit from a JSY approved attendant for post-natal care within 14 days of delivery. All indicators are dummy variables and correspond to the package of benefits specified in the JSY.

The variable $Eligible_{id}$ is a dummy variable indicating if the woman i residing in district d is eligible for treatment. It captures the pre-existing differences between treated and untreated women. We define a woman as eligible for treatment if she is SC/ST or resides in an LPS state, and is between the ages of 19 and 45 at the time of her pregnancy. 69 percent of the sample meets these eligibility criteria and more than a third of this sample is observed after the program was implemented (Table

4). In the above equation, β_1 captures difference between treatment and control groups prior to the intervention. As the program was not randomized, and was deliberately targeted to poor and disadvantaged women, we expect the coefficient for β_1 to be negative.

Since the program was established in May 2005, but the eligibility criteria were revised in November 2006, we treat *After* as a vector of two components: *Phase 1* (which covers the period May 2005 to November 2006) and *Phase 2* (which extends after November 2006). These variables equal 1 if a woman i give birth in Phases 1 and 2 respectively and 0 otherwise. These variables capture the change in the outcomes in the non-treated population relative to the baseline in each phase of the program. In Equation 1, β_2 is actually two coefficients (corresponding to Phases 1 and 2) that measure the overall levels in the two years after the launch of the program. We denote these by β_2^{Phase1} and β_2^{Phase2} respectively.

The impact of the JSY program is measured by β_3. This is the intent-to-treat effect, or rather, the impact of the program on the population that was eligible for treatment after the program began. It captures the changes in the treatment population after the program, controlling for any pre-program differences. Since we measure impact separately across two phases, we estimate two interaction terms to estimate the intent-to-treat (ITT) effect in each of the two phases of the program. These are denoted by β_3^{Phase1} and β_3^{Phase2} respectively. If the uptake of the program is highest among the treated women, we expect these coefficients to be positive. Since the program rollout may not have been immediate, and the initial rules may have been too stringent, we expect β_3^{Phase2} to have a larger coefficient than β_3^{Phase1}.

The most important assumption in a difference-in-differences specification is the parallel trends assumption–that the two groups had identical trends in all indicators, and would have continued to do so in the absence of the intervention. We present three graphs to illustrate that the data is consistent with this assumption. Trends in antenatal care, institutional deliveries, and post natal care are similar

between eligible and ineligible populations, though the magnitude of utilization differs significantly. This increases our confidence that the interaction term captures the effect of the JSY program.

Since response to the JSY may vary by a wide range of individual and household characteristics however, we also include a set of 12 control variables, X_{id} that are likely to affect our outcomes of interest. These include the child's sex, birth-order, religion (Hindu and Muslim), caste (SC/ST or other backward caste), mother's age, mother's years of schooling, father's age, father's years of schooling, a household wealth index and an array of village-level health infrastructure variables that measure the distance between a household and JSY-approved health facilities.[11,12] Summary statistics of all variables are presented in Table 4.

(a) Overall Impact

The results of estimation of Equation 1 are presented in Table 5. Panels (A)–(C) present the results for three dependent variables, Column (1) presents the unconditional estimates of program impact and Columns (2)–(5) present estimates with controls. Note that in all three panels, the variable β_1 is negative and significant, suggesting that eligible women are indeed disadvantaged in receiving these maternal and child-health services prior to the rollout of the program. This is unsurprising considering that eligible population was not randomly selected and was deliberately targeted for the program. The magnitude of the coefficients suggests that the extent of the pre-existing disadvantages in this population was quite significant: estimates from the full specification, with all controls, suggest that prior to the program, eligible women were 17 percentage points less likely to get pre-natal care, 13 percentage points less likely to deliver in a hospital and 3 percentage points less likely to receive a post-natal checkup than ineligible women. These numbers are quite striking considering that for all these outcomes, baseline levels were quite low in the Indian population (Table 4).

The results in Table 5 also illustrate that β_2^{Phase1} and β_2^{Phase2} in Panels (A)–(C) take a positive and

significant coefficient in all estimations, confirming that there was a significant overall improvement in pre-natal care, institutional deliveries, and post-natal care over the period of this study. The two coefficients are also close in magnitude in most estimations, suggesting that there was no significant change in trend between the two phases of the JSY: on average, there was a 5 percentage point growth in the utilization of pre-natal care and institutional deliveries after April 2005. There was a huge increase in reports of post-natal care, but this is largely driven by the low baseline levels of post-natal checkups prior to 2005.

The coefficients of greatest interest to us – the intent-to-treat effects β_3^{Phase1} and β_3^{Phase2} – reveal some interesting patterns across the three sets of estimations. Note that β_3^{Phase1} is negative and statistically significant in all three of the models (Columns 1–5), suggesting that women classified as eligible did not experience disproportionate increases of health-care services compared to the untreated wealthier population. On the contrary, they slid behind their wealthier counterparts. This is best explained by highlighting that there was a significant *overall* increase in access to such services in the immediate aftermath of the program, i.e. in Phase 1. The increases in the non-targeted population however, was larger than that of the targeted population, resulting in a negative coefficient of impact when controlling for all confounding factors (Panels (A)–(C), Column 5).

In Phase 2 however, the variable $Phase\,2 \times Eligible$, as captured by β_3^{Phase2} in Equation 1, becomes positive and significant at the 1 percent level, suggesting that in the second phase of the program, the targeted population displayed a sudden increase in hospitalizations and/or the receipt of medical supervision at delivery. The magnitude of the impact however, is still quite small. We estimate only a 2.9 percentage point increase in hospital delivery–a 4.6 percent increase from pre-program levels. The effect is nevertheless noteworthy for it reflects a break from the trends in the first phase of the program. It is also noteworthy however, that this reversal is only achieved for hospitalized deliveries and neither pre-natal nor post-natal care.

Why wouldn't the JSY program increase women's utilization of pre-natal and post-natal care? One of the reasons is simply faulty program design. In rural areas, ASHAs receive Rs. 250 for transporting a woman to a hospital for delivery, and a Rs. 150 incentive immediately after the delivery takes place. They are also entitled to a Rs. 200 incentive after the newborn receives the appropriate immunizations within two weeks of delivery, that must be disbursed by an Auxiliary Nurse Midwife (ANM) or other approved link worker. In urban areas, ASHAs are only given the Rs. 200. The structure of the incentive places little value on promoting quality care; ASHAs receive the same transfer post-delivery regardless of whether they schedule 3 antenatal care visits or not. The simplest explanation for our post-natal care results may be the difference in how each round of the DLHS solicited information on post-delivery care. However, program design may play a role as well. The size of the transfer post-delivery is nearly twice that of the transfer for post-natal care. While the ASHAs immediately receive cash at the hospital, a postnatal visit requires the ASHA to first track down the beneficiary and schedule a visit, and then make a trip to receive the reimbursement. The effort required to receive a post-natal cash incentive may exceed the value of the incentive itself. The issue is compounded by a general lack of understanding of the importance of post-natal care. A qualitative study conducted by the UNFPA found some support for this hypothesis: of the 4,472 women who had given birth prior to the survey in 2009, more than 75% delivered in an institution but only a third received the required level of post-natal care (Khan et al., 2010). Focus group discussions and interviews with both ASHAs and women confirmed that the small fee provided to the ASHA worker for this service, the lack of a proper verification system and the general lack of importance assigned to post-natal care were possible causes (Khan et al., 2010). The lack of priority given to post-natal care is most strikingly seen in the results of the survey of ASHAs: in Bihar only 15% of ASHAs were aware of the need to advise women on post-natal care. In Rajasthan, this number was 58% but in all other states it was around 30% (UNFPA, 2009).

(b) Heterogeneity of Impact

We also examine the extent to which the scheme's eligibility guidelines were successful in reaching its intended recipients. To further examine whether the program may have had a differential impact on uneducated women, poor women and rural women, we use a triple differences specification and interact the variables $Phase\,1 \times Treatment$ and $Phase\,2 \times Treatment$ with these characteristics.

We hypothesize that if the eligibility rules of the scheme were effective, marginalized women–those least likely to deliver in a facility without an incentive–should experience greater improvements in health-care utilization, as compared to the non-targeted groups, before and after the program. If, however, the target population didn't fit the eligibility requirements, we would see no significant change in health seeking behavior. We use the following specification:

$$\begin{aligned} \mathrm{Y}_{idt} &= \alpha + \beta_1 Eligible_{id} + \beta_2 After_t + \beta_3(Eligible_{id} \times After_t) + \beta_4(Eligible_{id} \times Characteristic_{id}) \\ &\quad + \beta_5(After_{id} \times Characteristic_{id}) + \beta_6(Eligible_{id} \times After_t \times Characteristic_{id}) + \gamma'_{12} X_{id} + \epsilon_{idt} \end{aligned}$$

These estimates of the heterogeneity of impact are presented in Table 6. Regressions are run with a full set of control variables for individual, mother, household and village characteristics. Note that across all three sets of results, there is considerable evidence for heterogeneity in impact of the treatment.

We note that the interaction term involving the coefficient *No Schooling* is positive and significant, suggesting that the least educated women received greater MCH services after the launch of the program. Note also that the triple interaction term is significant for both phases of the program,

suggesting that the targeting aspect of the program may have been working even early on in the program's implementation. The magnitudes of impact are stronger than what we observed for the overall program: illiterate women are approximately 8 percentage points more likely to receive ante-natal care, 6 percentage points more likely to deliver in a hospital and 12 percentage points more likely to receive post-natal care, though this may be due to survey round effects. Nevertheless, these estimates are strong and also in line with estimates of impact found in CCTs in other parts of the world, particularly Latin America (Adato and Hoddinott, 2010) and Fiszbein et al. (2009).

We also interact the variables $Phase\,1 \times Eligible$ and $Phase\,2 \times Eligible$ with a dummy variable that takes value 1 if a woman resides in a rural area. The results also confirm that the program had strong positive and significant effects in rural areas. The triple interaction term is positive and significant for all dependent variables. The magnitude of the effects are also quite notable in both phases of the program. Rural women increase average utilization of all three MCH services by approximately 4–7 percentage points.

Finally, we interact with variables $Phase\,1 \times Eligible$ and $Phase\,2 \times Eligible$ with a dummy variable that takes value 1 if a woman's household falls within the bottom quintile of the wealth distribution (as measured by our own wealth index). It is important to note that our measure of poverty is based on household data collected in 2008. India's BPL survey was conducted in 2002[5]; a household's economic circumstances can change significantly over 6 years. Our measure of poverty is however, more reliable as a measure of real deprivation. Using this measure allows us to examine whether the program is truly targeted towards those who need it most. Results are also presented in

[5]A survey conducted in 2002 classified households as BPL on the basis of deprivation in respect of 13 parameters: landholding, type of house, clothing, food security, sanitation, consumer durables, literacy status, labour force, means of livelihood, status of children, type of indebtedness, reasons for migrations, etc. Households with less than 15 marks out of maximum 52 marks were classified as BPL (Planning Commission, 2007; See http://www.pbplanning.gov.in/pdf/BPL16-3-07.pdf) and roughly works out to be the bottom quintile of the rural population. Though it was conducted in 2002, the survey could not be finalised due to a stay issued by the Supreme Court of India. The stay was vacated in February 2006 and this survey was finalised and adopted in September 2006. This survey formed the basis for benefits under government of India schemes.

Table 6. Here, the results are weaker than the case of illiterate women: they are 2 percentage points more likely to give birth in a hospital, but experience no other benefits from the program. We infer from this that the program may still not be reaching the poorest women. The program's benefits seem to be concentrated among disadvantaged women such as illiterate and rural women in higher income groups.

Why would the poorest women fail to benefit from the JSY? To explore this issue, we note that the relationship between BPL status and actual current wealth is not very strong.[13] Recall from section (b) that BPL cards are used as proof of eligibility for the program. We find that in the RCH3, only 35 percent of households in the lowest quintile of our wealth-index possessed the BPL card, while 27 percent of households in the richest quintile indicate they have a BPL card and thus technically remained eligible for the JSY scheme. This is highly problematic for it suggests that wealthy households, who were likely to choose to have ante-natal care, institutional delivery and post-delivery checkups in the absence of the JSY, may have been able to receive financial compensation, even though the program was not targeting them. This type of mis-targeting suggests that the program's eligibility rules may exclude some of its intended beneficiaries, while wasting money on unintended targets (Hunter et al., 2014). Though it appears that the program implementers were aware of this problem and used other forms of eligibility such as caste-certificates to verify eligibility for the poorest women, thereby including them in the program, our estimates suggest that there may have been substantial leakage to wealthier households.

Overall, the results suggest that even though the program's overall impacts remain modest, the program may indeed be succeeding in delivering MCH services to particularly vulnerable groups, though these benefits are concentrated in wealthier households. Women who live in rural areas may respond better to the program's incentive, as their major constraint to seeking care may be coordinating visits to distant health facilities. Additionally, very poor households–those who live in

rural areas, households without educated women–may respond well to the incentive, while less poor households–those that hold assets, but have less liquid income–may view the incentive as insufficient, or face bigger constraints to seeking health care during pregnancy.

5. Discussion

Our data and methods do not provide insights on the underlying mechanisms of the program. We are unable to examine why the program did not have a bigger effect on all targeted women and why its strongest effects are seen among illiterate women. We do however, draw on qualitative research on the JSY, the literature on CCTs in other contexts, as well as the implementation of poverty alleviation programs in India to interpret our findings.

The JSY resembles many other CCT programs in terms of its complicated eligibility rules and complex structure. The program is thus prone to the same operational difficulties that have been noted in a variety of contexts: identification of participants, compliance monitoring and timely payments systems through which funds from the central government can reach beneficiaries with minimal leakage or delay (Ahmed et al., 2007; Fiszbein et al., 2009).

Evidence from qualitative studies confirms that the program faced some implementation issues. A 2008 study conducted in 6 states on the JSY by the Population Council found that awareness of the program and ASHA workers among 4,472 women who had given birth in the year preceding the survey was about 81% (Khan et al., 2010; UNFPA, 2009). Yet only 55% actually delivered in an institution and only 8% were accompanied by an ASHA worker. Moreover, only 76% of women reported timely payments under the JSY scheme. Timely payments ranged from 40% of cases in Madhya Pradesh, 20% in Orissa, 9% in Rajasthan, 8% in Uttar Pradesh and 7% in Bihar (UNFPA, 2009). Similar estimates, drawing on this dataset, are reported by Dongre and Kapur (2012).

We hypothesize that some factors unique to the Indian context also play a major role in under-

mining the effectiveness of the program. Most importantly, targeting attempts may be undermined by the mobility of pregnant women in India. Traditionally, pregnant women travel to their mother's home to deliver their children (Palriwala and Uberoi, 2008; Jeffery and Jeffery, 1996; **?**). While the JSY scheme makes special allowances to issue cash transfers for women who deliver away from their usual residence, its success is entirely dependent on the local ASHA's initiative. As mentioned earlier, the incentive structure of the JSY may discourage ASHAs from providing antenatal care to women in their jurisdictions: ASHAs only receive a cash transfer after accompanying a woman to a hospital delivery, and may not put in effort to locate pregnant women and connect them to antenatal care when they do not expect to be compensated for their effort. Additionally, they may not be aware of each pregnant woman who travels to their town to deliver, and may not be able to connect them to care. Similarly, pregnant women may also find it difficult to seek out ASHAs' help in a new location, as they are likely to be unfamiliar with local health care providers.

This theory is also consistent with the heterogeneity of our findings, which suggests that uneducated women, and women who live in rural areas are more likely to receive care under the JSY scheme. Such women are highly likely to be poor, and thus less mobile (Jeffery and Jeffery, 1996). Staying in one location for the duration of their pregnancy due to financial constraints may actually make it easier for them to benefit from the JSY scheme. The effects we find amongst women in the lowest wealth quintile may be the result of using asset-based poverty measures rather than income-based poverty measures. Households with low asset scores may still have liquid income or the ability to borrow from others, which will allow women to travel during their pregnancies, and therefore miss out on JSY benefits.

We qualify our results and explanations however, by emphasizing that the JSY was not implemented in the framework of an RCT. Moreover, little is known about the details of the rollout across the country. We cannot rule out other factors that could explain the impact: improvements in the

supply of health services at the same time as the JSY, particularly in regions that were early adopters of the JSY could for example, be a competing explanation of our findings. Despite these shortcomings, our utilization of a large dataset and attempt to correct the methodological deficiencies of previous evaluations makes an incremental contribution to the impact of one of the largest CCT programs in the world.

6. Conclusion

This paper has presented an evaluation of India's new safe-motherhood conditional cash-transfer program, the *Janani Suraksha Yojana*. Earlier studies have documented large and strong positive effects of the program on women's access to maternal and child-health services as well as health outcomes. We argue that these effects may have been overstated. We use details of program the program's timing and eligibility rules to compare pre- and post-program health-care utilization rates.

Overall, we find that the program only had modest effects on those eligible to receive compensation under its guidelines. Relative to the broader population, groups specifically targeted by the scheme experienced a 3 percentage point increase in medically supervised births and no increase in ante-natal or post-natal care. Our results must be interpreted with caution: since the RCH collects health-care utilization information for the last child born, and poorer women have higher fertility and are thus more likely to be represented in our sample, these effects are likely to be an overestimate of the true effect of the JSY in the population.

Analysis of the heterogeneity of program impact however, suggests that even though the program did not have a large or significant overall impact, it did deliver benefits to groups such as women with no formal schooling and women living in rural areas. There is no evidence however, that the program has significant benefits for the poorest women. The poorest women may have insufficient access to the program because of the difficulty of proving their eligibility. Many wealthier households in our

survey possess the BPL cards that are needed to avail of the program's benefits.

These results have some important policy implications. The results suggest that CCT programs such as the JSY may indeed accomplished desired goals, but that effects take time to appear and may be modest. However, their large-scale, broad coverage and blanket implementation guidelines make it difficult to direct services to the most vulnerable groups. The JSY intended to target the poorest women, but the requirements of proving eligibility may have resulted in the program benefits accruing to slightly wealthier households. Illiterate women and rural women however, are better-served though they may face different constraints. Finally, the results underscore the importance of focusing on both demand and supply of health-care services. The relationship between health-care utilization on the one hand, and MCH outcomes on the other, is likely to be quite complicated and is an important topic for future research.

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Endnotes

Notes

[1]These estimates of the program are drawn from IndiaStat.com, which collected the data from the Rajya Sabha's records on July 27th, 2010.

[2]This estimate is based on author calculations from the District-Level Household Survey using the sample of women defined further on in this paper.

[3]These estimates are cited in the Ministry of Health and Family Welfare's online publication entitled "NRHM: The Progress So Far", Government of India (2012) obtained on MoHFW's website on August 15, 2012.

[4]Assessed Need is defined as the number of pregnant women during current year, which is calculated using the crude birth rate (CBR) and mid-year population (Pop) (Formula = (Pop*CBR/1000)*1.1). Source : Ministry of Health and Family Welfare, Govt. of India, 2012.

[5]These estimates are obtained from the Ministry of Health and Family Welfare, Govt. of India, 2012.

[6]These were Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Jammu and Kashmir, Manipur, Mizoram, Meghalaya, Madhya Pradesh, Nagaland, Orissa, Rajasthan, Sikkim, Tripura, Uttarakhand and Uttar Pradesh.

[7]The program aimed to provide every one ASHA to every 1000 rural residents. In tribal, hilly, desert and remote areas, the norm was relaxed to at least one ASHA per habitation.

[8]These include government health centers, subcenters (SCs), Primary Health Centers (PHCs), Community Health Centers (CHCs) or general wards of district or state hospitals, government medical colleges or accredited private institutions.

[9]These include Uttar Pradesh, Uttaranchal, Madhya Pradesh, Chhattisgarh, Rajasthan, Bihar, Jharkhand, Orissa, Jammu and Kashmir, and Assam.

[10] The survey question that was used to define treatment was as follows: "Did you receive any government financial assistance for delivery care under the Janani Suraksha Yojana (JSY)/State-Specific Scheme?" (Question 239 and variable v239).

[11]We constructed the wealth-index using all available measures of housing quality and asset-ownership in the RCH2 and RCH3. We constructed the index using principal-components analysis in STATA 12 using the command *factor*. Following examples in the literature, we focus only on the first factor. Robustness checks were carried out using the newer STATA command *pca*.

[12]Village level information was only available for 300,673 of the 323,809 observations in our sample. For the 23,136 cases where village information was unavailable, we replace missing values with averages of the distances from the various health-care institutions.

[13]We can only do this analysis for the RCH3 since the RCH2 did not ask women whether they held a BPL card.

Tables and Figures

Table 1: Cash Incentives for JSY, in rupees

	Rural Areas		Total	Urban Areas		Total
	Mother	**ASHA**		**Mother**	**ASHA**	
LP States	1400	600	2000	1000	200	1200
HP States	700		700	600		600

Source: Ministry of Health and Family Welfare, Government of India (2006).

Table 2: Eligibility for JSY Coverage

	April 2005	**November 2006**
LPS	BPL women aged 19–45	All pregnant women
	Two live births and third birth with tubectomy	
HPS	BPL women aged 19–45	All BPL SC/ST women
	Two live births, third with tubectomy	Two births, third with tubectomy

Source: Ministry of Health and Family Welfare, Government of India (2006).

Table 3: Year of latest birth, DLHS 2 and DLHS 3

Year of birth	**RCH2**	**RCH3**
1999	29,553	
2000	39,852	
2001	49,921	
2002	45,125	
2003	30,608	
2004	15,604	24,782
2005		40,754
2006		58,031
2007		71,594
2008		19,884
Total	210,663	215,045

Table 3: Notes: (i) RCH2 sample is restricted to women whose latest births were after 1999; (ii) RCH3 sample is restricted to women whose latest births were after 2004.

Table 4: Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.
Received at least 3 antenatal care visits	0.413	0.492	0	1
Delivered in a JSY facility or with JSY attendant	0.459	0.498	0	1
Check up within two weeks of delivery	0.282	0.45	0	1
Resides in a Low Performing State	0.594	0.491	0	1
District Proportion BPL	0.317	0.17	0.009	0.961
Eligible	0.702	0.457	0	1
Phase 1 (Apr 2005 to Nov 2006)	0.178	0.382	0	1
Phase 2 (Nov 2006 to Present)	0.225	0.418	0	1
Phase 1 × Eligible	0.133	0.339	0	1
Phase 2 × Eligible	0.158	0.364	0	1
Post	0.416	0.493	0	1
Post × LPS	0.259	0.438	0	1
Eligible	0.702	0.457	0	1
Post × Eligible	0.3	0.458	0	1
Poor (Lowest wealth quintile)	0.308	0.461	0	1
ST	0.172	0.378	0	1
SC	0.187	0.39	0	1
Hindu	0.765	0.424	0	1
Woman's years of schooling	4.415	4.919	0	63
Woman has no education	0.524	0.499	0	1
Woman's husband's years of schooling	6.641	5.082	0	35
Muslim	0.132	0.338	0	1
Woman's age	26.436	5.491	15	49
Woman's age squared	729.017	314.361	225	2401
Rural	0.764	0.425	0	1
Wealth Index	-0.081	0.977	-1.059	3.174
Distance to ICDS (km)	0.446	3.083	0	150
Distance to health sub-center (km)	3.188	5.476	0	261
Distance to primary health center (km)	9.407	8.91	0	510
Distance to community health center (km)	16.326	15.775	0	451
Distance to government hospital (km)	18.578	24.962	0	951
Distance to private clinic (km)	8.791	19.127	0	469

Table 4: Summary statistics of key variables.

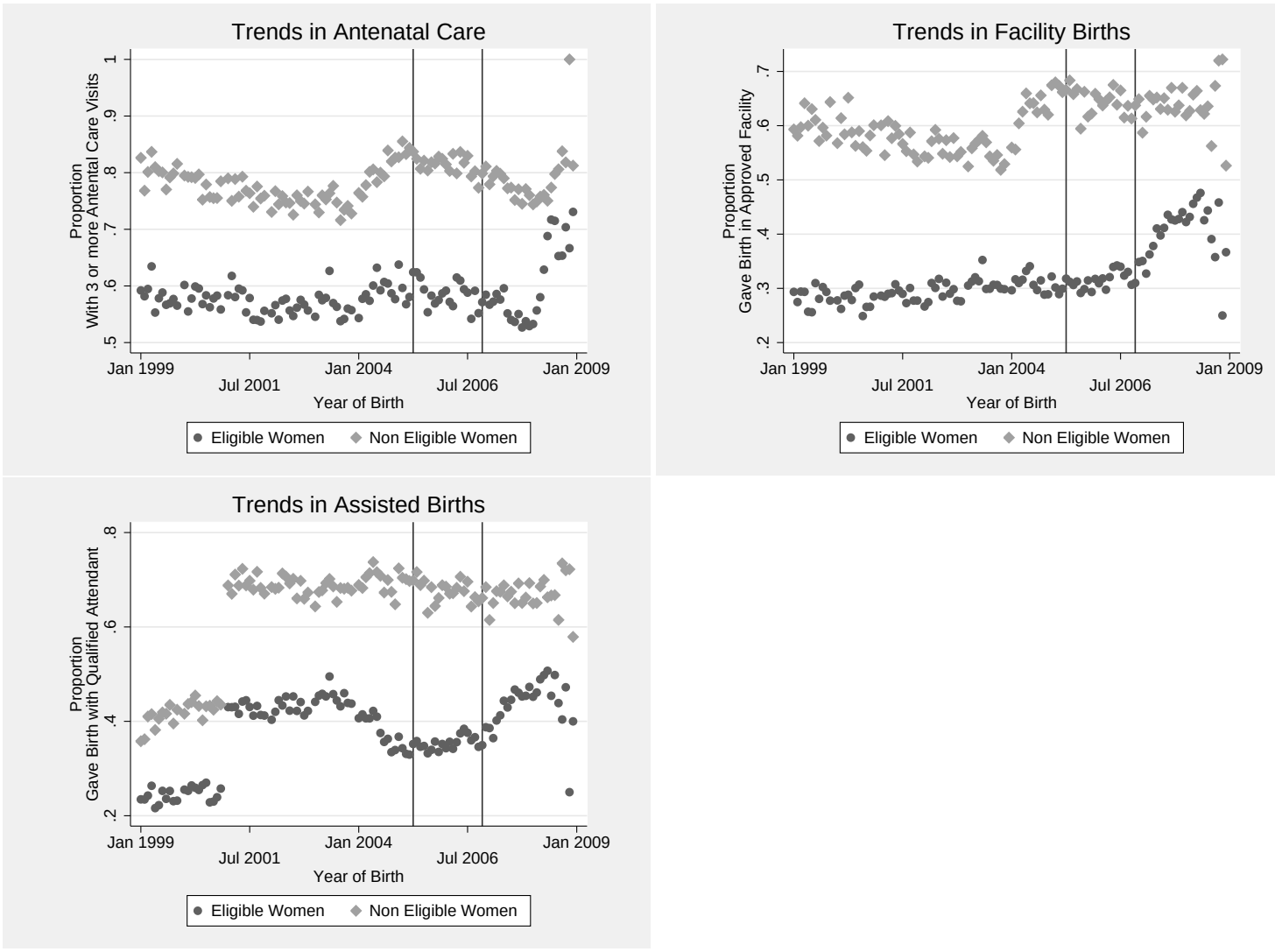

Figure 1: Trends in health-care utilization for the eligible and ineligible populations.

Table 5: Difference-in-Differences based on eligibility criteria

	(1)	(2)	(3)	(4)	(5)
Panel(A): Received at least 3 antenatalcare visits					
Eligible (β_1)	-0.313***	-0.245***	-0.204***	-0.172***	-0.171***
	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
Phase 1 (β_2^{Phase1})	0.120***	0.122***	0.088***	0.074***	0.073***
	(0.011)	(0.010)	(0.009)	(0.009)	(0.009)
Phase 2 (β_2^{Phase2})	0.079***	0.065***	0.070***	0.054***	0.053***
	(0.012)	(0.011)	(0.010)	(0.009)	(0.009)
Phase 1 × Eligible (β_3^{Phase1})	-0.014	-0.028***	-0.013	-0.029***	-0.030***
	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
Phase 2 × Eligible (β_3^{Phase2})	0.036***	0.030***	0.011	-0.004	-0.004
	(0.012)	(0.011)	(0.010)	(0.010)	(0.010)
Constant	0.605***	0.726***	0.039	0.267***	0.298***
	(0.012)	(0.013)	(0.048)	(0.047)	(0.048)
R-squared	.093	.135	.213	.226	.227
Panel (B): Delivered in a JSY facility or with a JSY approved attendant					
Eligible (β_1)	-0.289***	-0.215***	-0.166***	-0.131***	-0.128***
	(0.011)	(0.010)	(0.009)	(0.009)	(0.009)
Phase 1 (β_2^{Phase1})	0.061***	0.062***	0.028***	0.038***	0.040***
	(0.011)	(0.010)	(0.009)	(0.009)	(0.009)
Phase 2 (β_2^{Phase2})	0.048***	0.033***	0.032***	0.044***	0.047***
	(0.012)	(0.011)	(0.009)	(0.009)	(0.009)
Phase 1 × Eligible (β_3^{Phase1})	-0.039***	-0.054***	-0.038***	-0.041***	-0.040***
	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
Phase 2 × Eligible (β_3^{Phase2})	0.054***	0.046***	0.033***	0.028***	0.029***
	(0.012)	(0.011)	(0.010)	(0.010)	(0.010)
Constant	0.652***	0.788***	0.279***	0.561***	0.599***
	(0.011)	(0.011)	(0.043)	(0.042)	(0.042)
R-squared	.076	.126	.211	.235	.237
Panel (C): Check up within two weeks of delivery					
Eligible (β)	-0.079***	-0.048***	-0.033***	-0.029***	-0.027***
	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)
Phase 1 (β_2^{Phase1})	0.493***	0.494***	0.474***	0.474***	0.476***
	(0.012)	(0.012)	(0.013)	(0.014)	(0.014)
Phase 2 (β_2^{Phase2})	0.461***	0.455***	0.463***	0.463***	0.465***
	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)
Phase 1 × Eligible (β_3^{Phase1})	-0.256***	-0.263***	-0.252***	-0.251***	-0.251***
	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)
Phase 2 × Eligible (β_3^{Phase2})	-0.179***	-0.182***	-0.193***	-0.193***	-0.192***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Constant	0.226***	0.286***	-0.256***	-0.209***	-0.196***
	(0.008)	(0.009)	(0.031)	(0.029)	(0.029)
R-squared	.155	.166	.192	.193	.194
Individual controls	No	Yes	Yes	Yes	Yes
Parental controls	No	No	Yes	Yes	Yes
Household controls	No	No	No	Yes	Yes
Village controls	No	No	No	No	Yes

Table 5: Notes: (i) N=419,156; (ii) All regressions include the full set of individual and household controls; (iii) Standard errors in parentheses; (iv) * denotes significance at 10 percent level, ** significance at 5 percent level; and *** significance at 1 percent level.

Table 6: Heterogeneity of impact of JSY Programs based on SC/ST/LPS eligibility criteria

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Received at least 3 ante-natal care visits			**Delivered in a JSY facility or with attendant**			**Check-up within 2 weeks of delivery**		
Phase 1 × Eligible × No schooling	0.090***			0.044***			0.120***		
	(0.014)			(0.015)			(0.015)		
Phase 2 × Eligible × No schooling	0.078***			0.063***			0.118***		
	(0.014)			(0.016)			(0.014)		
Eligible × No schooling	-0.007			0.008			-0.046***		
	(0.010)			(0.011)			(0.009)		
Phase 1 × No schooling	-0.106***			-0.050***			-0.277***		
	(0.013)			(0.014)			(0.014)		
Phase 2 × No schooling	-0.074***			-0.070***			-0.269***		
	(0.013)			(0.015)			(0.014)		
Phase 1 × Eligible × Poor		-0.023**			0.008			-0.192***	
		(0.010)			(0.010)			(0.010)	
Phase 2 × Eligible × Poor		0.005			0.023**			-0.177***	
		(0.010)			(0.010)			(0.010)	
Eligible × Poor		-0.051***			-0.026**			-0.003	
		(0.011)			(0.012)			(0.011)	
Phase 1 × Poor		-0.031***			-0.007			-0.148***	
		(0.007)			(0.008)			(0.008)	
Phase 2 × Poor		-0.005			-0.032***			-0.151***	
		(0.008)			(0.008)			(0.009)	
Phase 1 × Eligible × Rural			0.040**			0.040**			0.036**
			(0.016)			(0.016)			(0.018)
Phase 2 × Eligible × Rural			0.061***			0.065***			0.052***
			(0.017)			(0.017)			(0.017)
Eligible × Rural			-0.071***			-0.038***			-0.081***
			(0.013)			(0.014)			(0.012)
Phase 1 × Rural			-0.076***			-0.036**			-0.290***
			(0.014)			(0.015)			(0.016)

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Table 6: Heterogeneity of impact of JSY Programs based on SC/ST/LPS eligibility criteria

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Received at least 3 ante-natal care visits			**Delivered in a JSY facility or with attendant**			**Check-up within 2 weeks of delivery**		
Phase 2 × Rural			-0.060***			-0.055***			-0.292***
			(0.015)			(0.016)			(0.016)
Phase 1 × Eligible	-0.047***	-0.005	-0.047***	-0.023**	-0.020	-0.040***	-0.238***	-0.067***	-0.227***
	(0.011)	(0.012)	(0.015)	(0.011)	(0.012)	(0.015)	(0.014)	(0.015)	(0.017)
Phase 2 × Eligible	0.018*	0.038***	0.002	-0.004	-0.001	-0.032**	-0.186***	-0.019	-0.187***
	(0.011)	(0.012)	(0.016)	(0.011)	(0.013)	(0.016)	(0.013)	(0.014)	(0.016)
Eligible	-0.137***	-0.106***	-0.093***	-0.213***	-0.192***	-0.183***	-0.038***	-0.059***	-0.001
	(0.011)	(0.013)	(0.014)	(0.012)	(0.014)	(0.015)	(0.010)	(0.013)	(0.012)
Phase 1	0.051***	0.028***	0.068***	0.089***	0.078***	0.097***	0.545***	0.486***	0.634***
	(0.010)	(0.010)	(0.014)	(0.010)	(0.010)	(0.013)	(0.013)	(0.013)	(0.015)
Phase 2	0.053***	0.033***	0.068***	0.078***	0.065***	0.093***	0.537***	0.478***	0.633***
	(0.010)	(0.009)	(0.014)	(0.009)	(0.010)	(0.014)	(0.013)	(0.013)	(0.015)
No schooling	-0.118***	-0.133***	-0.133***	-0.156***	-0.158***	-0.158***	0.039***	-0.068***	-0.069***
	(0.009)	(0.005)	(0.005)	(0.010)	(0.005)	(0.005)	(0.009)	(0.004)	(0.004)
Poor (Lowest wealth quintile)	-0.066***	-0.056***	-0.063***	-0.061***	-0.050***	-0.058***	-0.030***	0.029***	-0.029***
	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)
Rural	-0.096***	-0.066***	-0.043***	-0.080***	-0.069***	-0.053***	0.014*	0.052***	0.154***
	(0.008)	(0.011)	(0.013)	(0.008)	(0.011)	(0.014)	(0.007)	(0.011)	(0.012)
Constant	0.745***	0.680***	0.670***	0.305***	0.267***	0.261***	-0.220***	-0.256***	-0.289***
	(0.039)	(0.040)	(0.040)	(0.043)	(0.045)	(0.045)	(0.029)	(0.031)	(0.030)
R-squared	.244	.244	.244	.231	.231	.231	.21	.213	.216

Table 6: Notes: (i) N=419,156; (ii) All regressions include the full set of individual and household controls; (iii) Standard errors in parentheses; (iv) * denotes significance at 10 percent level, ** significance at 5 percent level; and *** significance at 1 percent level.