

# Financial incentives to influence maternal mortality in a low-income setting: making available ‘money to transport’ – experiences from Amarpatan, India

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**Objectives:** Only 40.7% women in India deliver in an institution; leaving many vulnerable to maternal morbidity and mortality (India has 22% of global maternal deaths). While limited accessibility to functioning institutions may account in part, a common reason why women deliver at home is poverty. A lack of readily available financial resources for families to draw upon at the time of labor to transport the mother to an institution, is often observed. This paper reports a yearlong collaborative intervention (between the University and Department of Health) to study if providing readily available and easily accessible funds for emergency transportation would reduce maternal deaths in a rural, low income, and high maternal mortality setting in central India. It aimed to obviate a deterrent to emergency obstetric care; the non-availability of resources with mothers when most needed. Issues in implementation are also discussed.

**Methods:** Maternal deaths were actively identified in block Amarpatan (0.2 million population) over a 2-year period. The project, with participation from local government and other groups, trained 482 local health care providers (public and private) to provide antenatal care. Emergency transport money (in cash) was placed with one provider in each village. Maternal mortality in the adjacent block (Maihar) was followed (as a ‘control’ block).

**Results:** Maternal deaths in Amarpatan decreased during the project year relative to the previous year, or in the control block the same year.

**Discussion and conclusions:** Issues in implementation of the cash incentive scheme are discussed. Although the intervention reduced maternal deaths in this low-income setting, chronic poverty and malnutrition are underlying structural problems that need to be addressed.

Keywords: *Maternal mortality; India; Reproductive health services*

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In 2005, it was estimated that there were about 535,900 maternal deaths worldwide, 20% of which were in India (1). The same year, maternal mortality appeared on the country’s political agenda, following evidence that maternal mortality was stagnating in India and that existing initiatives were not addressing the problem effectively (2). At the midpoint of the timeline to achieve the Millennium Development Goals (MDG), India’s progress towards meeting MDG 5 (3, 4) has been

slow; the pace of interventions to reduce maternal mortality will need to be accelerated.

The Government of India, in 1992, launched the Child Survival and Safe Motherhood (CSSM) program (with support from the World Bank and UNICEF) which ended in 1997 (5). Evaluations of the program concluded that while it contributed to better child survival outcomes, it had failed to increase the number of well-functioning birth facilities (6). Given that access to

emergency obstetric care (EmOC) is life saving and essential to reducing maternal mortality and morbidity (7, 8), the subsequent national programs emphasized the importance of functioning institutions and actively promoted institutional delivery. The subsequent Reproductive and Child Health (RCH) program I (1997–2004) (9) and its successor program, the RCH II (launched in 2005) (10) continued efforts initiated under the CSSM to strengthen referral units for childbirth and promote institutional delivery. While the implementation of the RCH II program has begun under the Government of India's National Rural Health mission, there has been some criticism of the quality of services provided under the program (11) which could influence desired outcomes.

Efforts to promote institutional delivery in India have met with limited success. Only an estimated 40.7% of deliveries now occur in institutions (31% in case of rural deliveries) (12). This represents a small increase of 7% in total institutional deliveries over the last decade (13). A number of reasons have been postulated for this, including limited availability and accessibility for many women in rural India (functioning referral facilities are only available in towns and cities, many kilometers from their homes) and the quality of care in the institutions. However, one of the common reasons why many women still deliver at home (and do not move to an institution raising their risk of maternal morbidity/mortality) is a lack of readily available financial resources for families to draw upon at the time of delivery, particularly to move the woman to an institution. In economically deprived areas, ready money is hard to come by which is a deterrent to moving the woman to an institution, given the possible loss of wages for family members, long distances, non-availability of reliable transport (hence needing to arrange transport privately), and poor road network. Of all health indicators, maternal mortality reveals the greatest gap between rich and poor women, both between and within countries (14).

The project (a part of collaborative operational research between the Medical University, Rewa and the Department of Public Health, Government of Madhya Pradesh [MP]) was an experiment to see if making ready funds easily available (and accessible) for transportation in an emergency would help reduce maternal deaths among vulnerable groups in this low income, rural, and high maternal mortality setting. It aimed to obviate one of the deterrents – the non-availability of resources with the mothers when they need it most.

The 'Three Delays' model proposes that pregnancy-related mortality is largely due to delays in: (1) deciding to seek appropriate medical help for an obstetric emergency; (2) reaching an appropriate obstetric facility; and (3) receiving adequate care when a facility is reached. Thus the project intended to address the first two of the

three D's (delays) contributing to maternal death – the delay in seeking care and the delay in reaching an adequate facility (7).

## Methodology

### Setting

The central Indian province of MP is one of India's largest and most socio-economically backward provinces. Of the 60.4 million people, 73% are rural (15). Scheduled castes (SC) and tribes (ST) constitute 15.2% and 20.3% of the population (15). Thirty-seven percent of the population lives below the poverty line (BPL) (16). SCs are communities who historically have been subject to social exclusion being at the lower rungs of a stratified Hindu society (ex-untouchables). For millennia, caste and occupation were closely interlinked in the traditional socio-economic order, and the lowest manual and menial occupations were reserved for the SC. Although the link is weakening, rural SC are predominantly landless and impoverished agricultural labor. STs are another vulnerable group who are akin to 'indigenous' inhabitants. They have traditionally been hill and forest dwellers and tend to form self-sufficient economic units. Belonging to either of these vulnerable groups has been identified as a structural factor that predisposes one to long-term poverty and deprivation. Both groups are the beneficiaries of a post-independence Government of India affirmative action program. The third vulnerable group includes those living BPL (Indian estimates of the poverty line are based on costs for a requirement of 2,400 calories per capita per day for rural areas. As of December 2005 (17), this translates to US\$ 110–167 per year per person per year). The SC and ST groups have a disproportionately high representation in BPL populations, these three vulnerable groups also share a large burden of the overall maternal and infant mortality.

Agriculture, mostly traditional, is the mainstay of the economy in MP. The state has relatively poor health indicators relative to other provinces in the Indian Union – infant mortality stands at 79/1,000 and Maternal mortality ratio (MMR) is 379/100,000 (18). MP is divided into 48 administrative districts, of which Satna is one.

Satna lies in the north-eastern part of MP, it is divided into five political administrative units called Community Development blocks. This study was undertaken in Amarpatan block of Satna district. Amarpatan block has a population of 201,136 (19) (92% rural) mostly employed in agriculture. The 161 villages of Amarpatan block each have populations varying between 500 and 3,000. SC and ST constitute 12.1 and 11.5% of the rural population, while 21% (outside these two groups) live BPL – implying that 45% of the population belong to at least one of these vulnerable groups. Amarpatan is serviced by a government community health center in

Amarpatan town, which has four full-time physicians and 30 beds. The average distance between the villages in the block and this center is 22.7 km (23% of villages have an all-weather road approach). The social structure in Amarpatan is strongly ‘patriarchal’ – the block has a gender ratio of 949 females per 1,000 males. Amarpatan block had MMR of 705/100,000 (19).

### Data collection and project intervention

#### Identifying maternal deaths the previous year

Conventional systems for reporting MMR are based on samples, hence these estimates vary widely, and have wide confidence intervals. Besides, the problem of under-reporting is commonly encountered (20). To study more accurately baseline maternal mortality, maternal deaths in the study area that occurred in the year preceding the project (1st October 2002–30th September 2003) were enumerated in a door to door survey throughout the study area (i.e. the 161 villages). The survey enlisted deaths of all women in the reproductive age group (15–45 years). Maternal deaths were identified from these using a questionnaire that was administered by one of eight trained health workers who carried out the survey between June and December 2003. The household survey for maternal deaths was complemented by a review of the major government hospital records in Satna, the University teaching hospital in adjoining Rewa district, and death reports from the police ‘kotwar’ (a member of the police force responsible for reporting all deaths in a village as is required by law).

#### The project year

The project intervention ran from 1st October 2003 to 30th September 2004. All pregnancies in the study area were listed in a door to door survey. The intervention included financial support for referrals needed by pregnant mothers in SC, ST, and BPL populations (BPL populations exist also within the SC and ST groups), as well as incentives for early registration of pregnancy. The scheme was pivoted on a motivated and trained locally resident village woman termed the ‘Emergency Obstetric care facilitator’ or ‘EOC facilitator’ in each village. The intervention also involved the training of all health care paramedical staff and traditional birth attendants in the public and private sectors in Amarpatan block (482 in all) with the intention of improving maternal health outcomes in the area. Emphasis was placed on early registration, high risk detection, and referral in an emergency situation. The incentives and support offered under the project (described subsequently) was also explained. The idea of the incentive scheme and the level of incentives were discussed with the local panchayats (village self-governments), teachers, NGOs, and other key stakeholder groups in the area before the interven-

tion began. Their support in the project was obtained. Information on the project was also disseminated locally to the public. All maternal deaths that occurred in the project intervention period were detected by reviewing hospital/health center records, monthly meetings with the village health worker (the EmOC worker in the project), health workers’ reports, and monthly visits by members of the project team to the villages during the study period. All the reported maternal deaths were confirmed by verbal autopsy.

The financial support for referral to the SC, ST, and BPL population were as follows (at the time of the study US\$ 1 = 43 Indian rupees):

- Up to Rs. 900 per emergency referral case (paid for transportation in emergency to pregnant mothers).
- Up to Rs. 100 (paid to the accompanying EOC facilitator traveling with the emergency referral case).

The money for referrals was made available as a grant in cash to the women without any lengthy administrative delays and ready cash was kept with the EOC facilitator who was a full-time resident of the village and was able to provide the money upfront to the family of the beneficiary mother. The EOC facilitators and members of the research team were in frequent contact to ensure that a sum of Rs. 900 was always available with the EOC facilitator. Transport arrangements had to be paid to the driver of the conveyance, this vehicle was organized mostly through informal contacts – persons or local small businesses that had a tractor or a van or some mode of transport.

In addition, Rs. 50 was paid to pregnant mothers of these disadvantaged groups who registered their pregnancy during first trimester and received desired antenatal care. A sum of Rs. 10 per registration was paid to EOC facilitator for first trimester registration. Antenatal care was provided by the state health worker. In addition, Rs. 100 per block of 10 pregnancies was paid to state health worker for registration of pregnancies in first trimester, provision of three antenatal checkups, two TT injections, 100 Iron Folic Acid tablets, and detection of high-risk pregnancies and their referral.

The costing of the incentives was proposed by the research team and finally agreed upon with the local government. Incentives were set to make the activities attractive to participating persons, in accordance with local standards of wages so as not to cause any distortions. Large payments were made for referral transport as this is often the biggest barrier to an institutional delivery. Delivery at public institutions is free; the financial barrier is often in getting to an institution.

All incentives were financed through funds for operational research in health through the Madhya Pradesh

Basic Health Services Project, Directorate of Health Services, Bhopal. These funds were provided to public health departments in the university teaching hospitals in the province, of which the University of Rewa is one.

Two members of the research team were postgraduate residents in public health, who worked on this project as part of their dissertation work. They made frequent visits to the study area to monitor the project, meet with EOC facilitators, collected information from them, cross-checked with beneficiaries and health workers, and ensured perverse referrals did not occur. They helped to maintain control over the quality of activities in the project and the information generated.

The adjoining block of Maihar (also in Satna district) served as a control block to measure maternal mortality throughout the year of the project intervention and to control for any other external influences that could influence maternal mortality in that period. Maihar is similar to Amarpatan in most socio-economic and cultural aspects, except that it is a larger block with some demographic differences. It has a population of 304,838 (89% rural) in comparison to Amarpatan's 201,136, and has 21.6 and 16.4% of its population belonging to SC and ST, respectively.

### Analysis

Results from the door to door survey before the project intervention commenced are shown as simple proportions. Results from the project intervention and a comparison to a control block (Maihar) are presented.

## Results

### *Pregnancy outcomes and deaths (among women of reproductive age)*

*Prior to the study intervention (1st October 2002–30th September 2003)*

A total of 110 deaths in women 15–45 years of age were enumerated in the door to door survey in Amarpatan during this period and 27 were identified as maternal deaths (24.5% of deaths in the women).

*During the study intervention (1st October 2003–30th September 2004)*

In Amarpatan, a total of 7,528 pregnancies were reported during the intervention period, of which 5,648 (75%) were registered. Of these, 923 (16.3%) were SC, 1,135 (20.1%) ST, and 281 (5%) BPL mothers (but not SC or ST mothers; BPL mothers who were SC or ST are captured in the SC and ST groups). Of the registered pregnancies, 3,317 delivered during this period, 2,161 were pregnant at the end of the project, and 170 pregnancies were lost. Maternal deaths occurring in the 1,880 unregistered pregnancies in Amarpatan were recorded.

In the control block of Maihar, during the same period, there were 46 maternal deaths among 204 deaths in women of the reproductive age group (22.5%, similar to Amarpatan's 24.5% the previous year).

### *The project intervention*

#### *Uptake of project benefits*

During the project life, the number of users of the project incentives and referral support from among the target groups are as shown in Table 1.

The proportion of pregnancies registered among SC/ST mothers was commensurate to or higher than their population proportions, respectively. However, a disproportionately lower number of non-SC and non-ST BPL mothers registered their pregnancies relative to population. This group also had a larger proportion requiring referral and availing the same.

It was observed that only 23.8% of mothers among the vulnerable groups who were advised referral availed the referral benefits.

### *Maternal mortality*

Table 2 shows the maternal deaths that occurred in Amarpatan during the project year and the preceding year. Maternal deaths in Maihar are also shown. During the project intervention year, in Amarpatan, there were six maternal deaths each among the 1,880 unregistered pregnancies and the 5,648 registered pregnancies, respectively (OR = 3.03, (0.86, 10.0)). None of the deaths occurred in mothers who had claimed referral money from the project.

A difference of 282 maternal deaths/100,000 births was observed (95% CI for the difference is (38; 530)  $p < 0.05$ ) in Amarpatan in the year before and during the intervention.

In both blocks, >75% of maternal deaths occurred in age group 18–29, with the remainder occurring after 29 years. No deaths were reported in women <18 years.

### *Place of delivery and death*

Table 3 shows the place of maternal death before and during the project period (that year 89% of deliveries occurred at home in Amarpatan, nearly all were conducted by the village traditional birth attendant or TBA). The proportion of deaths occurring in the hospital or en route increased the year of the project.

Complete information on place of delivery of the mothers who died was available only for Amarpatan during the project year. Of the 12 mothers who died, 10 delivered; six delivered at home and four in hospital. The three mothers who died at home all delivered at home. (The families of two of these mothers later reported that they did not shift the women to hospital for lack of resources.)

**Table 1.** Mothers among vulnerable groups who availed of the project referral support

Category	Total pregnancies registered	No. of referrals advised (% of registered pregnancies)	No. of emergency referrals availed (% advised)
SC	923	31 (3.4%)	10 <sup>a</sup> (32.4%)
ST	1,135	37 (3.3%)	01 (2.7%)
BPL (non-SC, non-ST)	281	16 (5.7%)	09 (56.2%)
Total	2,339	84 (3.6%)	20 (23.8%)
Other	3,309	162 (4.9%)	NA

<sup>a</sup>Includes four mothers who were at high risk during pregnancy.

**Table 2.** Maternal deaths in Amarpatan and Maihar blocks, Satna

Category	Amarpatan		Maihar
	Year before intervention	Intervention year	Intervention year
SC	9	5	12
ST	3	2	13
Others	15	5	21
Total deaths	27	12	46
Live births	5,084	5,221	7,662
MMR	531	249	600
95% CI	(324; 738)	(111; 386)	(423; 777)

### Time of death

Table 4 shows a comparison of the period (ante-, intra or post partum) of maternal death in Amarpatan before and after the project intervention and a comparison with Maihar (control block).

The project had the most influence on post partum deaths.

### Limitations of the study

The calculation of maternal mortality ratios are estimated based on the crude birth rates. Exact number of births was not documented in Amarpatan (either year) or Maihar.

The impact of the project on institutional delivery is not known (this could be a reason why proportion of home deaths dropped and hospital deaths increased). It is known that 89% of deliveries in Amarpatan in the project year took place at home, but the corresponding figures for the previous year and for the control block are unavailable. Evidence shows that women who receive antenatal care are more likely to deliver in an institution. Given that the project also focused on antenatal care, this could have been a possibility.

It is difficult to dissociate the impact of different interventions that went on simultaneously (focus on antenatal care, providing ready money for transportation, and make maternal mortality a public issue) in the project separately on the outcome (reduced maternal mortality).

The place of delivery for the mothers who died in the previous year in Amarpatan and in the project year in the control block is unknown. This information is only available for the 12 women who died in the project period.

Also a one-year period is too small to reflect changes in maternal mortality ratio.

Maihar as a control block: Maihar block neighbors Amarpatan block, and both lie within the same district Satna. The population is much larger, but population subgroups (age and sex) are similar as are literacy rates. The language is the same as is the broad culture in these two blocks. Important differences include a higher proportion of SCs and the presence of a large cement industry and a railway station in Maihar. Crude birth rate in Maihar is similar to Amarpatan, as are maternal mortality rates (maternal deaths/100,000 population). The point estimate of MMR computed here appears to be higher than in Amarpatan, this is difficult to comment upon, given that these numbers are very small and the CI for MMR are wide.

Contamination of the project intervention from the Maihar area could have occurred, though this was not measured. Maihar is a larger block with better facilities than Amarpatan, besides women tend to go for delivery to villages where their families reside, so it is unlikely that women from Maihar would travel to Amarpatan to deliver there because of the project.

**Table 3.** Place of maternal death

Place of maternal death	Amarpatan		Maihar
	Year before intervention	Intervention year	Intervention year
	Number	Number	Number
Home	15	3	27
Hospital	9	6	16
On road	3	3	3
Total	27	12	46

**Table 4.** Comparison of maternal deaths in Amarpatan and Maihar in relation to period of death

Period of death	Amarpatan		Maihar
	Year before project intervention	Intervention year	Intervention year
Total ante-partum	3	3	16
Total intra partum	3	1	7
Total post partum	21	08	23
Total	27	12	46

## Discussion

Maternal mortality in the poor parts of the world remains high, with the MDG Goal 5 seeming a little further away each year (21). There remains little evidence of the impact of interventions designed to reduce MMR at a population level in backward and remote areas, where the ratios are higher. Measuring MMR has also been problematic given that maternal death is a rare event and conventional surveillance systems are expensive and logistically challenging (19, 21).

India accounts for the largest number of global maternal deaths (22%). Two-thirds of these occur in nine provinces, of which Madhya Pradesh (the study province) is one (22). Most deliveries (70%) in this setting occur at home (12). A quarter of all women dying in the reproductive age group in the study area died from puerperal causes.

The Government of India has promoted delivery in institutions given the high MMR in the country. Despite a number of incentives under the earlier CSSM program and later the RCH program, the proportion of institutional deliveries in MP remains low at 30% (12) while maternal mortality in this province remains one of the highest in the country at 379/100,000 live births. Why has the proportion of institutional deliveries remained so low despite aggressive promotion by the state? Several studies have attempted to identify and measure the effects of the factors that contribute to use of maternal health services. A number of studies from different parts of the country concluded that utilization of maternal and child health services in rural areas was driven primarily by socio-

economic factors, such as education, media exposure, urban/rural location and standard of living, that create a demand for services and much less so by physical access to and availability of health and family welfare services (23–26).

While there are a number of reasons postulated for the limited success, one of the most direct on-the-ground reasons that do not allow a woman to be shifted to hospital (or delay that decision) is the lack of readily available financial resources for families to draw upon at the time of delivery. In rural areas in many parts of India, access to skilled obstetric care (with the necessary infrastructural support for blood transfusion or cesarean section) is only available at larger towns and cities, often kilometers away from villages which are poorly connected by roads.

The project attempted make available to underprivileged families in this setting the money necessary for transportation to a hospital in the event of needing it in an emergency. It intended to thus address the first two of the three D's (delays) contributing to maternal mortality. In remote areas like Amarpatan, where road infrastructure is poor, hospital facilities on an average are 22 km away, and most people are agricultural laborers (wage loss for absence), ready cash (saved income) is not easy available, thus the decision to journey to an institutional delivery is not an easy one to make from an economic perspective. The project provided money for transportation in case of complications to enable the women to travel to institutions. Amarpatan is serviced by a government community health center in Amarpatan town, which has four full-time physicians and 30 beds. Health

care services are free of charge in government institutions and patients are not required to pay any formal payments for services rendered. Maihar similarly has a government civil hospital (15 beds) as well as a private 30-bedded hospital linked to the cement industry to cater to the employees and their families.

The project intervention, however, is not in anyway a long-term solution to the problem of high maternal mortality. Poverty (and malnutrition) is a very central underlying structural factor in this setting, which has a direct effect on maternal morbidity and mortality.

### **Poor uptake of project funds**

It was observed that though the uptake of the project funds was poor, given that it was well publicized, had the support of local leaders and money was easily available. A number of reasons could be speculated. It is possible that the money was placed in the hands of persons who in some way were 'socially better placed' than the SC, ST, and BPL mothers the project aimed to target. Given the rigid social hierarchies and limited interaction between groups, this is a possibility. Another likely possibility is the extremely low status of women in a patriarchal study setting, which would imply that maternal health is not perceived as an important priority in the community. Another important element which the program could have focused on which might have contributed to better uptake included the 'trust' in institutions to which the women would be referred to. It is possible that trust in the public health institutions was not high, which contributed to poor uptake. Expectations of low-quality care at the nearest facility influences the initial decision to seek care (27). The National Rural Health Mission of the Government of India (under which the RCH II is implemented), launched in 2005, prioritizes north Indian states (including MP) for concerted efforts to improve maternal health (28). Rural health care, in most of these states, is marked by absenteeism of doctors/health providers, low level of skills, shortage of medicines, inadequate supervision/monitoring, and callous attitudes (29). As the quality of services is as significant as the availability of the services in ensuring better utilization and improved outcomes, it would be prudent for RCH II to aim at enhancing both access and quality (11). Informal charges that might have to be paid at the centers could have deterred some potential users of the scheme, particularly BPL women. Raising the levels of quality of care at referral institutions is a pre-requisite to ensure good uptake of such schemes. The project referral institutions were the public sector institutions in the study area, perceptions of which could have influenced participation in the scheme.

ST women though frequently referred, did not avail of the referral transport money for transportation. The reasons for this is unclear. A recent publication reported that the utilization of maternal care services were 'poor'

among ST mothers compared to mothers of other castes/tribes (28).

### **Project achievement in reducing mortality**

The project intervention of promoting antenatal care, training providers, and providing financial support for transportation seemed to have lowered the maternal mortality in the study block significantly in comparison to the previous year or the neighboring block the same year. Most deaths averted were in the post partum period and deaths that occurred at home (nine of 12 died in hospital or en route). It is possible that the project averted those post partum deaths that might have occurred at home by making available the funds for transportation. The project intervention seemed to have little impact upon the number of ante- and intrapartum deaths, but it is possible that the project focus on antenatal care in Amarpatan contributed to the small drop in the absolute numbers of these cases. The number of deaths from post partum hemorrhage were still quite high – it is possible that underlying poverty, the distances and other delays (elements which the project had little control over) could have contributed to these deaths. It is however difficult to comment on the intervention over a period of only a year.

### **Sustainability**

The project was a one-year operations research project, the result of which was shared with the Provincial Directorate of Health. This project ended in the year 2004, prior to the implementation of the RCH II under which the Janani Suraksha Yojana (JSY or Maternal safety scheme described below) operates (30). Shortly after the project ended, it was supplanted by the implementation of the Government of India led JSY (began in April 2005), which has many similarities to the project intervention. JSY is a cash benefit scheme to promote institutional delivery with the special focus on BPL and SC/ST pregnant women. It is a special scheme to promote antenatal care, referral transport, and institutional delivery through cash incentives. Similar to the EOC facilitator in the project, the JSY identifies a local woman called the Accredited Social Health Activist (ASHA). She functions as a link between the government and the pregnant women. Her main role is to facilitate pregnant women to avail services of maternal care and arrange referral transport.

There has not been any formal evaluation of the scheme, though at the end of 2006, 68,000 women in MP had been reported as using the scheme and some increase in institutional delivery is being reported.

### **Conclusion**

In economically deprived areas, ready money is hard to come by which is a deterrent to moving a woman to an institution in an emergency, given the possible loss of

wages for family members long distances, non-availability of reliable transport (hence needing to arrange transport privately), poor road network and uncertain quality of institutional care. The above discussion discusses some of the issues involved in implementing a cash incentive project for maternal health. As of now, providing facilities for institutional delivery on a mass scale in rural areas can at best be viewed as a long-term goal requiring massive health infrastructure investments. In the meanwhile, 70% of women do not reach a hospital to deliver, though the JSY is reported to be steadily raising the proportion of institutional deliveries.

While the project experiment addressed one main deterrents (ready cash for transportation) in case of emergency referral, the other deterrents coming undone are hinged upon poverty alleviation, better infrastructure (roads, transport), and making EmOC accessible as close as possible to the community.

The project intervention is not a solution to maternal mortality in low-income settings; rather it is at best a short-term measure to assist poor mothers in the given present situation. Chronic poverty and malnutrition are underlying structural problems that make these mothers vulnerable to dying during pregnancy and childbirth. It is also a challenge to have functioning good quality EmOC facilities close to the community, when communities live in contexts of dire poverty with little basic infrastructure (to support EmOC). In MP, 37% of the population live below poverty (when a fiercely contested much lower Indian poverty standard of approximately 25 cents a day per person (31) is applied). Poverty alleviation is critical. But until then, in many resource poor settings, providing ready cash to allow for transportation at the time of delivery can be considered as is currently being implemented under the Indian JSY scheme. The JSY scheme had not been evaluated formally as yet, but this operational research project attempts to describe some of the processes, pitfalls and the need for intense monitoring in the implementation of a project providing cash incentives in a low-income setting.

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## References

- Hill K, Thomas K, AbouZahr C, Walker N, Say L, Inoue M; Maternal Mortality Working Group. Estimates of maternal mortality worldwide between 1990 and 2005: an assessment of

- available. *Lancet* 2007; 370: 1311–9.
- Shiffman J, Ved RR. The state of political priority for safe motherhood in India. *BJOG* 2007; 114: 785–90.
- Vashishtha VM. Countdown to 2015 for maternal, newborn, and child survival: a critical appraisal of 2008 report. *Indian Pediatr* 2008; 45: 574–57
- Mavalankar D, Vora K, Prakasamma M. Achieving Millennium Development Goal 5: is India serious? *Bull World Health Organ* 2008; 86: 243–243A.
- World Bank. Implementation completion report: India Child Survival and Safe Motherhood project. Washington, DC: World Bank; 1997.
- Huque AAZ, Mavalankar D, Kwast BHM. Evaluation report (Safe Motherhood Programme of India). Prepared for the Ministry of Health and Family Welfare of India. Washington, DC: MotherCare, John Snow Inc; 1996.
- Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc Sci Med* 1994; 38: 1091–110.
- UNICEF, WHO, UNFPA. Guidelines for monitoring the availability and use of obstetric services. New York: UNICEF; 1997.
- World Bank. India – reproductive and child health. Project information document. Washington, DC: World Bank; 1997.
- Government of India. Reproductive and Child Health Program. RCH II Programme document; RCH II – document 2: The principles and evidence base for State RCH II Programme Implementation Plans (PIPs). New Delhi: Government of India; 2005.
- Rani M, Bonu S, Harvey S. Differentials in the quality of antenatal care in India. *IJQHC* 2008; 20: 62–71.
- International Institute of Population Sciences. National Family Health Survey -3 2005–06. Mumbai, 2007. Available from: <http://www.nfhsindia.org/index.html>; 2008 [cited May 2008].
- International Institute of Population Sciences. National Family Health Survey 1998–99. Mumbai, 2000. Available from <http://www.nfhsindia.org/index.html>; 2008 [cited May 2008].
- Obaid T. No woman should die giving life. *Lancet* 2007; 370: 1287–8.
- Census of India. Office of the Registrar General & Census Commissioner, Government of India; 2001.
- The Third Madhya Pradesh human development report. Bhopal: Government of Madhya Pradesh; 2002.
- Deaton A and Kozel W. Data and Dogma: The Great Indian Poverty Debate. *World Bank Res Obs* 2005; 20: 177–99.
- Government of India. Sample registration system bulletin. Available from: [http://www.censusindia.gov.in/Vital\\_Statistics/SRS\\_Bulletins/SRS\\_Bulletins\\_links/SRS\\_Bulletin-October-2006.pdf](http://www.censusindia.gov.in/Vital_Statistics/SRS_Bulletins/SRS_Bulletins_links/SRS_Bulletin-October-2006.pdf) (cited 30 May 2008).
- Academy of Administration, Government of Madhya Pradesh. Family Welfare Evaluation Survey 2003, Madhya Pradesh, Bhopal. Available from: [www.health.mp.gov.in/survey/fw-survey.pdf](http://www.health.mp.gov.in/survey/fw-survey.pdf); 2003 [cited May 2008].
- Barnett S, Nair N, Tripathy P, Borghi J, Rath S, Costello A. A prospective key informant surveillance system to measure maternal mortality – findings from indigenous populations in Jharkhand and Orissa, India. *BMC Pregnancy Childbirth* 2008; 8: 6.
- United Nations. Millenium development goals. New York: Oxford University Press; 2000.
- Registrar General, India. Sample registration system, maternal mortality in India: 1997–2003 trends, causes and risk factors. NewDelhi, 2006. Available from: [econpapers.repec.org/paper/esswpaper/id\\_3A753.htm](http://econpapers.repec.org/paper/esswpaper/id_3A753.htm) [cited May 2008].



23. Das NP, Mishra VK, Saha PK. Does community access affect the use of health and family welfare services in rural India? National Family Health Survey Subject Reports No 18. Mumbai & Honolulu: International Institute for Population Sciences & East-West Center; 2001.
24. Govindasamy P. Poverty, women's education and utilization of health services in Egypt. In: Garcia B, ed. Women, poverty and demographic change. New York: Oxford University Press; 2000, pp. 63–85.
25. Barlow R, Diop F. Increasing the utilization of cost-effective health services through changes in demand. *Health Policy Plan* 1995; 10: 284–95.
26. Kanitkar T, Sinha RK. Antenatal care services in five states of India. In: SN Singh, MK Premi, PS Bhatia, Bose A, eds. Population transition in India Volume 2. Delhi: B.R. Publishing; 1989, pp. 201–11.
27. Barnes-Josiah D, Myntti C, Augustin A. The “three delays” as a framework for examining maternal mortality in Haiti. *Social Sci Med* 1998; 46: 981–93.
28. Sunil TS, Rajaram Lisa S, Zottarelli K. Do individual and program factors matter in the utilization of maternal care services in rural India? A theoretical approach. *Soc Sci Med* 2006; 62: 1943–57.
29. Basu AM, Stephenson R. Low levels of maternal education and the proximate determinants of childhood mortality: a little learning is not a dangerous thing. *Soc Sci Med* 2005; 60: 2011–23.
30. Janani Suraksha Yojana, Ministry of Health and Family Welfare. Available from the official site of the Ministry of Health and Family Welfare, Government of India at: mohfw.nic.in/layout\_09-06.pdf (cited 30 May 2008).
31. Planning Commission, Government of India. Poverty estimates for 2004–2005, March 2007.

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