

# Evaluating the RSBY: Lessons from an Experimental Information Campaign

JISHNU DAS, JESSICA LEINO

Launched in 2008, the Rashtriya Swasthya Bima Yojana provides financial protection from health shocks for poor households. This paper discusses findings from an experimental information and education campaign and household survey carried out in the first year of the programme in Delhi. First, the IEC had no impact on enrolment, but households who were part of the household survey sample and therefore received information closer to the enrolment period were 60% more likely to enrol. Second, there is little evidence that the insurance company selectively enrolled healthier households. Instead, hospital claims were lower for households who received the IEC and for households who received both the survey and the IEC, suggesting that the marginal household enrolled was in fact healthier. Implications for the programme and its evaluation are discussed in the light of these findings.

## 1 Introduction

In 2008, the government launched its flagship health insurance scheme for the poor. The Rashtriya Swasthya Bima Yojana (RSBY) combines cutting edge technology with an unusual reliance on incentives to provide inpatient insurance coverage up to an annual sum of Rs 30,000 for eligible enrolled households. As the programme expands, two important questions arise (1) the degree to which contracted insurance companies are able to selectively enrol “healthier” households, a phenomenon known as “cream skimming” in the insurance literature, and (2) the impact of the scheme on financial protection and health outcomes for enrolled households. To better understand how these questions can be answered in the context of the RSBY, we carried out a pilot information and education campaign (IEC) and a household survey in six (of 72) administrative circles in Delhi in 2008. Both the samples of households chosen to receive the IEC and the household survey were randomly selected from the list frame of all eligible households in the chosen circles.

Using the experimental nature of the IEC and the equal-probability sampling in the household survey, we estimate causal effects of the IEC on enrolment and hospital claims using administrative programme data. With the IEC and the household survey, there are four “blocks” of households in our data (IEC only, IEC + household survey, household survey only, neither); the causal impacts of any treatment block can be computed by means-comparisons across blocks.

We report three results. First, the IEC by itself had no impact on enrolment. This could be because the IEC was carried out two months prior to the effective start of a delayed enrolment process, and because not all administrative details of the enrolment process were available at the time of the IEC. It is also possible that, because rumours had spread that if people did not enrol in RSBY they would not be able to obtain supplies through the public distribution system (PDS), the IEC actually discouraged enrolment by dispelling these fears. Second, and contrary to our expectations, the household survey itself increased enrolment. The household survey, which (coincidentally) took place immediately prior to and during the enrolment period, asked questions about the scheme and households’ knowledge of the scheme as well as households’ health status. It is likely that asking these questions (as well information that surveyors may have shared on the scheme as part of the interview process) increased the salience of the scheme among surveyed households and altered the likelihood of enrolment. Behaviour change as a consequence of observation, termed a Hawthorne effect, has been noted in several recent studies

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discussed in Zwane et al (2011). Third, households chosen for the IEC and IEC/household survey ultimately reported lower claim rates, suggesting that the marginal household enrolled as a result of this information provision was healthier than the average household. Insurance company profits therefore were higher for the set of households exposed to the IEC and household survey. This result is consistent with the incentives built into the design of the RSBY – the programme explicitly covers pre-existing illnesses in the belief that the “first enrollees” would be “sicker” households. Consequently, the marginal households that joined up as overall enrolments increase should be progressively healthier with lower claims.

These results raise the substantive issue of the impact of information and exposure to the programme on enrolments and hospital use. Information campaigns are likely to be extremely time sensitive, and need to be carefully timed and managed to coincide with actual enrolment dates. The marginal take-up as a result of even well-timed campaigns may be low, as household enrolment decisions depend on many factors outside the influence of the IEC. Furthermore, households who received both the IEC and the household survey, several months apart, reported the highest enrolments. This suggests that multiple doses of information may have a reinforcing effect.

Was this additional enrolment good for the insurance companies? If we disregard the cost of the campaign, almost certainly: there was an additional net profit of Rs 66 on every household enrolled under the IEC and household survey. It seems likely that in urban areas, a well done IEC could increase insurance company profits. What a well done IEC would look like and how much it would cost remains an open question.

These results also highlight methodological issues of how to evaluate the impact of the RSBY programme. One approach used in the literature combines a baseline household survey with an experimental encouragement design, where the encouragement could take the form of information or subsidies (King et al 2009; Thornton et al 2010). To the extent that the encouragement increases enrolment in the programme and is experimentally allocated, intention-to-treat (ITT) estimators and instrumental variables can be used to back-out the impact of the programme (under certain assumptions). But our programme administrative data shows that the baseline household survey itself provides information to households and increases enrolment. This raises the issue that without such independently available sources of administrative data, it would have been difficult to discern the effects of the survey on enrolment and programme outcomes since there is no information available on households who would not have been administered a survey. In Section 5, we discuss the options available for evaluating the broader impact of the RSBY programme when surveys alter participation decisions.

The remainder of our paper is as follows. Section 2 describes the RSBY and its implementation in Delhi. Section 3 describes our data and empirical strategy. Section 4 documents the results and Section 5 discusses broader methodological implications and concludes.

## 2 RSBY: A Background

India's health system was planned largely as a three-tiered referral system of primary healthcare centres, district hospitals and specialised hospitals where care would be sought primarily

through the public sector and financing would be based entirely on a supply-side model. But by the 1990s, studies showed that (1) the bulk of visits and out-of-pocket expenditures were incurred in a parallel private system of care, with 80% of all primary visits to the private sector; (2) the quality of care in the government sector was low due to the lack of incentives; and (3) expenditures in the government sector were barely progressive and investments in hospital care were regressive (Das and Hammer 2007; Government of India 2005; Mahal et al 2001; WHO 2000). Although in the 1990s, the government slowly opened up insurance markets to private providers, by 2007 at most 15% of the population carried any kind of insurance and the bulk of insured individuals were urban government sector employees and rich households (WHO 2008). Simultaneously, analysis of household survey data showed that illness-shocks were one of the primary reasons for households falling into poverty (e.g., Berman et al 2010; Garg and Karan 2009; Selvaraj and Karan 2009).

To redress these problems, the government launched its flagship health insurance product for the poor in 2008. The RSBY offers a micro-insurance product for households designated as “below the poverty line” (BPL) and aims to cover up to 60 million households throughout the country over the next five years. The objectives of the RSBY are to provide financial protection for households affected by major health shocks and improve health outcomes for poor households. The RSBY is a voucher-like intervention; by combining consumer choice among competing facilities with a demand-side subsidy, it aims to provide greater financial protection for poor households and foster better quality care through increased competition. There are several unique features of the programme.<sup>1</sup>

First, insurance companies are selected by competitive bidding in each district and receive a premium for every household enrolled by them in the scheme (typically paid 75% by the central government, 25% by the state government).

Second, insurance companies empanel in-patient care facilities (ICFs); they then reimburse ICFs for in-patient care provided to enrolled households. ICFs may be either public or private; public facilities may retain payments from the RSBY in self-governed societies known as Rogi Kalyan Samitis.

Third, eligible households (those identified as BPL by their states) can enrol in the programme by paying Rs 30, in return for which they receive a smart card. A maximum of five members may enrol from any family, including the head, spouse and up to three dependents of the head of the household. The smart card permits any registered member of the household to visit any ICF for in-patient care for any of the (approximately) 700 surgical or medical procedures. The prices for each procedure are fixed by the state, and an enrolled household is covered for a maximum of Rs 30,000 of in-patient care each year. Transactions are cashless for households and require only the fingerprint-verification of the user to deduct the cost of the procedure from the remaining smart card balance.

As of January 2011, the RSBY has been rolled out in over 400 districts in 26 states and in the first two years has covered more than 18 million households with around 55 million individuals. The smart-card data system that automates and centralises data collection provides administrative data on enrolled households and procedures performed at ICFs on a centrally maintained server.

During the initial rollout of the programme, several important shortcomings were identified. First, insurance companies are paid for every household enrolled, not for every individual enrolled. Therefore, they have incentive to enrol the first member of a household and zero incentive to enrol any other member. Although it is difficult for insurance companies to deny enrolment, one can imagine that they do not actively promote enrolment among additional household members; they may even assure households that enrolling a single member is sufficient. We see some evidence of this in the numbers. Across the programme, the average number of members enrolled per household in the RSBY at 2.6 is much lower than the average number of eligible household members of 4.6.<sup>2</sup> Second, there is currently no information on what happens at hospitals or how patients are diagnosed and assigned treatment codes. Therefore, we cannot ascertain whether hospitalisation was medically necessary, and if so, what the impact of this hospitalisation was on the health of the household. In an analysis of another health insurance scheme targeted to the poor, Desai (2009) points out that 43% of the gynaecological claims were for hysterectomies that were actively encouraged by participating hospitals. Within the RSBY, presently insurance companies are focused primarily on controlling outright fraud rather than examining medical necessity.

### Implementation Issues in Delhi

Delhi was the first state to start enrolling households in the RSBY programme. Understanding how the programme functioned in Delhi highlights the inherent uncertainties of programme implementation and that these findings may not generalise to other contexts.<sup>3</sup> We emphasise three characteristics of the process in Delhi. These are (1) the list of eligible households and the state's own IEC; (2) the pricing of services; and (3) the choice of the insurance company.

First, the nature of urban poverty and technical implementation issues limited the state's ability to provide clear information and generated considerable uncertainty about the purpose of the scheme and the process of enrolment. The initial list of beneficiaries in Delhi's programme included 1,47,000 households designated as Antyodaya households, considered the poorest BPL households in the state. Early on, we discussed with the implementing officer in the state's nodal agency the difficulties of IECs in an urban setting with many eligible households in slums and very low-income neighbourhoods scattered throughout the city. We were told that the state would advertise in newspapers and the night before enrolment began, the circle in-charge (Delhi has 72 circles for purposes of the food distribution under the PDS) would be responsible for contacting each of the eligible households and directing them to enrol in the programme. Since some circles had more than 8,000 households, it was difficult for us to see how the planned awareness activities would work in practice. As it turned out, Delhi reported the lowest enrolment of all participating states in the first year.<sup>4</sup> In general, information about the programme in Delhi was sparse and rumours circulated widely about the actual purpose of the RSBY card.<sup>5</sup>

In addition to problems with notifying potential beneficiaries, technical issues with the smart card delayed the starting enrolment

date by three months. Once enrolment started, the field key officer (FKO) responsible for verifying the identity of beneficiaries prior to enrolment became a bottleneck. The FKOs – who were all government employees – often did not come to work, would take long breaks, and would arbitrarily turn people away. Given the frequency of such problems, households had to make a real effort to enrol in the RSBY. In some cases, households would have to make three to four visits to the enrolment station before they found the FKO and the FKO decided that their papers were in order for enrolment.

Second, the choice of hospitals and the pricing scheme limited the incentives for ICFS to actively seek out patients from the RSBY scheme for treatment. Delhi decided not to empanel public facilities on the grounds that public hospitals were supposed to provide care for the poor free of cost and by participating in the programme, incentives would be skewed towards providing care for RSBY beneficiaries – because the reimbursement from RSBY procedures would be retained by the hospital. Furthermore, the government decided not to alter the price list that the centre had made available as a reference list based on prices in smaller towns. As the programme proceeded, it became clear that these prices were too low for many procedures and that in some cases hospitals were turning away patients.<sup>6</sup> These factors could affect the interpretation of hospital use statistics that we report here.

Finally, Oriental Insurance Company, a parastatal with potentially wider objectives beyond profit maximisation, won the bid for Delhi. In an analysis of 24 districts, those with private insurance companies reported significantly higher enrolments.<sup>7</sup> This suggests that parastatal insurance companies (a) operated under lower incentives; (b) operated in districts where enrolments were likely to be lower; or (c) were less likely to exert pressure on the state on important issues (such as FKO presence) that could increase enrolment. While the reality is almost certainly a combination of these factors, during the first year enrolment process it appeared that Oriental was not able to collaborate effectively with the Delhi state government in terms of choosing enrolment sites, improving the IEC, and ensuring FKO presence.

Due to these unique implementation circumstances, the results of this study apply only to Delhi in the first year of enrolment. The main lesson we would thus submit is not necessarily the specific programme impacts, but the experience from this pilot for designing evaluations of the programme in different states and in understanding how (and whether) IECs could add value to the functioning of the programme.

### 3 Data and Empirical Strategy

This paper relies upon data from several sources that was collected over a one and a half year period. The sample frame list provided by the Delhi government in early 2008 contained information on 23,836 eligible households in the six administrative circles selected for the IEC.<sup>8</sup> Of all households in the sample frame, 7,500 were then randomly sampled for the IEC and 3,000 (1,500 that received the IEC and 1,500 that did not receive the IEC) were randomly sampled for the household survey. There are thus four “blocks” of households (IEC only, IEC + household survey, household survey only, neither) in our data; because of the random

allocation of households to blocks, causal impacts of being in a given block can be computed simply by comparing the means across blocks. The block sizes are not the same; there are 6,004 households in IEC only block, 1,496 in the IEC + household survey, 1,484 in the household survey only and 14,852 in the group that received neither. All the post-intervention data are based on administrative records of enrolment and hospital use.

The timeline of the study was altered several times. Enrolment was originally slated to begin in March 2008, with the IEC to be carried out in January and February 2008. However, enrolment officially began in April, with the early months plagued by implementation problems. Enrolment picked up pace only around June/July 2008. The home visits component of the IEC took place in late April and early May 2008. Our household survey ultimately ran from June to September 2008. The administrative data on enrolled households as well as on all insurance transactions completed by enrolled households was obtained at the conclusion of the policy period in April 2009.

The IEC was conducted by an organisation with substantial experience implementing community-based interventions in the areas selected for the intervention. The IEC employed a “surround and engage” strategy so that the target audience would hear about the RSBY scheme through multiple channels. A letter was mailed to each household in the treatment sample as an introduction and this was followed with a home visit by a trained field officer. A leaflet with easy-to-read text as well as pictorial cues for low literacy audiences that outlined the key benefits of RSBY, the procedure for enrolment and a helpline number was also distributed during the household visit. As part of the IEC, posters also were put up at ration shops and at sites such as the local flour mill where members of the target audience were likely to congregate. The organisation found that 27% of households could not be reached for household visits, the vast majority due to the poor quality of the sample frame list.

To assess the characteristics of households enrolled in the programme with and without the IEC, the data collected from the household survey sample contains information on self-reported health status and questions on activities of daily living for all household members. It also has questions on household expenditures on health and details about any health shocks faced by the household in the past year. The household survey also contains information on attitudes towards risk, household assets, income and borrowing, and demographic characteristics.

Finally, administrative data collected automatically through the RSBY smart card technology and the programme management information system (MIS) are used to assess the impact of the IEC and the household survey on enrolment and claims rates. Note that without administrative data, estimating the effect of the household survey on enrolments and transactions requires both a follow-up household survey and an extension of the sample into households not exposed to the survey in the first round. However, the

administrative data generated through the programme also has limits. Since there is no information on non-enrolled households in the administrative data, we cannot compare the characteristics of households who were not surveyed to those who were.

The administrative data on enrolled households and hospital use were matched back to the sample frame and to household survey data for the subsample of households that completed the household survey. The empirical strategy relies on the ITR strategy as some households targeted for the information campaign could not be reached and ultimately 2,980 of the 3,000 sampled households completed the household survey.

## 4 Results

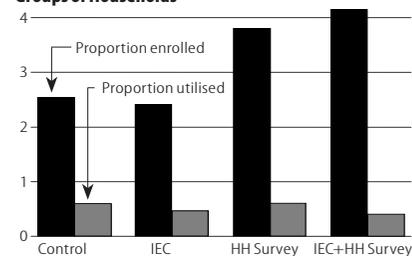
The analysis that follows examines the effect of both the information campaign and the household survey by classifying all households that were targeted to receive the IEC/survey as treated households.

### 4.1 Enrolment

The IEC had little impact on enrolment, except in conjunction with the household survey. Figure 1 shows mean enrolment and utilisation rates for the four types of households in our study. Enrolment rates were 24%-25% among households that did not receive the household survey, and increased to 38%-42% for households that received the household survey. The control households (those without the IEC or household survey) in Delhi had enrolment rates of 24%.

The results reported in Figure 1 are unconditional means; as the distribution of households in each group varied slightly across administrative circles and enrolment rates varied substantially across circles (from 12% to 87% of households), Table 1 reports

**Figure 1: Enrolment and Utilisation Rates across Groups of Households**



The figure shows the fraction of households who enrolled in the RSBY scheme and the fraction who reported a hospital claim within the RSBY scheme from administrative data for four groups of households: the control group that received neither an IEC nor a household survey; the group that received only the IEC, the group that received only the household survey and the group that received both. Enrolments were higher for the group that received the household survey and those that received both the household survey and the IEC, but not for those who received only the IEC. Claims were lower in the groups that received the IEC.

**Table 1: Impact of IEC and Household Survey on Enrolment, Utilisation and Profits**

Dependent Variable:	Percentage Enrolled		Number Enrolled (Conditional on Enrolment)	Percentage Utilised Insurance (Conditional on Enrolment)		Total Claims (Rs) (Conditional Upon Transaction)	Net Profits Per Policy (Rs) (Conditional Upon Enrolment)
	ols (1)	probit (2)		ols (4)	probit (5)		
HH sampled for IEC	-0.90 (0.68)	-1.03 (0.73)	0.02 (0.05)	-1.46** (0.48)	-1.30*** (0.31)	246** (106)	74** (25)
HH sampled for survey	7.99*** (1.76)	9.26*** (2.22)	0.03 (0.08)	0.52 (1.42)	0.57 (1.30)	-484 (1222)	0.6 (75)
HH sampled for both IEC and survey	4.83** (1.27)	5.02*** (1.10)	0.06 (0.08)	-0.66 (1.70)	-0.60 (1.49)	-719 (1018)	53 (104)
Constant	19.63*** (0.39)	25.20	3.45*** (0.02)	4.98*** (0.34)	45.08	4945*** (262)	298*** (14)
Circle FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23836	23836	6407	6407	6407	351	6407

All regressions include administrative circle fixed effects. Marginal effects evaluated at the mean of the independent variables are reported for probit estimates. Huber-White robust standard errors (clustered at the circle level) are presented, significantly different than zero at \* 90%, \*\* 95%, \*\*\* 99% confidence.

regressions of the impact of receiving the IEC and household survey within administrative circles, using circle fixed-effects. The results confirm that the IEC had no impact on enrolment, households sampled for the household survey were 8-9 percentage points more likely to enrol, and households in both the IEC and household survey groups were an additional 5 percentage points more likely to enrol relative to control households that received neither the IEC nor the household survey.

All effects were on the extensive enrolment margin; conditional on the household being enrolled, there was no further impact on the number of members enrolled (Table 1, column 3). Recall that under the RSBY policies, insurance companies have full incentives to enrol the first member of the household (the head) and zero incentives to enrol any additional members. Given that households who were part of the IEC and the household survey received explicit information about the number of members who could be enrolled and were informed that household members could not be enrolled unless they were physically present at the enrolment site, we thought it likely that the intervention would have resulted in greater participation of household members in enrolled households. Ultimately, we find no such impact.

That the IEC had little effect on enrolment may be related to the implementation context discussed in Section 2. Due to delays in registration, the IEC took place several months before RSBY cards were available, and because of the uncertainty of the roll-out timeline, the IEC was unable to provide households with firm information on when enrolment would take place in their areas. As many rumours were circulating about the type of benefits provided by the RSBY card, the IEC, by providing accurate information, may have reduced households' incentives to enrol to receive only one specific benefit, i.e., hospitalisation insurance. As the household survey ended up being fielded in the midst of the enrolment period, the information provided through the survey questionnaire itself and through any discussion with the enumerators may have been more salient for household enrolment decisions. However, obtaining a "double dose" of information in which the message from the earlier IEC was reinforced through the household survey also seems to have been a significant influence on households' enrolment decisions.

#### 4.2 Utilisation

While the IEC did not have a significant impact on enrolment rates, the campaign did have an impact on utilisation rates among households that ultimately enrolled. About 4.6% of enrolled households that received the IEC (and 4% of households that received both the IEC and the household survey) have at least one transaction under the RSBY during the policy period. As shown in Figure 1, this utilisation rate is 22% to 30% lower than households that did not receive the IEC (of whom 6% had at least one transaction). These differences remain significant after accounting for circle differences; as shown in Table 1 (columns 4 and 5), households sampled for the IEC have significantly lower claim rates at 1.30 to 1.46 percentage points below comparison group households. The household survey, however, did not have a significant impact on claims rates, nor is there a differential

impact on claims rates for households that were sampled for both the IEC and the household survey.

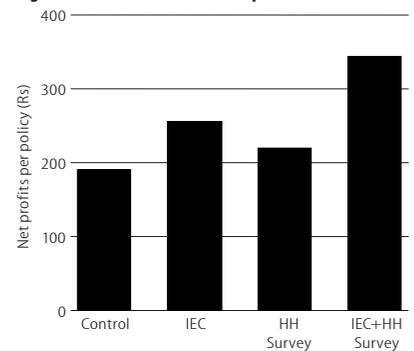
The IEC may have ultimately induced households who were healthier to enrol in the RSBY, even if the campaign did not impact overall enrolment rates.<sup>9</sup> Under such a scenario, households who enrolled after receiving the IEC would have been less likely to make claims as they would have fewer underlying health problems that would require hospitalisation. Unfortunately, the administrative data available on enrolled households contains little information that can be used to assess the pre-existing health status of households. Using the administrative data, we find no significant differences between the characteristics of households sampled and not sampled for the IEC in terms of the number of household members who enrolled under each policy, the age of enrolled household members, the number of females, the number of elderly, and the number of children and young children (results not shown).<sup>10</sup>

#### 4.3 Profits

Given the difference in claims rates induced by the IEC, we examine whether it could be profitable for insurance companies to run information and education campaigns themselves. Premiums paid by the government to the insurance company under the RSBY programme are constant and thus do not vary by the likelihood that a claim will be incurred. Insurance companies cannot turn away sicker households, but have strong incentives to enrol as many (and as healthy) households as possible to reduce their average claims risk. An IEC might be a successful way to induce households with lower expected claims rates to enrol.<sup>11</sup>

Insurance company profits are determined by total revenue (premium\*number of enrolled households) minus total claims and administrative costs. We calculate a rough measure of insurance company profits for each group of households, setting administrative costs to zero for all groups for convenience. Figure 2 reports these net profit measures, normalised by dividing by the number of policies in each group. Excluding the administrative costs of running the campaign, an IEC appears to be profitable for insurance companies – the net profit per enrolled household increases substantially for households that received the IEC and/or the household survey.<sup>12</sup> This result is confirmed in regression analysis that controls for variation across administrative circles – net profits are Rs 74 higher for each policy issued to a household sampled for the IEC (Table 1, column 7). In the regression analysis, net profits are not significantly higher for the household survey sample even assuming a zero cost of providing information through this channel.

Figure 2: Net Profits across Groups of Households



The figure shows insurance company profits (the premium minus average claimed amounts) from administrative data for four groups of households: the control group that received neither an IEC nor a household survey; the group that received only the IEC, the group that received only the household survey and the group that received both. Profits were higher for the groups that received the IEC, consistent with the lower claims reported for this group in Figure 1.

#### 4.4 Characteristics of Enrolled Households

The data collected from the household survey can be used to look at the characteristics of households who chose to enrol in the RSBY and whether the IEC had an impact on the type of households that enrolled in this sample. However, as the administrative data shows that administering the household survey had a direct impact on enrolment outcomes; these results require the significant caveat that household decisions in the survey sample may be different from the majority of households that did not receive the survey.

The household survey suggests that the IEC had a significant impact on increasing pre-existing knowledge about the RSBY scheme at the time of the household survey – only around 32% of households reported knowing about the RSBY, but households in the IEC sample were 5-6 percentage points more likely to have heard about the RSBY. Not surprisingly, knowledge about the RSBY is an important determinant of enrolment – households that claimed to know about RSBY were 54 percentage points, or more than twice as likely, to enrol (Table 2). Examining other household characteristics, the targeting of the programme appears to be successful. Poorer households are significantly more likely to enrol in the RSBY, as are households with more children – each additional child increases the probability of enrolment by 1-2 percentage points.

Table 2 shows that household experience with health shocks and other risk-coping mechanisms also seem to be important

**Table 2: Correlations between Household Health Status and Enrolment**

Independent Variable:	Marginal Effect on Enrolment Rate (Std Err)	Mean of dep var in Sample (Std Dev)
Respondent has heard about RSBY (1=yes)	0.542 *** (0.027)	0.32
Household has prior experience with health insurance	0.577 *** (0.038)	0.26
Household earnings in the last week (Rs)	-0.00006 *** (0.000)	886.98 (693.20)
Highest education level in household	-0.0053 (0.005)	8.98 (3.06)
Number of household members	-0.0026 (0.003)	5.50 (2.30)
Number of children	0.015 ** (0.007)	2.21 (1.65)
Number of over 60s	-0.040 (0.025)	0.41 (0.64)
Spent at least Rs 500 on health last year	0.041 *** (0.013)	0.27
Borrowed to pay for health expenses last year	0.051 ** (0.021)	0.21
Death of a household member in the last year	-0.133 *** (0.017)	0.20
Household head has a self-reported health problem	-0.081 * (0.042)	0.09
Household member has trouble lifting a 5 Kg bag	0.0057 (0.022)	0.51
Expect that a household member will require hospitalisation	0.044 * (0.026)	0.18
Household has high discount factor	0.072 *** (0.020)	0.37

All regressions include administrative circle-fixed effects and an indicator for the PSI intervention. Marginal effects are presented for probit estimates. Huber-White robust standard errors (clustered at the circle level) are presented, significantly different than zero at \* 90%, \*\* 95%, \*\*\* 99% confidence.

determinants of enrolment. Households that have prior experience with health insurance are vastly more likely to take up the RSBY, as are those with a high discount factor. Additionally, households that have spent at least Rs 500 on healthcare expenses in the last year or that report having borrowed money in the past year in order to pay for healthcare expenses are 4-5 percentage points more likely to enrol. To the extent that households have adaptive expectations and base their expectations of future hospitalisation on past experiences, those that experienced bad health outcomes should be more likely to enrol. Households that have experienced a large negative shock in the form of a recent death in the family are less likely to enrol, however. This result makes sense if households anticipate that their future needs for hospitalisation will be lower immediately following the death of a (potentially sick) household member.

The household survey sample does not provide evidence or “cream-skimming” households. Examining a wide range of indicators of current household health status shows that only about one in ten measures is a marginally significant predictor of enrolment; whether a household member has a severe or recurrent health problem and indicators of health status measured using activities of daily living are not significantly correlated with enrolment. There is some indication that households where the head self-reports a health problem are 8 percentage points less likely to enrol, but such a result is expected purely by chance. Finally, there is suggestive evidence that households predicting future hospitalisations are a little more likely to enrol, again contrary to our concern that insurance companies may be able to “select” healthier individuals.

While some household characteristics are correlated with the probability of enrolment, we find few significant differences in these characteristics between enrolled households that received and did not receive the IEC. For instance, households with lower earnings were not more likely to enrol if they received the IEC, nor were households with more members. At most, there is some suggestive evidence that households that had suffered from – and paid for – health shocks in the past may have made different enrolment decisions when they received the IEC. In particular, households that reported borrowing to pay for health expenses in the last year were about 8 percentage points more likely to enrol if they received the IEC. Also, households where a household member had died in the last year were even less likely to enrol if they received the information campaign; perhaps these households have a lower anticipated need for hospitalisation.<sup>13</sup> The IEC might thus have some success at convincing households to enrol using an approach modelled on adaptive expectations.

In combination, the results from the household survey sample suggest that households that enrol in the RSBY are on average poorer and have faced health shocks in the past and that the marginal households induced to enrol by the addition of the IEC are no less healthy than other enrolled households. Although past health shocks and current perceptions of health status are correlated with enrolment decisions, these factors do not have much predictive power on whether households will make a claim during the following policy year,<sup>14</sup> which is important from the perspective of insurance company profit motives.

## 5 Discussion

Our results have implications for both the initial experience of the RSBY implementation in the state of Delhi and for the potential design of evaluations of the larger programme. To begin with, a key issue in the administration of the RSBY is whether insurance companies will be able to “game” the system by insuring primarily relatively healthy households. For insurance companies, as well as for those seeking to maintain political support for the programme, there is also a question of how enrolments can be increased beyond those seen in the first year of implementation; in many such discussions, IECs have been promoted as a tool for increasing enrolment.

On the positive side, our results show little evidence of “cream-skimming” by the insurer with some evidence that those who had suffered health shocks in the past were more likely to enrol. Also on the positive side, the results suggest that even in states where the supply-side administration of the programme is poor, some kinds of information can dramatically increase enrolment. The household survey itself increased enrolment by 9 percentage points, and households exposed both to the IEC and the household survey were 15 percentage points or 60% more likely to enrol. Further, the marginal household enrolled as a result of information provision was healthier with lower claims relative to the average household. Thus, information provision can also lower insurance company liabilities by adding “good risks” to the enrolment pool.

On the negative side, we know no more than when we started about what constitutes a good IEC. Enormous effort was put into designing the IEC campaign and careful cost estimates of the campaign were made for future use. However, this IEC campaign had no impact on its own. We do not know precisely what information was conveyed to households through the household survey (which did increase enrolment) and what form this information took; given our relative ignorance, we are unable to price an effective IEC.

A second key issue on which this paper has bearing is how to design an evaluation of the programme that will allow researchers

to understand the impact of the RSBY on financial protection and health outcomes. The crucial result here is that conducting a household survey is likely to increase the salience of the programme among surveyed households; this in turn could increase participation in the programme. Accounting for this Hawthorne effect, we propose two alternate designs. We feel that these designs reduce the risk of conducting an evaluation in a context with possibly poor implementation while maintaining an emphasis on causal impacts, at least in the context of instrumental variables estimators.

In the first design, randomly selected households (or villages) are “encouraged” to participate in the programme, where the encouragement could consist of financial subsidies, information or other enabling/incentivising mechanisms. The targeted households/villages are then tracked through the administrative data and the impact of the encouragement intervention on enrolment is verified. If the encouragement is shown to be successful and power calculations show that the size of the effect is sufficiently large, an end-line household survey can be implemented at the conclusion of the policy period. Such a survey would include the treated households/villages as well as a set of households/villages that were not exposed to the encouragement. These control villages could be part of a design where there is random allocation into treatment and control or where more sophisticated methods of matching are also used to increase efficiency. Results from the end-line survey of both treatment and controls can then be used to evaluate the impact of the programme using standard tools from the literature, in particular ITT and instrumental variables estimators. Note that in this design, no household survey is conducted until after the encouragement is verified to have had a sufficiently large effect on the outcomes of interest in administrative data. To the extent that household characteristics that are of interest in the analysis are expected to be static (e.g., education of household head) or may be obtained with a reasonable recall (e.g., death in the family in the last year), collecting household data at the end-line may not pose any significant difficulties for subsequent evaluations.

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In the second design, the household survey *itself* is used as the encouragement, perhaps coupled with further incentive mechanisms. If the encouragement effect from the baseline survey is verified to be sufficiently large using the administrative data, a second household survey could then be conducted. As in the first design, the second, end-line household survey will also have to sample additional households not surveyed in the baseline survey – these additional households will serve as the control group that did not receive the encouragement intervention. The advantage of this design is that there is at least some information on the baseline characteristics of households; this design may be particularly relevant when the characteristics of interest are expected to be altered by the programme and thus baseline information on these characteristics is useful for subsequent analysis.

In standard programme evaluation, the Hawthorne effect is thought to be less severe (although without independent sources of data on outcomes of interest, like that collected through the RSBY administrative data, very few studies have actually verified the potential impact of Hawthorne effects on evaluation

outcomes) and baseline surveys of households are widely used to understand the heterogeneous impact of a treatment. In this study, the administrative data verifies that we cannot observe baseline characteristics without altering programme participation. Household surveys are expensive and in order to detect impacts on hospitalisations, which are relatively rare events, an evaluation of the impact of the programme on household health and financial protection outcomes would require a household sample exceeding 25,000. We feel that there is substantial risk involved in conducting baseline surveys for RSBY evaluations, as in the second design, because significant resources will be committed in a context where there is considerable uncertainty over whether an encouragement intervention will yield a large enough effect for tractable analysis on household outcomes. Under the first design, the *ex ante* investment is restricted to the cost of the encouragement intervention, and subsequent resources can be committed only after the first stage effect is verified with no risk of introducing distortionary Hawthorne effects.

## NOTES

- 1 See Palacios (2010) for further description of the scheme and the early implementation experience.
- 2 This could also be attributed to a dated BPL list data. See Sun (2010) for a detailed analysis of enrolment patterns.
- 3 In the context of designing evaluations of the RSBY programme, these uncertainties appear to be part and parcel of the overall implementation. Thus any evaluation strategy should be robust to a less than perfect situation on the ground – an observation similar to that of evaluations of government programmes in the United States in the 1980s and 1990s (Moffitt 2004).
- 4 See Grover and Palacios (2010) for further analysis of the enrolment experience in Delhi.
- 5 Where state IEC activities were better conducted, they probably did make a difference; enrolment rates across circles varied dramatically ranging from a low of 4% to a high of 88%. Informal conversations suggested that these differences may have been correlated with the interest and capacity of the PDS officer. In some cases, these officers went out of the way to ensure that lists of eligible beneficiaries were posted at the enrolment office and that posters of the programme were prominently displayed.
- 6 See Grover and Palacios (2010).
- 7 Sun (2010).
- 8 In Delhi, the initial sample list contained primarily the poorest households, known as Antyodaya or AAY households. The initial list of beneficiaries was later supplemented with additional lists of BPL households. However, all sampling for the IEC and household survey was done using the initial list, and all results are thus reported using the initial sample frame rather than the ultimate list of eligible households.
- 9 Of course, the IEC may have impacted utilisation rates through channels other than changing the composition of enrolled households. For instance, the information provided through the campaign may have misled households in a way that reduced utilisation rates. To take a potentially plausible (and non-malicious) example, if Hospital X, which is locally the preferred treatment option, was empanelled after the IEC but before enrolment, and if during the campaign households asked if the RSBY card could be used at Hospital X, the answer would, at that time, have been no. If updated information on empanelled hospitals was not made widely available, households may not have been aware of the change and may not have used their

card when seeking treatment at Hospital X.

- 10 The household survey data is used to examine the health status of enrolled and non-enrolled households in the following sub-section, but because the household survey itself induced a change in the enrolment rates, households that completed the survey may look very different from households that did not. Thus, caution needs to be taken in interpreting the likely non-generalisable results from the household survey sample.
- 11 Of course, an IEC administered by an insurance company would need to be monitored to ensure that the information provided was accurate and that the IEC was not used to manipulate the likelihood that households with higher claims risk enrolled.
- 12 Households that received the IEC have marginally higher value claims than other households (Table 1, Column 6), but this difference is overwhelmed by the differences in the claims rate.
- 13 On the other hand, households where at least one member reported having significant difficulty lifting objects were 4 percentage points more likely to enrol when they received the IEC, though of all the household health characteristics examined, this is the only one that had a significant impact.
- 14 Results available on request from authors.

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