

Article

Has the *Janani Suraksha Yojana* (a conditional maternity benefit transfer scheme) succeeded in reducing the economic burden of maternity in rural India? Evidence from the Varanasi district of Uttar Pradesh

Saradiya Mukherjee,¹ Aditya Singh²

¹Independent Researcher, New Delhi, India; ²Portsmouth-Brawijaya Centre for Global Health, Population, and Policy, University of Portsmouth, UK

Significance for public health

Improving the well-being of mothers is an important public health goal for India. For improving maternal health, it is necessary that mothers utilize maternity services. However, maternity often becomes an economic burden, especially for disadvantaged and poorer groups of the society. To encourage mothers to utilize services, India launched a conditional maternity benefit transfer scheme back in 2005. This study explored whether the scheme has been able to help alleviate the burden of maternity expenditure or not. The study finds that the scheme has been successful only partially to reduce out-of-pocket expenditure suggesting that maternity is a costly affair in rural India. Since the scheme is unable to save mothers from catastrophic expenditures, it is also unable to save mothers from a wide range of health ill-effects caused by catastrophic expenditure.

Abstract

Background. One of the constraints in the utilisation of maternal healthcare in India is the out-of-pocket expenditure. To improve the utilisation and to reduce the out-of-pocket expenditure, India launched a cash incentive scheme, Janani Suraksha Yojana (JSY), which provides monetary incentive to the mothers delivering in public facility. However, no study has yet examined the extent to which the JSY payments reduce the maternal healthcare induced catastrophic out-of-pocket expenditure burden of the households. This paper therefore attempts to examine the extent to which the JSY reduces the catastrophic expenditure estimate household expenditure on maternity, *i.e.*, all direct and indirect expenditure.

Materials and methods. The study used data on 396 mothers collected through a primary survey conducted in the rural areas of the Varanasi district of Uttar Pradesh state in 2013-2014. The degree and variation in the catastrophic impact of households' maternity spending was computed as share of out-of-pocket payment in total household income in relation to specific thresholds, across socio-economic categories. Logistic regression was used to understand the determinants of catastrophic expenditure and whether the JSY has any role in influencing the expenditure pattern.

Results. Results revealed that the JSY beneficiaries on an average spent about 8.3% of their Annual Household Consumption Expenditure on maternity care. The JSY reimbursement could reduce this share only by 2.1%. The study found that the expenditure on antenatal and postnatal care made up a significant part of the direct medical expenditure on maternity among the JSY beneficiaries. The indirect or non-medical expenditure was about four times higher than the direct expenditure on maternity services. The out-of-pocket expenditure across income quintiles was found

to be regressive *i.e.* the poor paid a greater proportion of their income towards maternity care than the rich. Results also showed that the JSY reimbursement helped only about 8% households to escape from suffering catastrophic burden due to maternity payments.

Conclusions. It can be concluded that the JSY appeared to have achieved only a limited success in reducing the economic burden due to maternity. To reduce the catastrophic burden, policy makers should consider increasing the JSY reimbursement to cover not only antenatal and postnatal services but also non-medical expenditure due to maternity. The government should also take appropriate measures to curb non-medical or indirect expenditure in public health facilities.

Introduction

Maternal mortality is the main contributor to female mortality during the reproductive span. India, the largest democracy in the world, bears the brunt of the highest number (56,000 in 2010) of maternal deaths in the world.¹ It is an established fact that ensuring facility-based skilled professional care for every mother could bring down maternal mortality significantly.^{2,3} However, the level of maternal healthcare utilisation in the country is still low. One reason behind such a low usage of these services is that a considerable number of households have very low or no capacity to pay for such services.⁴⁻⁶ For such households, the out-of-pocket expenditure on maternity care at times become catastrophic due to the lack of insurance or other risk pooling mechanisms.⁷⁻¹³

To increase the utilisation of maternal health care and to reduce the out-of-pocket expenditure of maternity care, India in the year 2005 launched the *Janani Suraksha Yojana* (JSY), a safe motherhood scheme, in 18 low performing states (in terms of socio-economic and demographic indicators) under the umbrella of the National Rural Health Mission (NRHM).¹⁴ This scheme provides a cash incentive of Rs.1400 (\$22) to the mothers who give birth in a public health facility, and Rs.500 (\$8) to the women below poverty line who deliver at home assisted by trained professionals. The first Annual Health Survey (2010-11) revealed that this has led to an increase in the institutional delivery in some states, which had recorded low institutional delivery prior to the NRHM. For instance, the percentage of institutional delivery in Uttar Pradesh (demographically the largest state of India) increased from 22 percent in 2005-06 to 45.6 percent in 2010-11).^{15,16}

A review of previous literature reveals that there exist several studies on the coverage of maternal care services and the differentials in the out-of-pocket expenditure on maternity care in India.

However, most of them do not focus on the JSY. For instance, Goli *et al.* (2016) measured the out-of-pocket expenditure on maternity care, they, however, did not mention any role of JSY in reducing the same.¹⁷ Even a number of state specific studies that examined the impact of the JSY did not measure the out-of-pocket expenditure borne by the JSY beneficiaries.^{18,19} Studies that do measure the impact of the JSY on reducing the out-of-pocket expenditure on maternity care have restricted themselves to analysing only delivery care expenditure, possibly because of data constraints.²⁰⁻²² Thus, there are barely any studies available on the post-JSY scenario of antenatal and postnatal care related costs.

The JSY was launched to encourage mothers to use free services at the point of delivery in addition a cash incentive of \$22. Although maternal healthcare services in all public health facilities are supposed to be free, childbirth in these facilities often incurs a variety of medical (direct) and non-medical (indirect) out-of-pocket expenditures. Previous studies have considered only medical or direct expenditure while calculating the out-of-pocket expenditure on maternity care even though the indirect or non-medical costs such as loss of wages of women during maternity, loss of wage of husbands for accompanying, transportation and special food costs for the woman may impact households' financial situation negatively. To the best of our knowledge, no study has measured the role of indirect or non-medical expenditure yet.

This paper therefore attempts to estimate maternity expenditure, *i.e.*, all direct (formal and informal medical expenditure) and indirect expenditure incurred by households, due to maternity and examine the extent to which the JSY incentives covered the burden of costs incurred. The background factors influencing the maternity expenditure have also been assessed. These objectives are addressed in the context of Varanasi district of the Uttar Pradesh state – a largely rural state that is home to about over 200 million people and has the highest maternal and child mortality among Indian states.

Materials and Methods

Area of the study

The study area, Varanasi district, is in Uttar Pradesh, the most populous state in India, with over 200 million people living over an area of 93,000 square miles. Due to high levels of pre-NRHM maternal and infant mortality,^{16,23} the state was identified as one of the *high focus* states where the JSY was to be implemented. It is noteworthy that Post-NRHM, maternal and infant mortality has reduced considerably and the coverage of institutional delivery has risen to about 46% by 2010-11.¹⁵

Sampling and data collection

To obtain a comparison of maternal health care expenditure incurred by JSY and non-JSY beneficiary, it was necessary to select a district with a fair share of both type of institutional deliveries – deliveries conducted in public and deliveries conducted in private facilities. Therefore, all 70 districts of the state were ranked by their coverage of institutional delivery as reported in the Annual Health Survey (AHS), 2010-11. The district of Varanasi was selected as it satisfied both criteria - the percentage of institutional delivery in the district was relatively high, and it also had a fair share of both kind of deliveries - about 25% conducted in public health facilities and about 40% in private health facilities.¹⁵

A field survey was conducted during October 2013 to April 2014 in rural areas of the Varanasi district. Only those households

that had at least one woman with a history of child birth during the period of 12 months preceding the survey, were considered for inclusion in the study. To select the households, the survey used two-stage sampling - villages in the first stage and from these villages, women with a birth during the reference period in the second stage. The villages were selected with probability proportional to size after stratification by village population size and the number of women to be selected from each village was specified so that the sample becomes self-weighting.

From each village, a list of women who delivered in the specified reference period was prepared with the help of community health workers and the stipulated number selected at random. A sample size of 400 was proposed taking into account sampling error and in order to accommodate non-response the sample size was raised by 10% to 440 so that about 400 women would be successfully interviewed. However, a total of 396 women could be contacted and were interviewed; of whom, 223 women had received JSY benefits as they delivered in public healthcare facilities and 173 women had not received any JSY benefits since they either delivered at home (n=31) assisted by unskilled birth attendant or at a private health facility (n=142). In this paper, the terms *JSY beneficiary* and *non JSY* have been used for these two groups respectively. No woman in this study was found to have delivered at an accredited private hospital hence not eligible to receive any JSY benefits.

Informed consent

A permission to carry out the study in villages was sought from the Chief Medical Officer (CMO) of Varanasi district. The village head (*Gram Pradhan*) of each selected village was briefed about the study and a permission was sought to contact the eligible women for the study. Finally, informed consent was sought from all the participants involved in the survey. They were assured that the information provided by the participants would be used for research purpose only and their identity would not be revealed to anyone. They were also informed that they had the right to terminate the interview if they felt uncomfortable to answer any question during interview. The respondents were very helpful and cooperative and no respondent left the interview without completing the schedule.

Measurement of maternity expenditure and monthly per capita consumption expenditure

To estimate maternity expenditure, *i.e.*, all direct (formal and informal medical expenditure) and indirect expenditure incurred due to maternity by households, a list of possible items of expenditure was prepared and used to obtain accurate and complete information on all expenditures on maternity for all the eligible women. A detailed information was collected with some closed-ended questions on the direct and indirect expenditure incurred by the household due to maternity.

Direct expenditure is defined as all formal and informal expenses on maternal health care. Formal expenditure includes all costs of drugs and medicine, cost incurred in laboratory tests, professional's fees, bed charges and costs incurred to treat complications during antenatal, natal, and postnatal period. The informal fees comprise kickbacks, bribes or gratitude amount paid by the member of the household to avail facility-based care.

Indirect expenditure covers productivity losses and opportunity cost of care seeking that included wage loss of woman due to maternity, wage loss of husband for accompanying woman to the health centre for prenatal, delivery or post-natal care, costs of buying special food for woman and travel cost to visit the health facility, travel and food costs of accompanying person to the health

facility. Reporting of expenditure on maternity and households by the respondents was further cross checked by the reporting of elder member (s) of the households. This was the method also applied by the National Sample Survey Organization (2006) in India.²⁴

Wage loss for the mother was calculated based on the number of days lost during pregnancy, childbirth, and post-delivery period. If the woman was being paid wages, then the amount of wage loss was calculated according to the number of days of wage loss she reported. If a woman was absent from unpaid family work she was asked about who took the charge of her activities during her nonattendance, and if the persons who took the responsibility of the day-to-day activities were paid, then the amount was asked. At last, the wage rate of the employed person was multiplied by the number of days that he/she worked for while the woman was absent.

Husband's loss of wages due to accompanying wife during ANC, delivery or PNC was calculated by asking the women. In case, the husband worked in a regular job and was granted leave without losing the wage/salary, no loss of wages was presumed. However, for the daily labourer, the loss of wage was calculated by multiplying the number of days lost to the wage rate.

Monthly Per capita Consumption Expenditure (MPCE) has been used as a proxy variable for the income of households. The calculation of MPCE for this study is in line with India's National Sample Survey (NSSO) method using Mixed Reference Period (MRP).²⁴ Following this approach, household consumption expenditure on items of clothing, footwear, education and durable goods, house maintenance, and other non-food items (conveyance, amusement, sundry articles etc.) is recorded for a reference period of *last 365 days*, and expenditure on all other food items is documented with a reference period of *last 30 days*. To obtain the monthly expenditure, the expenditure on non-food items (which were collected with a reference period of 12 months) was divided by 12. The consumption expenditure on food and non-food items was then added to get the total consumption expenditure of the household. Finally, adjustments were done according to the household size to get the MPCE.

Measurement of catastrophic expenditure and catastrophic overshoot

The calculation of catastrophic expenditure on maternity care requires data on the total out-of-pocket maternity expenditure and the total household consumption expenditure/income.²⁰ As mentioned earlier, the household consumption expenditure has been used as the proxy income variable in the study.²⁵ The MPCE is multiplied by twelve to obtain the annual consumption expenditure. This study considers 10% of the total annual consumption expenditure and 40% of the *capacity-to-pay* or the total non-food expenditure as threshold limits. The expenditure is called *catastrophic* if the total expenditure on maternity care is more than 10% of the total annual consumption expenditure or alternatively, if it exceeds 40% of the *capacity-to-pay*.^{9,26,27} Another measure, the *mean catastrophic payment overshoot*, or the intensity of catastrophic payment, captures the average degree by which the payments (as a proportion of total expenditure) exceed the threshold.

Examining predictors of catastrophic maternal health care expenditure

A binary logistic regression was carried out to examine how catastrophic maternity expenditure is associated with socio-economic characteristics. The dependent variable *i.e.*, *whether the expenditure was catastrophic* (0=non-catastrophic; 1=catastrophic) was a dichotomous variable. The logit of the probability of occurrence, p , is expressed as a function of a set of explanatory variables $\{X_i\}$ as: $\text{logit}(p) = \log(p/(1-p)) = \beta_0 + \sum \beta_i X_i$ where $\{\beta_i\}$

are the regression coefficients to be estimated. For a more meaningful interpretation of results, predicted probabilities (of the expenditure being catastrophic) have been computed for each category holding the other variables constant at the mean values.²⁸ From the estimated coefficients, the predicted odds for a given set of values of $\{X_i\}$ can be computed as $\exp(\beta_0 + \sum \beta_i X_i)$ and the predicted probability of occurrence as $\exp(\beta_0 + \sum \beta_i X_i) / [1 + \exp(\beta_0 + \sum \beta_i X_i)]$. In the present analysis, such predicted probabilities have been computed and expressed in percentage terms as *adjusted percentages*.

This regression analysis included several key socio-economic and demographic variables as predictors of catastrophic expenditure. The choice of the variables to be included was guided by the existing literature in the Indian context.^{9,27,29} Household income, religion, caste, and education are some important socio-economic variables that previous studies have found to have considerable influence the health seeking behaviour of women in India.^{9,12,26,30} Among demographic variables, the age of woman is considered an important predictor variable of the utilization of maternity care services. The parity of woman and the sex of the child have been found to determine the decision to go for an institutional delivery; women with higher age and higher birth order are less likely to use maternity services.³ All independent variables were categorical.

Results

Table 1 presents the descriptive statistics of the study population. It reveals that a great majority of the sampled JSY beneficiaries were Hindu and belonged to OBC category. About 65% of the JSY beneficiaries had two to three children whereas the proportion of such women among non-JSY women was about 57%. About half of the women included in the study were illiterate and over 65% women who received JSY did not work outside other than their household chores. About 36% JSY beneficiaries reported that their husbands worked as casual labourer; the corresponding figure for the non-JSY women was about 30%. The distribution across consumption quintiles did not reveal any significant difference between JSY beneficiaries and non-JSY women. For most variables, the two groups were within a close range.

Table 2 presents descriptive statistics of direct and indirect expenditure incurred due to maternity segregated by JSY beneficiaries and non-JSY. It reveals that the mean total expenditure for JSY beneficiaries and non-JSY women was Rs.5975 and Rs.23632, respectively. In other words, the mean total maternity expenditure incurred by JSY beneficiaries was about one fourth of the amount incurred by non-JSY women. The total direct expenditure among the non-JSY women was about 16 times higher than JSY beneficiaries while the indirect expenditures for both groups were similar. A major part of the total expenditure came from the indirect expenditure indicating that maternity not just incurs medical (direct) costs but also brings about other financial burden. The median expenditure on ANC and PNC for the JSY beneficiaries and on PNC for non-JSY women indicated that about half of the women either did not utilize the service or did not spend anything on the same.

Table 3 presents the expenditure on maternity care as the share of annual consumption expenditure of the household by expenditure quintiles. It also provides information about the reduction in out-of-pocket expenditure after JSY beneficiaries got reimbursed. The results show that on an average total maternal expenditure among JSY beneficiaries worked out at about 8% of their annual household consumption expenditure, whereas among non-JSY women, it turned out to be much higher – about 28% of their annu-

al household consumption expenditure. The reimbursement of the JSY money reduced the share of maternity expenditure only by 2.1% of annual household consumption expenditure. It is evident from the results that the expenditure burden declines progressively as one moves from a lower to a higher expenditure quintile. A sharp rich-poor gap in the share of expenditure indicated that health care expenditure was highly regressive, *i.e.*, the poor spent a relatively higher proportion of their disposable income (12.9%) than the rich. (5.3%). In order to determine whether poor households incurred more maternity payment than rich households, the concentration index (CI) was calculated. Negative index (-0.185) for both JSY beneficiary and (-0.187) non-JSY means that poorer economic groups were more likely to bear the burden of catastrophic maternal health care expenditures than their counterparts in richer economic groups. To investigate how far the JSY reduced the economic burden, we presented an analysis (JSY without reimbursement) before deducting the JSY incentive from the total maternity expenditure, this generated a hypothetical situation of what proportion of household would have incurred catastrophic expenditure, had JSY not been introduced (Table 4). It was observed that the catastrophic headcount was much higher for the non-JSY women (78.6%) than that of the JSY beneficiaries (33.7%). Even after taking the JSY incentive into consideration, the catastrophic headcount for the JSY beneficiaries remained a little over 25%. The overshoot (after incentive was considered) still turned out to be about 3.5% of the total income which means that about 25.6% JSY beneficiary households, who spent more than one-tenth of their income on maternity care, exceeded the catastrophic threshold on an average by about 3.5%. The mean catastrophic payment overshoot as assessed by the *capacity to pay* or non-food expenditure threshold was much higher than the one assessed by the percent of income threshold both for JSY beneficiaries and non-JSY women.

Table 5 presents differentials in the mean out-of-pocket expenditures on maternity by selected background characteristics. The average out-of-pocket expenditure was lower among Muslim women compared to Hindu women. The total expenditure incurred by 'working' women was found to be high as the loss of wage due to maternity substantially raised the burden of OOP expenditure on maternity. The JSY beneficiaries whose husbands were engaged in agricultural activities incurred the highest OOP expenditure on maternity followed by those women whose husbands worked as casual labour. Poorer JSY beneficiaries spent belonging to two bottom (poorest and poor) quintiles more money on maternity than the ones belonging to the two top (rich and richer) quintiles.

The gross (unadjusted) and net (adjusted based on logistic regression coefficients) percentages of catastrophic head counts for both, the 10% of total annual consumption expenditure threshold and the 40% of non-food expenditure threshold, are also presented in Table 5. Results of logistic regressions showed the deter-

minants of catastrophic maternity expenditure. Adjusted percentages are the predicted probabilities (expressed as percentages) of the dependent variable computed for each category from the logit regression coefficients, holding the other variables at average level or distribution. The results show that more *Hindu* households both at 10% of total income threshold and at 40% of non-food expenditure threshold incurred catastrophic maternity expenditure (as shown in the unadjusted percentages) compared to Muslim house-

Table 1. Background characteristics of surveyed women, field survey, Rural Varanasi, 2013-14.

Background characteristics	JSY beneficiary		Non-JSY	
	%	n	%	n
Religion				
Hindu	80.3	179	86.1	149
Muslim	19.7	44	13.9	24
Caste				
Scheduled castes	16.6	37	19.7	34
Other backward classes	70.9	158	71.1	123
Others	12.6	28	9.2	16
Age of mother (in years)				
15-24	54.3	121	57.8	100
25 and above	45.7	102	42.2	73
Parity				
1	26.5	59	30.1	52
2 to 3	64.6	144	57.2	99
4 to 7	9.0	20	12.7	22
Education of woman				
Illiterate or below primary school	55.6	124	40.5	70
High school	16.1	36	27.7	48
Above high school	28.3	63	31.8	55
Work status of woman				
Working	35	78	34.7	60
Non-working	65	145	65.3	113
Occupation of husband				
Casual labour	39.5	88	30.1	52
Agriculture	8.5	19	10.4	18
Business	26.9	60	24.9	43
Regular salary	25.1	56	27.2	47
Expenditure quintiles				
Poorest	18.4	41	19.7	34
Poor	18.4	41	20.2	35
Middle	22.9	51	20.2	35
Rich	21.1	47	20.2	35
Richest	19.3	43	19.7	34
All	100	223	100	173

Note: n=number of women.

Table 2. Descriptive Statistics for all components of maternal health care expenditure, field survey, rural Varanasi, 2013-14.

Composition of expenditure	JSY beneficiary (in INR)				Non JSY (in INR)			
	Mean	Median	Max	SD	Mean	Median	Max	SD
Direct expenditure on ANC	358	0	7000	887	2627	400	40,950	5577
Direct expenditure on delivery	659	320	17,800	1888	12,891	8000	75,000	13109
Direct expenditure on PNC	152	0	10,000	1007	1936	0	5034	40,000
Total direct expenditure	1169	540	19,600	2614	17,455	11,450	103,950	17,456
Total indirect expenditure	4806	3530	21,670	3677	6177	4650	23110	4545
Total expenditure	5975	4400	28,250	4611	23,632	17,000	110,030	18,354

ANC: Antenatal care; PNC: Postnatal care; INR: Indian National Rupee. One US\$ was approximately equal to Rs.60 in 2014; SD: Standard Deviation. Here the total expenditure is the amount before JSY reimbursement. After JSY reimbursement the amount is Rs.4575 (Mean) and Rs.3000 (Median). JSY beneficiary (n=223), non JSY (n=173).

holds but the gap in the adjusted percentages for catastrophic headcounts at non-food expenditure threshold narrowed down.

Table 5 also presents the odds of suffering from catastrophic expenditure. Religion, caste, and parity of women did not turn out to be statistically significant predictors of incurring catastrophic expenditure. The likelihood of incurring catastrophic expenditure at 10% of income threshold was higher in women with primary to secondary-level of education compared to illiterate and less than primary educated women while the odds at 40% of non-food expenditure were higher among women with primary-level education. *Not working* women were significantly less likely to suffer from catastrophic maternity expenditure compared to *working* women. The odds were higher for those women whose husbands worked in agriculture compared to the women whose husbands were in casual labour. The likelihood of incurring catastrophic expenditure among richer women was much lower than poorer women. It also comes to the fore that women who did not receive the JSY incentive were several times more likely to incur catastrophic expenditure both at 10% of income and 40% of capacity-to-pay thresholds.

Discussion

The present study estimates all direct (formal and informal medical expenditure) and indirect expenditure incurred by households due to maternity and examines the extent to which the JSY incentives reduced the burden of cost incurred. The findings of the study suggest that the JSY beneficiaries incur a substantial amount of direct out-of-pocket expenditure on maternity care even though the publicly-funded health system is supposed to provide its services free of cost. It turns out that close to one-fourth of total out-of-pocket expenditure on maternity care by the JSY beneficiaries comes from direct expenditures which ideally should not incur as

the public health system is supposed to provide maternity services free of cost.

This direct out-of-pocket medical expenditure may have incurred due to several reasons. Previous studies have found that the low availability of essential medicines at public health facilities and corrupt practices prevalent among doctors and pharmacists force patients to purchase medicines from private pharmacies where there is higher availability of medicines and for many medicines, only one brand of the product is available usually the costly one. This leaves patients with no choice but to buy that costly branded product thereby incurring catastrophic drug expenditure.³¹ The user charges and informal payments (bribes) to the providers and other health workers are also added to the expenses.

Kickbacks and bribery in India's public health facilities are a common phenomenon.³² Kickbacks are illegal in India, but they are nearly impossible to avoid in public health facilities, especially for the poor and illiterate. Patients incur a lot of informal payments during various stages of maternity in lieu of services received from the health facility. Moreover, the public health system is generally perceived to be incompetent to treat emergency obstetric complications and the patients prefer to visit the private providers for the treatment. Also the women who undergo C-section in the district hospital have to bear additional treatment costs. It is also a fact that most women are unaware of the benefits they are entitled to receive under the JSY for C-section delivery in accredited private hospitals. An important finding of the present study is that the indirect or non-medical expenditure forms a major chunk of the out-of-pocket payments made towards maternity. A deeper look into the data collected from the field reveals that mothers often have to pay for transportation from their own pocket. Although the state has a 24×7 free ambulance services, the fact of the matter is it is not always available, at least in Varanasi district, forcing patients to use unregistered private vehicles.

Another major source of the indirect expenditure is the loss of

Table 3. Expenditure on maternity as share of annual household consumption expenditure, field survey, Rural Varanasi, 2013-14.

Expenditure quintiles	Expenditure as percentage of AHCE								
	JSY beneficiary			Non JSY					
	TDE	TIDE	TMHCE	After JSY reimbursement	JSY reduces OOP share by	TDE	TIDE	TMHCE	
Poorest	2.2	10.7	12.9	10.2	2.7	27.1	16.8	43.9	
Poor	2.9	8.1	11	8.5	2.5	26.6	10	36.6	
Middle	1.4	7.6	9	6.8	2.2	25.4	7.7	33.2	
Rich	1.7	5	6.7	4.9	1.8	22.2	5.6	27.8	
Richest	0.6	4.8	5.3	4	1.3	13	4.6	17.6	
All	1.6	6.7	8.3	6.2	2.1	20.5	7.3	27.8	

TDE: Total direct expenditure, TIDE: Total indirect expenditure, TMHCE: Total maternal health care expenditure, AHCE: Annual household consumption expenditure.

Table 4. Catastrophic headcounts and overshoots at different thresholds, field survey, Rural Varanasi, 2013-14.

	Catastrophic headcount and overshoot at 10% consumption expenditure threshold		Catastrophic headcount and overshoot at 40% of capacity to pay	
	HC	Overshoot	HC	Overshoot
JSY beneficiary				
Actual	33.7	4.4	56.1	55.2
After deducting incentive	25.6	3.5	40.8	40.8
Difference	8.1	0.9	15.3	14.4
Non JSY	78.6	29.2	83.8	215.1

JSY beneficiary (n): 223, non JSY (n): 173, JSY beneficiary without reimbursement i.e. cash incentive of JSY was not deducted; HC: catastrophic head count, Non-food expenditure: capacity to pay.

mother's wages during maternity period. It is a well-established fact that poor women continue to work to earn a living for the family right up to the last days of their pregnancy, thus not being able to put on as much weight as they otherwise might. They also resume working soon after childbirth, even though their bodies might not permit it preventing their bodies from fully recovering, and their ability to exclusively breastfeed their new born in the first six months. Therefore, there is urgent need to introduce a modest maternity benefit in the JSY to partly compensate for their wage loss. Although, the Government of India has announced a new scheme entitled *Indira Gandhi Matritva Sahyog Yojana* for pregnant and lactating women that provides Rs.6000 as partial wage compensation to pregnant and lactating women in order to promote rest and healthy feeding practices, as well as increase utilisation of healthcare services, how successful it would be is yet to be seen.

The analysis showed that the maternal health expenditure even in the public sector was regressive. In other words, the poor women a relatively higher proportion of their disposable income

compared to the rich women to avail maternity services from publicly-funded health facilities. Even in absolute terms, the expenditure of poorer JSY households on maternity care exceeded that of richer households by about Rs.2000. It is argued that that due to low social capital, the poor people are often forced to make a lot of informal payments in public health facilities to receive services, while the rich pay no extra or informal fees and enjoy the service free of charge.

One important question that this paper asked at the outset was that to what extent the JSY protects households from incurring catastrophic expenditure. The analysis revealed that the monetary incentive of the JSY helped only about 8.1% (33.7% without JSY benefit and 25.6% with JSY) households at 10% of consumption expenditure threshold and 15.3% households (56.1% without JSY benefit and 40.8% with JSY) at *capacity to pay* threshold to escape from suffering catastrophic burden. It suggests that the JSY has achieved only a limited success in reducing the economic burden of out-of-pocket expenditure on maternal health care.

Table 5. Expenditure on maternity, catastrophic headcounts, odds ratios by background characteristics of women, Rural Varanasi, 2013-14 (n=396).

Background characteristics	Mean TMHCE		At 10% of annual consumption expenditure; % catastrophic expenditure			At 40% of annual consumption expenditure; % catastrophic expenditure		
	JSY	Non JSY	Unadjusted	Adjusted ^a	OR	Unadjusted	Adjusted ^a	OR
Religion								
Hindu [#]	4825	24668	50.9	51.2	1.000	61.6	40.8	1.000
Muslim	3555	17202	38.2	34.6	0.579	50.0	36.2	0.699
Caste								
Other [#]	5787	21851	44.4	37.8	1.000	48.9	23.3	1.000
OBC	4486	24501	48.8	23.4	1.165	60.5	43.7	1.813
SC	3473	20801	51.4	21.4	1.818	62.9	59.0	1.177
Age of mother (in years)								
15-24 [#]	4390	24375	49.8	23.1	1.000	59.3	40.3	1.000
25 and above	4810	22615	47.4	28.4	0.864	60.0	41.4	1.036
Parity								
1	4536	21779	51.4	45.0	0.928	59.5	54.9	0.483
2 to 3 [#]	4432	20709	46.5	25.4	1.000	58.8	35.9	1.000
4 to 7	5718	28540	54.8	22.9	1.284	61.3	36.3	1.253
Education of woman								
Illiterate or below primary school [#]	4826	25775	45.4	31.5	1.000	64.4	54.7	1.000
High school	4322	22494	57.1	22.2	1.153	59.5	12.2	0.467**
Above high school	4225	25775	48.3	15.9	1.418	51.7	23.5	0.559*
Work status of woman								
Working [#]	6665	25775	66.7	48.7	1.000	77.5	62.6	1.000
Non-working	3450	22494	39.1	13.1	0.209***	50.0	12.7	0.221***
Occupation of husband								
Casual Labour [#]	6659	20658	54.9	37.5	1.000	68.0	45.2	1.000
Agriculture	5397	23035	64.9	47.4	1.115**	70.3	51.2	0.789
Business	4132	23676	40.8	18.3	0.753	51.5	46.3	0.676
Regular salary	2893	26215	41.7	7.1	0.486**	51.5	31.6	0.528*
Expenditure quintiles								
Poorest [#]	5135	18626	62.8	41.5	1.000	76.9	53.2	1.000
Poor	5056	23401	57.5	31.7	0.518	65.0	25.2	0.622**
Middle	4380	27594	45	25.5	0.487*	56.3	35.0	0.449*
Rich	3803	26201	46.3	16.3	0.412**	56.3	29.6	0.461
Richest	3980	22153	32.1	14.9	0.137***	43.6	39.9	0.211***
JSY benefit received								
Yes [#]	-	-	25.6	24.6	1.000	40.8	41.2	1.000
No	-	-	78.6	79.6	18.53***	83.8	83.5	13.37***

One US\$ was approximately equal to Rs60 in 2014. For JSY beneficiaries, the expenditures were obtained after deducting incentive: JSY incentive amount (Rs.1400) from the total maternal health care expenditure. OR, odds ratio; ^aadjusted in a manner similar to a Multiple Classification Analysis, from the predicted values obtained from the logit regression, holding all other explanatory variables at average (that is, population distribution). [#]Reference category. ***P≤0.001; **P≤0.05; *P≤0.01.

The study also examined the determinants of catastrophic expenditure on maternity. In this regard, the finding that the richer, educated, and regularly salaried women were less likely to incur catastrophic maternity expenditure is similar to the findings of previous studies conducted in India and elsewhere.^{9,12} It is argued that richer and educated women are often more aware about the functioning of the health system and government health schemes through their greater exposure to the mass media, and know their healthcare rights as a mother which helps them avoid making any informal payment to avail services in public health facilities. The findings revealed that the non-JSY women were several times more likely to experience catastrophic maternal expenditure compared to the JSY beneficiaries. It should sound an alarm bell for the government as this finding suggests exorbitant costs of maternity care prevailing in the private healthcare sector.

Limitations

The most apparent limitation of the study might be in collecting the household consumption expenditure. The study followed the methodology for calculating the same as guided by the National Sample Survey Organization (NSSO). NSSO used an extensive survey tool to collect the household consumption expenditure for the rounds of consumption expenditure survey which was practically not time and cost effective for an individual researcher, besides the prime motive of the survey was to collect the expenditure incurred on maternity extensively. Next, the survey relied on the reporting of expenditure by the respondents which was further cross checked by the reporting of elder member (s) of the households (who were mostly present during interviews). This was the method also applied by the NSSO in India, still one may not deny under or over reporting of expenditure by the respondents and hence could be regarded as a limitation of this study.

Conclusions

This study reveals that JSY beneficiaries are spending a substantial amount on the services that are supposed to be provided free-of-cost in public health facilities. This is a loophole in the implementation of the JSY scheme that needs to be plugged urgently to stop spillage of the JSY money. Moreover, the amount of JSY incentive should be revised taking into consideration the rise in inflation since the year 2005 when the incentive was first fixed. As women incurred a significant amount of expenditure during antenatal and postnatal care as well, the JSY incentive should be linked to prenatal and postnatal care to encourage the use of full continuum of maternity services available at public health facilities which in turn could help reduce maternity related complications and thereby expenditure as well. A significant portion of out-of-expenditure was due to wage loss and it should be incorporated in the JSY benefit. The findings that even the JSY beneficiaries incur a huge indirect expenditure on maternity and the exiting JSY incentive can save only a limited number of households from incurring catastrophic expenditure suggests there is an urgent need to review this demand-side financing scheme.

References

1. World Health Organization. Maternal Mortality factsheet, department of reproductive health and research. Geneva: World Health Organization; 2014.
2. Singh RK, Patra S. Differentials in the utilization of antenatal

Correspondence: Saradiya Mukherjee, New Delhi, India.

Tel.: +91.9971579939

E-mail: saradiya7@gmail.com

Key words: Janani Suraksha Yojana, Maternity expenditure, Out of pocket expenditure, catastrophic diect expenditure, indirect.

Acknowledgements: the authors are indebted to Dr. P.M. Kulkarni (Retired Professor, Jawaharlal Nehru University, New Delhi, India) for his valuable comments and suggestions in the paper.

Contributions: SM designed the study, collected data, conducted the statistical analysis and wrote the manuscript. AS wrote the manuscript, contributed to the interpretation, revised the manuscript during the review process.

Conflict of interest: the authors declare no potential conflict of interest.

Funding: SM was a recipient of University Grants Commission's (India) doctoral research fellowship for this research.

Received for publication: 28 April 2017.

Accepted for publication: 28 July 2017.

©Copyright S. Mukherjee and A. Singh., 2018

Licensee PAGEPress, Italy

Journal of Public Health Research 2018;7:957

doi:10.4081/jphr.2018.957

This work is licensed under a Creative Commons Attribution NonCommercial 4.0 License (CC BY-NC 4.0).

- care services in EAG states of India. *Int Res J Soc Sci* 2013;2:1-6.
3. Navaneetham K, Dharmalingam A. Utilization of maternal health care services in Southern India. *Soc Sci Med* 2002;55:1849-69.
4. Leive A, Xu K. Coping with out-of-pocket health payments: empirical evidence from 15 African countries. *Bull World Health Organ* 2008;86:849-56.
5. O'Donnell O, van Doorslaer E, Rannan-Eliya RP, et al. Who pays for health care in Asia? *J Health Econ* 2008;27:460-75.
6. Joglekar R. Can insurance reduce catastrophic out-of-pocket health expenditure? *Labor Economics Working Papers* 22367, East Asian Bureau of Economic Research. 2012.
7. Nahar S, Costello A. The hidden cost of free maternity care in Dhaka, Bangladesh. *Health Policy Plann* 1998;13:417-22.
8. Balaji R, Dilip T, Duggal R. Utilization and expenditure on delivery care services: some observations from Nashik district, Maharashtra. *Reg Health Forum*. 2003.
9. Bonu S, Bhushan I, Rani M, Anderson I. Incidence and correlates of catastrophic maternal health care expenditure in India. *Health Policy Plann* 2009;24:445-56.
10. Gwatkin DR. Health inequalities and the health of the poor: what do we know? What can we do? *Bull World Health Organ* 2000;78:3-18.
11. Mariko M. Quality of care and the demand for health services in Bamako, Mali: the specific roles of structural, process, and outcome components. *Soc Sci Med* 2003;56:1183-96.
12. Mukherjee S, Singh A, Chandra R. Maternity or catastrophe: a study of household expenditure on maternal health care in India. *Health* 2013;5:109-18.
13. Sharma S, Smith S, Sonneveldt E, et al., Formal and informal fees for maternal health care services in five countries: policies practices and perspectives. Washington DC: Futures Group International, POLICY Project, 2005.
14. Ministry of Health and Family Welfare 2013. Framework for implementation National Health Mission. 2011-2012, G.o.I., New Delhi. http://nrhm.gov.in/images/pdf/NHM/NRH_

- Framework_for_Implementation__08-01-2014_.pdf.
15. Office of Registrar General and Census Commissioner. Annual Health Survey 2010-11 2011. Ministry of Home affairs, Government of India, New Delhi.
 16. International Institute for Population Sciences and Macro International. National Family Health Survey 2007. (NFHS-3), 2005-06 (Vol. 1). Mumbai, IIPS.
 17. Goli S, Rammohan A, Pradhan J. High spending on maternity care in India: what are the factors explaining it? *PloS One* 2016;11:e0156437.
 18. UNFPA, N.D., Concurrent Assessment of Janani Suraksha Yojna (JSY) in Selected States of India, 2008, 2009, May.
 19. Randive B, Diwan V, De Costa A. India's conditional cash transfer programme (the JSY) to promote institutional birth: is there an association between institutional birth proportion and maternal mortality? *PloS One* 2013;8:e67452.
 20. Lim SS, Dandona L, Hoisington JA, et al., India's Janani Suraksha Yojana, a conditional cash transfer programme to increase births in health facilities: an impact evaluation. *Lancet* 2010;375:2009-23.
 21. Mohanty SK, Srivastava A. Out-of-pocket expenditure on institutional delivery in India. *Health Policy Plan* 2013;28:247-62.
 22. Modugu HR, Kumar M, Kumar A, Millett C. 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* 2012;12:1048.
 23. Office of Registrar General of India. Special Bulletin on Maternal Mortality in India 1997-2003 2006. Sample Registration System, Office of the Registrar General of India, Ministry of Home affairs, Government of India, New Delhi.
 24. National Sample Survey Organization. Morbidity, Health Care and Condition of the Aged 60th Round (January-June 2004) 2006. National Sample Survey Organization, Ministry of Statistics and Programme Implementation, Government of India, New Delhi.
 25. National Sample Survey Organization 2015. Key Indicators of Social consumption In India, Health 71st round. National Sample Survey Organization, Ministry of Statistics and Programme Implementation, Government of India, New Delhi.
 26. Ahmed S, Khan MM. Is demand-side financing equity enhancing? Lessons from a maternal health voucher scheme in Bangladesh. *Soc Sci Med* 2011;72:1704-10.
 27. Berki S. A look at catastrophic medical expenses and the poor. *Health Affairs* 1986;5:138-45.
 28. Retherford RD, Choe MK. Statistical models for causal analysis. Philadelphia: John Wiley & Sons; 2011.
 29. Xu K, Evans DB, Kawabata K, et al. Household catastrophic health expenditure: a multicountry analysis. *Lancet* 2003;362:111-7.
 30. Nayar K. Social exclusion, caste and health: a review based on the social determinants framework. *Indian J Med Res* 2007;126:355.
 31. Kotwani A. Where are we now: assessing the price, availability and affordability of essential medicines in Delhi as India plans free medicine for all. *BMC Health Serv Res* 2013;13:285.
 32. Chatterjee P. How free healthcare became mired in corruption and murder in a key Indian state. *BMJ* 2012;344.