

Improving Maternal and Child Health in India: Evaluating Demand and Supply Side Strategies (IMATCHINE)

Presentation by
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Outline of Today's Presentation

- Background on the IMATCHINE project
- Gujarat:
 - Chiranjeevi Yojana (CY)
- Karnataka:
 - Thayi Bhagya Yojana (TBY)
 - Experimental Evaluation of Provider Incentives
- Qualitative research

Background 1: Objectives

- TWO key evaluation objectives:
 - Evaluation of subsidy programs in obstetric care aimed at increasing rates of institutional deliveries and improving maternal and child health
 - Gujarat: Chiranjeevi Yojana is a 'voucher' program where payment is made directly to provider by government
 - Karnataka: Newly announced program – Thayi Bhagya Yojana - a conditional cash transfer program, where payment is made to households
 - Experimental evaluation of supply-side incentives for maternity-care providers using randomized interventions of provider incentives to improve quality and health outcomes

Background 2: Components of the Evaluation

- Gujarat:
 - Retrospective evaluation of 'voucher' Chiranjeevi Yojana (CY) program since 2005
- Karnataka:
 - Prospective evaluation of new CCT component of Thayi Bhagya Yojana (TBY) program
 - Experimental evaluation of provider incentives to improve quality or health outcomes
- Both states
 - Qualitative research
 - Cost effectiveness analysis

Background 3: Relevant State Indicators

(2007-2008, unless noted)

Indicator	Karnataka		Gujarat		India	
	State	Rural	State	Rural	National	Rural
IMR (2007)	47		52		55	
MMR (2004-06)	213		160		254	
% Institutional Deliveries	65	60	57	48	47	37
% Safe Deliveries	72	67	62	54	53	43
% Public CHCs w/GYNOB	34		14		25	
% Public CHCs w/ C-section	19		18		19	

Source: DHLS-3, SRS estimates

Research Questions

- What are the impacts of the CY and TBY schemes on institutional deliveries, quality of care and MCH outcomes? Why, why not?
- Do supply-side incentives impact MCH outcomes and quality processes? Is so, how? (Karnataka)
- What are the comparative effects of CY vs.TBY?
- What are the comparative effects by CY controlling for JSY? (Gujarat)
- What are the barriers to people's demand for institutional deliveries? Why do some woman continue to deliver at home?
- What is the comparative cost effectiveness of CY and TBY?

Gujarat: Chiranjeevi Yojana (CY)

- Introduced in 2005
- Response to acute shortage of OBGYNs in public sector
- Leveraging presence of private providers in rural areas
- Pays approx \$ 45 to accredited provider per delivery
- Eligibility: BPL card holder or BPL eligible (~23% of population; total pop 55 million)

More on CY

- First introduced in 5 backward districts 2005-2007 and then rolled out across the state Jan 2007-08 onwards
- B/w 2005 – Feb 2008, CY had covered over 165,000 deliveries provided by 852 providers
- Claims: (in 2009)
 - Has increased institutional births from a national average of 57% to over 80%
 - Has reduced MMR & IMR
 - Won WSJ Innovations Award & is now widely looked upon as the “model”

Previous 'Evaluations' of CY

Table 5

Expected and reported maternal and newborn deaths and estimated lives saved by the Chiranjeevi Scheme, January 2006 to December 2008.

Total deliveries	Expected maternal deaths in absence of the scheme ^a	Maternal deaths reported ^b	Maternal lives likely to be saved	Estimated newborn deaths in absence of the scheme ^a	Estimated newborn deaths based on reported deaths ^c	Newborn lives likely to be saved
269 942	588	52	536	10 798	3 183	7 615

^a Assumptions for expected maternal deaths: MMR for poor before intervention = 218 per 100 000 live births; NNMR for poor before intervention: 40 per 1000 live births.

^b As reported by the private practitioners and government MIS.

^c Estimate is calculated by multiplying the reported deaths by 3—the factor of under-registration of newborn deaths.

Source: Mavalankar, D. et al. 2009. Saving mothers and newborns through an innovative partnership with private sector obstetricians: Chiranjeevi scheme of Gujarat, India. *International Journal of Gynecology and Obstetrics* 107: 271–276.

- Have typically used data from CY facilities to extrapolate estimated utilization and health benefits in the population

Gujarat: Regression Discontinuity Evaluation Design

- The program uses the BPL line as the eligibility criteria, which allows a quasi-experimental regression discontinuity design
 - Since the BPL score is continuous, households immediately next to each other across the BPL line are comparably similar to each other
 - Discontinuity in program eligibility across the BPL line allow us to test for differences in outcomes that *can* be attributed to the program

Gujarat: RD Design ...contd...

Two main challenges with BPL criteria:

- Lots of other state run programs use BPL eligibility (such as JSY, food subsidies),:
 - SOLUTION: We use a “Difference-in-Difference” framework by relying on timing of introduction and expansion of the program to 5 districts in 2005 and all over the state in 2007 to try to identify program effects of CY.

- | Year | Pilot Districts | Expanded Districts |
|------|-----------------|--------------------|
| 2005 | BPL + CY | BPL |
| 2008 | BPL + CY | BPL + CY |

- Manipulation of BPL criteria, resulting in misclassification
 - SOLUTION: We rely on a “Fuzzy” regression discontinuity strategy, where we calculate the “true” eligibility and then instrument for CY participation using simulated eligibility

Gujarat: RD Analysis

- First Stage: (instrumenting for CY Participation)

$$participate_{ih} = \alpha + \gamma BELOW_h + \beta BPL_h + \sum_k \delta_k CONTROLS + \varepsilon_{ih}$$

- Second Stage: (Change in avg. outcomes)

$$outcome_{ih} = \varphi + \lambda participate_{ih} + \theta BPL_h + \sum_k \delta_k CONTROLS_{ik} + \xi_{ik}$$

- Key outcomes:

- Rates of institutional delivery
- Study is not powered to detect effects on IMR or MMR, but we will collect data on these measures anyway in addition to measures of morbidity that are more common. Also will collect data on HH characteristics

Gujarat: RD Analysis using the Geographic Spread

- Accounting for CY roll out in time and space (2nd difference estimate)

$$\begin{aligned}
 \text{participate}_{ihdy} = & \alpha + \gamma \text{BELOW}_h + \rho \text{CY}_{dy} + \eta(\text{BELOW}_h \times \text{CY}_{dy}) \\
 & + \beta \text{BPL}_h + \sum_k \delta_k \text{CONTROLS}_{ik} + \mu_d + \mu_y + \varepsilon_{ihdy}
 \end{aligned}$$

- Second Stage: (change on avg. outcomes : same equation accounting for roll out)

$$\begin{aligned}
 \text{outcome}_{ihdy} = & \varphi + \lambda \text{BELOW}_h + \tau \text{CY}_{dy} + \lambda \text{participate}_{ihdy} + \theta \text{BPL}_h \\
 & + \sum_k \pi_k \text{CONTROLS}_{ik} + \sigma_d + \sigma_y + \xi_{ihdy}
 \end{aligned}$$

Karnataka: Thayi Bhagya Yojana (TBY)

- New Conditional Cash Transfer program of Rs. 1000 for women who prefer to give birth in the private sector
- Two components
 - (1) Prospective evaluation
 - Since the program uses a BPL eligibility like the CY program, we will use a RD based method, combined with a difference-in-difference
 - We are working with the Govt. of KN to implement a baseline survey starting next month

KN : Experimental Evaluation of Provider Incentives (2nd component)

- Cluster randomized trial of incentives for providers to estimate effect of incentives for improvements in process measures v/s outcome measures
 - Arm 1: Provider incentives evaluated based on performance on quality of care indicators
 - Arm 2: Provider incentives evaluated based on improvement of MCH outcomes in catchment area population
 - Arm 3: Control group, with no incentives

KN Incentives Experiment: Design Issues

- 180 rural clusters, in 3 groups of 60 each
- Each cluster is approximately at the level of the *HOBLI* (called *kasba* in N. India)
- On average: 3 OBGYN providers in each cluster
- Sample for the study: approx 550 doctors and 18,000 households (100 women who have a baby in catchment area of each cluster)

KN Incentives Experiment: Design Issues ...contd...

- There are three key issues related to measurement in this study:
 - Definition of clusters and catchment area
 - Measurement of process measures of quality and health outcomes in a population
 - Identification of women who have had a baby and interviewing them in time

Measurement Issues - 1

- Definitions:
 - **Clusters:** Geographically separate (non-overlapping) areas, each comprised of overlapping catchment areas served by 1-5 private obstetric care providers
 - **Catchment area for a provider:** An outer radius (“buffer zone”) of all villages from which patients frequently (once a month ??) come to the provider

Protocol for Clusters/ Catchment Area

- Steps:
 - Exclude all taluka headquarters (TH) (and outlying areas served principally by facilities in TH)
 - Exclude all towns with large public providers (CHCs or larger)
 - Map all remaining provider catchment areas
 - Exclude all clusters with more than 5 OBGYN private providers
- This process will generate the sampling frame of clusters from which 180 will be selected for CRT

Measurement Issues - 2

- Need to measure quality of care and health outcomes
 - Problem 1: Cannot measure quality by observing provider (Hawthorne Effects and practically not feasible to use this to reward them) & no records to rely on
 - Problem 2: Need to have measures of health (maternal and child morbidity) that can be measured from household surveys

Measurement Issues - 2 ...contd...

- SOLUTION: Develop a set of measures of quality of care and health outcomes that can be reliably asked to women
- For Quality of Care, we are currently conducting a validation exercise to see what survey questions match the "clinical truth"
 - For example, did the Dr. examine BP when she went in to the hosp? Was she asked about previous medical history? How long was she in labor (did she experience prolonged labor without appropriate intervention?)
 - Similarly, for health outcomes, we will ask women about health status measures focusing on PPH, sepsis and eclampsia, which are most common and important for MMR

Measurement Issues - 3

- Identification of women to be enrolled in study
 - Women who had a baby in the catchment area
 - Need to be interviewed within TWO WEEKS after delivery
- SOLUTION: Conducting weekly visits to each of the villages in the cluster areas to identify women who have given birth in the past week – & interviewed in next week

Qualitative Research

Component

- Gujarat: Understand better why eligible (BPL) women have been slow to take up participation in CY program. What factors tend to limit (or enhance) different peoples' demand for institutional deliveries?
- Karnataka
 - Identify the nature of barriers that limit peoples' demands for formal health care and in particular demand for institutional deliveries.
 - Understand how norms and patterns of seeking health care, in particular, trends in accessing formal system have changed over past 5-10 years? Influence of national JSY scheme? Generational shift?

Qualitative Research . . . contd

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- Karnataka

- Mapping channels of gaining access to formal health care: use of intermediaries, informal payments, etc.. How is alliance on any set of intermediaries associated with patterns of access and care seeking behaviors?
- Identifying how practices of private OBGYN have changed after introduction of supply-side incentives.

Thanks

- 3ie
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- Government of Karnataka
- DFID
- World Bank

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Gujarat: RD Study Protocol

- Objective of data collection: to identify households close to the BPL eligibility line
- Sample 250 villages from across the state using census data, stratified based on village population (Census 2001)
- In EACH sampled village, we will conduct 'house-listing' to identify the sample frame and to recreate BPL scores ("*true*" scores) by collecting information (2002 levels) on all BPL scoring questions

Gujarat: RD Study Protocol ...contd...

- Once we recreate “true scores” for all households, we select households within 5 BPL points on each side (to be decided) as the sampling frame – and randomly sample 5000 households from this frame
- Planned Timeline:
 - Field work: August 2010 – November 2010