Money Matters: Evidence from a Conditional Cash Transfer Scheme on Child and Maternal Health

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Abstract

We study the impact of a maternity benefit conditional cash transfer scheme from India, on child and maternal outcomes. By exploiting the spatial variation in implementation and temporal variation in cohort-based eligibility, our DID-matching estimates suggest reductions in child mortality. Using variation in size of the transfer, our estimates reveal the importance of cash amount for desirable program effects. The potential mechanisms are increase in healthcare utilization and indirectly incentivized increase in service utilization. The muted effects on maternal outcomes indicate the concerns regarding fulfilling program conditionalities by mothers. Our findings are robust to sample restrictions, falsification tests, exact randomization.

JEL Codes: I15, I18, I12, O15, O12

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1. Introduction

Numerous factors contribute to the high maternal and child mortality in developing countries, including anemia among pregnant women, low birth weight, and inequitable service utilization. (Amin et al., 1989; Ramakrishnan, 2004). India recorded the highest number of maternal deaths (45,000 deaths) and infant deaths (850,000 deaths) in the world in 2015. Despite some improvement in the last decade, it remains one of the six nations that account for 50% of maternal mortality worldwide (World Health Organisation, 2015). Since these fatalities can largely be avoided, formulating policies that improve maternal and child healthcare (MCH) is one of the most pressing issues for policymakers. Supply-side measures such as improving the quality of healthcare institutions, financial and geographical accessibility, and availability of doctors and medical equipment are necessary but insufficient in targeting the poor. (Bhatia et al., 2006).

Over the past three decades, demand-side measures have become increasingly popular. Cash transfers, both conditional and unconditional, are such demand-side policy interventions that have been widely used in several developing nations. However, the effect of cash transfers on child and maternal mortality outcomes remains inconclusive, and evidence is majorly limited to Latin American countries, where institutions are comparably more advanced (Lagarde et al., 2007). For instance, Gertler (2004), from a randomized control program, found that PROGRESA, Mexico's conditional cash transfer program, improved child health in the long term. Barham (2011) assesses the effect of the same program on infant mortality and finds an 11% reduction in rural Mexico, but there was no impact on neonatal mortality from the program. In India, Janani Surakshya Yojana (JSY), a national conditional cash transfer (henceforth, CCT) program that focuses on institutional delivery, significantly increased the utilization of prenatal and antenatal care but did not affect neonatal, perinatal, and infant mortality (Powell-Jackson et al., 2015; Debnath, 2021).

The cash component of CCTs plays a vital role in determining their successes. Transfer size can influence gender dynamics, behavioral decisions regarding health service usage, and the overall well-being of the targeted population (Bastagli et al., 2016). If the transfer is too low, it may fail to incite people to go through the extra hassle of fulfilling conditions. Whereas if the amount is too high, it can exacerbate conflict in the household over its hold and usage. The amount must be carefully decided to cater to the program's objectives. A study on Malawi's Social Cash Transfer Programme found that adequate transfer can increase the productive capacity of rural women by stabilizing household consumption and mitigating the pressure to participate in the distress sale of labor (Davis et al., 2016). This holds important implications for rural women with limited access to productive assets and resources due to gender biases that have persisted for a long time. Another study elucidates the role of cash in Oportunidades, Mexico's anti-poverty program, showing that an increase in cash assistance to households led to better child health outcomes like higher height-for-age z-score, low stunting, and improved cognitive skills (Fernald et. al., 2008, 2009).

In this paper, we evaluate the impact of the Indira Gandhi Matritva Sahyog Yojana (henceforth, IGMSY), a maternity benefit scheme launched as a pilot in 53 districts of India in October 2010, which offers cash transfers to pregnant women if they satisfy certain conditions. The scheme aims to improve the health of pregnant and lactating women and their infants by encouraging appropriate healthcare practices and service utilization. Mothers above the age of 19 are eligible to claim the scheme for their first two births. Benefits can be availed conditional on the mother registering the pregnancy, getting at least two antenatal check-ups, participating in health and nutrition counseling, picking up iron tablets and one tetanus vaccination, attending at least two infant and young child feeding meetings after delivery, breastfeeding exclusively for six months, getting child weighed at least four times since birth till six months of age, and completing BCG, DPT, and Polio immunizations. The program offers women cash

incentives in installments to encourage them to use the abovementioned practices. The incentives are spread from six months of pregnancy to six months post-delivery. Thus, it also aims to partly compensate the mother for wage loss by reducing the need to return to work immediately after giving birth. We study the scheme's impact on maternal mortality, maternal health outcomes, and five measures of child mortality- that are, early neonatal mortality, perinatal mortality, neonatal mortality, infant mortality, and child mortality.

Exploiting the spatial variation arising from the program's pilot phase and temporal variation arising from the eligibility criteria, we employ matching pair difference-in-difference estimation strategy to estimate the program's intent-to-treat effect on the outcomes mentioned earlier. Furthermore, exploiting the variation in transfer amount, we separately evaluate the impact of higher cash transfers. We construct the program exposure by interacting the dummy variable identifying the treatment district (pilot districts) with that for eligible cohorts. We find that potential exposure to the program significantly reduces early neonatal mortality, perinatal mortality, and neonatal mortality. However, the effect is modest on infant mortality. With an increase in transfer size, the effect size and statistical significance increase for all outcomes, and the reduction in infant mortality become significant. These impacts seem operationalized through healthcare practices and vaccinations directly conditioned by the scheme, and through indirectly incentivized antenatal and postnatal service utilization.

We do not seem to find any effect on maternal mortality. We also observe marginal improvement in mild/moderate anemia among mothers and no improvement in severe anemia. This is in line with the nascent literature that CCTs, by formulation, are gendered and put the responsibility of fulfilling all conditionalities solely on the mother, thereby adding to their unpaid work burden (Benderly, 2011; Sinha et al., 2016). Maternity benefit schemes focus on fulfilling conditions related to the newborn's nutritional requirements, ignoring the mother's

requirements[3]. There is no obligation for the father to attend any counseling or family planning meetings which may disseminate the gender stereotype that child rearing is exclusively the mother's duty (Molyneux & Thomson, 2011; Esser et al., 2019). The scheme's inability to impact maternal health outcomes also stems from low wage compensation resulting in inadequate rest after pregnancy (Sinha et al., 2016; Drèze et al.,2021).

We use the children's dataset from the fourth round of the National Family, and Health Survey (NFHS-4) surveyed in 2015-16, collecting data on births five years preceding the survey to estimate the impact on child mortality outcomes. We use the NFHS-4 household data to estimate the impact on maternal mortality. Our results are robust to various sample restrictions and falsification tests. We use the third round of the District Level Household Survey (DLHS-3) to reject any pre-intervention trends in outcomes. Ideally, we would have preferred the previous round of NFHS data to test pre-trends. However, the absence of district identifiers in NFHS-3 prevents us from doing so. Additionally, we test for exact randomization wherein the treatment is randomly assigned first by district and second by birth cohorts. From this randomization exercise, we obtain effects centered around zero, supporting our findings that the scheme drives our intent-to-treat effects.

The program's effects on child mortality outcomes are more significant for male than female children. This is consistent with the literature on discrimination against the female fetus due to prevalent prenatal sex detection (Bharadwaj et al., 2013) and the persistence of discrimination post-birth (Jayachandran & Kuziemko, 2011). The results also demonstrate that children in rural areas benefit more from the scheme, which aligns with existing findings on other conditional cash transfer programs in India (Debnath, 2021). Lastly, we find lower effects for children belonging to socially disadvantaged groups. A possible explanation is that the

[3] Bartholo, (2016) in their evaluation of Bolsa Família, elucidates that although women are at the forefront in implementing CCT, the program is centred around children's welfare and ignores women's reproductive rights, thereby failing to empower women.

scheme excludes most marginalized women who face high fertility rates and lower marriage ages (Lingam & Yelamanchili, 2011).

This study adds to the extensive literature on the global evidence regarding the effects of conditional and unconditional cash transfers. The impact of CCT on healthcare utilization is primarily consistent across several reviews, which find an increase in antenatal care, institutional delivery, and immunization, but this increase in healthcare has not substantially translated to better maternal and child health outcomes (Ranganathan & Lagarde, 2012; Glassman et al., 2013). Most studies focus on the first one to two years following the launch of a program, and there needs to be more evidence regarding the program's long-term effectiveness (Hunter et al., 2017). Bastagli et al. (2016) report mixed findings in a comprehensive review of the impact of CCTs on child anthropometric outcomes. Overall, the CCTs are found to have the potential to improve anthropometric outcomes, particularly height, but the effects are typically modest. There are only a few studies that have connected healthcare utilization to child mortality, and even fewer to maternal mortality-but with mixed results (J-PAL, 2018).

Previous evaluations of IGMSY find a positive impact on healthcare utilization. Ghosh and Kochar (2018) conducted a primary survey in two districts of Bihar and reported improvement in child's weight and extended birth intervals between first and second child among treated cohorts. Haaren and Klonner (2021) did the first national-level analysis of IGMSY, and they documented higher complete immunization and a borderline significant decline in child mortality. Following the same empirical strategy, Aizawa (2022) reports that IGMSY reduced infant mortality through a survival model analysis. Both of these studies limit their research to the first two years of the scheme's launch and do not check the variation in impact due to the varying cash components in the scheme. Therefore, they find only a moderate effect of the scheme.

To our knowledge, our paper is also the first to evaluate the role of cash size in conditional cash transfer schemes in India. Further, we evaluate its impact on early neonatal and perinatal mortality, where we expect a higher impact than infant mortality since scheme conditions are centered around that time. Our second contribution to the literature is the impact of maternity benefit schemes on maternal mortality and anemia among pregnant women, which have not been well studied. Although we find no significant effect on maternal mortality and low reduction in anemia, we highlight the need to include gender sensitivity while devising the conditional components of the CCTs.

The paper is divided into eight sections, including the introduction. Section 2 provides a review of the IGMSY scheme. Section 3 details the empirical framework entailing the identification strategy and data. Section 4 discusses the results of the main outcomes, followed by robustness checks and heterogeneity of the estimates in Sections 5 and 6, respectively. Section 7 describes the potential mechanisms explaining our results. The last section discusses potential concerns and concludes.

2. Background

2.1 Maternal and Child Healthcare

In 2005, India accounted for about 20% of the global maternal deaths and 31% of the global neonatal deaths (Rajaratnam et al., 2010). The government, in response, introduced the National Rural Health Mission, which has undertaken several projects to improve Matrenal and Child Health (MCH). The JSY is one such initiative that aims to improve access to institutional delivery for women, particularly those from the most underprivileged parts of society, consequently lowering maternal and newborn mortality. This has to be implemented with the help of community-based health workers, such as the ASHAs. About 0.9 million ASHA

workers are a vital link between the government and pregnant women receiving institutional delivery financing. They identify pregnant women and assist them in reaching a health center. It is a fully centrally sponsored, national CCT scheme. Cash disbursement is to be done after delivery, dependent on institutional birth, with the help of a skilled birth attendant.

JSY focuses on poor pregnant women, specifically in states with low institutional delivery rates called the Low Performing States[4]. In these states, all women are entitled to cash assistance of Rs. 1400 (US$ 16.95 approximately) in rural areas and Rs. 1000 (US$ 12.11 approximately) in urban areas for all births. In other states, the benefits are restricted to the below poverty line (BPL) households or women from socially disadvantaged groups who are given cash assistance of Rs. 700 (US$ 8.47 approximately) in rural areas and Rs.600 (US $7.26 approximately) in urban areas for the first two births. All BPL pregnant women in all states or union territories are eligible for financial assistance of Rs. 500 (US$ 6.05) for each delivery, regardless of their age or the number of children if they wish to deliver at home (Press Information Bureau, 2015). While the poor maternal and child healthcare system, is a prevalent problem, there is considerable regional variation in the quality and utilization of healthcare services (Carvalho & Rokicki, 2019; Mishra et al., 2021).

Many studies on JSY have shown that it significantly improved intended outcomes such as antenatal care, prenatal care, and institutional births (Lim et al., 2010; Powell-Jackson et al., 2015; Rahman & Pallikadavath, 2018) and unintended positive outcomes such as an increase in immunization (De & Timilsina , 2020). It does not seem to impact breastfeeding or child health outcomes such as birth weight and mortality (Carvalho et al., 2014; Debnath, 2021). Also, the poorest and least educated women does not seem to have the highest odds of receiving JSY payments. Its uneven application, high out-of-pocket expenditure, low quality of services,

[4] These include Uttar Pradesh, Uttarakhand, Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Assam, Rajasthan, Orissa, Jammu and Kashmir. The states left are called as High performing States.

and unintended adverse effects on raising fertility are some of the reasons for its failure to address child health outcomes (Modugu et al., 2012; Nandi & Laxminarayan, 2016). As a result, to address the dismal MCH, several states launched their own maternity benefit schemes along with IGMSY. Table A1 provides a list of major programs that were in place in the country between 2005 and 2015.

2. 2 Indira Gandhi Matritva Sahyog Yojana (IGMSY)

The MoWCD rolled out the IGMSY on october 2010 as a Pilot in 53 districts providing a conditional cash transfer of Rs 4000 (US$ 49 approximately) in three installments (Rs. 1,500 + Rs. 1,500 + Rs. 1,000). The minimum eligibility age for the scheme is set at 19 to ensure marriage and childbirth at the right age. It is restricted to first two live births to evade incentivizing fertility. A composite score of six development indicators calculated from the DLHS-3 was used to select these 53 districts. Based on the score, all districts were divided into three groups: low-performing, middle-performing, and high-performing. From this, districts were chosen randomly. That is, 11 districts from poor performing, 11 from high performing, 26 from middle performing, and 4 were Union Territories. In these districts, all eligible pregnant women, excluding the state and the central government employees, could avail of the benefits for their first two live births[5] (MoWCD, 2011).

It is implemented through Anganwadi centers (AWC) run by Anganwadi workers (AWW) under Integrated Child Development Services. AWW informs the beneficiaries about the program and submits applications for each installment on their behalf. AWW receives a cash incentive of Rs. 200 (US$ 2.42) per beneficiary once all the transfers are complete. They are responsible for monitoring the health of pregnant women, managing the supplementary

[5] If the beneficiary gives birth to live twins during her first pregnancy, she can avail of the scheme only once, as she would only need to take time off and lose wages once. If the beneficiary has one child and gives birth to twins during the second delivery, she can still avail of the scheme.

nutrition program, assisting health workers in immunization drives, and informing IGMSY beneficiaries to also enroll in JSY. The beneficiary receives a Mother and Child Protection (MCP) card upon registering the pregnancy. For each installment, the mother is required to provide the AWW with a copy of her MCP card, bank passbook, and Unique Identification (UID) provided by the government of India, which is also known as the Aadhaar card. This application is sent by the AWW to her supervisor, who then sends it to the block child development office, which adds the data to the IGMSY software. The transfer is then made directly to the beneficiary's bank account. The compulsion to have a bank account in the beneficiary's name and this long, convoluted process are significant bottlenecks to the scheme, delaying the transfer to the beneficiary (Sinha et al., 2016).

On July 2013, the IGMSY was brought under the National Food Security Act (NFSA), which was the first act to recognize maternity entitlement of Rs. 6000 (US$ 73 approximately) per child as the legal right of every pregnant woman. The cash benefit was revised from Rs. 4000 (US$ 48.82) to Rs. 6000 (US$ 72.64) but was still limited to the first two live births. Previous evaluations of the scheme mention that the restrictive eligibility criteria hinders its ability to target the most vulnerable women who face high fertility rates (Lingam & Yelamanchili, 2011). In response to inquiries regarding the universalization of NFSA, MoWCD claimed that it planned to expand IGMSY from 53 to 200 districts in 2015-16 and all districts in 2016-17. However, the IGMSY budget allocation in the Union Budget for 2016–17 remained at just Rs.400 crore (that is, US$ 24.2118 million, as in 2015–16 and 2014–15), making expansion beyond the 52 pilot districts unlikely. Table A2 reports the budget allocations for the program over the years.

In 2017, the scheme was renamed Pradhan Mantri Matru Vandana Yojana (PMMVY), and MoWCD announced pan-India implementation. The scheme was reformulated wherein the cash benefit was reduced to Rs 5000, and eligibility criteria were limited to the first child only.

The government contended that since PMMVY is complementary to JSY, the total cash benefit would be in accordance with NFSA. Table A3 summarises the scheme's evolution and table A4 lists the conditionalities attached.

3. Empirical framework

3.1 Identification Strategy

The institutional aspects of implementing IGSMY give us an intriguing dimension of variation across districts, cohorts, and cash assistance. Using a matching pair difference-in-differences (DID) design, we take advantage of these dimensions to evaluate the impact of IGMSY on child and maternal mortality. We also want to see if receiving higher cash benefits in IGMSY resulted in better child and mother survival. Our estimation method is similar to studies (Ghosh & Kochar, 2018; Haaren & Klonner, 2021) which use Intent to Treat analysis considering the scheme's pilot phase as a natural experiment. As mentioned earlier that 53 of the 640 districts were chosen at random based on a composite score as treatment districts, thereby giving us 'IGMSY Districts'. For the control districts, we could consider all other districts in which the program was not implemented. However, such a naive comparison could give biased results in the case of control districts having different characteristics than the treatment districts. To address this issue, Von Haaren & Klonner (2020) conducted a matching exercise wherein they recalculated the composite index from DLHS-3, which was originally used to select the pilot districts to identify for each pilot district a control district from the same state. The same matched pairs are used in this study. Table A5 provides a list of these pairs.

The cohort variation in the program's implementation is the first dimension of our DID-matching framework. As discussed above, the scheme was in the pilot phase till 2014, so we restrict our analysis to births from 2010 to 2014. Although the scheme was launched in October

2010, the center and the states reached an agreement on program guidelines in April 2011, and the training of implementation staff was to be completed by May 2011. As a result, the first cohort to receive the benefits of the scheme are those born from January 2012 onwards (Haaren & Klonner, 2021). In terms of budget, apart from Meghalaya, no other state spent any money in the fiscal year 2010-11, and therefore there were essentially no beneficiaries during this time (Falcao et al.,2015). So, children born in 2010-2011 consist of 'ineligible cohorts', and children born in 2012-14 consist of 'eligible cohorts'.

Further, children born post-July 2013 received higher cash benefits. This variation is considered in the second specification of our analysis. Table 1 summarises our identification strategy.

<Insert Table 1 here>

The children who were born between 2012-2014 and in pilot districts are called the exposed cohorts, which are additionally divided into two categories: 'Exposed Low' indicating the cohorts which received lower transfers in phase 1, and 'Exposed High' indicating the cohorts which received higher transfers in phase 2. Using a matched pair DID, we compare the differences in the outcomes of the eligible cohorts and not-eligible cohorts in IGMSY Districts to the differences in the outcomes of the eligible cohorts and not-eligible cohorts in Non-IGMSY Districts. The identification assumption is that in the absence of IGMSY, the difference between the means of outcomes for the eligible cohort in IGMSY and Non-IGMSY districts would be the same as the difference between the means of the outcomes for the not-eligible cohort in IGMSY and Non-IGMSY districts. We discuss the validity of this assumption in Section 4.3.

The double difference regression equation for the entire sample is given by:

$$Y_{ihdst} = \alpha_d + \theta_t + \pi_{st} + \beta_1(Eligible_i \times IGMSY\_District_d) + \gamma_1 X_{ihdst} + \varepsilon_{ihdst} \quad (1)$$

where Y_{ihdst} is the outcome variable for i^{th} individual (child when evaluating child's outcomes and mother when evaluating mother's outcomes) in household *h* of district *d* of state *s* born in birth-year *t*. $Eligible_i$ is an indicator variable representing the individuals from the treated or control cohorts (takes the value 1 if the child is born between 2012-2014 and takes the value 0 otherwise). $IGMSY\_District_d$ is an indicator variable representing the treated districts (takes the value 1 if the child is born in pilot districts where IGMSY was implemented and 0 otherwise). The coefficient of interaction β_1 captures the effect of exposure to the maternity benefit scheme on *Y*. α_d captures the district-fixed effects. θ_t represents the child's birth-year fixed effect when considering the child's outcomes and the mother's birth-year fixed effects when considering the mother's outcomes. $\pi_{st,}$ are the state-time trends that capture state-specific common time-trends. X_{ihdst} represents the set of controls which includes the sex of the child and birth order, household characteristics such as the area of residence, religion, caste, and wealth quintile, and the mother's characteristics such as age, height, and education level wherever applicable. Standard errors are clustered at the district level, which is the level of treatment (Abadie et al., 2017).

As specified previously, the cash assistance under the IGMSY scheme was low in the initial years but was later increased. We estimate the following regression equation to gauge the variation in cash transfer:

$$Y_{ihdst} = \alpha_d + \theta_t + \pi_{st} + \beta_{Phase\ 1}\left(Eligible_{Phase\ 1_i} \times IGMSY\_District_d\right) + \beta_{Phase\ 2}\left(Eligible_{Phase\ 2_i} \times IGMSY\_District_d\right) + \gamma_1 X_{ihdst} + \varepsilon_{ihdst} \quad (2)$$

where *Phase 1* represents the cohorts born between 2011 to June 2013 (18 months) that received lower cash benefits, and *Phase 2* represents the cohorts born between July 2013 to

2014 (18 months) that received higher cash benefits. $\beta_{Phase\ 1}$ and $\beta_{Phase\ 2}$ are the coefficients of interest which estimate the change in outcomes of exposed cohorts relative to unexposed cohorts in each phase. We expect the impact in phase 2 to be higher owing to the higher cash assistance.

3.2 Data

The NFHS-4 data, collected in 2015-16, surveyed 640 districts of India, covering 601,509 households from randomly selected women aged 15 to 49 and men aged 15-54 years. The survey used four questionnaires: household questionnaire, women questionnaire, men questionnaire, and biomarker questionnaire. Our working sample consists of household-level data derived from the household questionnaire and child-level data derived from the women's questionnaire.

We use five measures of child mortality: early neonatal mortality (if the child dies before completing seven days), perinatal mortality (if the pregnancy ends in stillbirth or early neonatal death), neonatal mortality (if a child dies before completing one month), infant mortality (if the child dies before completing one year), and child mortality (if the child has perished). These are all binary variables that take the value one if the child has perished before completing the required age. We exclude children who have not reached the required age for the respective mortality measure.

Maternal mortality is an indicator variable that takes the value one if the mother has died during pregnancy, childbirth, or within two months after the end of pregnancy, and 0 if she survived. However, NFHS data is not suitable to estimate the nationally representative maternal mortality rates. The survey asks the household head on whether any female above the age of 12 has passed during pregnancy, childbirth, or two months post-delivery, and due to the

high nonresponse rate in this question, the NFHS cannot accurately estimate maternal mortality (Bhatia et al.,2021). Therefore, we also explore a few more maternal health outcomes to understand how the scheme works for mothers. We consider the prevalence of different stages of anemia to reflect maternal health because it is a prevalent problem among women in India that affects maternal and early child mortality (Daru et al., 2018; Smith et al.,2019). Since the program gives iron tablets and provides nutrition to mothers during pregnancy, we expect improvement in those outcomes as well. Further, we explore the impact of the scheme on practices and immunizations directly incentivized by the scheme and healthcare service utilization to explain our results.

To ensure that we capture the true impact of the scheme, we exclude those states which have their own maternity program functioning in this time frame. The states excluded from our working sample are Odisha (for the MAMATA Program), Madya Pradesh (for the Mukhyamantri Mazdoor Suraksha Yojana), Tamil Nadu (for the Dr. Muthulakshmi Maternity Assistance Scheme), and Maharashtra (for the Matrutva Anudan Yojana). We also exclude Union Territories, Nagaland, and Jammu and Kashmir, which were not surveyed in DLSH-3. We do not restrict our sample to eligibility criteria of the first two childbirths because of the likelihood of non-conformity with this rule as established in the literature (Haaren & Klonner, 2020).

To examine the potential selection bias brought on by sample attrition, we conduct a balancing test of outcomes and covariates. We do this exercise because for DID to produce unbiased treatment effects, the baseline characteristics of the treatment and control districts should not differ significantly. Table 2 reports the mean of outcomes and covariates in IGMSY and Non-IGMSY districts before the launch of the scheme, which shows there is no significant difference between the two for the main outcome variables. We see a borderline difference in BCG and DPT vaccination coverage. The difference between mothers who have had at least

four antenatal care is statistically significant at a 5% level. We also observe that IGMSY districts have a higher population with religious affiliation Hindu, belonging to SC/ST, and taller mothers. However, the magnitude of the observed differences being very small when we control for those characteristics in all our specifications, we believe it reduces the potential of our treatment effects to be biased. With regard to education and the wealth index, we observe a mixed spread with IGMSY districts having more poorest and fewer poorer people. We account for these differences by including them as controls in our specifications. We also include district fixed effects, and birth year-fixed effects that are expected to take care of district-specific differences between children born in the pilot district and control district, and district-invariant but time-variant differences between children born before and after the scheme, respectively. Further, we also have state-time trends to absob state-specific general time-trends in unobservables.

<Insert Table 2 here>

The summary statistics after the scheme's implementation are reported in table A6. Columns (1) and (2) show the means for eligible cohorts born in non-IGMSY districts (not exposed) and IGMSY districts (exposed) for the entire sample. The mean value for all measures of child mortality is lower for children born in IGMSY districts. Except for mothers having at least two antenatal care, the means of all other directly incentivized healthcare practices and healthcare utilization are higher for cohorts exposed to the scheme. The table also reports phase-wise mean values of variables for pilots in control districts from columns (3) to (6). As expected, on average, we observe the lowest mortality in Phase 2. The same pattern can be observed for the mean values of variables on healthcare utilization and immunisations directly incentivised by the scheme. We do not see a similar pattern in the control variables, which

implies that the averages of household charaertcis have more or less remained the same across IGMSY and Non-IGMSY districts.

4. Results

4.1 Child Outcomes

Table 3 reports the effect of IGMSY on five measures of child mortality explained earlier. Panel 1 reports the coefficient of interaction terms from equation 1, which captures the effect of IGMSY on the entire sample, wherein the exposed cohorts are children born between 2012-2014. Panel 2 and Panel 3 report the estimates of $\boldsymbol{\beta_{Phase\ 1}}$ and $\boldsymbol{\beta_{Phase\ 2}}$ from equation 2, which capture the effect of IGMSY in phase 1 where the cash transfer was low, and phase 2, where cash transfers were high, respectively.

<Insert Table 3 here>

The estimates in Panel 1 indicate that for the exposed cohorts, the reduction in early neonatal mortality equals 45 % of the control mean, which is statistically significant at the 5% level. We also observe that perinatal mortality and neonatal mortality were reduced by 30 % and 32 % of the controlled mean, respectively. We do not find any statically significant fall in infant mortality which carries a negative sign. Overall, child mortality for exphosed cohorts was reduced by 1.8 percentage point which is a 37 % decrease from the baseline mean. We do not observe any significant effect in phase 1, even though all coefficients have negative signs. Moreover, as expected, the effect size in phase 2 is the largest, as shown in Panel 3. The highest impact is still on early neonatal mortality, which is now significant at the 1% level. We also observe a significant reduction in infant mortality for exposed cohorts in phase 2. A possible

reason for less reduction in infant mortality can be that the incentives under the IGMSY are contingent on prenatal care and centered around the first six months of birth.

Overall the results indicate significantly lower early child mortality for the cohorts potentially exposed to IGMSY program compared to unexposed cohorts. We also conduct a robustness check to verify if the estimates are sensitive to the covariates. Table A7 reports the result of estimating equations (1) and equation (2) without controls. The coefficients carry almost similar effect sizes and significance.

4.2 Maternal Outcomes

Column (1) of table 4 shows that the program seem to have no significant effect on maternal mortality, even with higher cash assistance.

<Insert Table 4 here>

Columns (2) to (4) report the effects of the IGMSY on severe anemia, mild and moderate anemia, and no anemia. Overall exposure to the program led to a 4% decline from the control mean in the likelihood of mild/moderate anemia among mothers and a 5% rise from the control mean in the likelihood of no anemia. We do not observe any significant change in severe anemia, which may be challenging to address. Again coefficients have a higher magnitude in phase 2, but they are statistically significant at only 10%. Overall, the IGMSY does not seem to be as much beneficial for maternal health as it has been for child health. Studies have shown that when CCTs explicitly target mothers to complete all program requirements, they further add to their unpaid work burden (Benderly, 2011). This may further

prevent them from getting adequate rest during pregnancy due to the conditionalities of such a program where most of the burden to meet those conditions lies on the mothers.

4.3 Pre-intervention trends and Falsification Test

Our estimation strategy relies on the assumption of parallel trends, which implies that the difference in outcomes between the eligible and non-eligible cohorts born in IGMSY and Non- IGMSY districts would be the same in the absence of the program. This, by definition, is not testable; however, trends in dependent variables before the program launch can be tested. To ensure the reliability of the estimated results, we test for pre-intervention using DLHS-3 dataset[6] surveyed in 2007-08, interviewing 720,320 households and collecting data from ever-married women aged 15-49 on reproductive health and child outcomes for births five years preceding the survey.

Similar to our identification strategy (see Table 1), we define children born in 2004-05 as placebo ineligible and 2006-2008 as placebo eligible. Eligible children born in IGMSY district are defined as placebo exposed cohorts. Using the same identification strategy mentioned in equation 1 and 2 we estimate the interaction coefficient between placebo-eligible cohorts and IGMSY districts. The results are reported in table A8. The estimates are all statistically insignificant, and the effect sizes are close to zero. Based on the findings it appears unlikely that pre intervention differences in trend of outcome variables between cohorts born across IGMSY and Non-IGMSY districts would confound our estimates. Therefore, we conclude that our research design satisfies the falsification test.

[6] We could not use NFHS-3 AND DLHS-4 because the NFHS-3 lacks district identifiers and the DLHS-3 excludes the central states of our analysis.

5. Robustness

5.1 Sample restrictions

As discussed in our identification strategy, although the scheme launched in 2011, the first cohort to benefit from the scheme is those born in 2012. However, there is a possibility that some children born between June and December 2011 might have benefited from the scheme earlier than expected, underestimating its impact. Therefore we remove children born between June to December 2011 from our ineligible cohorts and run the same model as above. The results are presented in Table A9. As anticipated, we observe an increase in magnitude for all outcomes. The effect size increase in magnitude and for cohorts exposed in phase 2 the impact becomes statically significant at 1% for all five measures of child mortality. We also observe some impact in Phase 1. So we conclude that our previous estimates may be considered to underestimate the IGMSY impact.

We also check that our estimates are not sensitive to this sample by appending NFHS-5 data on 2014 births. NFHS-4 was surveyed in 2019-2021 in two phases due to covid pandemic, and it collected data on births five years preceding the survey. So for the states which were surveyed in 2019[7], we have the data on births from 2014. The results from the appended datasets are shown in Table A10. We observe almost the same impact for all the outcomes except for infant mortality which has the same magnitude but has lost its significance in Phase 2. Although it was just boderline significant previously, we consider our findings regarding infant mortality as less robust.

[7] 22 states were surveyed in 2019-20, which includes: Andhra Pradesh, Assam, Bihar, Goa, Gujarat, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Telangana, Tripura, West Bengal, Andaman Nicobar Island, Dadra, and Nagar Haveli and Daman and Diu, Jammu & Kashmir, Ladakh and Lakshadweep.

5.2 Exact Randomisation

We test for exact randomization or random simulation of treatment status (Bharadwaj et al., 2014) to ensure that our findings are not spurious but indeed show the actual program's effect. Two different simulations are run to carry out the test. For the first simulation, instead of using the pilot districts in which IGMSY was implemented, we randomly assigned districts' IGMSY and Non-IGMSY statuses. Following the empirical strategy mentioned in equation 1, we do the regression analysis for all our main outcome variables. One thousand simulations are run for each outcome. Our identification assumption would hold if the estimates from this test are insignificant and the effect size is more diminutive. The reason is that these estimates reflect the results of a placebo trial, not the actual effect of IGMSY. Results from this simulation exercise are shown in Figure 1. Notice that for child mortality, the distribution of stimulated coefficients is centered around zero and much smaller than our estimated coefficients -0.0137 (indicated by a solid red line). A similar trend follows for all other outcomes.

For the second simulation, we do the same exercise for the eligibility criteria of IGMSY. Children born are randomly assigned as eligible and ineligible status, and we plot the distribution of coefficients from 1000 simulations in Figure 2. Again, the simulated coefficients are centered around zero, following a normal distribution. This randomization helps us to strengthen the validity of our identification strategy, wherein delegating treatment to random districts or cohorts produces inaccurate results.

<Insert Figure 1 and 2 here>

6. Heterogeneity

Tables 5-9 present the heterogeneity in impact by caste, sex of the child, and area of residence for all the main outcomes. Due to the male-preferring attitude towards the sex of children and overall neglect of the mother when a female child is born, the effects of the scheme could be different across the sex of the children. The estimates show that the mortality rates are lower for male children, specifically in phase 2, when the scheme had the most impact. Column (3) in panel 3 of table 5 shows that for the male child, the mortality due to higher cash transfer declined by 2.1 percentage points, but the effects for female children are lower in magnitude and statistically insignificant, shown in column (4).

<Insert Table 5 here>

<Insert Table 6 here>

<Insert Table 7 here>

<Insert Table 8 here>

<Insert Table 9 here>

The gender-based heterogeneity in effects for early neonatal and perinatal mortality, as presented in columns (3) in panel 3 of Tables 6 and 7 show that male mortality declined by approximately by 2 percentage points on average. In contrast, our results do not support any significant reduction in female mortality. The significant reduction in early neonatal and perinatal male mortality and none in female is interesting because it indicates that male children seem to have lower chances of stillbirth and manifest a better survival chance within the first week of being born. A plausible channel for these findings could be the pervasiveness of prenatal sex selection in India, which could lead to discrimination against female fetuses (Bharadwaj et al.,2013). Column (1) in panel 3 of table (9) report that infant mortality for male children also seems to fall by 2.8 percentage points, whereas the impact is marginally close to zero for the female child. The continuation of discrimination post-birth can explain this.

Jayachandran & Kuziemko (2011) discuss the gender-ender disparity in breastfeeding rates accounts for 14% of additional female child mortality.

Columns (1) from tables 9-11 indicate that socially disadvantaged groups benefit less from the program. Column (2) in panel 3 of table 6 shows that for children born in households other than Scheduled Caste/Scheduled Tribe (SC/ST)[8], the early neonatal mortality declined by 2.1 percentage points, which is statistically significant at the 1% level. Lingam & Yelamanchili (2011) discuss that the scheme excludes 48% of women from maternal entitlement who marry before 18 and have more than two children due to its eligibility criteria. The burden is born mainly by the women of SC/ST households because they face early marriage and tend to have higher fertility rates. Since they had worse outcomes, to begin with, a small transfer may not be able to make an impact. Therefore, we observe that the effect size is smallest in Phase 1, but with an increase in cash transfer in phase 2, we see some improvement, although not statically significant.

Lastly, as shown by column (6) of table 7-11, the scheme was more effective for women residing in rural areas. From column (6) in panle 3 of table 6 we observe that on average a significant reduction in early neonatal mortality by 2.7 percentage points and overall child mortality by 3.1 percentage points in rural areas, reported in table 5. This is in line with the JSY, which also had a higher impact in rural areas (Debnath, 2021).

7. Mechanisms

We found that children who might have been exposed to the IGMSY scheme were likely to have less mortality. This could directly result from the program since IGMSY has

[8] These are socio-economically disadvantaged groups identified by the government of India on the basis of their caste affiliations, for the purpose of providing them certain benefits.

conditionalities on getting children vaccinated and mandate Infant and Young Child Feeding counseling sessions. In addition, the program holds meetings on nutrition and health, and regularly weighs children. The above finding also indicates that the maternity benefit scheme has a modest effect on mothers' health outcomes and no effect on maternal mortality. This reason could be the lack of rest after pregnancy and the conundrum of unpaid work faced by women, which is difficult to explore due to the scarcity of data on paid and unpaid work during pregnancy. However, for outcomes that are significantly impacted, we provide a few plausible mechanisms that could explain our results.

First, we examine the program's effect on directly incentivized vaccinations and other conditions, documeneted in tabe 10. Panel 3 of column (1) shows that exposed mothers are, on average, 3 percentage point more likely to collect iron tablets during pregnancy which is one of the conditions to get the first installment of the scheme. Column (2) in panel 3 reports if the mother had at least two antenatal care visits during pregnancy which also on average increases by 3 precentage point in phase 2. Columns (3) to (5) report the effect of IGMSY on three immunizations: BCG, three doses of DPT, and three doses of Polio. We see a higher impact on DPT and Polio vaccine, for which the baseline mean is low, whereas the coverage of the BCG vaccine is almost 90% before the scheme's launch. We do not observe any impact on breastfeeding exclusively for at least six months.

<Insert Table 10 here>

<Insert Table 11 here>

Secondly, we look at the effect on service utilization due to potential exposure to the scheme, shown in Table 11. Again, we observe the highest impact in Phase 2. Possible exposure to the scheme significantly increases the likelihood of getting at least four antenatal care during pregnancy. Take up of service from Anganwadi centers also rises, as shown in columns (2) and (4). However, we consider these effects with caution due to the high non-response rate. Column

(3) in panel 3 shows that IGMSY increases the likelihood of postnatal check-ups for infants within two months of birth by 16% of control mean in phase 2.

8. Discussions and Conclusion

Using spatial and temporal variation in a natural experiment setup, this paper studies the impact of a maternity benefit related conditional cash transfer scheme implemented in India on maternal and child mortality. Additionally, by exploiting the variation in transfer size, we explore the role that the size of the transfer plays in making the scheme more effective. The ITT estimates using the matching DID method demonstrate that the scheme seems to reduce child mortality, specifically in the early stages, and the impact is more significant for cohorts who received higher cash benefits. The impacts are operationalized through immunization and nutrition counseling and are directly conditioned by the scheme and through higher healthcare service utilization. Again we find that increasing transfer size incentivizes people to seek healthcare practices.

Secondly, we are unable to establish an evidence of such an impact of the scheme on the maternal mortality of the mothers. We find only a moderate impact on reducing anemia among mothers. We highlight how the gendered nature of CCT may have a role in preventing it from addressing outcomes related to mothers.

The heterogeneity results indicate that the male children benefit more from the program pertaining to discrimination against female children both in utero and after birth. When the cash transfer is low, the scheme does not seem to have any impact on children born in marginalized households. We observe some improvement when the cash is increased but not substantial enough owing to the vulnerable conditions they begin with. The scheme has the scope of providing universal maternity entitlement by dropping its eligibility criteria. The

amount of cash disbursed can hold high value for the most marginalized however, its successor PMMVY has further restricted the eligibility to only one child and reduced the cash assistance to Rs. 5000 (US$ 60.44), which violates NFSA. As mentioned, the IGMSY excludes the most vulnerable women who face high fertility rates. The PMMVY, with more restrictive eligibility criteria, is expected to exclude more such women leading to targeting failure, if not paid enough attention to its impact. Our paper is expected to contribute towards that objective.

References

Abadie, A., Athey, S., Imbens, G. W., & Wooldridge, J. M. (2022). When should you adjust standard errors for clustering?. *Quarterly Journal of Economics*. National Bureau of Economic Research, 1–35. doi:10.1093/qje/qjac038 (No, w., *24003*).

Aizawa, T. (2022). Does the conditional maternal benefit programme reduce infant mortality in India? *Health Policy and Planning*, *37*(9), 1138–1147. doi:10.1093/heapol/czac067

Amin, R., Chowdhury, S. A., Kamal, G. M., & Chowdhury, J. (1989). Community health services and health care utilisation in rural Bangladesh. *Social Science and Medicine*, *29*(12), 1343–1349. doi:10.1016/0277-9536(89)90234-7

Barham, T. (2011). A healthier start: The effect of conditional cash transfers on neonatal and infant mortality in rural Mexico. *Journal of Development Economics*, *94*(1), 74–85. doi:10.1016/j.jdeveco.2010.01.003

Bartholo, L. (2016). Bolsa Família and women's autonomy. *Research Brief*, *57*.

Bastagli, F., Hagen-Zanker, J., Harman, L., Barca, V., Sturge, G., Schmidt, T., & Pellerano, L. (2016). *Cash transfers: What does the evidence say. A rigorous review of programme impact and the role of design and implementation features*, *7* p. 1. London: Overseas Development Institute.

Benderly, B. L. (2011). *A bargain or a burden? How conditional cash transfer (CCT) program design affects the women who participate in them*. World Bank.

Bharadwaj, P., & Lakdawala, L. K. (2013). Discrimination begins in the womb: Evidence of sex-selective prenatal investments. *Journal of Human Resources*, *48*(1), 71–113

Bhatia, M., Dwivedi, L. K., Banerjee, K., Bansal, A., Ranjan, M., & Dixit, P. (2021). Pro-poor policies and improvements in maternal health outcomes in India. *BMC Pregnancy and Childbirth*, *21*(1), 389. doi:10.1186/s12884-021-03839-w

Bhatia, M. R., Yesudian, C. A. K., Gorter, A., & Thankappan, K. R. (2006). Demand side financing for reproductive and child health services in India. *Economic and Political Weekly*, 279–284.

Carvalho, N., & Rokicki, S. (2019). The impact of India's Janani Suraksha Yojana conditional cash transfer programme: A replication study. *Journal of Development Studies*, *55*(5), 989–1006. doi:10.1080/00220388.2018.1506578

Carvalho, N., Thacker, N., Gupta, S. S., & Salomon, J. A. (2014). More evidence on the impact of India's conditional cash transfer program, Janani Suraksha Yojana: Quasi-experimental evaluation of the effects on childhood immunization and other

reproductive and child health outcomes. *PLOS ONE*, *9*(10), e109311. doi:10.1371/journal.pone.0109311

Daru, J., Zamora, J., Fernández-Félix, B. M., Vogel, J., Oladapo, O. T., Morisaki, N., . . . and Khan, K. S. (2018). Risk of maternal mortality in women with severe anaemia during pregnancy and post partum: A multilevel analysis. *Lancet. Global Health*, *6*(5), e548–e554. doi:10.1016/S2214-109X(18)30078-0

Davis, B., Handa, S., Hypher, N., Rossi, N. W., Winters, P., & Yablonski, J. (Eds.). (2016). *From evidence to action: The story of cash transfers and impact evaluation in sub Saharan Africa*. Oxford: Oxford University Press.

De, P. K., & Timilsina, L. (2020). Cash-based maternal health interventions can improve childhood vaccination—Evidence from India. *Health Economics*, *29*(10), 1202–1219. doi:10.1002/hec.4129

Debnath, S. (2021). Improving maternal health using incentives for mothers and health care workers: Evidence from India. *Economic Development and Cultural Change*, *69*(2), 685–725. doi:10.1086/703083

Drèze, J., Khera, R., & Somanchi, A. (2021). *Maternity entitlements in India: Women's rights derailed*.

Esser, A., Bilo, C., & Tebaldi, R. (2019). *How can cash transfer programmes work for women and children? A review of gender- and child-sensitive design features*.

Falcao, V. L., Khanuja, J., Matharu, S., Nehra, S., & Sinha, D. (2015). *Report on the study of the Indira Gandhi Matritva Sahyog Yojana*. New Delhi: Centre for Equity Studies.

Fernald, L. C., Gertler, P. J., & Neufeld, L. M. (2008). Role of cash in conditional cash transfer programmes for child health, growth, and development: An analysis of Mexico's Oportunidades. *Lancet*, *371*(9615), 828–837. doi:10.1016/S0140-6736(08)60382-7

Fernald, L. C., Gertler, P. J., & Neufeld, L. M. (2009). 10-year effect of Oportunidades, Mexico's conditional cash transfer programme, on child growth, cognition, language, and behaviour: A longitudinal follow-up study, L. M. *Lancet*, *374*(9706), 1997–2005. doi:10.1016/S0140-6736(09)61676-7

Gertler, P. (2004). Do conditional cash transfers improve child health? Evidence from PROGRESA's control randomized experiment. *American Economic Review*, *94*(2), 336–341. doi:10.1257/0002828041302109

Ghosh, P., & Kochar, A. (2018). Do welfare programs work in weak states? Why? Evidence from a maternity support program in India. *Journal of Development Economics*, *134*(C), 191–208.

Glassman, A., Duran, D., Fleisher, L., Singer, D., Sturke, R., Angeles, G., . . . and Koblinsky, M. (2013). Impact of conditional cash transfers on maternal and newborn health. *Journal of Health, Population, and Nutrition*, *31*(4)(Suppl. 2), 48–66.

Hunter, B. M., Harrison, S., Portela, A., & Bick, D. (2017). The effects of cash transfers and vouchers on the use and quality of maternity care services: A systematic review. *PLOS ONE*, *12*(3), e0173068. doi:10.1371/journal.pone.0173068

International Institute for Population Sciences (IIPS). (2010). *District level household and facility survey (DLHS-3), 2007–08* [Dataset].

International Institute for Population Sciences (IIPS), & I. C. F. (2017). *National Family Health Survey (NFHS-4), 2015–16* [Dataset].

International Institute for Population Sciences (IIPS), & I. C. F. (2021). *National Family Health Survey (NFHS-5), 2019-21* [Dataset].

J-PAL. 2018. "The Role of Cash Transfer in Improving Child Health: A Review of the Evidence" Cambridge, MA: Abdul Latif Jameel Poverty Action Lab. Retrieved from:

https://www.povertyactionlab.org/review-paper/role-cash-transfers-improving-child-health

Jayachandran, S., & Kuziemko, I. (2011). Why do mothers breastfeed girls less than boys? Evidence and implications for child health in India. *Quarterly Journal of Economics*, *126*(3), 1485–1538. doi:10.1093/qje/qjr029

Lagarde, M., Haines, A., & Palmer, N. (2007). Conditional cash transfers for improving uptake of health interventions in low- and middle-income countries: A systematic review. *JAMA*, *298*(16), 1900–1910. doi:10.1001/jama.298.16.1900

Lim, S. S., Dandona, L., Hoisington, J. A., James, S. L., Hogan, M. C., & Gakidou, E. (2010). India's Janani Suraksha Yojana, a conditional cash transfer programme to increase births in health facilities: An impact evaluation. *Lancet*, *375*(9730), 2009–2023. doi:10.1016/S0140-6736(10)60744-1

Lingam, L., & Yelamanchili, V. (2011). Reproductive rights and exclusionary wrongs: Maternity benefits. *Economic and Political Weekly*, *46*(43), 94–103.

Mishra, P. S., Veerapandian, K., & Choudhary, P. K. (2021). Impact of socio-economic inequity in access to maternal health benefits in India: Evidence from Janani Suraksha Yojana using NFHS data. *PLOS ONE*, *16*(3), e0247935. doi:10.1371/journal.pone.0247935

Modugu, H. R., Kumar, M., Kumar, A., & Millett, C. (2012). State and socio-demographic group variation in out-of-pocket expenditure, borrowings and Janani Suraksha Yojana (JSY) programme use for birth deliveries in India. *BMC Public Health*, *12*(1), 1048. doi:10.1186/1471-2458-12-1048

Molyneux, M., & Thomson, M. (2011). Cash transfers, gender equity and women's empowerment in Peru, Ecuador and Bolivia. *Gender and Development*, *19*(2), 195–212. doi:10.1080/13552074.2011.592631

MoWCD. (2011). Indira Gandhi Matritva Sahyog Yojana- A conditional maternity benefit scheme: Implementation guidelines for state governments. New Delhi: UT Administration. Ministry of Women and Child Development, Government of India. Retrieved from https://wcd.nic.in/sites/default/files/IGMSYImpGuidelinesApr11.pdf.

Nandi, A., & Laxminarayan, R. (2016). The unintended effects of cash transfers on fertility: Evidence from the Safe Motherhood Scheme in India. *Journal of Population Economics*, *29*(2), 457–491. doi:10.1007/s00148-015-0576-6

PIB. (2015). Janani Suraksha Yojna. New Delhi: Press Information Bureau, Government of India, Ministry of Health and Family Welfare. Retrieved from : https://pib.gov.in/newsite/printrelease.aspx?relid=123992.

PIB. (2015). Malnourishment among Women: Press Information Bureau, Government of India, Ministry of Health and Family Welfare. Retrieved from : https://archive.pib.gov.in/newsite/PrintRelease.aspx?relid=123958

PIB. (2016). Promotion of Breast Feeding: Press Information Bureau, Government of India, Ministry of Health and Family Welfare. Retrieved from : https://archive.pib.gov.in/newsite/PrintRelease.aspx?relid=137706

PIB. (2017). Cabinet approves Pan-India implementation of Maternity Benefi t Program: Press Information Bureau, Government of India, Ministry of Health and Family Welfare. Retrieved from : https://archive.pib.gov.in/newsite/PrintRelease.aspx?relid=161858

Powell-Jackson, T., Mazumdar, S., & Mills, A. (2015). Financial incentives in health: New evidence from India's Janani Suraksha Yojana. *Journal of Health Economics*, *43*, 154–169. doi:10.1016/j.jhealeco.2015.07.001

Rahman, M. M., & Pallikadavath, S. (2018). How much do conditional cash transfers increase the utilization of maternal and child health care services? New evidence from Janani

Suraksha Yojana in India. *Economics and Human Biology*, *31*, 164–183. doi:10.1016/j.ehb.2018.08.007

Rajaratnam, J. K., Marcus, J. R., Flaxman, A. D., Wang, H., Levin-Rector, A., Dwyer, L., . . . and Murray, C. J. (2010). Neonatal, postneonatal, childhood, and under-5 mortality for 187 countries, 1970–2010: A systematic analysis of progress towards Millennium Development Goal 4. *Lancet*, *375*(9730), 1988–2008. doi:10.1016/S0140-6736(10)60703-9

Ramakrishnan, U. (2004). Nutrition and low birth weight: From research to practice. *American Journal of Clinical Nutrition*, *79*(1), 17–21. doi:10.1093/ajcn/79.1.17

Ranganathan, M., & Lagarde, M. (2012). Promoting healthy behaviours and improving health outcomes in low and middle income countries: A review of the impact of conditional cash transfer programmes. *Preventive Medicine*, *55*(Suppl.), S95–S105. doi:10.1016/j.ypmed.2011.11.015

Sinha, D., Nehra, S., Matharu, S., Khanuja, J., & Falcao, V. L. (2016). Realising universal maternity entitlements: Lessons from Indira Gandhi Matritva Sahyog Yojana. *Economic and Political Weekly*, 49–55.

Smith, C., Teng, F., Branch, E., Chu, S., & Joseph, K. S. (2019). Maternal and perinatal morbidity and mortality associated with anemia in pregnancy. *Obstetrics and Gynecology*, *134*(6), 1234–1244. doi:10.1097/AOG.0000000000003557

Von Haaren, P., & Klonner, S. (2021). Lessons learned? Intended and unintended effects of India's second-generation maternal cash transfer scheme. *Health Economics*, *30*(10), 2468–2486. doi:10.1002/hec.4390

World Health Organization. (2015). *Trends in maternal mortality: 1990-2015: estimates from WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population*

Division. World Health Organization. Retrieved from :

https://apps.who.int/iris/bitstream/handle/10665/193994/WHO_RHR_15.23_eng.pdf

Table 1: Framework assigning treatment and control groups

	Non-IGSMY District	IGMSY Districts	Amount received
Not Eligible (Born before 2012)	Unexposed	Unexposed	0
Eligible in Phase 1 (Born from Jan 2012 to June 2013)	Unexposed	Exposed Low	4,000
Eligible in Phase 2 (Born from July 2013 to Dec 2014)	Unexposed	Exposed High	6,000

Table 2: Balancing Test (from t-test of difference in means before implementation)

	Non-IGSMY Districts		IGMSY Districts		Diff.
	Mean	Obs.	Mean	Obs.	
Child Outcomes					
Early Neonatal Mortality	0.022	2262	0.022	2407	-0.000
Perinatal Mortality	0.030	2262	0.030	2407	0.001
Neonatal Mortality	0.028	2262	0.029	2407	0.001
Infant Mortality	0.035	2262	0.033	2407	0.005
Child Mortality	0.037	2262	0.040	2407	0.004
Mother Outcomes					
Maternal Mortality	0.030	86	0.003	86	0.012
Severe Anaemia	0.012	2249	0.014	2394	-0.001
Mild/Moderate Anaemia	0.573	2249	0.591	2394	-0.023
No Anaemia	0.416	2249	0.395	2394	0.024
Directly Incentivised by the scheme					
Mother had atleast 2 antenatal care	0.829	1203	0.806	1281	0.019
Iron tablets/syrup during pregnancy	0.809	1200	0.827	1272	-0.021
BCG vaccine	0.903	2167	0.916	2315	0.017*
DPT vaccine	0.794	2167	0.803	2315	0.022*
Polio	0.670	2167	0.690	2315	0.021
Breastfeeding for 6months	0.732	1333	0.704	1433	0.032*
Healthcare Service Utilization					
Mother had atleast 4 antenatal care	0.547	1203	0.593	1281	-0.041**
Baby postnatal check-up within 2 months	0.316	1195	0.386	1276	-0.016
Antenatal care from AWC	0.149	1010	0.159	1067	-0.001
Child got food from AWC at least once a month	0.732	1085	0.739	1137	-0.020
Controls					
Rural	0.709	2262	0.768	2407	-0.008
Hindu	0.812	2262	0.816	2407	0.050***
SC/ST	0.323	2262	0.357	2407	-0.036**
Child is female	0.456	2262	0.471	2407	-0.016
No education	0.343	2262	0.345	2407	-0.043***
Primary Education	0.149	2262	0.158	2407	-0.010
Secondary education	0.410	2262	0.410	2407	0.044***
Higher Education	0.097	2262	0.086	2407	0.008
Poorest	0.262	2262	0.280	2407	-0.031**
Poorer	0.229	2262	0.198	2407	0.037***
Middle	0.180	2262	0.193	2407	0.012
Richer	0.180	2262	0.183	2407	-0.009
Richest	0.149	2262	0.145	2407	-0.008
Mother's Age	28.958	2262	28.893	2407	-0.250*
Mother's Height	151.194	2262	151.436	2407	0.386**

*p < 0.10, **p < 0.05, ***p < 0.01

Table 3: Main Outcomes – Child

	(1) Early Neonatal Mortality	(2) Perinatal Mortality	(3) Neonatal Mortality	(4) Infant Mortality	(5) Child Mortality
Panel 1: Effect of IGMSY on full sample					
$(\boldsymbol{\beta_1})$	-0.010**	-0.009**	-0.009*	-0.011	-0.014**
	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)
Observations	18,559	18559	18,559	17312	18,559
Panel 2: Effect of IGMSY with lower cash					
$(\boldsymbol{\beta_{Phase\ 1}})$	-0.003	-0.004	-0.002	-0.004	-0.008
	(0.004)	(0.005)	(0.006)	(0.006)	(0.006)
Observations	11629	11629	11629	11629	11629
Panel 3: Effect of IGMSY with higher cash					
$(\boldsymbol{\beta_{Phase\ 2}})$	-0.015***	-0.014**	0.013**	-0.016*	-0.018**
	(0.005)	(0.006)	(0.006)	(0.009)	(0.008)
Observations	11599	11599	11599	10352	11599
Baseline mean	0.022	0.030	0.028	0.035	0.037
District Fixed Effects	✓	✓	✓	✓	✓
Birth Year Fixed Effects	✓	✓	✓	✓	✓
State Time Trends	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

Outcome variables are binary assuming value one if the child died before completing the required age of the respective mortality measure.

Early Neonatal Mortality equals 1 if the child perished before completing seven days. Perinatal Mortality equals 1 if stillbirth or early neonatal death. Neonatal Mortality equals 1 if the child perished before completing one month. Infant Mortality equals 1 if the child perished before completing one year. Child mortality equals 1 if the child has perished.

Cohorts eligible in Phase 1 (born between 2012-June 2013) received low cash transfers, and cohorts eligible for Phase 2 (born between July 2013-2014) received high cash transfers.

All regressions control for the sex of the child, birth order, area of residence, religion, wealth quintile, mother's height, age, and education, child's birth-year fixed effects, district fixed effects, and state-specific time trends.

Table 4: Main Outcomes – Mother

	(1) Maternal Mortality	(2) Severe Anemia	(3) Mild/Moderate Anemia	(4) No Anemia
Panel 1: Effect of IGMSY on full sample				
$(\boldsymbol{\beta_1})$	0.024	0.002	-0.021**	0.019*
	(0.019)	(0.005)	(0.010)	(0.010)
Observations	708	18438	18438	18438
Panel 2: Effect of IGMSY with lower cash				
$(\boldsymbol{\beta_{Phase\ 1}})$	0.021	0.003	-0.020	0.017
	(0.015)	(0.006)	(0.016)	(0.015)
Observations	708	11555	11555	11555
Panel 3: Effect of IGMSY with higher cash				
$(\boldsymbol{\beta_{Phase\ 2}})$	0.025	0.001	-0.023*	0.021*
	(0.020)	(0.005)	(0.012)	(0.012)
Observations	446	11526	11526	11526
Baseline mean	0.030	0.012	0.573	0.416
District Fixed Effects	✓	✓	✓	✓
Mother Year Fixed Effects	✓	✓	✓	✓
State Time Trends	✓	✓	✓	✓
Controls	✓	✓	✓	✓

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

Maternal Mortality equals 1 if any female above the age of 12 in a household has passed during pregnancy, childbirth, or two months post-delivery. Severe anemia equals 1 if the mother has severe anemia. Mild/Moderate anemia equals 1 if the mother has mild or moderate anemia. No anemia equals 1 if the mother is not anemic.

Mothers eligible in Phase 1 (gave birth between 2012-June 2013) received low cash transfers, and mothers eligible for Phase 2 (gave birth between July 2013-2014) received high cash transfers.

All regressions control for the sex of the child, birth order, area of residence, religion, wealth quintile, education, mother birth-year fixed effects, district fixed effects, and state-specific time trends.

Table 5: Heterogeneous scheme effect on Child Mortality

	Caste		Sex		Residence	
	SC/ST	Other	Male	Female	Urban	Rural
	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Effect of IGMSY on full sample						
$(\boldsymbol{\beta_1})$	0.002	-0.022**	-0.010	-0.018	0.008	-0.021**
	(0.014)	(0.009)	(0.008)	(0.012)	(0.013)	(0.008)
Observations	8237	10322	9623	8936	4243	14316
Panel 2: Effect of IGMSY with lower cash						
$(\boldsymbol{\beta_{Phase\ 1}})$	0.018	-0.019**	0.003	-0.020	0.008	-0.009
	(0.011)	(0.009)	(0.011)	(0.012)	(0.018)	(0.007)
Observations	5224	6405	5991	5638	2625	9004
Panel 3: Effect of IGMSY with higher cash						
$(\boldsymbol{\beta_{Phase\ 2}})$	-0.009	-0.022*	-0.021**	-0.014	0.010	-0.031***
	(0.019)	(0.012)	(0.009)	(0.013)	(0.010)	(0.011)
Observations	5044	6555	6098	5501	2653	8946

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

Dependent variables are dummy assuming value 1 if the child belongs to the respective category and 0 otherwise.

Cohorts eligible in Phase 1 (born between 2012-June 2013) received low cash transfers, and cohorts eligible in Phase 2 (born between July 2013-2014) received high cash transfers.

All regressions control for the sex of the child, birth order, area of residence, religion, wealth quintile, mother's height, age, and education, child birth-year fixed effects, district fixed effects, and state-specific time trends.

Table 6: Heterogeneous scheme effect on Early Neonatal Mortality

	Caste		Sex		Residence	
	SC/ST	Other	Male	Female	Urban	Rural
	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Effect of IGMSY on full sample						
$(\boldsymbol{\beta_1})$	0.003	-0.017***	-0.010	-0.010	0.010	-0.017***
	(0.011)	(0.005)	(0.006)	(0.006)	(0.009)	(0.005)
Observations	8237	10322	9623	8936	4243	14316
Panel 2: Effect of IGMSY with lower cash						
$(\boldsymbol{\beta_{Phase\ 1}})$	0.013	-0.010**	0.001	-0.009	0.008	-0.006
	(0.010)	(0.005)	(0.008)	(0.007)	(0.010)	(0.006)
Observations	5224	6405	5991	5638	2625	9004
Panel 3: Effect of IGMSY with higher cash						
$(\boldsymbol{\beta_{Phase\ 2}})$	-0.004	-0.021***	-0.019**	-0.011	0.013	-0.027***
	(0.015)	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)
Observations	5044	6555	6098	5501	2653	8946

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01
All notes from Table 5 apply.

Table 7: Heterogeneous scheme effect on Perinatal Mortality

	Caste		Sex		Residence	
	SC/ST	Other	Male	Female	Urban	Rural
	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Effect of IGMSY on full sample						
$(\boldsymbol{\beta_1})$	0.006	-0.018***	-0.010	-0.009	0.012	-0.017***
	(0.011)	(0.006)	(0.006)	(0.007)	(0.009)	(0.006)
Observations	8237	10322	9623	8936	4243	14316
Panel 2: Effect of IGMSY with lower cash						
$(\boldsymbol{\beta_{Phase\ 1}})$	0.013	-0.013**	0.003	-0.011	0.011	-0.007
	(0.012)	(0.005)	(0.009)	(0.008)	(0.011)	(0.007)
Observations	5224	6405	5991	5638	2625	9004
Panel 3: Effect of IGMSY with higher cash						
$(\boldsymbol{\beta_{Phase\ 2}})$	0.002	-0.022**	-0.020**	-0.008	0.013	-0.025***
	(0.015)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Observations	5044	6555	6098	5501	2653	8946

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01
All notes from Table 5 apply.

Table 8: Heterogeneous scheme effect on Neonatal Mortality

	Caste		Sex		Residence	
	SC/ST	Other	Male	Female	Urban	Rural
	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Effect of IGMSY on full sample						
$(\boldsymbol{\beta_1})$	0.007	-0.017**	-0.010	-0.007	0.016	-0.017**
	(0.014)	(0.007)	(0.007)	(0.008)	(0.010)	(0.007)
Observations	8237	10322	9623	8936	4243	14316
Panel 2: Effect of IGMSY with lower cash						
$(\boldsymbol{\beta_{Phase\ 1}})$	0.020*	-0.012*	0.001	-0.006	0.021	-0.006
	(0.011)	(0.007)	(0.009)	(0.009)	(0.013)	(0.007)
Observations	5224	6405	5991	5638	2625	9004
Panel 3: Effect of IGMSY with higher cash						
$(\boldsymbol{\beta_{Phase\ 2}})$	-0.001	-0.020**	-0.020**	-0.007	0.012	-0.025**
	(0.019)	(0.008)	(0.009)	(0.008)	(0.010)	(0.010)
Observations	5044	6555	6098	5501	2653	8946

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

All notes from Table 7 apply.

Table 9: Heterogeneous scheme effect on Infant Mortality

	Caste		Sex		Residence	
	SC/ST	Other	Male	Female	Urban	Rural
	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Effect of IGMSY on full sample						
$(\boldsymbol{\beta_1})$	0.003	-0.018*	-0.010	-0.011	0.014	-0.018*
	(0.015)	(0.009)	(0.009)	(0.011)	(0.012)	(0.009)
Observations	7723	9589	8967	8345	4014	13298
Panel 2: Effect of IGMSY with lower cash						
$(\boldsymbol{\beta_{Phase\ 1}})$	0.018*	-0.014	0.005	-0.014	0.017	-0.007
	(0.011)	(0.009)	(0.009)	(0.012)	(0.014)	(0.008)
Observations	5224	6405	5991	5638	2625	9004
Panel 3: Effect of IGMSY with higher cash						
$(\boldsymbol{\beta_{Phase\ 2}})$	-0.008	-0.020*	-0.028**	-0.002	0.013	-0.029**
	(0.023)	(0.012)	(0.011)	(0.014)	(0.012)	(0.013)
Observations	4530	5822	5442	4910	2424	7928

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

All notes from Table 7 apply.

Table 10 : Mechanisms – Directly incentivized by scheme

	(1) Iron Tablets	(2) Atleast 2 ANC	(3) BCG	(4) DPT	(5) Polio	(6) Bf 6 mo
Panel 1: Effect of IGMSY on full sample						
$(\boldsymbol{\beta_1})$	0.028*	0.021	0.009	0.026*	0.029**	0.034
	(0.017)	(0.015)	(0.011)	(0.016)	(0.011)	(0.026)
Observations	13107	13178	17786	17786	17786	13873
Panel 2: Effect of IGMSY with lower cash						
$(\boldsymbol{\beta_{Phase\ 1}})$	0.018	0.008	0.010	0.025	0.029*	0.035
	(0.018)	(0.019)	(0.014)	(0.018)	(0.016)	(0.029)
Observations	6910	6952	11120	11120	11120	7541
Panel 3: Effect of IGMSY with higher cash						
$(\boldsymbol{\beta_{Phase\ 2}})$	0.030*	0.031**	0.010	0.027*	0.026**	0.043
	(0.018)	(0.015)	(0.009)	(0.016)	(0.011)	(0.027)
Observations	8669	8710	11148	11148	11148	9098
Baseline mean	0.809	0.829	0.903	0.794	0.670	0.732
District Fixed Effects	✓	✓	✓	✓	✓	✓
Birth Year Fixed Effects	✓	✓	✓	✓	✓	✓
State Time Trends	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓

Dependent variables are all indicator variables taking value 1 or 0. Iron Tablets equals 1 if given or brought iron tablets/syrup during pregnancy. At least 2 ANC equals 1 if the mother had at least two antenatal check-ups during pregnancy. BCG equals 1 if the child is vaccinated for Bacillus Calmette–Guerin. DPT equals 1 if the child has received all three doses of Diphtheria-Tetanus-Pertussis. Polio equals 1 if the child has received all three doses of the polio vaccine.

Bf 6 mo takes value 1 if the child is exclusively breastfed for at least six months.

All other notes from Table 3 apply.

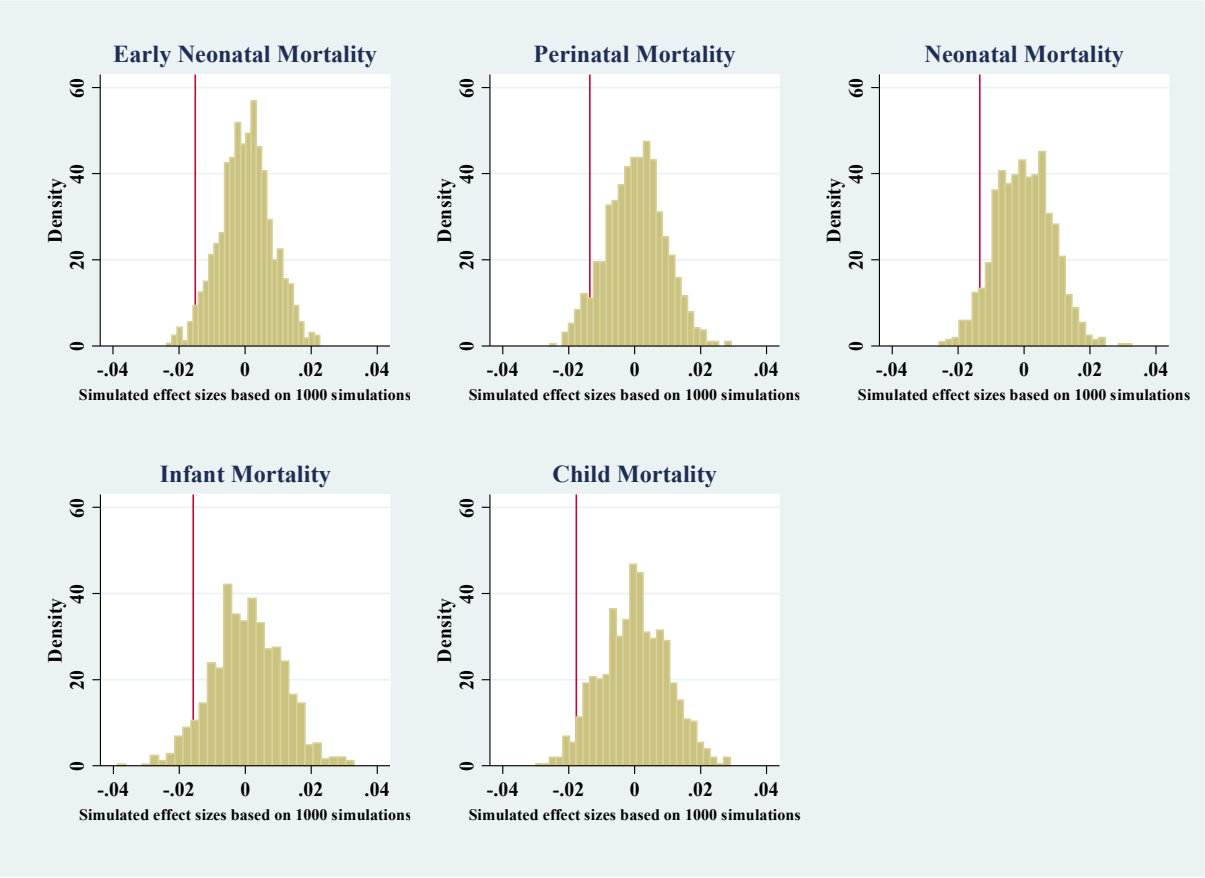
Table 11: Mechanisms – Healthcare Service Utilization

	(1) Atleast 4 ANC	(2) ANC from AWC	(3) Baby Postnatal Check-up	(4) Child Check-up from AWC
Panel 1: Effect of IGMSY on full sample				
$(\boldsymbol{\beta_1})$	0.030 (0.018)	0.027* (0.015)	0.039 (0.026)	0.036* (0.021)
Observations	13013	11035	13117	10027
Panel 2: Effect of IGMSY with lower cash				
$(\boldsymbol{\beta_{Phase\ 1}})$	0.016 (0.022)	0.022 (0.014)	0.020 (0.031)	0.024 (0.023)
Observations	6856	5796	6910	5880
Panel 3 Effect of IGMSY with higher cash				
$(\boldsymbol{\beta_{Phase\ 2}})$	0.044** (0.019)	0.029* (0.016)	0.051* (0.027)	0.041* (0.023)
Observations	8618	7316	8678	6369
Baseline mean	0.547	0.149	0.316	0.732
District Fixed Effects	✓	✓	✓	✓
Birth Year Fixed Effects	✓	✓	✓	✓
State Time Trends	✓	✓	✓	✓
Controls	✓	✓	✓	✓

Dependent variables are all indicator variables taking value 1 or 0. At least 4 ANC equals 1 if the mother had at least four antenatal check-ups during pregnancy. ANC from AWC equals 1 if the mother went to Anganwadi center for antenatal care. Baby Postnatal Check-up equals 1 if the child received a postnatal check-up within two months of birth. Child Check-up from AWC would equal 1 if child had a health check-up from Anganwadi center at least once a month.

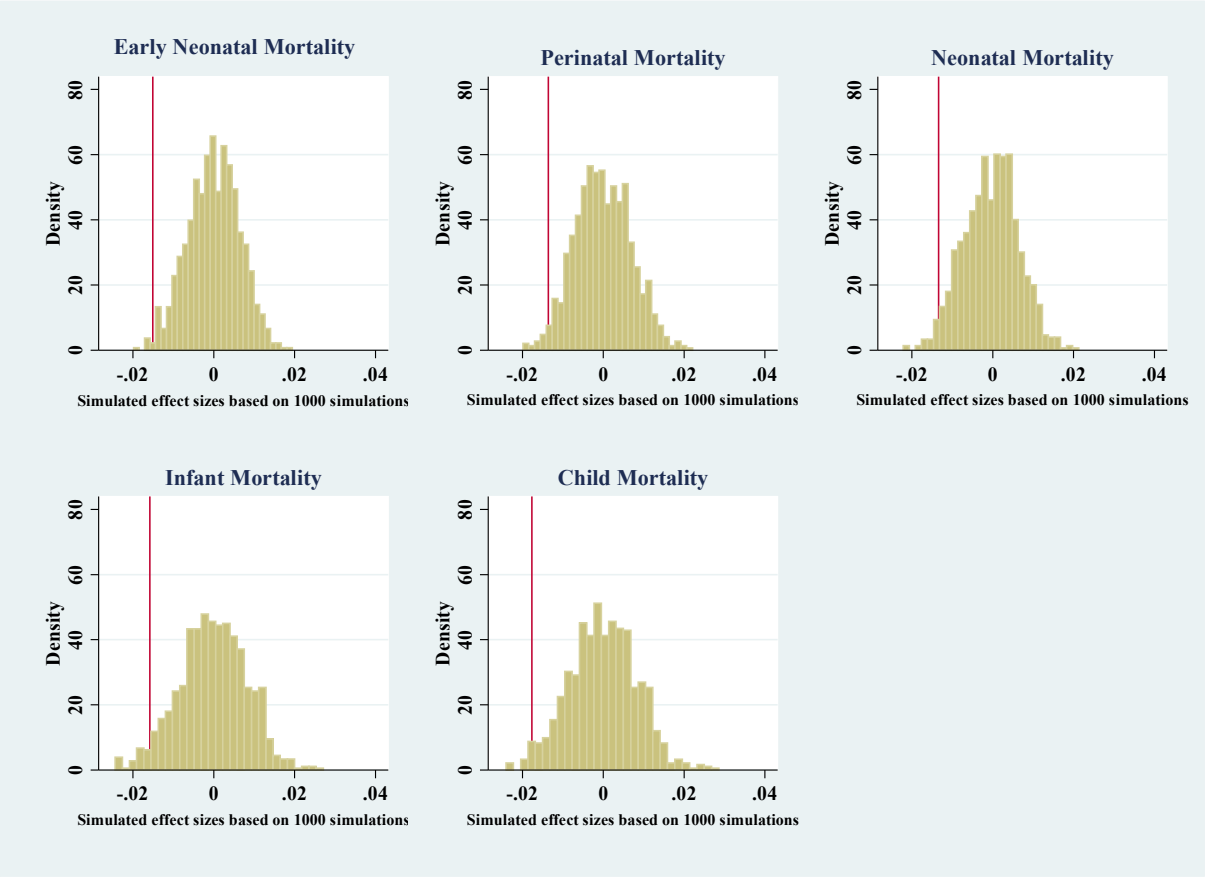
All other notes from Table 3 apply.

Figure 1: Eligibility Randomization



Notes: We randomly assign cohort eligibility criteria and run our specification 1000 times, noting the coefficients from each simulation. The above graft plots the coefficients of this randomization exercise.

Figure 2: Districts Randomization



Notes: We randomly assign treatment district and run our specification 1000 times, noting the coefficients from each simulation. The above graft plots the coefficients of this randomization exercise.

Appendix

Table A1: List of Maternal Conditional Cash Transfer Programs

	Program	Launch year	State(s)	Objective and Eligibility	Conditions and Benefits
1	Janani Suraksha Yojana (JSY)	2005	All states	Cash transfer to all women in Low performing states and BPL women in High performing states to reduce maternal and neonatal mortality.	Conditional on intuitional births- Rs. 1400 in rural areas and Rs. 1000 in urban areas for Low performing states for all births Rs. 700 rupees in rural areas and 600 rupees in urban areas in High performing states for first two live births.
2	Dr. Muthulakshmi Reddy Maternity Benefit Scheme	2007	Tamil Nadu	Provide cash assistance to 19 and above BPL pregnant women for first two deliveries.	Rs 12,000 paid in three installments conditional on- i. First instalment after getting 3 antennal checks and tetanus immunization ii. Second installment after institutional delivery iii. Third installment after completing three doses of vaccinations
3	Mamata Scheme	2011	Odisha	Provide nutrition and partial wage compensation to 19 and above lactating and pregnant women for first two live births.	Rs.5000 paid in four instalments on fulfilling – i. Rs.1500 after 2nd trimester conditional on registering pregnancy, receiving IFA and tetanus vaccine, atleast one counselling session and antenatal care ii. Rs.1500 paid 3 months after delivery conditional on registering child, completing BCG, DPT and Polio vaccination.

					iii. Rs.1000 paid 6 months after delivery for breastfeeding exclusively for six months and child weighed twice. iv. Rs.1000 paid 9 months after delivery conditional on complete vaccinations and feeding complementary foods to infants.
4	Matru Samrudhi Yojana	2011	Daman & Diu	All pregnant women for first two live births.	Rs.5000 conditional on institutional birth.
5	Mukhyamantri Mazdoor Suraksha Yojana	2013	Madhya Pradesh	Cover delivery cost of pregnant women belonging to agricultural labor family and compensate six weeks of wages	Rs 16000 cash transfer in two instalments conditional on- i. Rs. 4000 for institutional birth given by 18+ registered Shramik women or husband ii. Rs. 12000 after completing immunization of child and breastfeeding for 6 months

Table A2: Budget Allocation

Allocations	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Rupees in Crore	520.00	520.00	500.00	400.00	438.00	400.00

(USD in million)	(62.859)	(62.859)	(60.441)	(48.353)	(52.947)	(48.353)

Table A3: Eligibility and cash transfer

Implementation	Districts	Eligibility	Cash Transfer
2011- June 2013	53	First 2 births for 19 above	4000 (USD 48.28)
July 2013-2014	53	First 2 births for 19 above	6000 (USD 72.42)
2014-2015	200	First 2 births for 19 above	6000 (USD 72.42)
2015-2016	All	First 2 births for 19 above	6000 (USD 72.42)
2017 Renamed PMMVY	All	Only first birth for 19 above	5000 (USD 60.35)

Note: PMMVY stands for Pradhan Mantri Matru Vandana Yojana

Table A4: Conditionalities of IGMSY

Installment	**Conditions**	**Amount**
IGMSY Phase 1 – Incentive of 4000		

First installment after 2nd trimester of pregnancy	1. Register pregnancy within 4 months 2. Received iron folic tablets, one tetanus vaccination and at least one antenatal checkup 3. Attend atleast one counselling meting	Rs 1500
Second installment paid 3 months after delivery	4. Register child birth 5. Child received BCG , 2 doses of DPT and Polio vaccinations. 6. Child weighted at least twice after birth 7. Mother attend at least two Infant and Young Child Feeding sessions after birth	Rs 1500
Third installment paid 6 months after delivery	8. Exclusive breastfeeding for 6 months 9. After 6 months child has been introduced to complementary food 10. Child received third doss of DPT and Polio 11. Child weighted at least between 3 and 6 months of age 12. Mother attend at least two Infant and Young Child Feeding sessions between 3 and 6 months of age	Rs 1000

IGMSY Phase 2 – Incentive of 6000		
First installment after six months into pregnancy	1. Register pregnancy 2. Received iron folic tablets, one tetanus vaccination and two antenatal checkup	Rs 3000

Second installment paid 3 months after delivery	3. Register child birth 4. Child received BCG , 3 doses of DPT and Polio vaccinations. 5. Mother attend at least three Infant and Young Child Feeding and growth monitoring sessions within 3 months of delivery 6. Exclusive breast feeding for 6 months	Rs 3000

Renamed PMMVY (2017 onwards) – Incentive of 5000		
First installment	1. Register pregnancy within 4 months	Rs 1000
Second installment	2. Mother had at least one antenatal care	Rs 2000
Third installment	3. Register child 4. Child received BCG, 2 doses of DPT, Polio and Hepatitis-B vaccinations or its equivalent	Rs 2000

Table A5: Pilot districts and their matched Control districts

S.No.	State	Pilot Districts	Control Districts
1	Andhra Pradesh	West Godavari	Rangareddy
2	Andhra Pradesh	Nalgonda	Y.S.R
3	Arunachal Pradesh	Papum pare	Changlang
4	Assam	Kamrup	Dibrugarh
5	Assam	Goalpara	Dhemaji
6	Bihar	Vaishali	Saran
7	Bihar	Saharsa	Katihar
8	Chhattisgarh	Dhamtari	Durg
9	Chhattisgarh	Bastar	Bilaspur
10	Delhi	North West	South
11	Delhi	West	East
12	Goa	North Goa	South Goa
13	Gujarat	Bharuch	Kheda
14	Gujarat	Patan	Valsad
15	Haryana	Panchkula	Rewari
16	Himachal Pradesh	Hamirpur	Bilaspur
17	Jharkhand	East Singh Bhum	Ranchi
18	Jharkhand	Simdega	Godda
19	Karnataka	Kolar	Tumkur
20	Karnataka	Dharwad	Davanagere
21	Kerala	Palakkad	Kozhikode
22	Manipur	Tamenglong	Ukhrul
23	Meghalaya	E.Garo Hills	West Garo Hills
24	Mizoram	Lawngtlai	Mamit
25	Punjab	Amritsar	Muktsar
26	Punjab	Kapurthala	Fatehgarh Sahib
27	Rajasthan	Bhilwara	Banswara
28	Rajasthan	Muktsar	Tonk
29	Sikkim	West Sikkim	South District
30	Tripura	Dhalai	North Tripura
31	Uttar Pradesh	Mahoba	Muzaffarnagar
32	Uttar Pradesh	Sultanpur	Azamgarh
33	Uttarakhand	Dehradun	Chamoli
34	West Bengal	Jalpaiguri	Puruliya
35	West Bengal	Bankura	Dakshin Dinajpur

Table A6: Summary statistics – After scheme implementation

	Full Sample		Phase 1		Phase 2	
	(1) Non IGMSY District	(2) IGMSY District	(3) Non IGMSY District	(4) IGMSY District	(5) Non IGMSY District	(6) IGMSY District
Child Outcomes						
Early Neonatal Mortality	0.030	0.020	0.029	0.023	0.032	0.018
Perinatal Mortality	0.041	0.029	0.039	0.031	0.042	0.027
Neonatal Mortality	0.038	0.028	0.036	0.033	0.039	0.024
Infant Mortality	0.052	0.038	0.047	0.039	0.057	0.037
Child Mortality	0.051	0.039	0.054	0.047	0.049	0.032
Mother Outcomes						
Maternal Mortality	0.023	0.006	0.017	0.005	0.028	0.007
Severe Anaemia	0.010	0.012	0.011	0.014	0.008	0.010
Mild/Moderate Anaemia	0.592	0.599	0.590	0.600	0.594	0.599
No Anaemia	0.398	0.389	0.398	0.386	0.398	0.391
Directly Incentivised by the scheme						
Mother had atleast 2 antenatal care	0.812	0.800	0.825	0.794	0.804	0.804
Iron tablets/syrup during pregnancy	0.785	0.818	0.793	0.821	0.779	0.817
BCG vaccine	0.917	0.928	0.905	0.913	0.929	0.942
DPT vaccine	0.801	0.816	0.802	0.814	0.800	0.818
Polio	0.731	0.750	0.709	0.733	0.752	0.766
breastfed_6mo	0.816	0.830	0.778	0.785	0.843	0.863
Healthcare Service Utilization						
Mother had atleast 4 antenatal care	0.519	0.566	0.538	0.569	0.507	0.565
Baby postnatal check-up within 2 months	0.349	0.394	0.345	0.380	0.351	0.403
Antenatal care from AWC	0.183	0.218	0.180	0.215	0.185	0.221
Child got food from AWC	0.716	0.745	0.735	0.754	0.700	0.737
Controls						
Rural	0.701	0.743	0.696	0.749	0.705	0.737
Hindu	0.795	0.800	0.786	0.808	0.805	0.793
SC/ST	0.314	0.373	0.328	0.375	0.302	0.372
Child is female	0.480	0.471	0.492	0.480	0.469	0.461
No education	0.293	0.316	0.322	0.337	0.266	0.295
Primary Education	0.137	0.139	0.138	0.139	0.136	0.139
Secondary education	0.444	0.440	0.423	0.423	0.464	0.456
Higher Education	0.126	0.106	0.116	0.102	0.135	0.109
Poorest	0.252	0.269	0.262	0.275	0.242	0.263
Poorer	0.212	0.198	0.210	0.207	0.215	0.190
Middle	0.186	0.189	0.186	0.184	0.185	0.195
Richer	0.184	0.183	0.177	0.179	0.190	0.187
Richest	0.166	0.160	0.164	0.155	0.168	0.165
Mother's Age	27.076	27.062	27.821	27.857	26.368	26.290
Mother's Height	151.390	151.571	151.347	151.540	151.430	151.601

Table A7: Main Outcomes without controls

	(1) Early Neonatal Mortality	(2) Perinatal Mortality	(3) Neonatal Mortality	(4) Infant Mortality	(5) Child Mortality
Panel 1: Effect of IGMSY on full sample					
$(\boldsymbol{\beta_1})$	-0.010**	-0.009**	-0.009*	-0.011	-0.014**
	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)
Observations	18,559	18559	18,559	17312	18,559
Panel 2: Effect of IGMSY with lower cash					
$(\boldsymbol{\beta_{Phase\ 1}})$	-0.004	-0.004	-0.003	-0.005	-0.008
	(0.004)	(0.005)	(0.006)	(0.006)	(0.006)
Observations	11629	11629	11629	11629	11629
Panel 3 Effect of IGMSY with higher cash					
$(\boldsymbol{\beta_{Phase\ 2}})$	-0.015***	-0.013**	-0.013**	-0.016*	-0.018**
	(0.005)	(0.006)	(0.006)	(0.009)	(0.008)
Observations	11599	11599	11599	10352	11599
Baseline mean	0.022	0.030	0.028	0.035	0.037
District Fixed Effects	✓	✓	✓	✓	✓
Birth Year Fixed Effects	✓	✓	✓	✓	✓
State Time Trends	✓	✓	✓	✓	✓
Controls	×	×	×	×	×

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

Outcome variables are binary variables assuming value one if the child died before completing the required age of the respective mortality measure. Early Neonatal Mortality equals 1 if the child perished before completing seven days. Perinatal Mortality equals 1 if stillbirth or early neonatal death. Neonatal Mortality equals 1 if the child perished before completing one month. Infant Mortality equals 1 if the child passes before completing one year. Child mortality equals 1 if the child has died.

Cohorts eligible in Phase 1 (born between 2012-June 2013) received low cash transfers, and cohorts eligible for Phase 2 (born between July 2013-2014) received high cash transfers.

All regressions control for child birth-year fixed effects, district-fixed effects, and state-specific time trends.

Table A8: Falsification Test using DLHS 3

	(1) Early Neonatal Mortality	(2) Perinatal Mortality	(3) Neonatal Mortality	(4) Infant Mortality	(5) Child Mortality
Panel 1: Effect of IGMSY on full sample					
$(\boldsymbol{\beta_1})$	0.000 (0.002)	-0.000 (0.003)	0.003 (0.003)	0.003 (0.003)	0.002 (0.004)
Observations	16972	17081	16972	16972	17080
Panel 2: Effect of IGMSY with lower cash					
$(\boldsymbol{\beta_{Phase\ 1}})$	-0.002 (0.003)	-0.003 (0.003)	0.001 (0.003)	0.001 (0.003)	-0.001 (0.004)
Observations	12091	12150	12091	12091	12149
Panel 3 Effect of IGMSY with higher cash					
$(\boldsymbol{\beta_{Phase\ 2}})$	0.003 (0.003)	0.004 (0.004)	0.005 (0.004)	0.007 (0.005)	0.007 (0.005)
Observations	10237	10300	10237	10237	10299
District Fixed Effects	✓	✓	✓	✓	✓
Birth Year Fixed Effects	✓	✓	✓	✓	✓
State Time Trends	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

β_1 is the coefficient of interest from equation 1, which measures the placebo impact of exposure to IGMSY on the outcomes mentioned above. $\beta_{Phase\ 1}$ and $\beta_{Phase\ 2}$ are the coefficient of interest from equation 2, and they measure the placebo impact of exposure to IGMSY in phases 1 and 2, respectively.

Placebo cohorts eligible in Phase 1 (born between 2007-June 2007) received low cash transfers, and placebo cohorts suitable for Phase 2 (born between July 2007-2008) received high cash transfers.

All other notes from Table 3 apply.

Table A9: Robustness checks after excluding June - December 2011 cohorts

	(1) Early Neonatal Mortality	(2) Perinatal Mortality	(3) Neonatal Mortality	(4) Infant Mortality	(5) Child Mortality
Panel 1: Effect of IGMSY on full sample					
$(\boldsymbol{\beta_1})$	-0.020*** (0.007)	-0.016* (0.009)	-0.019*** (0.006)	-0.022*** (0.007)	-0.024*** (0.008)
Observations	16069	16069	16069	14822	16069
Panel 2: Effect of IGMSY with lower cash					
$(\boldsymbol{\beta_{Phase\ 1}})$	-0.012 (0.007)	-0.010 (0.010)	-0.013* (0.007)	-0.015** (0.007)	-0.017** (0.008)
Observations	9139	9139	9139	9139	9139
Panel 3: Effect of IGMSY with higher cash					
$(\boldsymbol{\beta_{Phase\ 2}})$	-0.027*** (0.008)	-0.022** (0.010)	-0.024*** (0.007)	-0.032*** (0.010)	-0.030*** (0.010)
Observations	9109	9109	9109	7862	9109
District Fixed Effects	✓	✓	✓	✓	✓
Birth Year Fixed Effects	✓	✓	✓	✓	✓
State Time Trends	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

Our working sample excludes children born in 2011 from the ineligible cohorts.

All other notes from Table 3 apply.

Table A10: Robustness checks after appending NFHS-5 data (2019-21)

	(1) Early Neonatal Mortality	(2) Perinatal Mortality	(3) Neonatal Mortality	(4) Infant Mortality	(5) Child Mortality
Panel 1: Effect of IGMSY on full sample					
(β_1)	-0.010** (0.004)	-0.009** (0.004)	-0.009* (0.005)	-0.009 (0.006)	-0.013** (0.006)
Observations	19155	19155	19155	17908	19155
Panel 2: Effect of IGMSY with lower cash					
$(\beta_{Phase\ 1})$	-0.003 (0.004)	-0.004 (0.005)	-0.002 (0.006)	-0.004 (0.006)	-0.008 (0.006)
Observations	11629	11629	11629	11629	11629
Panel 3: Effect of IGMSY with higher cash					
$(\beta_{Phase\ 2})$	-0.014*** (0.005)	-0.013** (0.006)	-0.013** (0.006)	-0.013 (0.008)	-0.016** (0.007)
Observations	12195	12195	12195	10948	12195
District Fixed Effects	✓	✓	✓	✓	✓
Birth Year Fixed Effects	✓	✓	✓	✓	✓
State Time Trends	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓

Robust standard errors clustered at district level are reported in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

We have appended data from NFHS 5 in our sample.

All other notes from Table 3 apply.