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Reducing Maternal Mortality One District at a Time

**A district level analysis of the
utilization of skilled birth attendants
in four districts of Bihar**

By Christina Chang

Objective

- Explore patterns, determinants, and disparities between the poor and the better-off in the proportion of deliveries attended by a skilled birth attendant in four districts of Bihar - West Champaran, Jehanabad, Samastipur, and Katihar

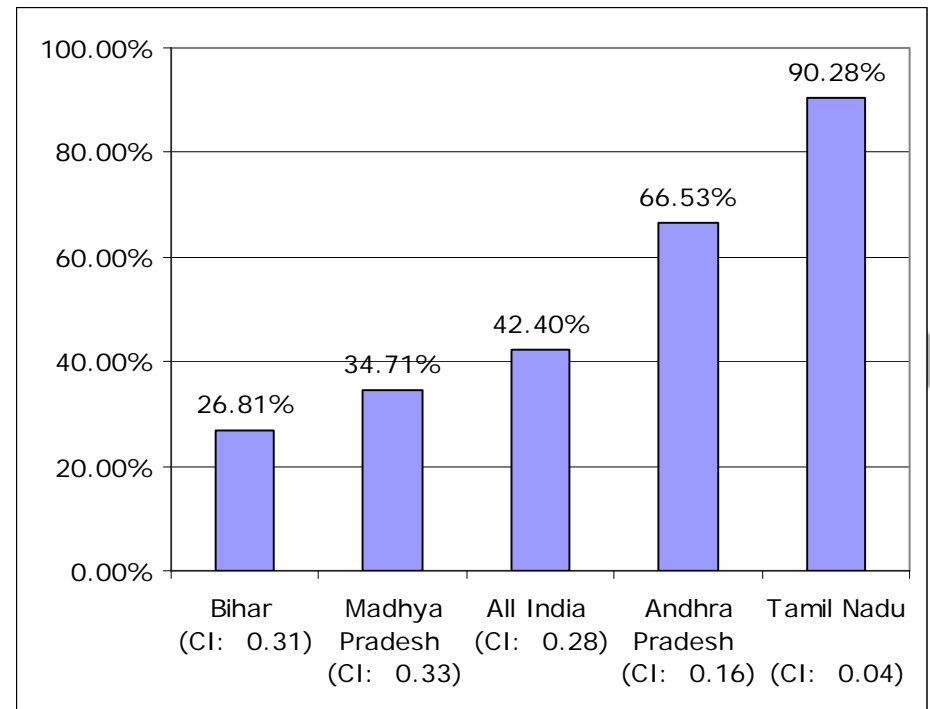
Background

- Bihar
 - Highest percentage of people living in poverty in any single state in India
 - Large rural population - urbanization is low in Bihar (10.5%)
 - Government criticized for
 - Lack of transparency
 - Unresponsiveness to citizen needs
 - High levels of corruption

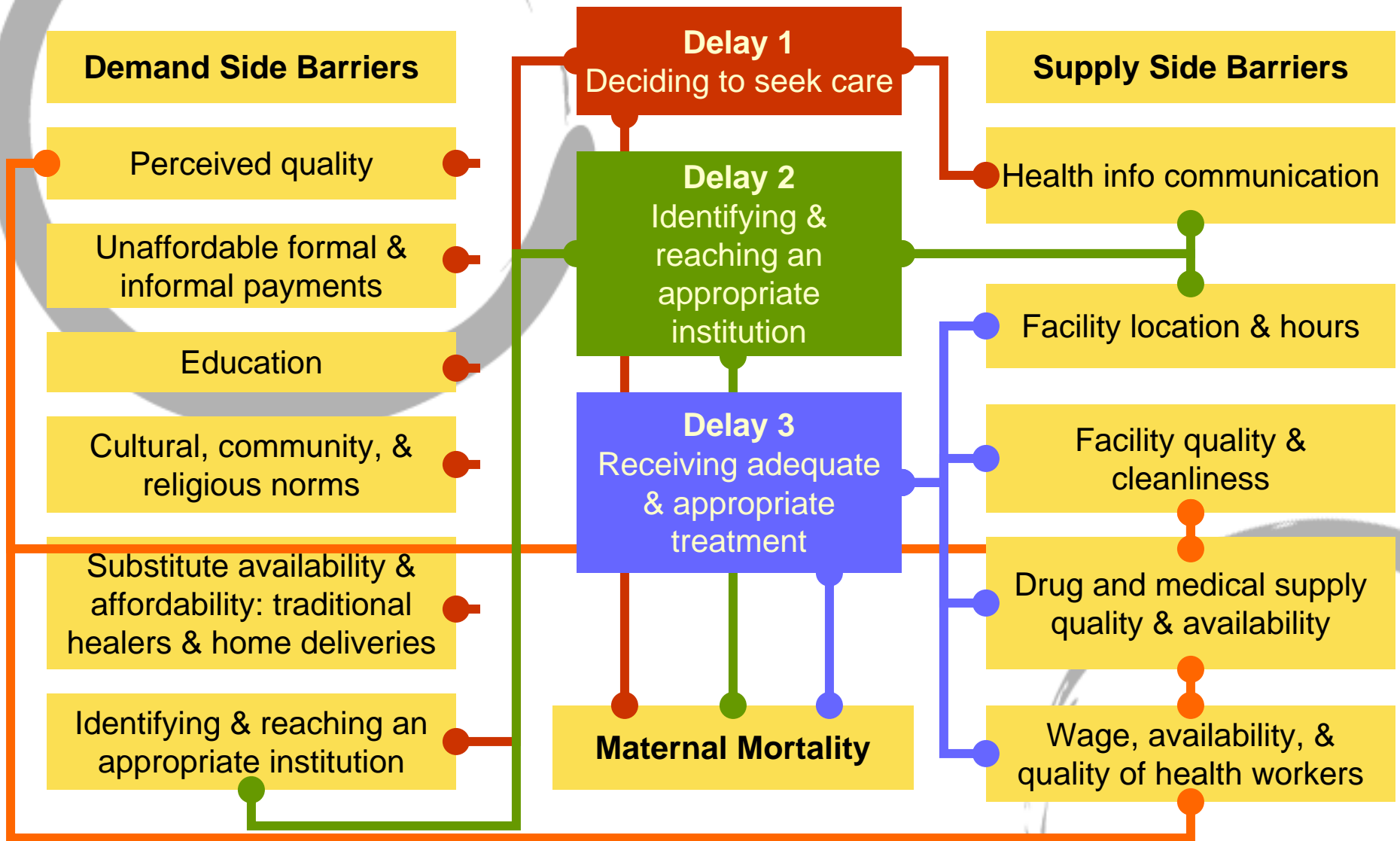
Background

- Bihar has extremely low rates and large socioeconomic differences in the use of skilled birth attendants at delivery

Proportion of women utilizing skilled birth attendants at delivery in Bihar, Madhya Pradesh, Andhra Pradesh, Tamil Nadu, and all of India, (DLHS, 2002)



Conceptual Model



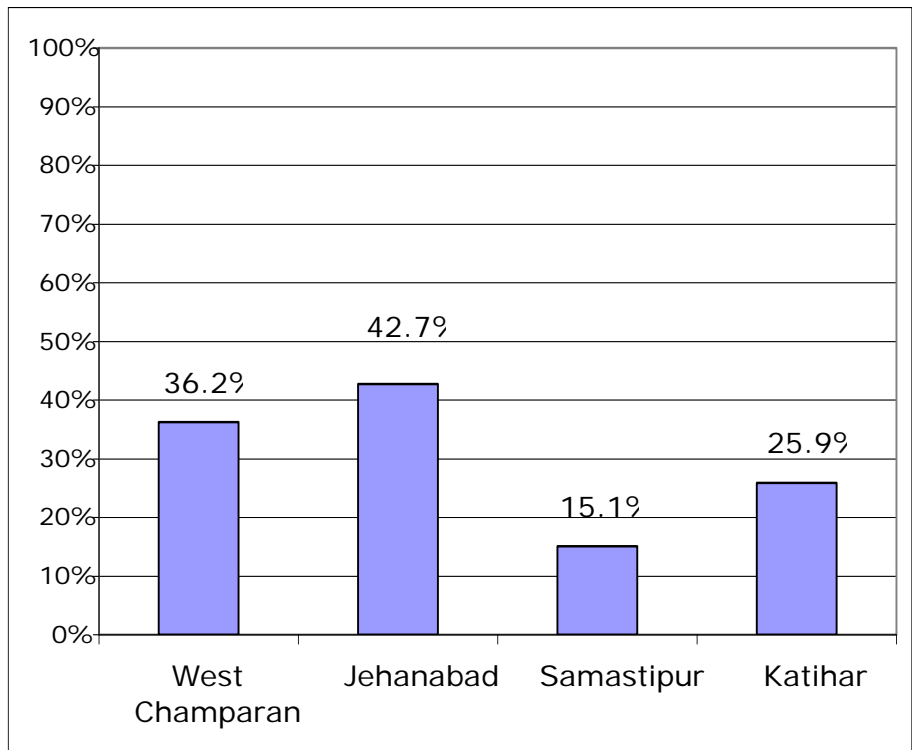
Data & Methodology

- District Level Household Survey (DLHS), 2002
 - West Champaran: 712 women
 - Jehanabad: 561 women
 - Samastipur: 629 women
 - Katihar: 606 women
- Multivariate logistic regression
- Dependent variable
 - Skilled birth attendants + institutional deliveries
- Explanatory variables
 - Wealth quintile
 - Education of mother
 - Education of husband
 - Religion
 - Caste/Tribe
 - Number of ANC visits
 - Age of mother
 - Place of residence (rural or urban)

Inter-district inequalities

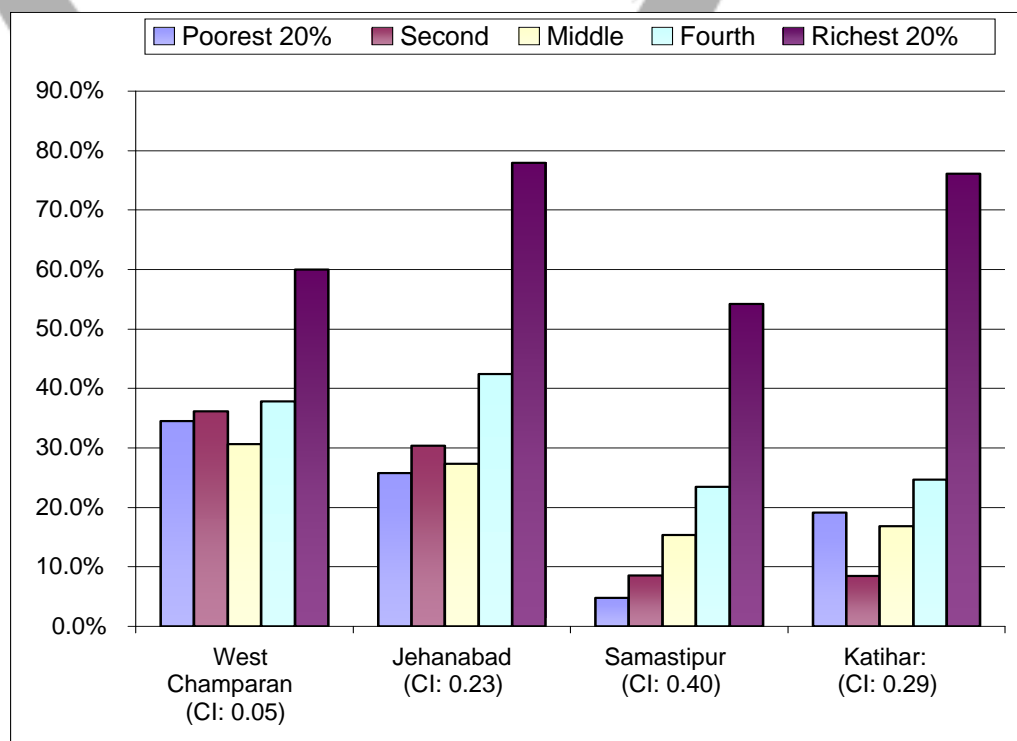
- All districts have low rates of utilization of skilled birth attendants
- Some districts do worse than others. Clearly, there are inter-district differences

Proportion of women utilizing skilled birth attendants at delivery in West Champaran, Jehanabad, Samastipur, and Katihar, (DLHS, 2002)



Intra-district inequalities

Proportion of women utilizing skilled birth attendants at delivery in West Champaran, Jehanabad, Samastipur, and Katihar by wealth quintile (DLHS, 2002)



- Inequality is highest in Samastipur, indicated by CI: 0.40
 - Poorest 20%: 4.8%
 - Richest 20%: 54.2%
- Inequality is smallest in West Champaran, indicated by CI: 0.05

What mattered?

- Wealth status mattered for all districts except West Champaran.

	West Champara (CI: 0.05)	Jehanaba d (CI: 0.23)	Samastipu r (CI: 0.40)	Katihar (CI: 0.29)
Wealth Quintile				
Q1: Poorest 20%	Ref. Cat.	Ref. Cat.	Ref. Cat.	Ref. Cat.
Q2: Second	0.89	1.11	1.78	0.34***
Q3: Middle	0.71	0.97	3.30***	0.7
Q4: Fourth	0.73	1.39	3.64***	0.62
Q5: Richest 20%	1.18	3.13***	8.00***	3.37***

***significant at the $\alpha=0.01$ level **significant at the $\alpha=0.05$ level * significant at the $\alpha=0.10$

What mattered?

- Mother's education was a statistically significant predictor for SBA utilization for the two lowest performing districts, Samastipur (OR: 4.7) and Katihar (OR: 3.4).
- Having an educated husband was associated with greater odds of utilizing SBA at delivery in all districts

What mattered?

- Household religion only mattered in Jehanabad
 - Hindu women had 50% less odds than Muslim women
- Household caste only mattered in Jehanabad
 - OR comparing women from non-scheduled castes and tribes to women belonging to scheduled castes and tribes: 3.2

What mattered?

- Effect of age was not statistically significant after adjusting for other covariates but generally showed a reduction in odds of using SBA with increasing age.
- Place of residence under bivariate analysis showed increased odds of delivery by SBA in urban versus rural. After adjusting for other covariates, place of residence only mattered in Samastipur.
 - OR 3.7 comparing urban to rural

What mattered

- The number of ANC visits are **STRONGLY** associated with increased odds in using skilled care at delivery in all districts after controlling for covariates

Number of ANC Visits	West (CI: 0.05)	Jehanabad (CI: 0.23)	Samastipur (CI: 0.40)	Katihar -0.29
No visits	Ref. Cat.	Ref. Cat.	Ref. Cat.	Ref. Cat.
1 visit	0.72	1.73	4.99***	2.81***
2 visits	0.78	4.77***	3.98***	2.45***
3 visits	1.71	6.09***	9.57***	2.71***
4 visits	3.36***	4.69***	20.58***	2.55**

***significant at the $\alpha=0.01$ level **significant at the $\alpha=0.05$ level * significant at the $\alpha=0.10$

Inter-district inequalities

(The district a women lives in matters)

District	Rich-Poor OR	Q1	Q2	Q3	Q3	Q5	Total	CI	CI Std Error
Samastipur	Ref. Cat.	4.8%	8.6%	15.4%	23.5%	54.2%	15.1%	0.3980	0.1162
Katihar	1.48**	19.1%	8.5%	16.8%	24.7%	76.1%	25.9%	0.2908	0.1513
Jehanabad	3.02***	25.8%	30.4%	27.3%	42.4%	77.9%	42.7%	0.2255	0.0483
West Champaran	3.59***	34.5%	36.2%	30.6%	37.8%	60.0%	36.2%	0.0532	0.0677

- Women in West Champaran and Jehanabad are 3 times more likely than women in Samastipur to deliver with the assistance of a SBA
- The poorest households within the lowest performing districts are the most unreached and underserved



Policy Implications

Four delivery care models

(Where they now and where should they aim to go?)

- Model 1: Non-professional delivery at home
- Model 2: SBA delivery at home
- Model 3: SBA delivery basic EOC facility
- Model 4: SBA delivery in comprehensive EOC facility
- Countries successful at reducing MMR moved from model 1 to model 2,3, or 4.
- Bihar is currently a Model 1 state

Source: Koblinsky et al. and the World Bank

Learning from other countries

- Honduras
- Indonesia
- Sri Lanka



Honduras

- Model 2 may not be enough to achieve reductions in MMR
- MMR reduction strategies aimed to meet the needs of the worst-off in the country:
 - Targeted regions with highest maternal mortality ratios
 - Built 7 new rural area hospitals
 - Built 5 maternity waiting homes along side rural hospitals
 - Build 8 birthing centers
- Community participation and ownership of birth centers
- Traditional birth attendants: trained to recognize danger signs. Found that TBAs were referring women correctly and often accompanied women to facilities

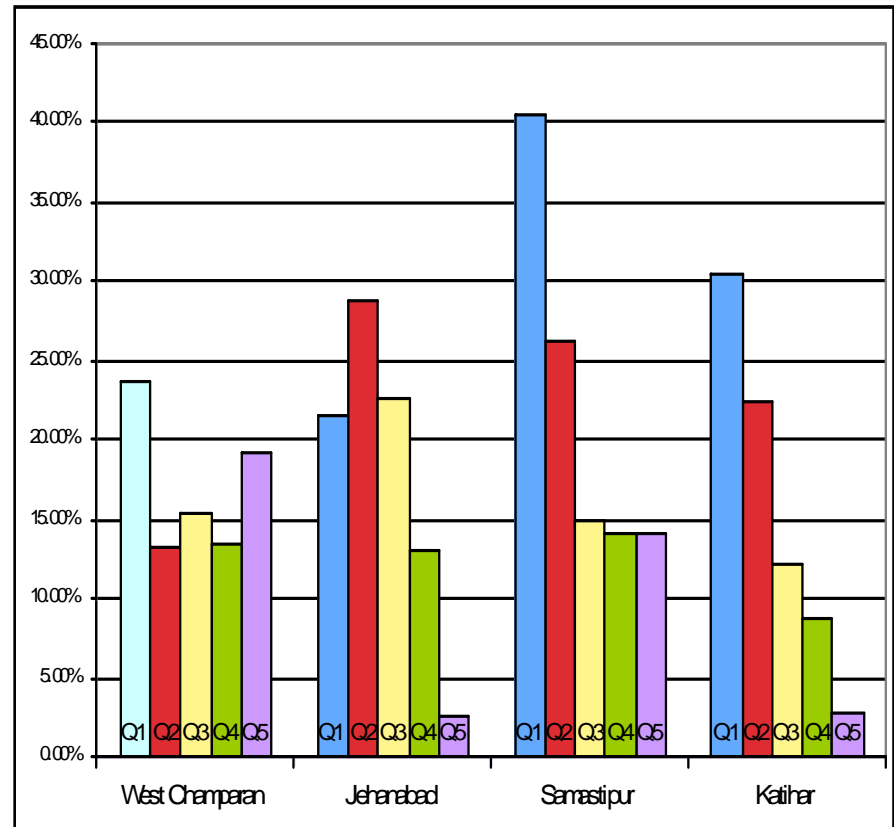
Indonesia

- Initial strategy: Train traditional birth attendants - did not work for them
- Village-based midwives
 - Surge of deliveries attended by SBA but no change in institutional deliveries
- Learning from Indonesia's mistakes:
 - Only been able to move from model 1 to model 2
 - Did not address demand-side barriers
 - Lack of transportation
 - High costs of care
 - Cultural appropriateness of institutional deliveries

Learning from the data

- Among women who did not deliver in an institutional setting, “too far/no transportation” was the second most common reason in every district
- More women from poorer households state distance and transportation barriers as their primary reason for not delivering in an institution

Percent of women stating “too far/lack of transportation” as their primary reason for not delivering in an institution by quintile, (DLHS, 2002)



Sri Lanka

- Professionalism of midwives
 - Midwives made frequent visits to villages to provide antenatal care to women
- Information system
 - Civil registration of maternal deaths as a tool to raise importance of maternal deaths in villages
 - Initiated maternal death reviews that included investigations:
 - Interviews with local midwives, community leaders, district hospitals, household members
 - Two important benefits:
 - Provides meaningful information to decision-makers to make immediate and appropriate programmatic changes
 - Raises importance of maternal deaths in a culture that has accepted maternal death as tragic yet accepted part of childbearing

Policy Actions

- Increase the number of midwives in villages, supported by a strong referral network
 - Midwives are frontline workers who educate mothers, provide essential medical care during her pregnancy, and coordinate and prepare the household with clear instructions on what to do when the mother goes into labor
- Increase the number of birthing facilities embedded in a strong referral network
 - Strategy should be similar to Honduras: build in rural areas with high MMR
 - Birthing centers closer to women in remote rural areas
 - Maternal waiting homes can help address geographical barriers

Policy Actions

- Provide free or subsidized transport services from villages to facilities
 - Transportation is a major barrier for women in the four districts
 - Transportation from villages to nearby birthing centers, between basic EOC facilities to comprehensive facilities should be reliable and affordable
- Make decisions using a community-based participatory approach (example: beneficiary assessments)
 - Qualitative tools can be used to understand the special needs of a community
 - Decision should include input of village members, leaders, local NGOs, district officials...
 - Projects that originate from a participatory approach are more likely to be accepted and utilized by the beneficiary population.



Policy Action

- Implement an information system that records maternal deaths to monitor and evaluate district level successes
 - Perhaps the most difficult to implement
 - Village norms such as burial ceremonies could be used to identify deaths.
 - Main idea: raise importance of maternal death at the village level



Conclusion

- Nature of the problem is very complex and simple solutions are likely to fail
- Kingdon: policies are only likely to be taken seriously by government when policy streams run together
 - Problem: perception of problems as a matter of requiring government action
 - Solution: an analysis of the problem and its solutions
 - Politics: political will or shift in politics (example: elections)
- The extent to which policy recommendation will be put into action depends now on the political will of Bihar...