

# Do Financial Incentives Work for Mothers?: Evidence from India

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# Introduction



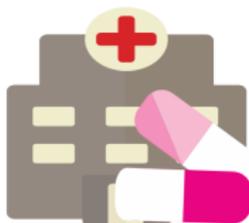
830 women and 6000 newborns die everyday

# Introduction



90 percent of total deaths are preventable

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High-quality care during and post pregnancy.



Skilled health professional in attendance



Prevention of unwanted pregnancies

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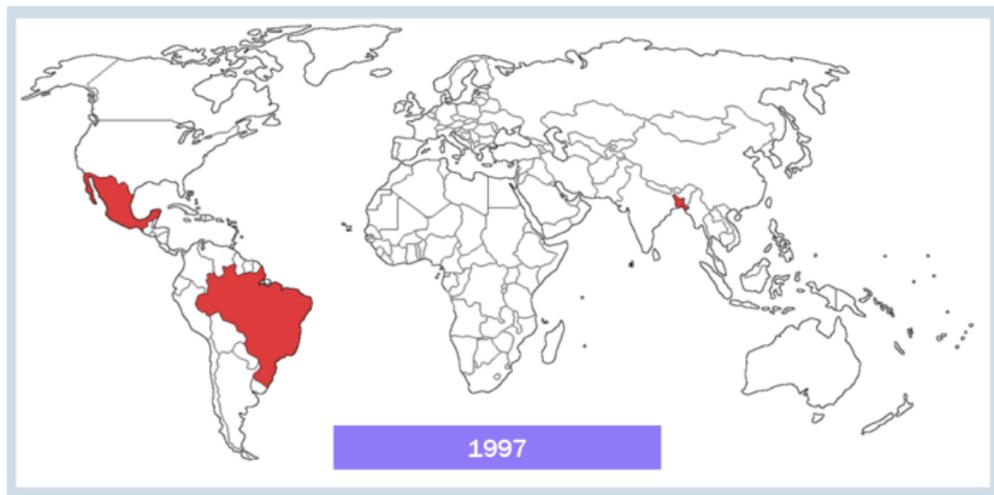


Prevention of unwanted pregnancies

**Lack of accessibility and affordability** limit the use of maternal and child healthcare services.

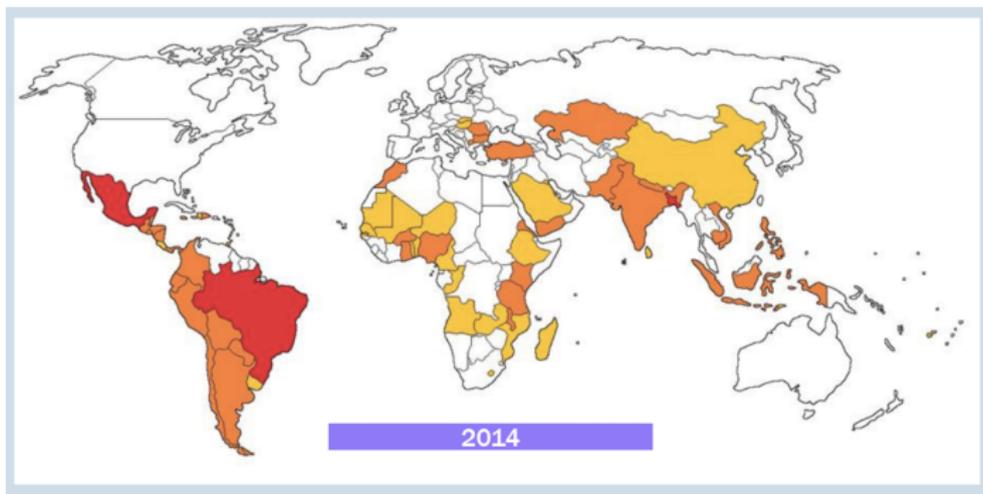
## Conditional Cash Transfers

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What is a **conditional cash transfer** (CCT)?

- Under CCT, cash is transferred contingent on certain behaviors by beneficiaries.
- The idea is “rewarding” socially desirable behaviors. e.g.: education, health visits, labor activities.
- Aim to increase health service utilization by **offsetting financial costs** for users, or **increasing household income** for incentivizing “healthy behaviours”.
- Financial help in short run leads to inter-generational effects in the long run.

# Do CCTs impact Maternal Healthcare Utilization?

## **Evaluate the effects of a maternal CCT program on health outcomes in India?**

Why India?

- Direct targeted health behaviors and child mortality.
- Indirect impact on use of auxiliary services and fertility choices.
- Comparison to other studies on the program.

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## **More broadly, do financial incentives impact women's healthcare behavior and outcomes?**

- Mechanisms at play.
- Compare estimates to similar international programs.
- Lessons to learn.

## Janani Suraksha Yojna: CCT for Safe Motherhood

Launched in 2005, JSY **integrates cash assistance with delivery care.**

- Cash assistance for delivery in public health facilities for socially excluded groups.
- Encourage pregnant women to give birth in registered health institutions.
- More than \$290 million are spent to benefit 10.4 million women annually (8% of total public health expenditure).

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**Accredited Social Health Activists (ASHAs)** help pregnant women to access the benefits under JSY.

- Tracks pregnancies and register mothers in their local communities.
- Counsel women on birth preparedness, importance of safe delivery, breastfeeding and complementary feeding, immunization, contraception.
- Over 1 million ASHAs in the country with the general norm being ‘One ASHA per 1000 population’.

### ANGER SIGNALS DURING PREGNANCY



Severe pain in abdomen.



Continued headache, very frequently and troublesome.



Bleeding per vagina.



Excessive swelling in legs.



Deliveries.



Weak.

If any complications occur, seek help immediately to preserve your health and life.

### DANGER SIGNALS DURING PREGNANCY & LABOR

Immediately contact ANM/AWC in case of following:

#### Contact P.H.C.

- Burning micturition.
- High gastric fever or any medical illness.
- Vaginal itching in early pregnancy.
- Excessive nausea and vomiting.
- Leaking per vagina before onset of labour.
- High blood pressure detected in AMC.
- Floating and/or pain in abdomen.

#### Contact F.R.U.

- Vaginal bleeding in advanced pregnancy.
- Decreased or no foetal movements.
- Swelling all over body, pallor/anaemia, shortness of breath.
- Swelling all over body and/or blurring of vision.
- High blood pressure detected in AMC.
- Fits.
- Labour pains or breaking before 9 month of pregnancy.
- Leaking for more than 12 hours without labour pains.
- Four smearing leaking with or without fever.
- Labour pains more than 12 hours.
- Continuous abdominal pain.

Seek timely help from facility for proper management of complications. It saves your life as well as the baby's.

Illustrations of a woman and child with text boxes:

- Do not allow your child to play with sharp objects like knives, scissors, pins, needles, etc.
- Do not allow your child to play with fire.
- Do not allow your child to play with electricity.
- Do not allow your child to play with heavy machinery like tractors, etc.
- Do not allow your child to play with toxic substances like pesticides, etc.
- Do not allow your child to play with animals like dogs, cats, etc.
- Do not allow your child to play with water bodies like ponds, etc.
- Do not allow your child to play with roads, etc.
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# My Safe Motherhood

Booklet for expecting mothers

Maternal Health Division  
Ministry of Health & Family Welfare  
Government of India

## Eligibility for Cash Assistance

Eligibility is defined by state, caste, poverty, number of children and age of woman at childbirth.

<b>State</b> <small>Map</small>	<b>Criteria</b>
Low Performing	All pregnant women delivering in public health centres
High Performing	Poor pregnant women, aged 19 years and above, or All Scheduled Caste and Scheduled Tribe women delivering in a public health centres, with at most two births

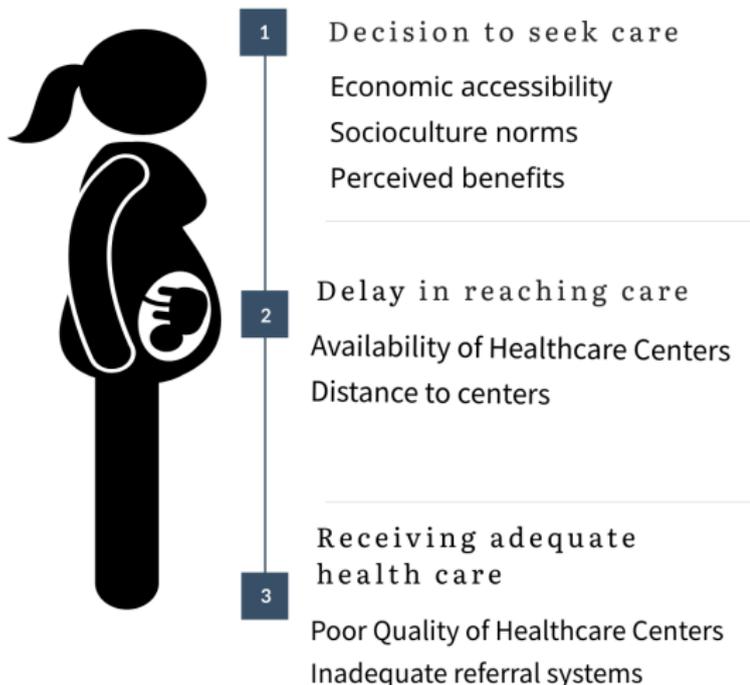
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- Fulfilling the eligibility criteria, a cash amount of \$13 and \$32 is given to women in HP and LP states respectively, for giving birth at a public health institution (covers 22% to 50% of total delivery costs).
- Only 1 in 19 pregnancies is fully covered by JSY cash benefits.
- ASHAs are awarded cash per registration and institutional delivery only in LP states.

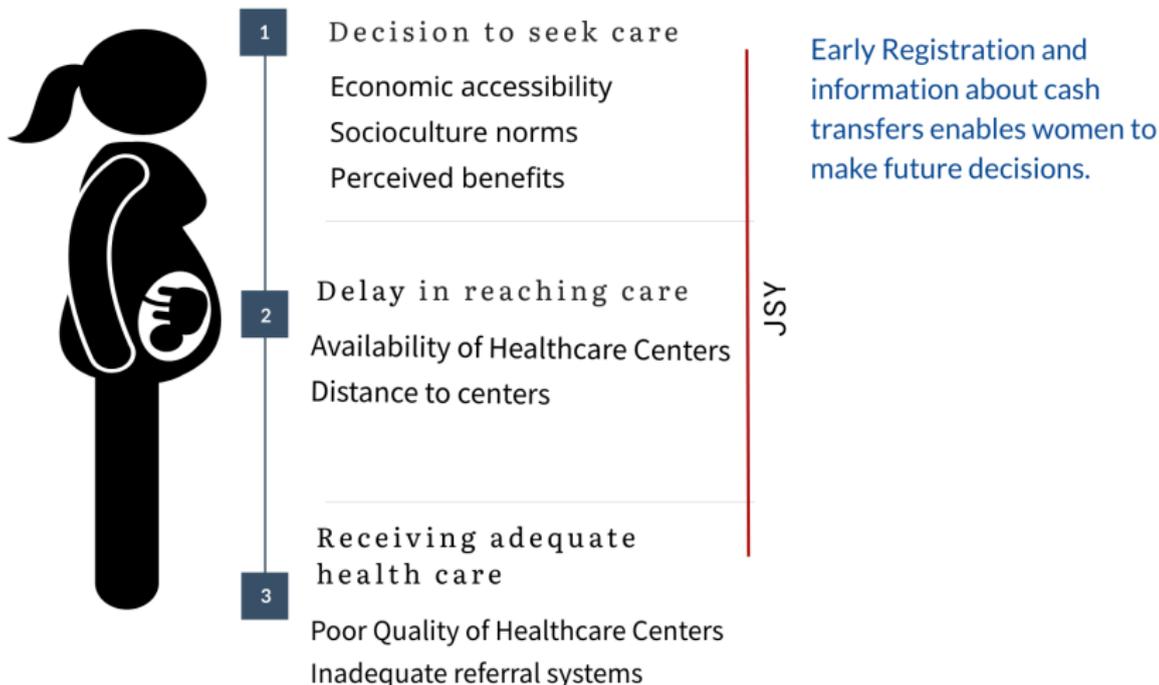
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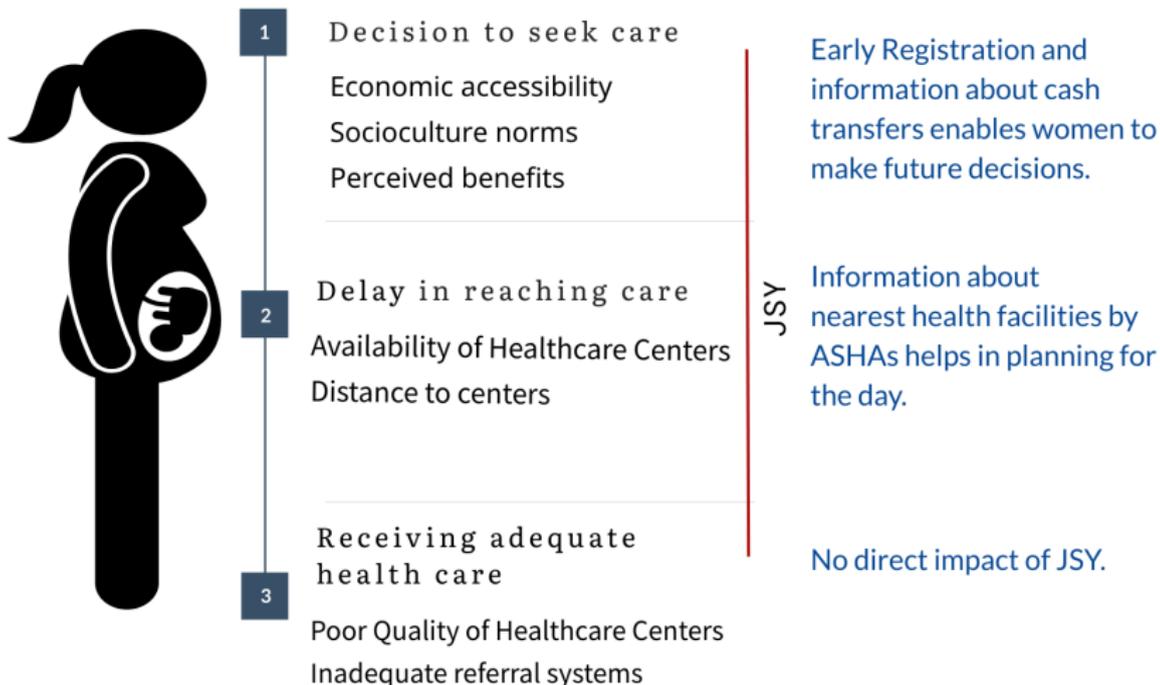


JSY

Early Registration and information about cash transfers enables women to make future decisions.

Information about nearest health facilities by ASHAs helps in planning for the day.

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- Early JSY registration → **Increased demand for auxiliary healthcare services.**
- Financial incentives for pregnancy → **implicitly serve to incentivise pregnancy.**

## Contributions

Use **individual eligibility** criteria.

- **State eligibility** (Dongre and Kapur (2012)),
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Closest to Joshi and Shivaram (2015), I differ in approach:

- Use a **fixed effects** model.
- Add rich data on **healthcare supply**.

## **District Level Household Survey (II, III, IV)**

- Information on family planning, reproductive healthcare, utilization of maternal and child healthcare services.
- Create a repeated cross-sectional dataset of most recent births of ever-married women with at least one pregnancy from 1999 to 2010.

## **District Census Handbook**

- Provides list of health institutions and ASHA workers across districts.

## **Rural Health Statistics (2005-2010)**

- Infrastructural information on different types of healthcare centers at different administrative levels.

## **Census Population (2011)**

- Use district population to control for per capita changes in healthcare supply.

## Table: Summary Statistics- Control Variables

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<b>Pre-JSY</b> (1999-2004)	<b>Post-JSY</b> (2005-2010)
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	<b>Pre-JSY</b> (1999-2004)	<b>Post-JSY</b> (2005-2010)
Woman's Age	26.40	26.10
Woman's Age at First Birth	18.98	20.10
Poor	0.605	0.487
Caste-SC/ST	0.393	0.402
Caste-General	0.213	0.214
Religion-Hindu	0.776	0.755
No Education	0.561	0.472
Village- Health Worker	0.681	0.660
Village- Distance to Facility	3.096	2.774
Village-ASHA	0	0.665
District- CHC per sq km	0.157	0.169
Observations	165,638	170,228

Notes: The sample consists of all 35 states and 591 districts from three rounds of the District Level Households Survey (DLHS).

The full forms include: SC/ST - Scheduled Caste/ Scheduled Tribe, ASHA - Accredited Social Health Activists, and CHC- Community Health Centers.

**Table: Summary Statistics- Outcome Variables**

	<b>Pre-JSY</b> (1999-2004)	<b>Post-JSY</b> (2005-2010)
Delivery at Home	0.706	0.578
Delivery at Public Facility	0.162	0.263
Skilled Health Professional	0.318	0.434
Neonatal Deaths*	42.71	38.76
Weekly Deaths**	18.54	16.20
Any Antenatal Care	0.670	0.717
Atleast 4 Antenatal Visits	0.386	0.446
First Trimester Antenatal Care	0.305	0.384
Postnatal Care	0.368	0.411
Immunization	0.721	0.764
Breastfeeding	0.302	0.419
Observations	165,638	170,228

Notes: The sample consists of all 35 states and 591 districts from three rounds of the District Level Households Survey (DLHS).

\* Neonatal mortality is the number of deaths within the first day of birth per 1000 live births.

\*\* Weekly Death Rate is the number of deaths under a week who survived first day per 1000 live births.

Antenatal care includes checkup during pregnancy, tetanus injections and intake of iron supplements.

Figure: Trends in Choice of Place of Delivery

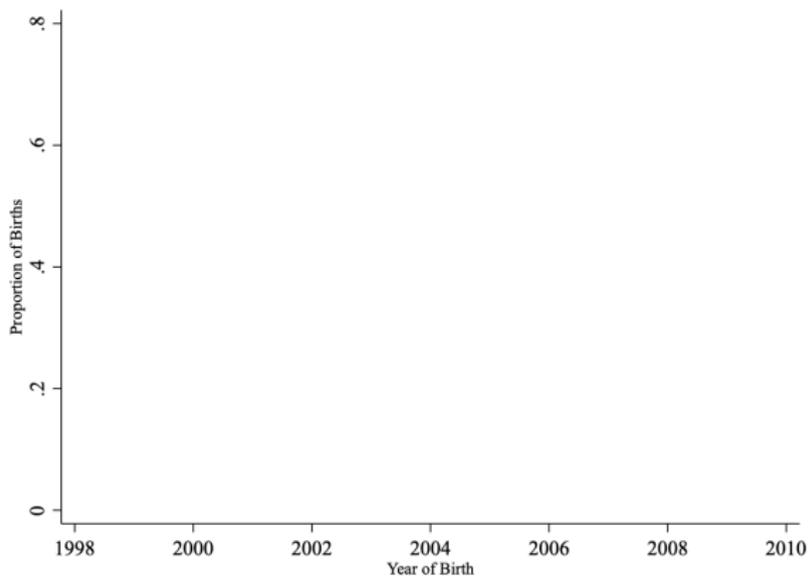


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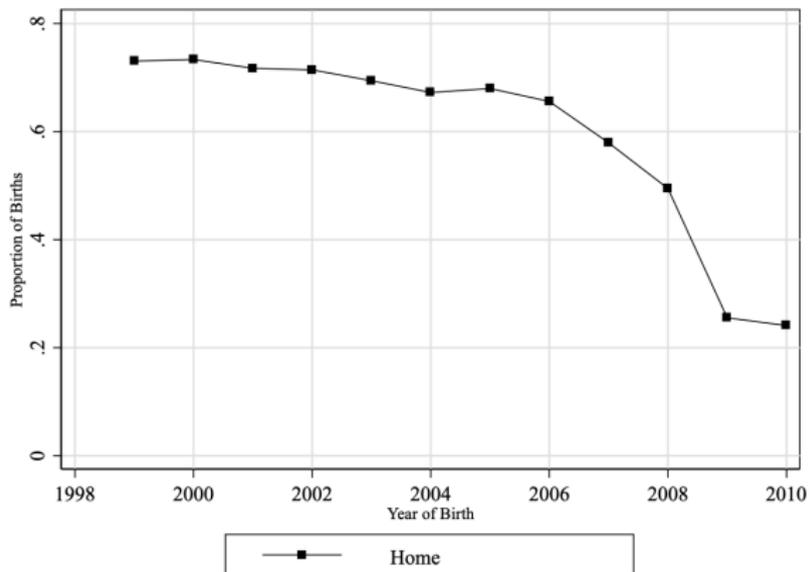


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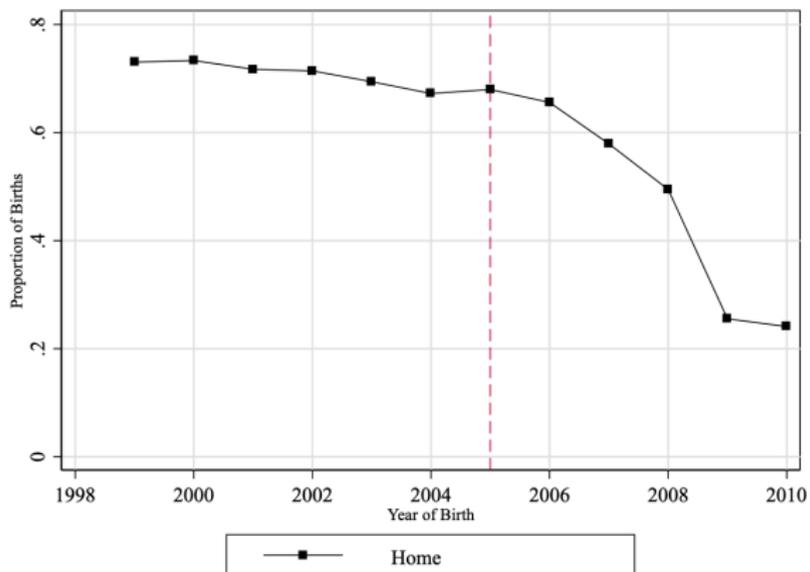


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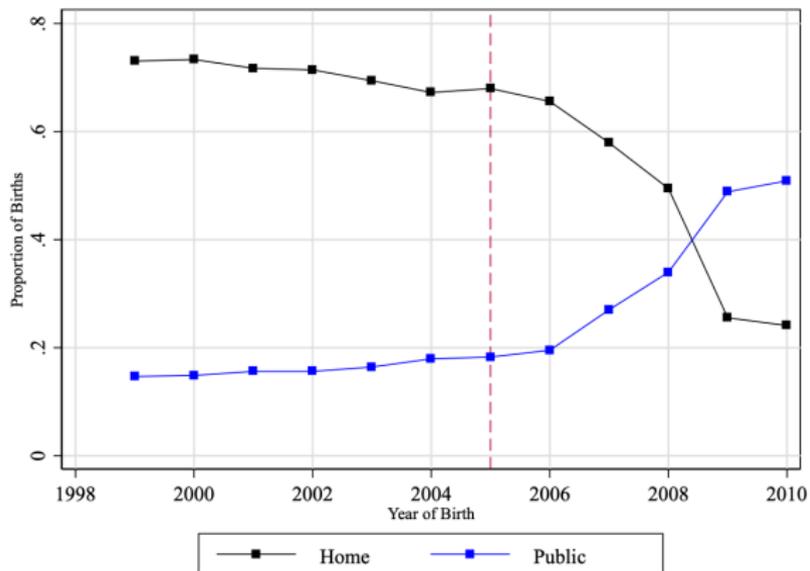
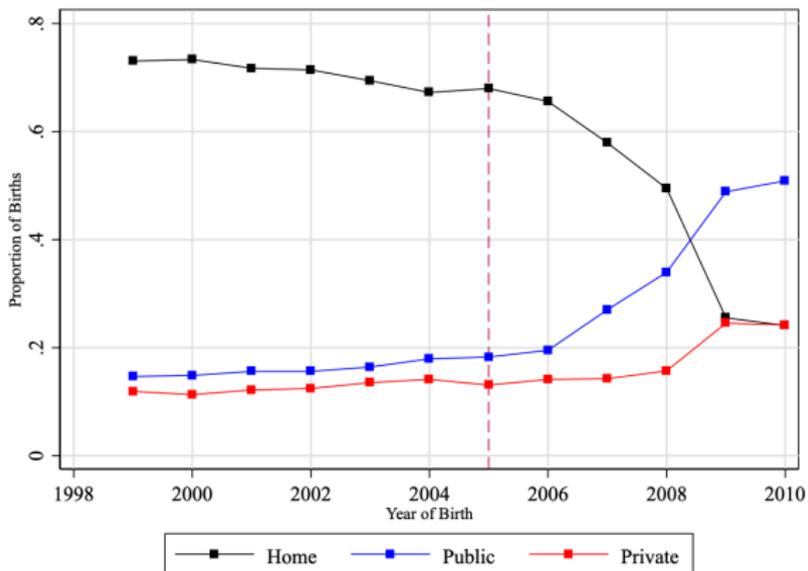
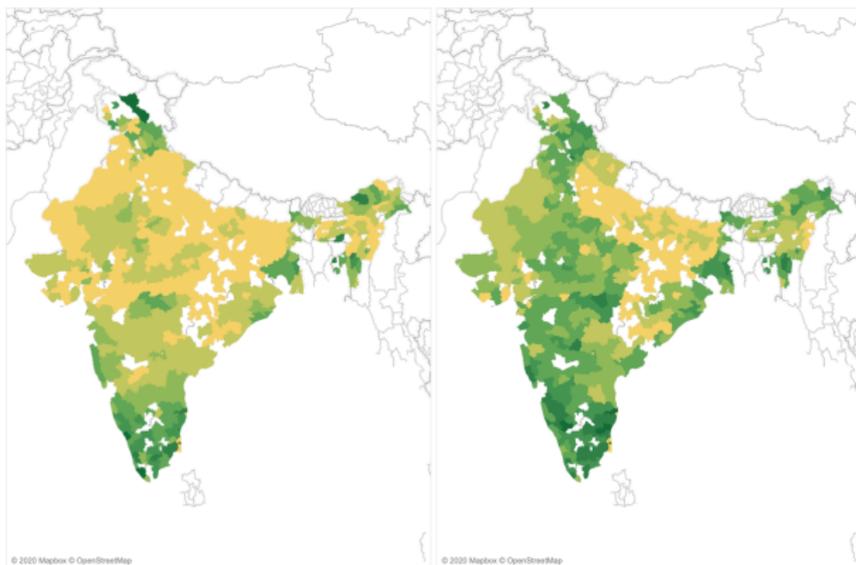


Figure: Trends in Choice of Place of Delivery



**Figure: Public Institutional Delivery (Pre vs Post)**



Source: Dataset compiled using DLHS II and DLHS III

Notes: The change in the average utilization of institutional delivery at public health facilities is illustrated by yellow (lowest) to green (highest). The missing districts in the survey are white in color.

Using a difference in difference (DiD) framework,

$$\begin{aligned} Outcome_{idt} = & \beta_0 + \beta_1 Eligible_{id}^{JSY} + \beta_2 Post_t + \beta_3 Post_t \times Eligible_{id}^{JSY} \\ & + \beta_4 X_{idt} + \gamma_d + \delta_t + \epsilon_{idt} \end{aligned}$$

where  $i, d, t$  are the indexes for individual, district, and time.

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- $X_{idt}$  → Woman, household and time-varying village- and district-level characteristics.
  - Woman's education, age, caste, place of residence, wealth index, religion, number of health facilities in district, distance and accessibility, presence of ASHA and health worker in village.

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- $\gamma, \delta$  → District and time fixed effects.

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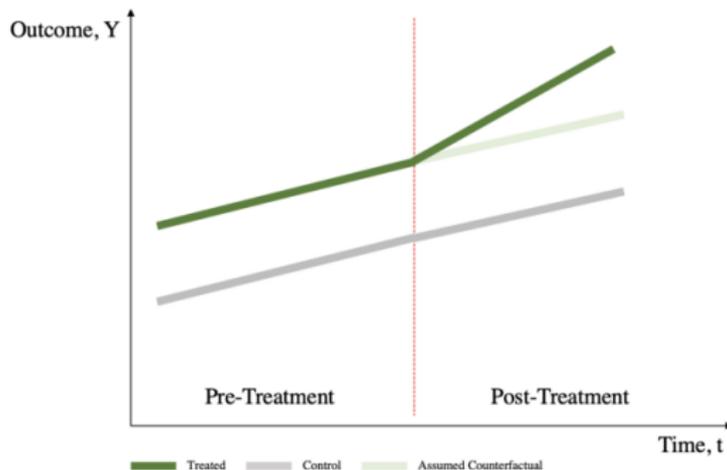
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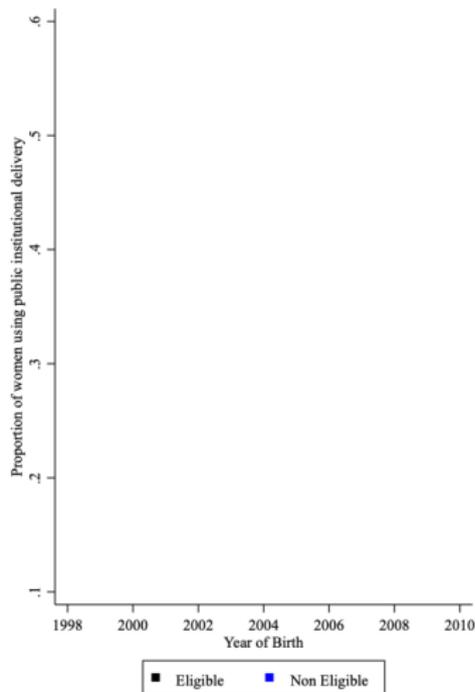
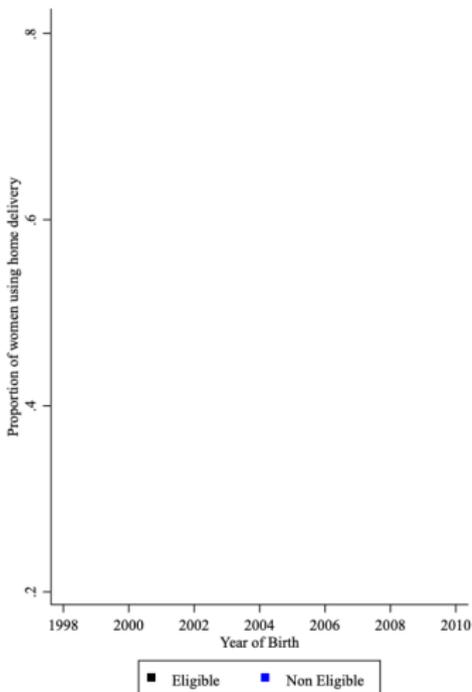
- $\beta_3$  measures the **intent-to-treat effect** of JSY.
- Based on the initial treatment assignment and not on the treatment eventually received.
- Measures the impact of JSY on the eligible population (and not those who receive JSY benefits) after controlling for pre-JSY differences and other confounding factors,  $X_{idt}$ .

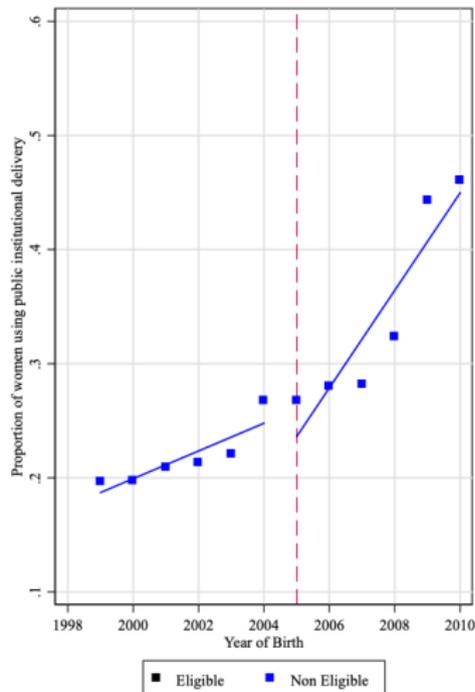
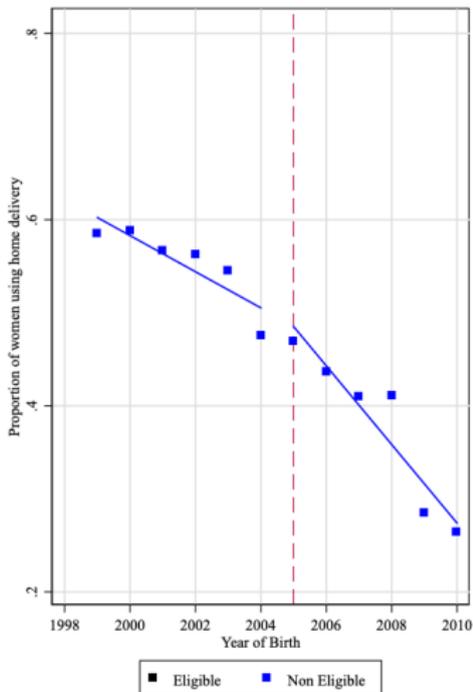
Trends of the treatment and control group must be similar in the absence of treatment.

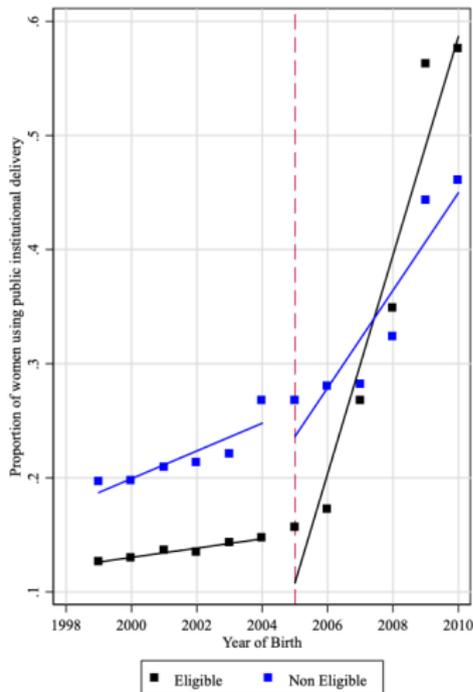
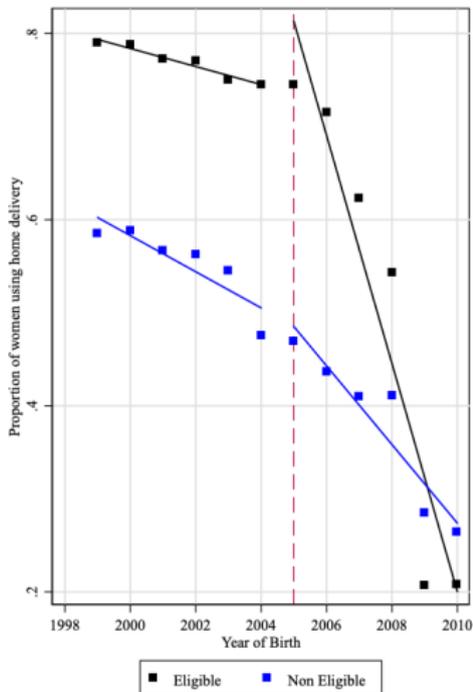
# Parallel Trends

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In the next few slides, we would look at the impact of JSY on the following outcomes:

- **Place of delivery:** home, private and public health facility
- **Auxiliary Maternal Health Services:** Antenatal and postnatal care
- **Child mortality:** Fetal, one-week and one-month mortality

The results show the estimates for  $\beta_3$  measuring the average effect of being JSY eligible as compared to the ineligible population on the outcomes.

## Impact of JSY on Place of Delivery

	(1) Home	(2) Public	(3) Private
Eligible x Post JSY			
<i>Mean</i>			
<i>Observations</i>			
<i>R<sup>2</sup></i>			

Notes: Robust standard errors are clustered at the district level with significance levels at the 10, 5, and 1 percent.

## Impact of JSY on Place of Delivery

	(1)	(2)	(3)
	Home	Public	Private
Eligible x Post JSY	-0.0179*** (0.004)		
<i>Mean</i>	0.612		
<i>Observations</i>	277126		
<i>R</i> <sup>2</sup>	0.328		

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	Home	Public	Private
Eligible x Post JSY	-0.0179*** (0.004)	0.0373*** (0.004)	-0.0184*** (0.003)
<i>Mean</i>	0.612	0.229	0.152
<i>Observations</i>	277126	277126	277126
<i>R</i> <sup>2</sup>	0.328	0.184	0.239

Notes: Robust standard errors are clustered at the district level with significance levels at the 10, 5, and 1 percent.

## Impact of JSY on Auxiliary Services

	(1)	(2)	(3)	(4)
	Any ANC	Timing	Any PNC	Bf
Eligible x Post JSY				
<i>Mean</i>				
<i>N</i>				
<i>R</i> <sup>2</sup>				

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## Impact of JSY on Auxiliary Services

	(1)	(2)	(3)	(4)
	Any ANC	Timing	Any PNC	Bf
Eligible x Post JSY	0.0363*** (0.003)			
<i>Mean</i>	0.719			
<i>N</i>	277093			
<i>R</i> <sup>2</sup>	0.235			

Notes: Robust standard errors are clustered at the district level with significance levels at the 10, 5, and 1 percent.

## Impact of JSY on Auxiliary Services

	(1) Any ANC	(2) Timing	(3) Any PNC	(4) Bf
Eligible x Post JSY	0.0363*** (0.003)	0.0673*** (0.004)		
<i>Mean</i>	0.719	0.620		
<i>N</i>	277093	286429		
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Eligible x Post JSY	0.0363*** (0.003)	0.0673*** (0.004)	-0.0633*** (0.004)	
<i>Mean</i>	0.719	0.620	0.322	
<i>N</i>	277093	286429	267508	
<i>R</i> <sup>2</sup>	0.235	0.211	0.250	

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## Impact of JSY on Auxiliary Services

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	Any ANC	Timing	Any PNC	Bf
Eligible x Post JSY	0.0363*** (0.003)	0.0673*** (0.004)	-0.0633*** (0.004)	0.0454*** (0.004)
<i>Mean</i>	0.719	0.620	0.322	0.377
<i>N</i>	277093	286429	267508	272175
<i>R</i> <sup>2</sup>	0.235	0.211	0.250	0.218

Notes: Robust standard errors are clustered at the district level with significance levels at the 10, 5, and 1 percent.

## Impact of JSY on Child Mortality

	(1)	(2)	(3)	(4)
	Fetal	Neonatal	Weekly	Infant
Eligible x Post JSY	-0.00106* (0.001)	-0.00039 (0.001)	0.00024 (0.000)	-0.000177 (0.000)
<i>Mean per 1000</i>	37.5	15.0	9.18	3.06
N	271117	270056	268953	268709
$R^2$	0.00449	0.00324	0.00200	0.00794

Notes: Robust standard errors are clustered at the district level with significance levels at the 10, 5, and 1 percent.

## Heterogeneous Impact of JSY

So far, we have looked at the “common effect” of JSY, i.e., assuming that all treated individuals have the same impact from the program.

- Different exposure length to program is expected to yield different effects.
  - **Cohort effects** measure the differential effect of JSY based on when first exposed to the program.
  - JSY disproportionately benefits women introduced to program as teenagers (14-19 years old).
  - Highest decline in home births and shift to public institutional delivery.
  - Increased antenatal care and breastfeeding.

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  - Highest decline in home births and shift to public institutional delivery.
  - Increased antenatal care and breastfeeding.
- To understand whether the program benefits the most vulnerable population, we study heterogeneity by **personal characteristics**.
  - Significant positive impact on non-poor households compared to poor households.
  - Women with more than primary education (5+ years) more likely to use institutional care and auxiliary services than women with no or less than primary education.
  - JSY less effective for women living in districts with a higher proportion of tribal population.

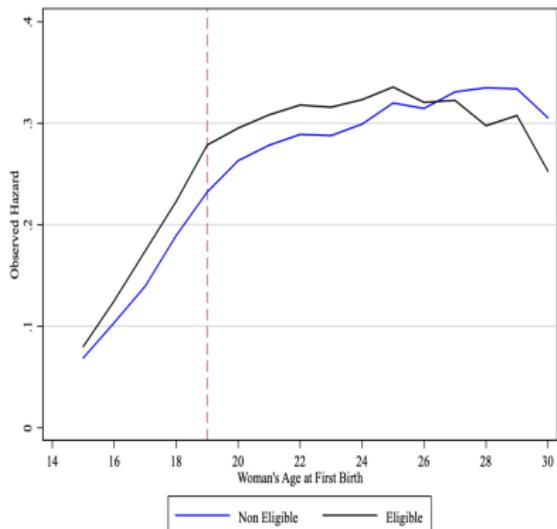
### **Do JSY eligibility rules reduce woman's age at first birth?**

- Pregnancy-related complications are the number one cause of death among girls between 15 and 19 years of age.

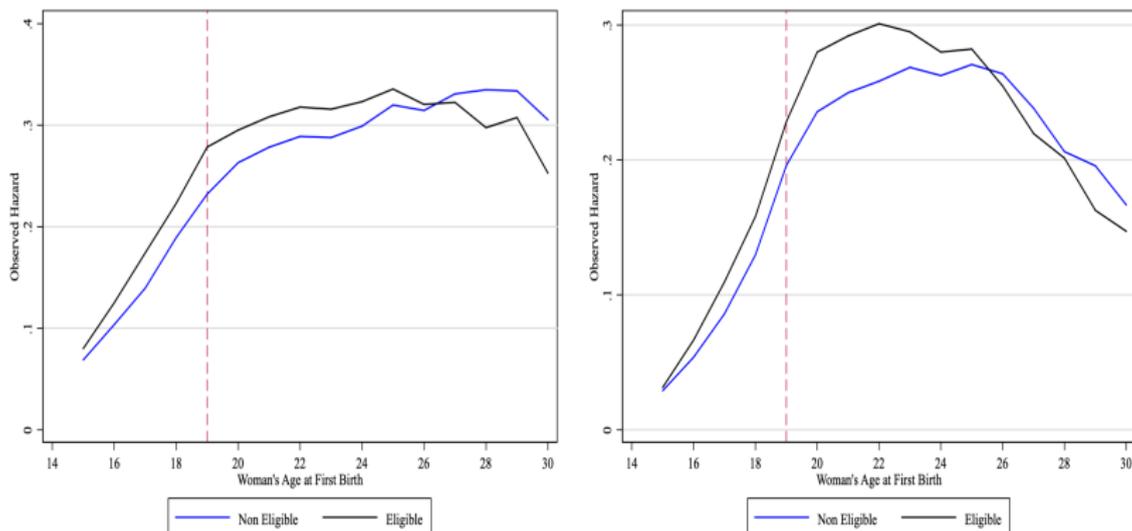
### Do JSY eligibility rules reduce woman's age at first birth?

- Pregnancy-related complications are the number one cause of death among girls between 15 and 19 years of age.
- Women above the age of 19 years at first birth are JSY eligible.
- The rationale for setting eligibility rules was to:
  - Encourage women to delay marriages and first births.
  - Reduce the fertility rates.

Figure: Observed First Birth Hazard Curves



**Figure: Observed First Birth Hazard Curves**



Notes: The hazard curve shows the observed proportion of eligible women — among those who have not reported earlier child birth — who report a first birth at each age period before (a) and after (b) the program was implemented. The figure uses data from DLHS between 1999-2010.

**Table: Impact of Eligibility on First Birth Age of 19)**

	(1)	(2)
Potential Eligible x Post JSY	0.0240*** (0.004)	0.0302*** (0.005)
States	All	HPS
Observations	272597	112972
R <sup>2</sup>	0.188	0.229

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- Using eligibility rules would give **biased results**.
  - Already have a component of age at first birth.
- **Potential eligibility** is defined by the exogenous components of the eligibility criteria, namely belonging to either SC/ST caste or living below the poverty line.

## Discrete-Time Hazard Model

- Since the question involves decision-making (of whether to have a child) at every age of the reproductive cycle, a hazard approach analyzing the probability of birth over time is appropriate.
- Apart from taking into account the sequential nature of decisions, the discrete-time hazard model also helps to examine the heterogeneity of impact at different ages.

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- Since the question involves decision-making (of whether to have a child) at every age of the reproductive cycle, a hazard approach analyzing the probability of birth over time is appropriate.
- Apart from taking into account the sequential nature of decisions, the discrete-time hazard model also helps to examine the heterogeneity of impact at different ages.
- The data for analysis is organized such that in each age period that the women are at "risk" of giving birth, they receive a zero if they did not drop out by surviving the age period and a one if they do drop out by giving birth.

## Figure: Distribution of Age at First Birth

Final-den-eligibles1.png

Notes: The distribution of age at first birth for potentially eligible women is calculated by estimating the survival functions accumulating the information on the hazard from age 15 to age of first birth. The mean values for the distributions are 18.60 and 18.75 for pre- and post-JSY periods, respectively.

## Figure: Distribution of Age at First Birth

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## Do CCTs impact Maternal Healthcare Utilization?

### **Evaluate the effect of JSY program on health outcomes.**

- Direct targeted health behaviors and child mortality
- Indirect impact on fertility choices.
- Comparison to other studies on JSY.

### **More broadly, do financial incentives impact women's healthcare behavior and outcomes?**

- Mechanisms at play.
- Compare estimates to similar international programs.
- Lessons to learn.

## Evaluate the effect of JSY program on health outcomes.

### Direct Impact:

- Increase in public facility delivery by 23 percent.
- $\Delta \downarrow$  Private facility  $>$   $\Delta \downarrow$  Home births.
- Modest effect on one-week and one-month infant mortality.
- Effect on institutional delivery not large enough and quality of the public healthcare system.

### Indirect Impact:

- Increase in ANC and first-trimester doctor visits among eligible women.
- Postpartum checkups reduce by 17.2 percent as women substitute it with delivery care.
- Eligible women shift their first birth by 3-4 months.

### Comparisons to Other Studies:

- A **relatively smaller increase** in institutional delivery and ANC.
- Flawed treatment groups and failure to control for healthcare supply.
- Joshi & Shivaram (2012) use few parameters of individual eligibility and find smaller JSY impact.

## Do financial incentives impact women's healthcare?

Yes, financial incentives act as positive reinforcements for inducing a change in the targeted health behavior (public institutional delivery in this case).

- Enough?: No!
- Maternal health services must be available, accessible, and of acceptable quality.
- Integrate cash incentives with nutritional support like Mexico and Brazil to reduce child mortality.
- Include comprehensive care into JSY benefits to realize full program benefits.
- Cautious program targeting: JSY delivered smaller benefits to more vulnerable groups such as women with no schooling and poor women.
- Indirect effect on maternal mortality?

## Moving forward, what do we need to know?

### **JSY**

- Interaction with other maternal healthcare programs (another paper).
- Impact on high school graduation rates for women.
- Impact on women empowerment and say in household decisions, including fertility.

### **Financial incentives based maternal programs**

- Long-term effects of financial assistance including changes in women's healthcare decisions outside of maternal care.
- Cost-effectiveness of CCTs and inter-program comparisons.
- Intrafamilial decision-making affects women's ability to access and use maternal health services. Future works on the impact of financial incentives on household behavior.

Thank you

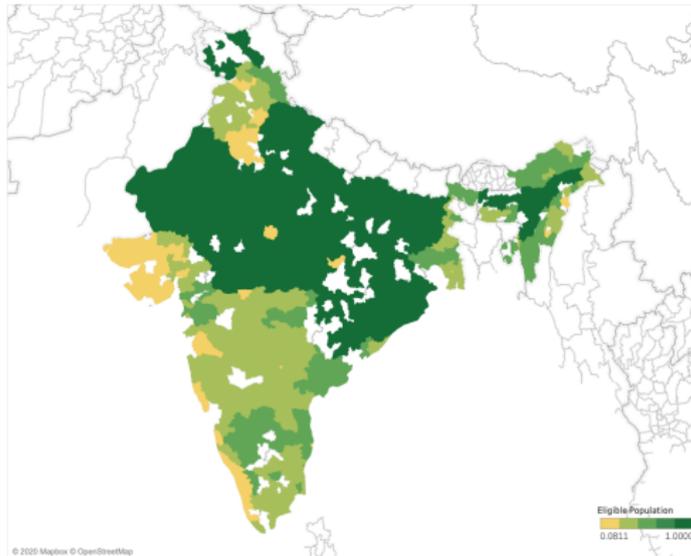
For comments and suggestions, please email :  
**[dpokhriyal1@gsu.edu](mailto:dpokhriyal1@gsu.edu)**

- India contributes **one-fifth** of all maternal and child deaths.
- **Financial constraints and lack of facilities** as primary reasons (45%) for not utilizing services during pregnancy.
- Investments in healthcare programs **increased 10x times** from early 2000s to \$66.7 million in 2012. [link](#)
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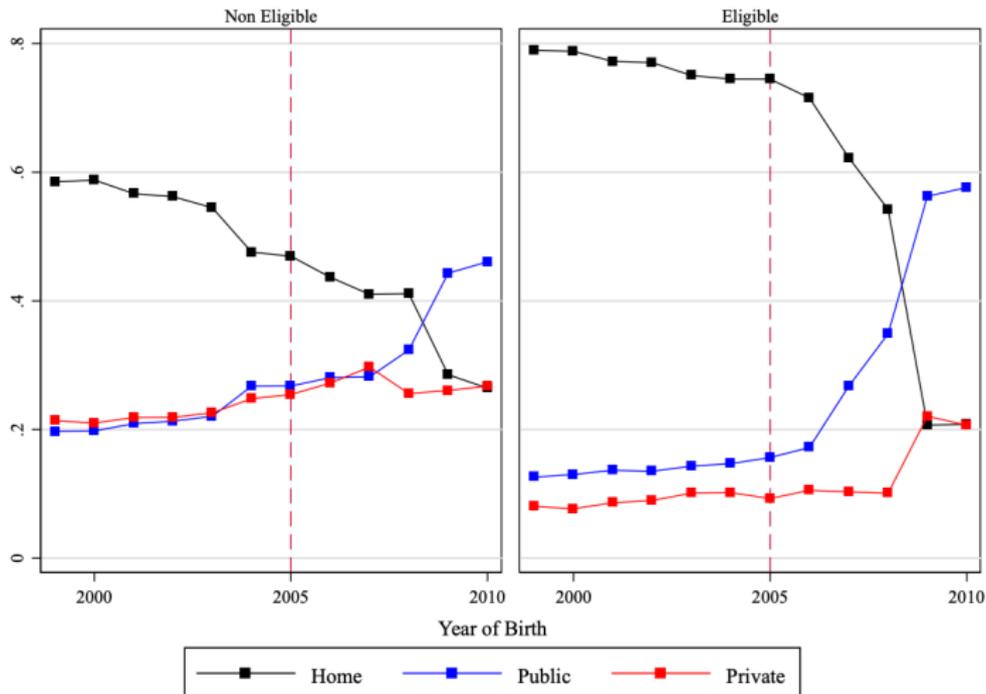
**How do investments in maternal healthcare programs change healthcare utilization and outcomes?**

Figure: District-wise JSY Eligible Population [Back](#)



Notes: The proportion in the average utilization of institutional delivery at public health facilities is illustrated by yellow (lowest) to green (highest). The missing districts in the survey are white in color.

Figure: Choices of Place of Delivery by Eligibility (1999-2010) [Back](#)



Source: Dataset compiled using DLHS II and DLHS III

Figure: Intensity of Healthcare Centres- 2005 (left) and 2010 (right) [Back](#)

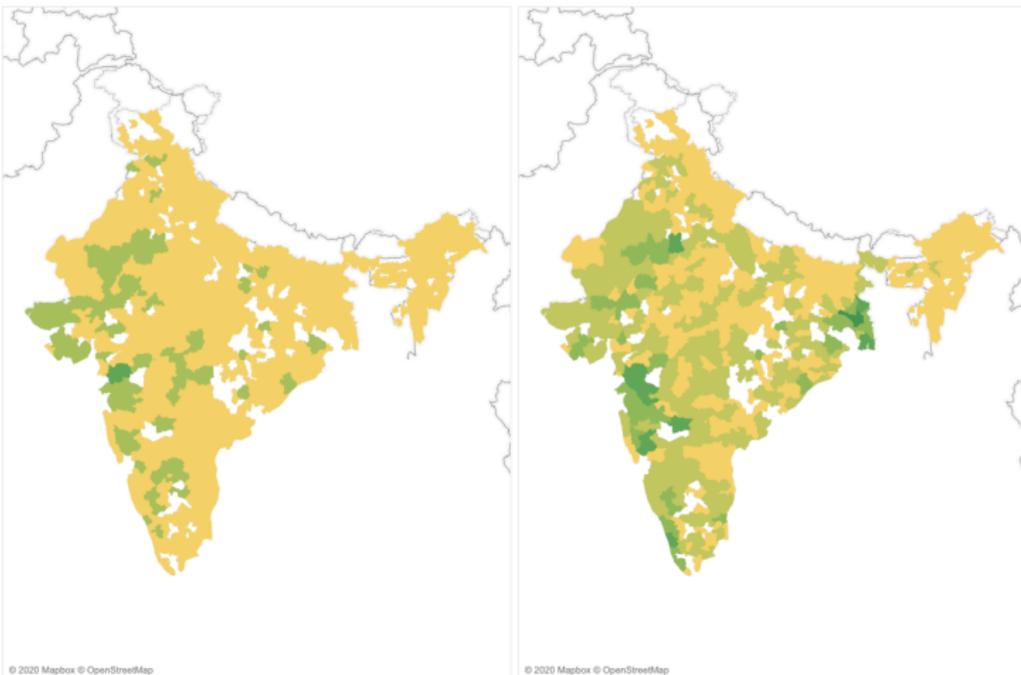


Figure: Event Analysis for Public Institutional Delivery [Back](#)

