PUBLIC HEALTH FOUNDATION OF INDIA

Indian Health Insurance Experiment

Baseline and Enrolment Analysis Report

REPORT SUBMITTED TO DEPARTMENT FOR INTERNATIONAL DEVELOPMENT (DFID)

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LIST OF ABBREVIATIONS

PHFI: Public Health Foundation of India

DFID: Department for International Development

WHO: World Health Organization

OOP: Out of Pocket

NSSO: National Sample Survey Organization

BPL: Below the Poverty Line

APL: Above the Poverty Line

HI: Health Insurance

RSBY: Rashtriya Swasthya Bima Yojana

IHIE: Indian Health Insurance Experiment

HH: Households

TOC: Theory of Change

BMI: Body Mass Index

RCT: Randomized Control Trial

DBT: Direct Benefit Transfer

PHES: Post Health Event Survey

DC: District Collector

IFMR: Institute of Financial Management and Research

CMF: Centre for Microfinance

FKO: Field Key Officer

SC: Scheduled Caste

ST: Scheduled Tribe

RAND HIE: RAND Health Insurance Experiment

BCG: Bacillus Calmette–Guérin

DPT (Diphtheria, Tetanus, Pertussis)

NHPS: National Health Protection Scheme

FAQ: Frequently Asked Questions

PAPI: Paper and Pen Interviewing

PN: Prenatal Care

Executive Summary

About the Health Insurance Experiment in India

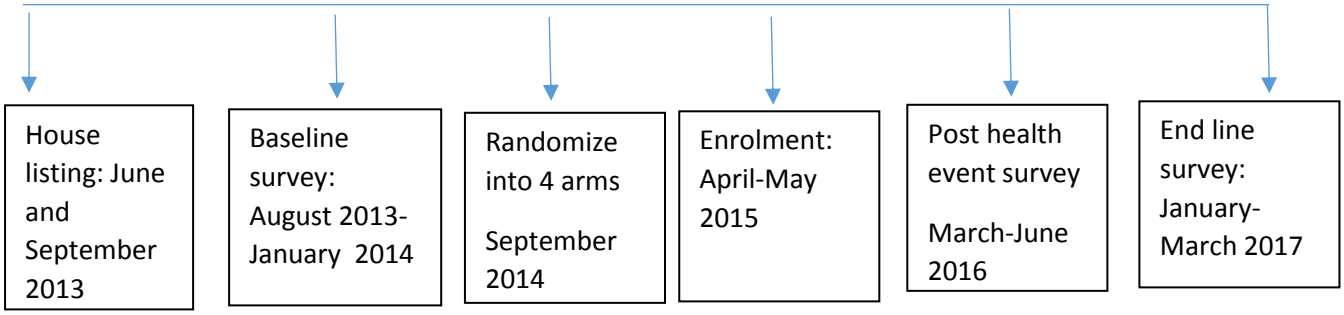
The Health Insurance Experiment (HIE) in India is a randomized experiment being undertaken by the Public Health Foundation of India and the University of Chicago, in close collaboration with the Government of Karnataka. It is targeted at households just above the poverty line in two districts of Karnataka- Gulbarga and Mysore. The primary objective of Indian Health Insurance Experiment (IHIE) is to measure the health and financial benefits of health insurance in the context of RSBY, the most widely available form of health insurance in India. A secondary but related objective is to measure the impact of RSBY on investments in the human and health capital of the children (for example, more expenditures on children's schooling or more regular consumption of healthy food items).

The HIE is supported by the Department of International Development (DFID) as well as a grant from Tata Trusts to the University of Chicago. The baseline data collected as part of the HIE was paid for by DFID. All findings in this report do not reflect the views of DFID.

The experiment piggybacks on the erstwhile Rashtriya Swasthya Bima Yojana (RSBY)- the health insurance program for the poor in India. For a registration fee of Rs. (Rupees) 30 per year, RSBY provides free inpatient hospitalization up to a maximum of Rs. 30,000 per year per enrolled family. Since households below the poverty line (BPL) are already eligible for RSBY, the experiment excludes households that have a BPL card. Further, from the house listing exercise, most of the richer households were excluded from the study. In our final sample, roughly 80 percent of the population in both Gulbarga and Mysore report a household per-capita expenditure that would qualify them as being "poor" as per the 2014 poverty standards. In order to enrol the households, the study worked closely with the Government of Karnataka. The Government agreed to pay the premium for the first year of enrolment highlighting the importance of this study for the Government.

The broad timeline of the experiment is presented in Figure E1.

Figure E1. Timeline with key dates



The HIE was conducted primarily to examine the impact of RSBY expansion. As such, it was important to try to exclude households that reported having other forms of health insurance coverage. This exclusion was done at the time of the house listing exercise. Soon after house listing, households that reported being covered by any form of health insurance (for example, Yeshaswini which is a surgical insurance scheme largely meant for farmers who are members of co-operative societies) were excluded from our study sample. The baseline data covered a range of questions that included (a) variables that could be potentially related to RSBY enrolment, and (b) variables that could be used as potential outcome variables. The choice of key variables included in the survey was informed by our hypothesis (listed below) connecting an expansion of health insurance with household health, finance, and human capital outcomes.

a) Hospital insurance reduces the out of pocket cost of hospitalization and hence potentially increases both the probability of inpatient hospitalization and the number of hospitalizations.
    1. Health insurance reduces the marginal cost of hospitalization. For people that visit a hospital (even in the absence of health insurance), health insurance should reduce the probability that a household borrows money to meet inpatient health expenditures. This would happen for the sickest- for whom a delay in hospitalization is not an option.
    2. However, individuals that are not very sick may choose not to visit the hospital in the absence of health insurance. For this sub-sample, we expect to find that the provision of hospital insurance increases the probability of hospitalization.

b) An increase in the probability of hospitalization is likely to also have one or more of the following secondary effects:
   (1) Lead to an improvement in health status but this is mediated by the quality of the health care provided.
   (2) Lead to an increase in non-medical consumption such as expenditures on child primary health care and education.
c) Hospital insurance improves self-reported health, and increases the likelihood of diagnosis of chronic health conditions. Further, to the extent that hospital insurance reduces the extent of financial risk faced by the household and hence reduces stress levels, it may also lead to an improvement in mental health scores and/or a reduction in blood pressure.

At the time of enrolment, households were randomized into one of four arms. First, in arm A households were offered RSBY completely free- no premiums and also waiving the Rs. 30 enrolment fee. Arm B households were offered a lumpsum cash transfer equal in value to the expected premium (Rs. 163 in Gulbarga and Rs. 203 in Mysore). In Arm C, households were given the option to enrol in RSBY, but could enrol only upon payment of the full premium and registration fee. Finally, in arm D households were not offered the choice of enrolling in RSBY. The distribution of households is shown in Table E1. In addition to the households that were thus randomized, a few households were also selected and interviewed with a specific focus on questions related to their willingness to pay for health insurance. These households were not followed at end line.

Table E1 Number of households randomized across intervention arms and districts

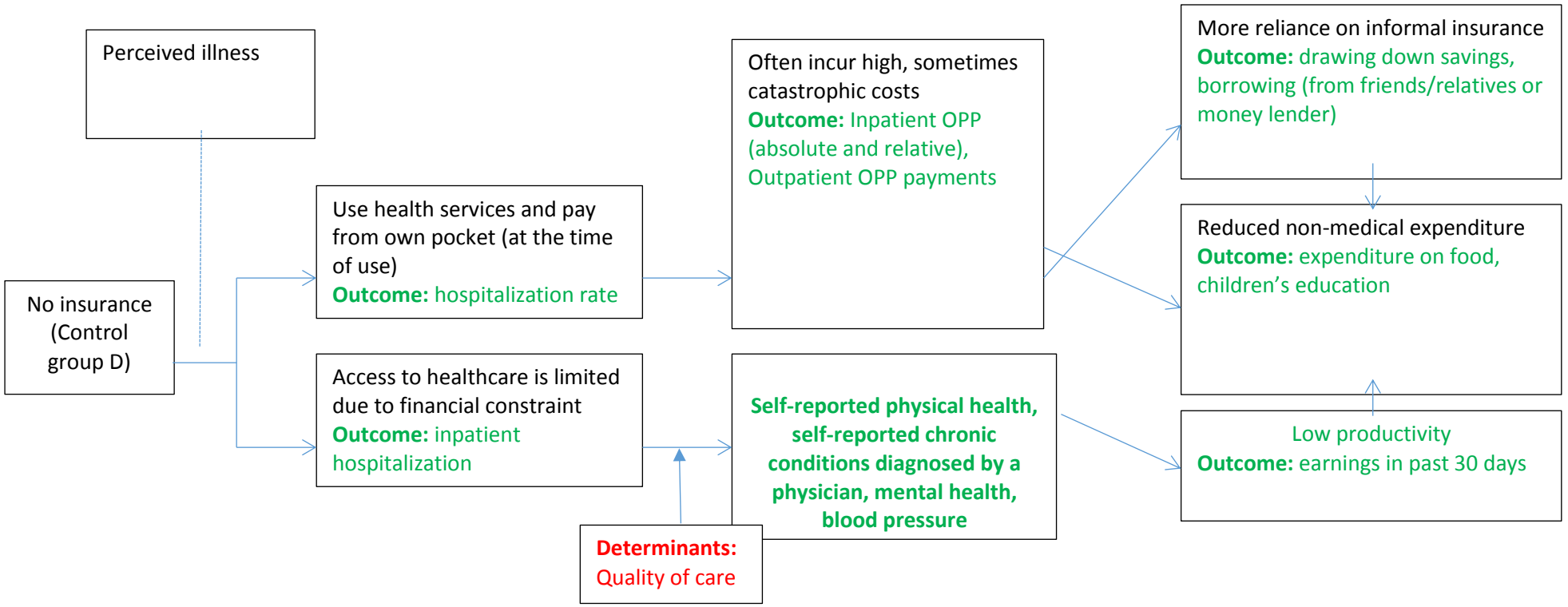
Treatment arm	**Gulbarga**	**Mysore**	**Total**
Arm A	2,201	1,954	4,155
Arm B	1,095	985	2,080
Arm C	1,101	921	2,022
Arm D	1,110	923	2,033
Total	**5,507**	**4,783**	**10,290**

Given the long-time interval between the baseline and end line data collection efforts, we recognized that recall error may influence the reporting of health events and hospitalizations

that occurred in the interim. We therefore conducted a post-health event survey that asked households over the phone whether any member had a serious health event since the date of the baseline survey. In case the answer was yes, a survey was done by a visit to the HH where detailed questions on both the event as well as hospitalizations were asked. Furthermore, in addition to the quantitative data collected, we had an anthropologist and a sociologist work on gathering qualitative data from households that were not part of the study sample but were from adjacent villages. The qualitative information thus collected focused on how much households valued health, health care and health insurance. The instruments for end line and qualitative surveys were designed by the University of Chicago.

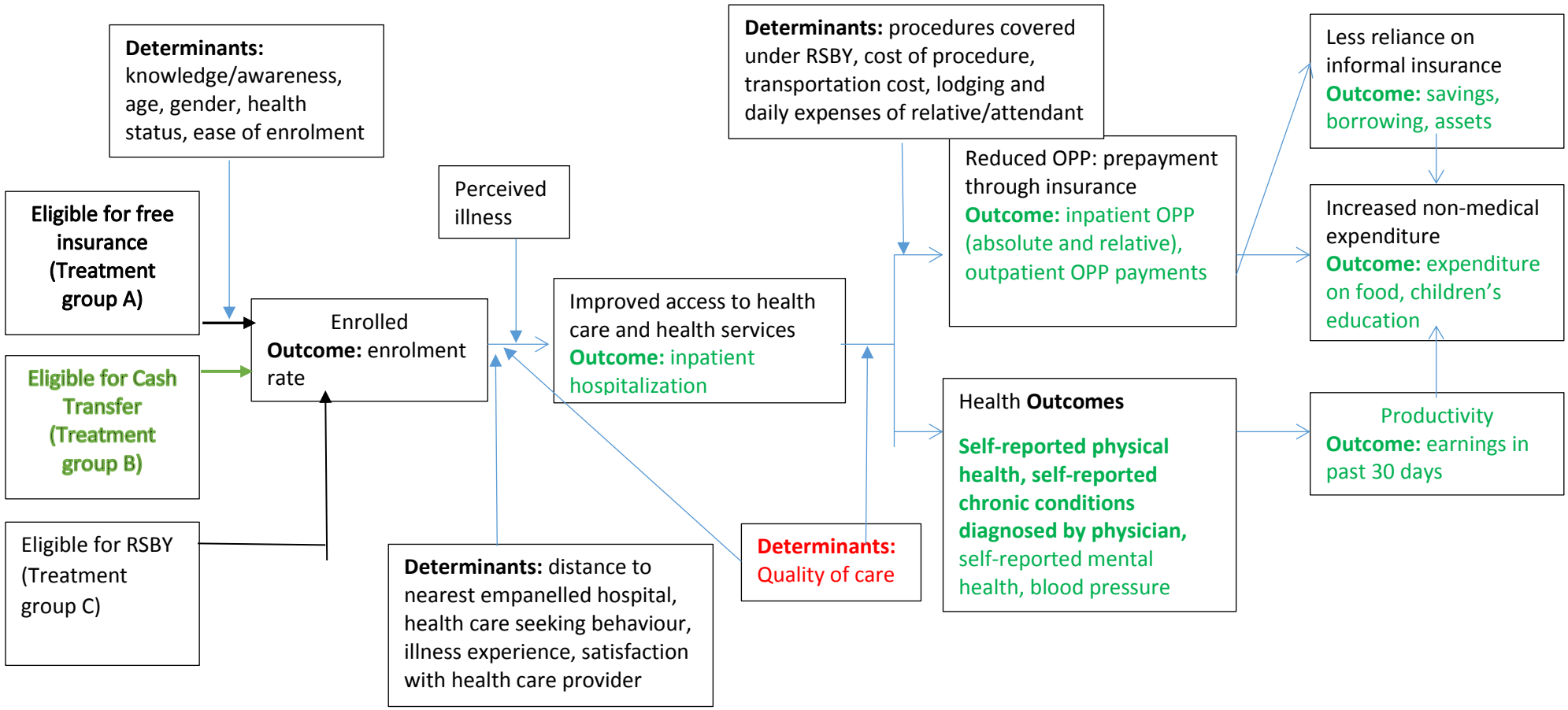
The aforementioned hypothesis may be depicted in a Theory of Change Diagram (Figure E2).

Figure E2. Indian Health Insurance Experiment: Theory of Change (Control Group)



Note: This does not include indirect costs (time costs of person ill and informal caretaker) which would arise irrespective of health service utilization. Outcomes denoted with a RED font are not collected and examined in this study. The key outcomes in our analysis are depicted in the GREEN font.

Figure E2. Indian Health Insurance Experiment: Theory of Change (Treatment Group)



Note: This does not include indirect costs (time costs of person ill and informal caretaker) which would arise irrespective of health service utilization. Outcomes/Variables denoted with a RED font are not collected and examined in this study. The key outcomes in our analysis are depicted in the GREEN font.

KEY FINDINGS.

In this section, we summarize our main findings following our analysis of the baseline and enrolment data.

Randomization worked well

In this section we examine whether the randomization of households across arms worked to ensure comparable households across the various arms. We examined characteristics of households and individuals (Table E2). We found a very striking balance across arms on each one of the characteristics.

Table E2: Balance across arms: household- and individual-level variables

	A	B	C	D
Household level characteristics				
Average HH size	6.03	6.14	5.99	6.02
Mean annual total expenditure (in Rs)	114,366	116,791	116,155	114,493
Mean annual inpatient health care expenditures	15,392	15,739	16,115	16,053
Religion (%)				
Hindu	92.0	93.1	92.4	92.1
Muslim	7.1	6.0	6.6	6.6
Caste (%)				
Scheduled caste (SC)	10.6	12.0	10.4	10.9
Scheduled tribe (ST)	4.5	4.6	3.5	4.6
Other health insurance coverage (%)	5.7	5.6	5.8	5.3
Inpatient expenditures/Total expenditures (%)[a]	10.4	10.6	10.6	10.3
Positive inpatient expenditures (%)	49	49	48	49
Individual level characteristics				
Health (Males) (%)				
Heart disease	5.6	4.5	4.8	4.7
Hypertension	12.0	13.2	11.9	13.9
Diabetes	7.2	7.5	7.5	8.7

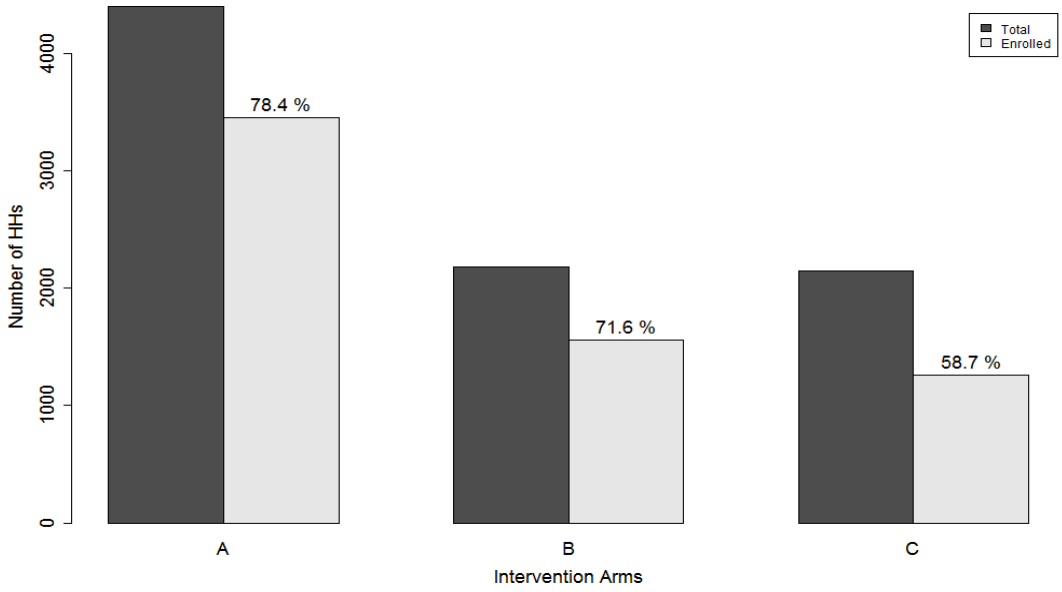
Poor health	9.5	10.3	7.8	9.5
Health (Females) (%)				
Heart disease	4.3	4.2	3.9	3.8
Hypertension	10.5	10.4	10.8	11.0
Diabetes	3.2	3.4	3.1	3.7
Poor health	14.7	14.8	14.7	14.4

Notes: Total expenditures include expenditures on food, clothing, footwear, wedding, miscellaneous as well as inpatient expenditures. Heart disease, hypertension and diabetes pertain to whether or not a doctor has diagnosed the individual with these conditions. More specifically, heart disease question is in response to "Has any health professional ever told you that you had/have a heart attack, angina, coronary heart disease, congestive heart failure, or any other heart problems? We create a dichotomous, indicator variable "poor health" that equals 1 if individual's self-reported health status (on a 5-point scale) is rated as poor or very poor.

Enrolment Rates across Arms

We find that about 78.4 percent of the households choose to enrol in Arm A (Figure E3). We note that households randomized into this Arm were essentially offered "free" health insurance and were asked to pay no premiums and were waived the Rs. 30 enrolment fee as well. However, this result should be placed in the context of the overall observation that RSBY has averaged enrolment rates of about 51 percent. The enrolment rate we observe in Arm A (78.4%) is about 27 percentage points higher, partly because of the added financial incentive (no enrolment fee or premiums). In Arm B, we find that 71.6 percent of the HH choose to enrol. This rate, just 7 percent lower than HH in Arm A were surprising to us at first, but it is probably an appropriate response in the context of recent work on "labeled cash transfers" (Behassine et al., 2015). The idea underlying these transfers is that they basically "nudge" the households or individuals into making a desired decision. In our context the cash transfer was made to the households but along with this transfer, households in the arm were provided an explanation of what RSBY entitlement meant, and also that this was a unique opportunity to enrol (i.e., not available to them normally). Arm C is the arm that is closest to the "status-quo" in the sense it approximates the incentive given to BPL households- they were given the option to enrol but were asked to pay the full premium. Enrolment rates in this arm 58.7 percent are higher than what is observed in RSBY enrolment for BPL households (around 50-52 %). Once again, the slightly higher enrolment could be attributed to a "nudge" since households were told that this was a unique and perhaps only opportunity to enrol in RSBY since typically non-BPL households are not eligible.

Figure E3: Enrolment Rates across Arms



Determinants of Enrolment

We ran a regression of the determinants of enrolment, separately for each of the 3 Arms (A,B and C). The one variable that was statistically significant in all regressions was the variable identifying an individual as "lazy" (we coded the individuals that identified themselves as "very" lazy and "somewhat" lazy into an indicator variable "lazy"). In linear regression models that included other covariates (total expenditure, religion, caste, poor health status of household head,etc), we find that laziness of the male adult (group 3 respondent) is associated with a 7.4 percentage point lower probability of enrolling in RSBY (95% CI 4.5- 10.3) while laziness of the female adult (group 1 respondent) is associated with a 5.3 percentage point reduction in enrolment (95% CI 2.3- 8.3) individuals that identified as being lazy were roughly 5 percentage points less likely to enrol than their counterparts that were not lazy. Furthermore, the effect of "laziness" was strongest among Arm B households- those that were offered the cash transfer along with the option to enrol. Indeed, these effects of laziness to be placed in the context of more "traditional" determinants of enrolment such as poor health status- we find that poor health of the head of the household is associated with a 3.6 percentage point increase in the probability of enrolment. More striking, the 7.4 percentage point difference between "lazy" and "non-lazy" male adults is slightly higher in magnitude than the approximate 7 percent difference in enrolment between arms A (free insurance) and B (cash transfer).

Discussion and Conclusion

In this report, we have summarized the baseline survey and enrolment exercise for our Indian Health Insurance Experiment- a unique experimental study that seeks to understand the impact of expanding health insurance coverage. The study is the first of its kind in India, and joins the small list of experimental studies to evaluate the effectiveness of health insurance expansions.

Recently, the Government has proposed the National Health Protection Scheme (NHPS) that seeks to increase the coverage amount of RSBY (to rupees one lakh (100,000) with an additional amount provided to the elderly (60 years or older). Furthermore, the new program intends to more precisely target the poor by relying on very recently collected data from the Socio-economic and Caste Survey to identify eligible households. Currently RSBY eligibility is largely for households that were in poverty more than a decade ago (2002). Clearly, this type of targeting is inefficient. Our study relies on concurrent data to identify poor households and the experiment is therefore rolled out to the type of households that the government intends to cover.

Moreover, the government is interested in determining whether it should provide this expanded population free insurance, provide only premium supports for private insurance, or simply offer a public insurance option that individuals can purchase with their own money. Some even propose replacing in-kind benefits like health insurance with an unconditional cash transfer. Our study is designed to evaluate the relative benefits of these alternate policy options. If we find that RSBY has had only limited effects on the outcomes, then it would suggest that the government must revisit the structure and rollout of RSBY. On the other hand, if we do find that RSBY has had beneficial impacts, then the government may want to consider expanding this type of health insurance to uncovered populations. Till date, RSBY does not cover all poor people because of a multitude of factors such as poor knowledge and awareness on part of the population, and/or weak government efforts at enrolment. A positive finding in our study would also suggest that the government must ramp up efforts to raise awareness of the population regarding the RSBY program while simultaneously increasing the enrolment of the poor.

The RAND health insurance experiment (RAND HIE) in the United States, in the late 1970s-early 1980s continues to remain the gold standard for evidence on the causal effects of health insurance in the United States. In terms of the promise of informing Government policy, our

study has a crucial advantage over the RAND HIE. The RAND study was done after the United States introduced both Medicare and Medicaid- the cornerstones of public health insurance in the United States. Therefore, the RAND HIE has not ushered in changes in the scope and coverage of either Medicare or Medicaid. On the other hand, since our study is being conducted right at the beginning of proposed expansions in health insurance coverage in India, it is plausible that the findings from this study could be used to inform subsequent health insurance expansions in India.

In summary, our analysis of the baseline and enrolment data has resulted in the following findings: (a) Randomization worked well, (b) Enrolment Rates are lower than expected in Arm A (free health insurance arm) and arguably higher than expected in Arm B (labelled cash transfers). However, we find that a part of the reason for this could be that behavioural factors (e.g., laziness) are important determinants of the decision to enrol. As the Government ramps up its efforts to increase enrolment (thereby driving down premiums), these findings on enrolment could be important to consider. In the next stage of this proposal, we will evaluate the impact of health insurance on health and financial outcomes. The sense, in general, is that health insurance coverage can be used as a tool that improves the financial well-being of households. However, since enrolment into health insurance is often a choice of the household, it is not possible to draw convincing conclusions with existing secondary data. We have just wrapped up the collection of the end line data and hope to start processing the data this summer. We should have some early results soon after that. Our results should become available tantalisingly close to the time when the Government decides to roll out the NHPS scheme. We hope that the findings from our study can be used to inform and frame some of the discussion about health financing policies in India.

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Indian Health Insurance Experiment: Study Design, Baseline Survey and Enrolment Report

1. Introduction

Financial constraint is one of the major barriers to accessing healthcare for the poor and those employed in the informal sector in many countries, including India [1-4]. In many settings, poor people, migrants, ethnic minorities and indigenous people use health services less than other population groups, even though their needs are not any less. The world's 1.3 billion poor have little or no access to health services simply because they cannot afford to pay at the time they need them [5]. Moreover, many of those who do use services often incur high, sometimes catastrophic costs in paying for their care. According to the WHO 2010 world health report, 10 % of the population suffers this type of severe financial hardship each year, and approximately 4% is forced into poverty [6]. Globally, about 150 million people suffer financial catastrophe annually while 100 million are pushed below the poverty line [7] due to health care expenditure.

Out-of-pocket (OOP) expenditure on health care has significant implications for poverty in many developing countries, including India. Based on Consumer Expenditure Survey (CES) data from the National Sample Survey (NSS, 1999-2000) in India, Garg and Karan (2009) estimated that the OOP expenditure is about 5% of total household expenditure (ranging from about 2% in Assam to almost 7% in Kerala) with a higher proportion being recorded in rural areas [1]. As per their estimate, approximately 32.5 million persons fell below the poverty line in 1999-2000 through OOP payments, implying that the overall poverty increase after accounting for OOP expenditure is 3.2%. Using NSSO 60^{th} round data (2004), Berman et al. (2010) estimated that 63.2 million individuals (6.2%) were pushed to BPL due to healthcare expenditure [8]. While estimating the impoverishing effect of health expenditure, they corrected for financial coping mechanisms (such as running down its stock of financial and physical assets, or by borrowings) to avoid an overestimation of impoverishing effect of healthcare payments.

Using Consumer Expenditure Survey (CES), 61^{st} round (July 2004- June 2005) conducted by the NSSO, Shahrawat and Rao (2012) found that the poverty headcount ratio increased by 3.5% due to OOP payments for healthcare [9]. This increase is larger among rural (3.8%)

compared with urban (2.7%) populations and varies across the APL expenditure quintiles. In the APL group, the poorest 20% experienced a poverty headcount increase of 17.5%.This increase in poverty headcount is almost 4 times that of the next APL quintile and 26 times the richest APL quintile.

Catastrophic expenditure on health is incurred by 5% of households, with considerably higher proportions among rural (6%) compared with urban (3%) households. In this study, a household was considered to have experienced catastrophic payments for health care if health expenditures exceeded 40% the household's non-food expenditure [9]. In the BPL group, 2.6% of households incurred catastrophic health expenditures compared with 5.8% in the APL group. Catastrophic spending on health increased progressively with higher economic status ranging from 2.6% in the BPL group to 9.4% in the richest APL quintile.

In the context of inpatient care, Peters et al. (2002) found that hospitalized Indians spent 58 percent of their total annual expenditures on health care [2]. More than 40 percent of hospitalized people borrow money or sell assets to cover expenses. Using NSSO 52nd round data (1995-96), Peters et al. found that 24% of hospitalized Indians were not poor when they entered the hospital but became so because of hospital expenses, a risk that, like many other elements of the Indian health system, varies greatly from state to state. Even at public hospitals, which are intended to protect the poor from financial risks, the poor are vulnerable to health costs. Indeed, in some states (Uttar Pradesh, West Bengal, Madhya Pradesh, Rajasthan, Haryana, and Bihar), the poor are more likely to borrow money when hospitalized in the public sector than in the private sector [2].

Moving away from out-of-pocket (OOP) payments for health care at the time of use to prepayment through health insurance (HI) is an important step towards averting financial hardships associated with paying for health services [10]. OOP payments for health care includes expenditures on medicines, health provider's fee, diagnostics, hospital/nursing home charges, family planning and other medical expenses. Shahrawat and Rao (2012) estimated that, overall, 72% (74% rural and 67% urban) of OOP expenditures on health were on drugs [9]. The share of drugs was considerably higher for outpatient (82%) relative to inpatient visits (42%), a pattern seen in both rural and urban areas and across socioeconomic groups. The poor consistently spent a greater proportion of their health expenditure on drugs compared with the better-off: the share of drugs in OOP payments was highest for those below the poverty line (88%) and this progressively declined with rising economic status,

with those in the top 20% of the APL quintile spending 62% of OOP payments on drugs. Berman et al. (2010) found that much of the impoverishment (79.3%) happens due to outpatient care which involves relatively small but more frequent payments, and only 20.7% of impoverishment is due to inpatient care [8]. However, countries with weak healthcare infrastructure favor solely inpatient insurance because it is easier to administer.

Concern over the high OOP payments among the poor and their lack of insurance coverage prompted several initiatives to remedy the situation. To provide protection to Below Poverty Line (BPL) households from financial liabilities arising out of health shocks that involve hospitalization, in 2008, the Government of India launched its first large-scale public health insurance program RSBY.[1] It provides cashless hospitalization coverage up to Rs. 30,000 per annum per household (maximum of five members) for around 750 specific procedures that require hospitalization. Government has even fixed the package rates for the hospitals for a large number of procedures. Pre-existing conditions are covered from day one and there is no age limit. Beneficiaries need to pay a nominal registration fee of Rupee 30 to the insurer selected by the state government on the basis of a competitive bidding (occurring at the district level) while the central and state government pay the premium (75% central funding, and 25% state funding, except for Jammu and Kashmir and North-eastern states where the ratio is 90:10).

In order to draw convincing evidence about the effects of a lack of health insurance, it is critical that a large scale randomized experiment is conducted whereby assignment of insurance coverage is random. After analysing the most recent round of NSSO data on Social Consumption and Health (NSSO 71st round, 2014), we find that the presence of chronic conditions is about 5 percent higher among individuals that report RSBY coverage compared to their counterparts that do not report such coverage. This suggests that despite the somewhat nominal cost of this program, it is possible that those most in need are the ones that are enrolling in the program. Therefore, estimates of the impact of RSBY that derive from non-experimental studies are likely to be biased (Nandi et al., 2015)

The most rigorous studies of health insurance have taken place in high and middle-income countries [11, 12]. Generalizability of such studies to lower-income countries is questionable. Populations in lower-income countries perhaps have greater health needs, limited income, a weaker healthcare supply infrastructure, less developed insurance markets or social safety

[1] http://www.rsby.gov.in/about_rsby.aspx

nets, and simpler insurance coverage. The RSBY plan does not have co-payments and cover only hospitalization. Although RSBY is the most widespread insurance plan in India and one of the largest plans in all developing countries, only a few quasi-experimental evaluations of RSBY have been conducted (Karan et al., 2017). A recent review of the literature on the impact of publicly financed health insurance programs in India found that health insurance increases utilization but has equivocal effects on financial risk protection (Prinja et al., 2017). Given the importance of this question in India, and given the pitfalls involved in quasi-experimental designs, our experimental study on the impact of India's largest health insurance program- RSBY- should go a long way in plugging this gap in our understanding.

2. Scope of our project

The study was conducted in two districts of Karnataka State. One district (Gulbarga) is located in the northern part of Karnataka and the other (Mysore) is in the south. We chose Karnataka as the study site to study health insurance in a context of RSBY since we found a partner willing to actively participate in the expansion of RSBY coverage to a population that is not typically eligible for RSBY (non-BPL). By the time of submission of the report, baseline data collection, enrolment of households across different intervention arms, and the end line data collection have been completed.

Objective

The primary objective of Indian Health Insurance Experiment (IHIE) is to measure the health and financial benefits of health insurance in the context of RSBY, the most widely available form of health insurance in India. A secondary but related objective is to measure the impact of RSBY on investments in the human and health capital of the children (for example, more expenditures on children's schooling or more regular consumption of healthy food items).

2.1 Target Population

To assess the financial and health benefits of population being covered under RSBY, we sampled households that were not already eligible for RSBY or other government led insurance schemes. The workers in the unorganized sector and the BPL households are eligible for RSBY in Karnataka. Therefore, we selected APL households (HHs) having an APL ration card to design a trial to evaluate the impact of RSBY. Selection of APL HHs will limit confounding factors in the control and treatment arms by ensuring that they are treatment naïve. Moreover, selection of APL households for the experiment allows us to

study the impact of RSBY on the APL population- an important group given the possibility that the next set of expansions of health insurance coverage will include the APL population as well.

Figure 1, panel A Monthly per capita household expenditure (Mysore)

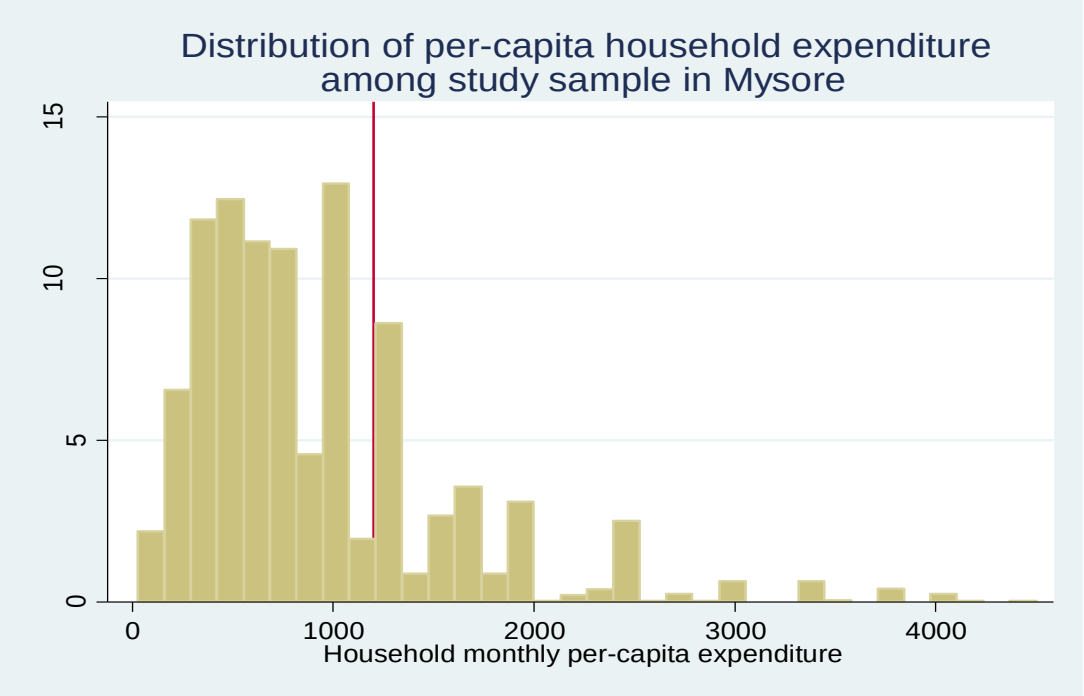


Figure 1, panel B Monthly per capita household expenditure (Gulbarga)

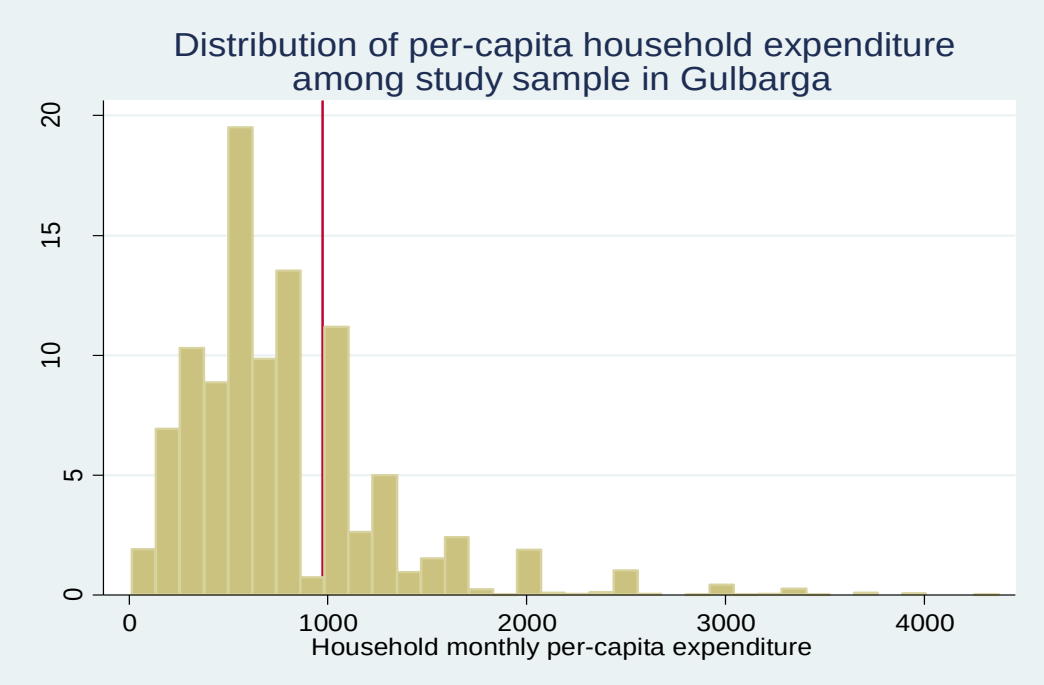


Figure 1, panels A and B summarize the distribution of per-capita monthly household expenditure in Mysore and Gulbarga respectively. The vertical (red) line is drawn at 1,200 in Mysore and 972 in Gulbarga that matches the poverty threshold set by the Rangarajan Committee (2014) for urban and rural areas respectively. Since Gulbarga is comprised of more rural areas than Mysore, we chose these particular thresholds for the two districts. The data suggest that 75 percent of the sample in both districts has an expenditure level that is below the poverty threshold.

2.2 Overall Methodology

The selection of the variables was guided by the Theory of Change (TOC) that inform the possible changes that can arise as a result of the introduction of health insurance. Our TOC diagrams are included as a separate file.

We will first use an intent to treat methodology and regression analysis to estimate the effect of health insurance on the mean value of outcomes that were collected at the end line survey, after adjusting for potential individual and household level confounders.

A. Primary Outcomes

i. Financial Status. We will assess the effect of health insurance on various factors that influence the financial status of households such as borrowing and savings, medical and non-medical expenditure, out of pocket medical spending (inpatient vs outpatient as well as expenditure arising out from different sources such as medicines, health provider's fee, diagnostics, hospital/nursing home charges).

ii. Health. We consider health status variables such as self-reported general health, mental health score, self-reported chronic conditions, objective health measures such as lung capacity, body mass index (BMI), and health care access as measured by hospitalization.

B. Secondary outcomes.

i. Health behaviour (e.g., smoking cessation and frequency of healthy food consumption for children)

ii. Education expenditure on children

iii. Earnings from the Labour market.

C. Empirical Approach

To identify the impact of RSBY we adopted a randomized controlled trial (RCT) design. Households are the unit of randomization. We use random assignment to address concerns about self-selection into health insurance. RSBY has two components: insurance and premium subsidy. In order to study the income effect of providing a subsidy for purchasing insurance and the effect of insurance, we considered four intervention arms. Most studies of insurance compare free health insurance – that is, insurance plus subsidies for premiums – to no insurance. Distinguishing these two components of free insurance is crucial to assessing the impact of insurance market creation vs. premium supports. Our study randomizes households to one of the four arms (A, B, C, or D):

- A: Free RSBY insurance (without Rupee. 30 registration fee)
- B: Unconditional cash transfer (premium) + RSBY option
- C: RSBY option
- D: Nothing

In addition to households randomized into one of the four arms (A-D), 150 households were selected (Arm E) to examine their "willingness to pay" for health insurance coverage.

Arm A is the treatment arm that receives free RSBY insurance. Arm B receives an unconditional cash transfer equivalent to the premium for RSBY insurance and the opportunity to buy RSBY (since our study population is not automatically eligible to buy RSBY). Arm C receives no cash transfer, but the opportunity to buy RSBY. Arm D receives nothing – no cash or opportunity to buy insurance. However, we note that there was no ethical dilemma since the households were not going to receive anything since they were non-BPL households. Arm E is the "Willingness to pay" arm that asks about how much a household is willing to pay to be covered by health insurance. This set of households was selected to provide a "qualitative" sense about how much health insurance is worth to the households. These arms are chosen since it allows us the option of answering a range of policy-relevant questions. In all of our comparisons listed below, the comparison group is the same—GROUP D is the control group. We chose three different "treatment" groups, A, B, and C. There are therefore three comparisons (i) A-D, (ii) B-D, and (iii) C-D. The Theory of Change diagram (also attached) also uses a similar logic- one control group and three treatment groups.

- The difference between the mean outcomes in treatment arm (A) and arm D will measure the causal impact of current RSBY policy on the aforementioned outcomes (health status, health care utilization, financial security, health-promoting behaviour).
- The difference between mean outcomes in treatment arm B and D will provide an estimate of the impact of providing a cash transfer (equivalent to the amount of the health insurance premium) on the take-up of health insurance and health care utilization. The idea of Direct Benefits Transfers (DBT) is quickly gaining traction in India. The recent focus on increasing the number of individuals with bank accounts is related to the idea that the Government can begin to make direct transfers of money as an alternative to other methods of providing subsidies (e.g., Public Distribution System).
- The difference in health insurance take up and outcomes between arms C and D can provide us the impact of expanding health insurance coverage to a population that is currently uncovered. The provision of health insurance costs money and the budget to expand health insurance to a larger population can be prohibitively high. The alternative may be to simply provide individuals the option to buy health insurance on the open market. This current comparison provides an estimate of the potential benefits of this type of expansion.

Treatment and control arms receive their respective interventions for two years starting in June 2015.

Denoting our generic outcome as Y, we propose to estimate the following regression model:

$$Y_i = \alpha_0 + \alpha_1 I_A + \alpha_2 I_B + \alpha_3 I_C + \alpha_4 X_i + u_i$$

where I's denote the respective arms into which the household is randomized into and X denotes individual and household level confounders such as age, education, expenditure measured at baseline.

Some of the households that are offered a choice to enrol in RSBY will choose not to do so. Hence, the aforementioned approach does not allow us to gauge the effect of RSBY on health insurance- rather it examines the impact on outcomes stemming from alternate methods of encouraging health insurance coverage (i.e., (a) providing free coverage, (b) providing a cash

transfer equivalent of premiums, and (c) providing eligibility to enrol). In order to examine the effect of RSBY coverage directly, we propose to use an Instrumental Variable (IV) approach. The main independent variable is the actual health insurance coverage after enrolment (RSBY or not). Since enrolment is a choice, we use the assignment status (one of four arms) as the instrumental variable. With similar outcomes as previously, the IV estimate will provide us with the causal impact of RSBY on outcomes for the sub-group of households that chose to enrol in RSBY when given a choice.

2.3 Potential Issues: Spill over/Contamination

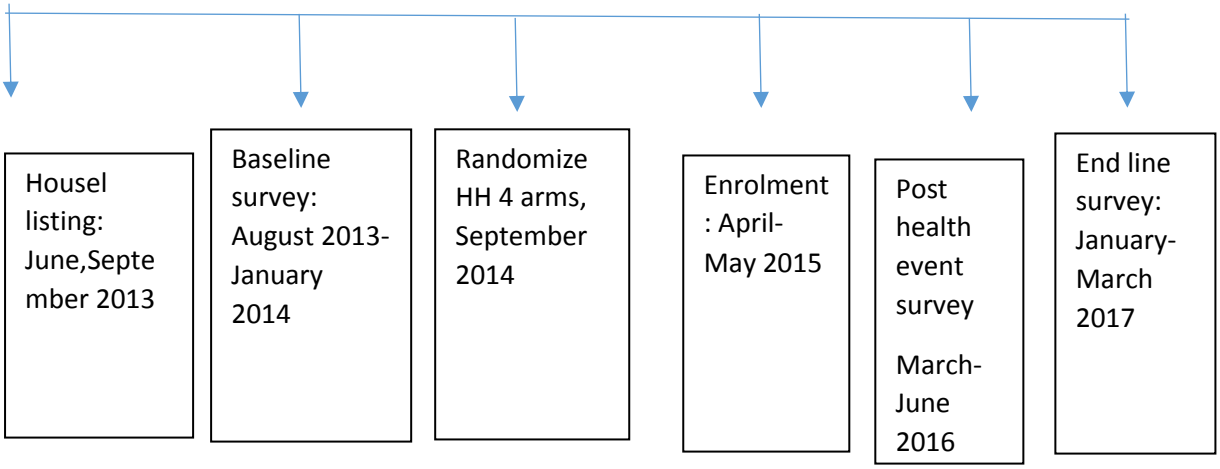
A potential concern in our randomized study is that households that are randomized to receive free RSBY may change the extent of their participation in informal insurance markets within the village and thereby alter the cost of borrowing for other households within the village. Such a possibility would ultimately affect the financial distress of control arm (D) households for whom the cost of borrowing may decrease. This possibility should bias our estimated result (comparison with arm D households) towards the null hypothesis (no difference in outcomes relative to Arm D). Nevertheless, we believe that the potential "spill over" is likely to be small since a maximum of 25 households within a village receive the free RSBY policy. The 25 households comprising only a small fraction of households (7%) within a village (on an average, Gulbarga and Mysore have 350 HHs within a village) are randomized to receive free RSBY. Second, back of the envelope calculation based on the prevailing RSBY premium (Rs. 200) suggests that the total amount of money displaced is likely to be small (25 households x 200=Rs. 5,000). This number is only one-sixth of the total amount covered under a single RSBY policy.

Even though we expect spill over to be minimal, our study design allows us to formally test for this possibility. The motivation for measuring spill overs is that formal health insurance may crowd out informal insurance or alter savings and investment behaviour that may impact local credit markets [13, 14]. Such spill overs might affect the outcomes of the control groups, compromising their validity as a counterfactual. In both the baseline and midline surveys, we ask questions about borrowing and lending patterns of all households in the study. If spill over effects were indeed important in our study, we would expect them to alter the lending behaviour of the households randomized to receive free RSBY and the borrowing behaviour, specifically the amount and cost of credit, for the others.

2.4 Quantitative Data Collection

Figure 2 provides the timeline for our data collection. The house listing survey enabled us to reach almost exclusively our target population of interest (i.e. non-BPL households that were also living with resources close to the poverty threshold. The baseline survey collected information on key outcomes of interest (financial status, health, health care utilization, food consumption, education expenditures and earnings), a wide array of socio-economic variables, clinical, and behavioural factors relevant to health and/or health care decisions. In addition, information on the perceived quality of health care system as well as trust in the system was gathered. Responses to these questions will help us understand the context better, and thereby lead more accuracy in interpreting our findings.

Figure 2: Timeline



The data collection for both baseline was conducted by the Institute of Financial Management and Research (IFMR). Following randomization in September 2014, households were asked to enrol in April-May 2015 following the official enrolment of BPL households. The post-health event survey (PHES) survey was added to screen households by phone to determine whether they had experienced a serious health event- a major risk factor for hospitalizations. If the household reported experiencing such an event, they were interviewed directly to ask about details of the event and also details on any hospitalization that occurred as a result of the event. This process will increase the number of hospitalizations observed per survey, and thereby lower the number of surveys required to achieve statistical power. Moreover, waiting until the end line survey would potentially introduce more recall error since subjects are asked to recall hospitalizations that occur over a 1-2-year period. The end line survey collected much of the same information that was collected in the baseline survey but after

integrating some of the lessons learnt from our experience at baseline. For example, more stress was laid on the wording of questions related to inpatient hospitalizations. Furthermore, since the end line was carried a couple of months after demonetization emphasis was laid on ensuring that responses to a few pertinent questions (e.g. borrowing) differentiated between periods before- and after demonetization. Finally, we also propose to obtain administrative claims data about utilization for households enrolled in RSBY from the insurance company that provides RSBY insurance.

2.5 Timeline Detail and Challenges

In Mysore, enrolment activities (including RSBY card distribution and data upload to the RSBY server) happened between Feb-June 2015. In Gulbarga it was completed by July, 2015.

Baseline data collection was completed in April 2014 for Mysore and the end line data for Gulbarga will be collected prior the May 31, 2017. Enrolment process was scheduled to start in April, 2014. However, because of several reasons it was delayed by a year. The initial plan was to move along with the Government trucks when they are enrolling BPL households into the RSBY scheme and have our study households enrolled at the same time. The first budget for enrolment process was prepared in April as we were given the indication by Government officials that enrolment will start in a few days. We conducted training for surveyors in Gulbarga at that time. However, enrolment process was delayed because of National Elections and the work was brought to a halt for couple of months.

Enrolment activity was further delayed because the Government was taking a decision regarding including PDS data in the RSBY smart card. For this purpose, there were discussions between the Food and Civil Supplies Department and Ministry of Labour and Employment. Finally, end of September it was decided that PDS data will not be included in the RSBY smart card.

Moreover, we needed to upload a new updated data set to the Central Government servers having information about our study households. The reason for a new data upload from our end was that between May and October 2014, we were able to identify households that had dropped out of the sample or we wanted to exclude from our sample (attrition). To improve the power of our study, we dropped this list of households and re-assigned households into

different treatment arms. Therefore, we sent a new list of households to the person who handles data for RSBY in Karnataka.

In November, Government enrolment process started in both Mysore and Gulbarga. We could not start enrolling our study households along with Government's enrolment process because the data upload was not done by the data coordinator at RSBY Karnataka till end of November.

Since our enrolment process involved enrolling study households in a Government scheme, we had to coordinate with several local authorities such as District Collector (DC) and Assistant Labour Commissioner and obtain necessary permissions from them. During one such meeting with the Labour Commissioner of Karnataka, we explained the objectives of the study and the method of enrolment we wanted to follow. He expressed concern that enrolling our study households (who are primarily APL households) along with BPL households at the same time will create issues in the field. He was concerned that by offering a scheme to non-BPL population when it was meant only for BPL population may cause the BPL population to oppose this strongly and it might disrupt the overall enrolment process. For the benefit of the study and to ensure peace in the field, he suggested that we should rent our own kits and enrol our study households ourselves four-five days after BPL enrolment has been completed in the village. Due to the unforeseen change in plans, the enrolment process was delayed by a year and the cost had increased significantly. The cost of renting kits, hiring transportation to carry kits around, purchasing invertors etc. had contributed to the increased cost.

2.6 Qualitative Data Collection: Qualitative methods of data collection will be used to complement the quantitative survey. We had an anthropologist and a sociologist do qualitative work in Mysore and Gulbarga respectively to understand, from households that are not part of the study sample but are from adjacent villages, how they value health, health care, and health insurance. One reason was to improve our surveys. Another was to get qualitative evidence through which to generate hypothesis about the quantitative data and as a lens through which to interpret that data.

2.7 Sample Size Calculations

In order to answer our research questions of interest, we will compare the arm (A) separately to arms (B), (C) and (D). The number of households (k) required per intervention group (assuming there are two arms), based on testing the hypothesis of equality of proportions in two groups, is given by

$$k = \frac{\left(\tau_{\alpha/2} + \tau_{\beta}\right)^2 [P_1(1-P_1) + P_2(1-P_2)]}{m(P_1 - P_2)^2}$$

In the above expression, τ_x is the upper x point of standard normal distribution, i.e., $P(Z > \tau_x) = x$, where $Z \sim N(0,1)$. α is the pre-specified type I error or level of significance (usually, 5%) of the test. The quantities P_1 and P_2 are the proportions of primary outcome variable in the treatment and control groups, respectively. The test has power $1-\beta$ (usually 80% or more) to detect the difference in proportions, if exists. The quantity m is the number of individuals within a HH who can be enrolled under RSBY. Here we assume that individuals within a HH are independent as far as the primary outcome of interest (event of hospitalization) is concerned. Hence, the formula is not adjusted for variance inflation factor.

To calculate the sample size, we considered annual hospitalization rate from 60th round of NSSO data (2004). Annual hospitalization rate is defined as number of estimated cases of hospitalization during last 365 days divided by total number of estimated persons. This is turned out to be 2.4% in Karnataka.

Based on the above-mentioned formula, number of households required (sample size) per intervention group to detect a 25% change in hospitalization rate (meaning hospitalization rate will increase from 2.4% to 3%) with 80% statistical power based on a two-sided test having 5% level of significance (type I error) is 2,290 in Karnataka. Our assumption of effect size of 25% is a conservative choice. From the most recent round of NSSO data on Social Consumption and Health (NSSO 71st round, 2014), we find that the difference in the hospitalization rate between the group having RSBY (5.3%) and no RSBY (4.2%) is approximately 30%.

In order to answer our research questions of interest, we will compare the arm (A) separately to arms (B), (C) and (D). Because the arm (A) appears more often in our comparisons of interest than arms (B), (C) and (D), we double the sample size in arm (A) and consider 2,290 HHs in each of arms (B), (C) and (D). This allocation offers more power than equal allocation across arms given the research questions we ask involve arm (A) more than the other arms [15].

Table 1 provides distribution of sampled households across districts, taluks, and villages in Karnataka while Table 2 provides numbers of HH randomized in the two districts.

Table 1. Distribution of sampled households across districts and villages in Karnataka

District	**Taluk**	**Number of villages/wards**	**Distribution of households across villages/wards**	
Gulbarga			Total	Range (Min-Max)
	Afzalpur	15	510	9-61
	Aland	22	849	15-67
	Chincholi	18	417	8-60
	Chitapur	20	673	7-63
	Gulbarga	83	2330	6-98
	Jevargi	14	441	8-58
	Sedam	19	570	6-61
Gulbarga Total		**191**	**5,790**	**6-98 (Median 27)**
Mysore	Heggadadevankote	9	118	4-37
	Hunsur	42	1194	3-80
	Krishnarajanagara	37	731	4-80
	Mysore	66	1030	1-54
	Nanjangud	33	843	6-70
	Piriyapatna	27	487	2-50
	Tirumakudal – Narsipur	11	170	2-41
Mysore Total		**225**	**4,573**	**1-83 (Median 16)**
Total		**416**	**10,363**	**1-98 (Median 19)**

Table 2 Number of households randomized across intervention arms and districts

Treatment arm	**Gulbarga**	**Mysore**	**Total**
Arm A	2,201	1,954	4,155
Arm B	1,095	985	2,080
Arm C	1,101	921	2,022
Arm D	1,110	923	2,033
Total	**5,507**	**4,783**	**10,290**

We note that the total number in Table 2 (10,290) is less than the total number in Table 1 (10,363) because Table 2 does not include households that were only part of the willingness to pay sample.

3. Baseline Survey

All eligible and consenting households from a village were included in the baseline survey, given that the household is located within 25 km of a hospital empanelled in the RSBY scheme. Insurance will have little impact if there are no hospitals in the vicinity of a household.

3.1 Baseline Questionnaires

Data from target households were collected using five structured questionnaire modules or groups administered to different members of the household. The questionnaires for each module were bilingual, with questions in English and Kannada (principal language of Karnataka). Field testing of translated questionnaires happened in selected non-sampled villages. The contents of each of the five questionnaires are described below.

3.1.1 Group 1 (Individual level)

Respondent selection: According to the questionnaire, the following individuals need to be approached for the survey in the order that has been mentioned. If the first choice respondent is not available then the second choice respondent will be surveyed and so on.

1) Female most knowledgeable about household's income sources and overall well-being with a child below 18 years of age
2) Female with a child below 18 years of age
3) Female most knowledgeable about household's income sources and overall well-being between 15 and 49 years of age
4) Female between 15 and 49 years of age; only Section G (cognitive capacity survey) should be administered in case this category of respondent is selected.

The respondent for Section G (cognitive capacity survey) was supposed to be the most knowledgeable female about household's income sources and wellbeing.

Field implementation: The same respondent selection criteria were followed in the field except for the following changes:

- In case category 4) respondent was to be selected i.e. female between 15 and 49 years of age, then Section N (Adult Health behaviour) and Section O (Adult Health) was also asked in addition to Section G (cognitive capacity survey). This decision was taken because it was felt that these sections were also relevant as they were related to adult health behaviour and health care use.

- Additionally if there was only one woman in the house who was more than 49 years of age, only Sections N, O, G were asked. Again, this decision was taken because it was felt that these three sections had data pertaining to health behaviour, health care use and cognitive abilities and this was found relevant.

Group 1 Content: The following modules were part of group 1 questionnaire:

- Woman's status in household (Marital status, dowry practices, women's autonomy and decision making power)
- Women's input in decision-making in her household
- Fertility and family planning
- Maternal and new born health (regarding the most recent delivery)
- Childcare and development (youngest child)
- Child health & investment (for youngest child aged 0-5: breastfeeding, care for diarrhoea and other illness, immunization, and child health for youngest child aged 5-14, food frequency and diet diversity)
- Adult health behaviour (smoking, drinking, physical activity, food frequency and diet diversity)
- Adult health (self-reported health status and illness, health care utilization, hospitalization, mental health, cognitive capacity)Adult health (self-reported health status and illness, health care utilization, hospitalization, mental health
- Cognitive capacity survey

3.1.2 Group 2 (Household and Individual level)

Respondent selection: According to the questionnaire, the following individuals need to be approached for the survey in the order that has been mentioned. If the first choice respondent is not available then the second choice respondent will be surveyed and so on.

1) Female who is most knowledgeable about household income sources and overall well being
2) Male who is most knowledgeable about household income sources and overall well being
3) Any other knowledgeable adult woman

Field implementation: The same sequence was followed in the field. Thus, the Group 2 questionnaire respondent was supposed to match the Section G (cognitive capacity survey) respondent of Group 1 questionnaire.

Group 2 content

- BPL/APL status verification of the HH, any HH member having certain types of occupation and/or membership of the corresponding registered association (taxi driver, auto rickshaw driver, rickshaw puller, sanitation worker, mine worker, rag picker, rural farmer's cooperative)
- HH Roster (basic details about all individual HH members- name, gender, RSBY and other health insurance enrolment status, relationship to the Head of the Household, age, education, marital status, working status, occupation, income)- *Individual level data*
- Religion, caste, type of healthcare utilization of the HH
- Infrastructure access and possession of assets
- Possession of livestock and land (and their monetary value)
- Business income of the HH
- Detailed HH expenditure (last one month and last one year- different food groups, medical, clothing, entertainment and expenses for children)
- Food security and unpaid bills
- HH indebtedness (loans and borrowings), lending, and savings

3.1.3 Group 3 (Individual Level)

Respondent selection: According to the questionnaire, the following individuals need to be approached for the survey in the order that has been mentioned. If the first choice respondent is not available then the second choice respondent will be surveyed and so on.

1) Male who is most knowledgeable about household income sources and overall well being
2) Female who is most knowledgeable about household income sources and overall well being
3) Another man who is most knowledgeable about the household
4) Another woman who is most knowledgeable about the household

Field implementation: The same sequence of respondent selection was followed in the field. An important point to note here is that the respondent of Group 3 questionnaire i.e. most knowledgeable male may not be the head of the household. This is because head of household is normally a notional concept which may sometimes be understood as the eldest male in the family. Therefore, the head of household may not be the one who is most knowledgeable about household.

Group 3 content

- Playing games with the respondent on the computer and record their understanding
- Extensive Trust Module (cognitive social capital)
- Cognitive capacity and self-control
- Adult health behaviours (smoking, drinking, physical activity, food frequency and diet diversity)
- Adult health (health care utilization during illness, hospitalization, self-reported health status and illness, mental health)
- Risk taking behaviour

3.1.4 Group 4 (Adult Female and Child Anthropometrics)

Respondent selection: There are no questions on selecting appropriate respondent in the questionnaire. There is one sentence stating female head of household should be surveyed.

Field implementation: This questionnaire was administered to the respondent of Group 1 questionnaire. Initially, there was confusion and the surveyors didn't know who exactly to administer the questionnaire to. So, IFMR provided them the name of Group 1 respondent and her child's name (under 18) and the surveyors surveyed them only. In very few cases, if the Group 1 respondent was not available, the Group 2 respondent (the most knowledgeable female) was surveyed.

Group 4 content: Female anthropometrics

- Age, gender, pregnancy status of the respondent
- Blood Pressure and Pulse (3 measurements)
- Height and Weight (1 measurement)

- Waist, Hip, and Mid Upper Arm Circumference (1 measurement)
- Lung Function (3 trials)
- Skinfold Thickness, Biceps, Triceps and Subscapular (3 measurements)
- Dominance Section (which hand/foot you use most often when writing or performing activities)

Group 4 content: Child anthropometrics (only conducted for households that have a child under 18)

Identify the youngest child from the household roster and administer this group. Number of measurements for different indicators remains the same as in case of adult anthropometrics. Different measurements were taken for different age group children.

- Height and Weight (all children)
- Waist, Hip, and Mid Upper Arm Circumference (all children)
- Lung Function (5 years and above)
- Skinfold Thickness, Biceps, Triceps and Subscapular (3 years and above)
- Blood pressure (7 years and above)

3.1.5 Group 5 (Adult Male Anthropometrics)

Respondent selection: There are no questions on selecting appropriate respondent in the questionnaire. There is one sentence stating that male head of household should be surveyed.

Field implementation: In the field, this questionnaire was administered to the respondent of Group 3 questionnaire. Initially, there was confusion and the surveyors didn't know who exactly to administer the questionnaire to. So, IFMR provided them the name of Group 3 respondent and the surveyors surveyed them only.

Group 5 Content

- Age, gender, pregnancy status of the respondent (if female)
- Blood Pressure and Pulse (3 measurements)
- Height and Weight (1 measurement)
- Waist, Hip, and Mid Upper Arm Circumference (1 measurement)
- Lung Function (3 trials)
- Skinfold Thickness, Biceps, Triceps and Subscapular (3 measurements)
- Dominance Section (which hand/foot you use most often when writing or performing activities)

3.2 Survey Implementation

The study is done in coordination with the RSBY Office in the Government of India's Ministry of Labour and Employment and the RSBY State Nodal Agency in Karnataka and conducted with the cooperation of the two insurance vendors for the RSBY program in Karnataka.

Data collection for IHIE baseline was conducted by the Centre for Microfinance (CMF) at the Institute for Financial Management and Research (IFMR) on behalf of PHFI. IFMR has a field office in Bangalore. Paper and pen interviewing (PAPI) method was used to collect data. Data collection involved two key components: 1) house listing of selected clusters to identify eligible HHs and 2) administering the five groups of questionnaires to selected HHs.

3.3 Incentive

As is typically done, when a survey takes up significant amount of a respondent household's time (in this case, more than 5 hours), we offered a small token of compensation to households that completed all modules of the survey. This took the form of a small silver coin (< $5 in value) with the IFMR logo on it.

The logistics manager based out of the Mysore and Gulbarga office provided the supervisor of the coin distribution team the following items:

1) The list of households in each village to be given the coin

2) A certain number of coins equal to the number of households provided in 1)

3) Payment sheets on which we take the signature of the respondent as having received the coin.

The supervisor accompanied and monitored the 8 surveyors distributing the coins in each village. At the end of the day the supervisor brought back remaining coins and submitted them to the logistics manager in Mysore office. The logistics manager verified if the remaining coins tally with the number of signatures on the payment sheet for that day. The Logistics manager also made phone enquires to a randomly selected small fraction of the households in each village to find out if they actually received the coin.

4. Data Quality and Integrity

4.1 Data Cleaning and Quality Assurance

We identified the respondent from the household roster by name. For each module, we matched manually by eyeballing the name of the respondent to names in the household roster to derive the line number of the respondent from the roster. The line number from the roster will allow us to extract information on background characteristics (age, gender, marital status, and level of education, employment status, and so on) of respondent from roster and link it with data on respondent collected under the current module. We could match 99.1%, 99.8%, 98.9%, 98.1% and 98.5% of group 1, 2, 3, 4 and 5 respondents' names to names recorded in the household roster. We also employed approximate string matching algorithms based on different string distance functions to cross-check the matching performed manually. We found the matching done manually adequate. Using line numbers, we are then able to match respondents across groups.

Group 1 respondents, by definition, were supposed to be female respondents, as we outline in 0. We check manually the names of the Group 1 respondents who are recorded as 'male' in the household roster (less than 1%) and flag the ones we are unsure about. For Group 2 respondents, the interviewer recorded the gender of the respondent. We matched this information with that from the roster and for the mismatches (6%) tried to reconcile the name with the gender. For Groups 4 and 5, age and gender of respondents were recorded and these were matched against data extracted from roster. Gender mismatches occur for only 2% of the respondents; however, age difference is more than 5 years for 9% of the respondents.

We flagged these occurrences, so that one can choose to analyze with or without these individuals and check for sensitivity to these data points. We performed the usual checks and balances as we analysed the variables, for example, assessed agreement between repeated biometric measures, examined whether reported dates of various life events lined up and appeared plausible, assessed correlation between information on the same or similar variables provided at different occasions during the course of the interview and/or by different members, and so on.

Our house listing exercise ensured that we excluded from our sample any HH that had other forms of health insurance coverage. However because of temporal churning with regards to HH entering (and potentially leaving) health insurance as well as churning with regards to

poverty status (BPL versus APL), some HH reported BPL status as well as other forms of health insurance coverage at the time of baseline. A small percent of our sampled households (1.9 percent in Gulbarga and 4.2 percent in Mysore) had acquired a BPL card by the time of the baseline survey. Furthermore, 10.7 percent of the households in Mysore reported that they had another form of health insurance (apart for RSBY) at the time of the baseline survey, and the majority of those households (over 90 percent) reported that they had Yeshashwini coverage. However, since we use a randomized study design, the validity of our approach is not compromised. Furthermore, as noted above, the majority of those with health coverage reported Yeshashwini which only provides health insurance for tertiary care. Since RSBY- the focus of our analysis- covers secondary care, we do not expect that our estimates will be substantially affected.

4.2 Baseline Data Statistics

We provide an overview of the summary statistics of our baseline data. We choose to focus on summarizing the variables in the data set that are most pertinent to the question posed: what is the impact of RSBY expansion on financial well-being and health. More specifically, we summarize variables that are either directly or indirectly related to our Theory of Change.

4.2.1 Financial Indicators

Table 3 provides statistics for outcomes that are related to financial situation of the household. With a large (~80%) of the target population close to the poverty threshold, it should not come as a surprise that 70 percent of the sample in Mysore and 65 percent in Gulbarga had taken out a loan in the year prior to the survey. Furthermore 77 and 76 percent of the sample had an outstanding loan in Mysore and Gulbarga respectively. Only about 2 percent of the sample had provided a loan to others. In Mysore, 87 percent of the sample had a savings account, and in Gulbarga 58 percent had a savings account. These numbers suggest that our target sample is potentially vulnerable to large inpatient expenditures incurred as a result of a health shock- justifying the expansion of health insurance coverage to this population (i.e., near-poor). The survey also asked members a question about their self-perceived financial stability- most of our sample reported rather middling levels of financial stability. The self-perceived financial stability (also called the MacArthur scale of subjective social status has been found to be an important indicator of subsequent mortality, self-reported health as well as objective indicators of socio-economic status (Singh-Manoux 2003; Singh-Manoux 2005).

Table 3. Indicators of Finances and Financial Stability

Variable	Mysore	Gulbarga	Overall
Unpaid bills (%)	15.3	6.4	10.4
Amount unpaid bills (in Rs. among those with unpaid bills at time of survey)	787	1,468	1,000
Took new loan year prior to survey (%)	70.3	64.5	67.1
Outstanding loan (%)	76.6	75.5	76.0
Given loan (%)	2.5	2.2	2.3
Have savings account (%)	86.6	57.7	70.6
Total value of savings and assets (Rs.)	107,038	24,041	60,280
Self-perceived financial stability (7-point ladder 1 is most stable, 7 is very unstable, %)			
1	1.3	1.3	1.3
2	11.5	16.2	14.2
3	36.0	40.7	38.6
4	38.7	29.8	33.7
5	10.0	9.0	9.4
6	2.2	2.7	2.5
7	0.3	0.3	0.3

4.2.2 Inpatient Utilization

The question about inpatient hospitalization was asked in the following fashion "what was the household's annual expenditure on hospital visits (inpatient)". The response produced the distribution shown in Table 4 where about 48-49 percent of the sample reported positive (non-zero) expenditures in Mysore and Gulbarga. This number is clearly much higher than the one that has been published previously (~ 5%). One reason for the large discrepancy could be a mis-understanding that the question was asking about ANY visit to the hospital including an outpatient visit to the hospital. Back of the envelope calculations done by our group using NSSO data suggests that this could be one reason for the high percent of non-zero hospitalization expenditures. Furthermore, when we examine the mean annual inpatient expenditures, we find that the number is 13,459 in Mysore and 17,719 in Gulbarga- numbers that are similar to the ones obtained using NSSO data for 2014. We also summarize the distribution of an alternate variable that also could be used to arrive at hospitalization rate. A question to both the male and female adult respondents (Group 1 and Group 3) asked "what was the reason for discharge from the hospital (if hospitalized)"? This question had non-valid or missing values for individuals that were not hospitalized. Using this variable, we find that

19% and 32 % of the males respectively were hospitalized in Gulbarga and Mysore, while 10% and 16% of the females were hospitalized in the two districts. These numbers are much smaller and arguably because the question here specifically asked about "discharge" from a hospital- it is likely that most individuals construed the word "discharge" to report only inpatient hospitalizations. Since hospitalization is also a key outcome in our study, the implications of potential measurement error in this variable for the interpretations of our findings are discussed later in this report.

Table 4. Inpatient Hospitalization

Variable	Mysore	Gulbarga	Overall
Positive inpatient expenditure	48.4	49.2	48.9
Monthly inpatient expenditure (among those with positive expenditure)	1,130	1,530	1,353
Male hospitalization (%) (based on response to question about reason for discharge if hospitalized)	19.0	32.3	26.4
Female hospitalization (%) (based on response to question about reason for discharge if hospitalized)	10.5	16.2	13.7

4.2.3 Health Indicators

Table 5 reports summary statistics on several indicators of health. The question on self-reported health asks individuals' to rank their health on a 5-point scale. We include the bottom two categories (very poor and poor) into one category that we label "poor health". In Mysore, 16 percent of men and 22 percent of the women report poor health while in Gulbarga, 4 percent of men and 8 percent of women report poor health.

Table 5: Health status

Variable	Mysore	Gulbarga	Overall
Men			
Self-reported health is poor	16.4	3.9	9.3
Self-reported health is very good	6.0	15.3	11.3
Diabetes	5.6	10.2	7.6
Hypertension	16.7	9.5	12.6
Heart Disease	5.9	4.4	5.0
Anthropometric Measurements			
Body Mass Index	22.2	22.3	22.3
Overweight (BMI>=25, %)	23.2	22.5	22.8
Obese (BMI>=30,%)	3.0	4.1	3.6
Systolic blood pressure (mean)	136	130	133

Diastolic blood pressure (mean)	83	81	82
Lung volume (liters per minute)	248	245	246
Biceps fold (millimetres)	8.0	7.6	7.8
Triceps fold (millimetres)	16.3	14.8	15.4
Women			
Self-reported health is poor	22.4	8.4	14.6
Self-reported health is very good	4.9	16.5	11.3
Diabetes	4.7	2.3	3.3
Hypertension	12.4	9.3	10.6
Heart Disease	3.3	4.7	4.1

Conversely, a larger percent of men and women in Gulbarga (relative to Mysore) report themselves as being in "very good" health- the highest level of health on the 5-point scale. Overall about 13 percent of the men and 11 percent of the women report hypertension, and 7.6 % of the men and 3.3 percent of the women report diabetes. Our baseline survey also measured directly the height, weight, systolic and diastolic blood pressure, lung capacity of adults, and the skinfold width on the biceps and the triceps. The summary statistics are presented in Table 5. An important take away from this table is that although none of those included in this sample had other forms of health insurance, many of them (16 percent of men and 22 percent of women) identified themselves as being in poor health. This, in turn, highlights the importance of providing health insurance to these groups.

4.2.4 Child Consumption, Immunization, Prenatal and Postnatal care

Table 6 reveals that only about a third of the sampled mothers' report that their child consumes green vegetables, dairy, and pulses on a daily basis. There are gaps in the immunization coverage for children in our sample, especially for DPT 3. About 10 percent of the mothers' report that one of her children has died. Overall, the reported infrequent consumption of green vegetables, dairy and pulses by children, a few gaps in health insurance coverage, and non-trivial child mortality rates suggests that many of these children in the sample are at risk for adverse health outcomes and also hospitalization

Table 6: Child Food Intake, Vaccinations, Anthropometrics and Child Mortality

Variable	Mysore	Gulbarga	Overall
Food Consumption			
Green vegetables daily (%)	27.6	39.3	34.0
Dairy products daily (%)	35.2	43.7	39.8
Child pulse daily (%)	32.7	42.7	38.2
Vaccinations			
Child BCG	94.6	93.8	94.1

Child DPT 1	92.9	87.5	89.7
Child DPT 2	93.1	86.3	89.0
Child DPT 3	58.1	63.6	61.1
Child Measles	89.1	64.9	74.6
School Fees (Rs. Annual)	19,143	13,625	17,107
Child Anthropometric measurements			
Child weight (>=2 years) in kilograms	24.3	22.5	23.0
Child height in centimeters	112.2	110.5	111.0
Child lung volume (liters per minute) (child >=5 years)	207.0	192.5	196.6
Child Mortality	9.4	14.7	12.3

Notes: BCG (Bacillus Calmette–Guérin), DPT (Diphtheria, Tetanus, Pertussis)

Table 7 highlights that about one-fifth of the mothers did not receive essential checks at the time of their prenatal visit. Although institutional delivery rates were higher in Gulbarga, a higher percent of mothers had prenatal care in Mysore.

Table 7: Prenatal and Post-natal care Obtained

Variable	Mysore	Gulbarga	Overall
Institutional Delivery (%)	71.2	83.6	78.0
Payment for delivery (%)	50.1	62.7	57.3
Prenatal (PN) care (%)	91.2	79.2	84.2
Among those that sought PN care			
Weight Measurement (%)	81.3	74.7	77.4
Blood Pressure Measurement (%)	85.9	75.5	79.7
Urine test (%)	83.1	75.4	78.5
Blood test (%)	80.5	74.0	76.6
Tetanus injection (%)	82.4	73.9	77.4
Post-delivery care (%)	73.8	64.0	68.0

4.2.5 Socioeconomic Characteristics

The Table 8 presents the distribution of several socio-economic characteristics in Gulbarga and Mysore. A few summary statistics are worth highlighting. First, a significant percent of the households in both Mysore and Gulbarga have household sizes that exceed 5- 24 % of the households in Mysore and 46% of the households in Gulbarga report household size greater than 5. Since RSBY can cover only up to a maximum of 5 members per household, a significant proportion of individuals cannot enrol in RSBY even if their household chooses to do so. Second, about 26 percent of the households in Gulbarga have kuccha rooms. The proposed expansion/integration of RSBY into the National Health Protection Scheme (NHPS) uses the presence of kuccha rooms as one the factors to determine eligibility. About 21 percent of the households in Mysore and 32 percent in Gulbarga use a public tap as the

primary source of drinking water. Further, the means of total expenditures spent on food, clothing and other expenses are also shown in the table.

Table 8: Socio-Demographic Characteristics

Variable	Mysore	Gulbarga	Overall
Household Size (mean)	4.5	5.7	5.1
Household size > 5 (%)	24.1	46.1	36.3
Age (household head)	54	48	51
Age (spouse)	43	40	42
Education (household head years of education)	10.2	10.6	10.5
Education (spouse years of education)	10.4	11.1	10.8
Hindu (%)	95.6	89.6	92.2
Muslim (%)	2.4	10.0	6.6
Caste General (%)	14.2	46.5	32
Caste OBC (%)	65.0	28.4	45
Caste SC (%)	9.0	12.3	10.9
Caste ST (%)	6.8	2.4	4.3
Rooms in house (mean)	3.4	3.5	3.4
% Kuccha rooms in house (%)	2.3	24.9	14.9
Treat drinking water (%)	37.2	40.7	39.1
Source Drinking Water			
Private Tap (%)	72.8	40.5	54.9
Public Tap (%)	20.5	32.5	27.1
Well (%)	1.4	10.8	6.6
Other (%)	5.3	16.2	11.4
Latrine			
Septic Tank (%)	63.6	25.8	42.7
Field (%)	34.4	73.9	56.2
Other	3.0	0.3	1.1
Expenditure (mean monthly Rupees)			
Food	3260	4716	4063
Footwear	107	159	136
Wedding	815	1031	934
Clothing	437	571	511
All other/Miscellaneous	2158	3469	2887
Inpatient and other Medical Institutional Expenses as a percent of total expenditure	10	10.8	10.4
Have savings account (%)	86.6	57.7	70.6

4.2.6 Participation in/ Knowledge of Health Insurance Programs

Although most of the sample under consideration is not eligible for RSBY based on their BPL status, it is surprising that only a minority of households are even aware about health insurance (Table 9). In response to the question about why they do not have health insurance coverage, the majority responded that they were not aware of it, while a smaller minority

responded by saying that they could not afford health insurance coverage. This point will become important later when we discuss the uptake of health insurance in our experiment. Similarly, only a minority appear to know about the existence of the JSY program that provides incentives for hospital delivery.

Table 9: Participation in/ Knowledge of Health Insurance Programs

Variable	Mysore	Gulbarga	Overall
Do not know about health insurance (%)	59.5	83.3	72.6
Cannot afford health insurance (%)	7.1	5.9	6.4
Know about Janani Suraksha Yojana (%)	31.7	11.5	20.6
Participate in Janani Suraksha Yojana (%)	26.3	43.3	31.6

4.2.7 Behavioural Factors

A particularly strong addition to the set of questions typically asked in surveys, our baseline survey asked about a range of questions that pertained to "behavioural" factors such as self-discipline, self-control, laziness, etc. It was envisaged that in addition to price- a standard variable in studies of health insurance uptake- behavioural factors may be important as well. RSBY is a program that is provided virtually free to eligible (BPL) households, but nationwide only about 53 percent enrol in RSBY. It is plausible that non-economic factors may explain the middling uptake of RSBY. Table 10 summarizes the key variables.

Table 10: Behavioural Factors

Variable	Mysore	Gulbarga	Overall
Males			
Wish more discipline (%)	65.9	50.2	57.2
Lazy (very/somewhat) (%)	14.2	9.7	11.7
No self-control (%)	16.4	11.1	13.4
Females			
Wish more discipline (%)	80.2	53.2	65.3
Lazy (very/somewhat) (%)	21.9	12.5	16.7
No self-control (%)	19.7	12.3	15.7

The distributions suggest that 66 percent of the males and 80 percent of the females in Mysore wish they had more discipline, while 14 percent of the males and 22 percent of the females identified themselves as being either very or somewhat lazy (5-point scale), and 16 percent of the males and 20 percent of the females felt that they had no self-control. In Gulbarga, the numbers again suggest that the majority of members wished for more discipline while about 12-17 percent identified themselves as being lazy and 13-16 percent felt that they had no self-control. Although these variables are subjectively measured, they represent an important set of variables in our data given that behavioural factors have been found to be key determinants of financial decisions (Chetty 2015). At the very least, our results suggest that future work on this topic should consider the potential importance of behavioural factors.

4.2.8 Indicators of Cognitive Capacity

A few studies have used cognitive measures as predictors of health insurance enrolment . For example, in the United States, the take-up of Medicare prescription drug subsidy for low-income beneficiaries has been low despite the attractive drug coverage and outreach efforts by the Social Security Administration. Kuye et al. (2013) found that, after adjusting for other covariates, individuals with lower cognitive capacity were less likely to avail of the Medicare prescription drug subsidy. Our study includes multiple questions that are aimed at gauging the cognitive capacity of individuals in both Group 1 and Group 3. Table 11 provides information on the percent of individuals that report poor cognition. The statistic summarized in the table is the percent of individuals with "poor" cognition where "poor" is defined by individuals that report "very often" to questions about how often they forget something or how often they have difficulty making decisions. The original question elicited responses in any one of five categories ranging from "very often" to "never".

Table 11: Cognitive Measures

Variable	Mysore	Gulbarga	Overall
Males	59.5	83.3	72.6
Forget whether locked door/turned off gas burner (%)	7.1	5.9	6.4
Forget where kept things in house (%)	0.4	1.0	0.7
Difficulty making decisions (%)	1.0	1.1	1.0
Females			
Forget whether locked door/turned off gas burner (%)	3.1	3.5	3.3
Forget where kept things in house (%)	8.0	12.5	7.9
Difficulty making decisions (%)	2.3	3.5	3.0

4.3 Measurement Error in Inpatient Hospitalization

A key outcome is inpatient hospitalization. At baseline, we found that reported rates of inpatient hospitalization were much higher than expected (~48%). We believe that this is because of possible misinterpretation of the question. The rate of 48% is closer to the rate observed in NSSO data in response to a question on visiting a health care provider. Many outpatient visits also occur in a hospital and many procedures (dialysis and/or cataracts) do take place in a hospital. Therefore, in our end line we asked the question more clearly and emphasizing that an inpatient stay must involve an overnight stay (without considering overnight stays for a child birth). In our analysis, we propose to use two alternate variables as outcomes to measure inpatient utilization, (a) dichotomous variable (measured at end line) as to whether or not an inpatient stay occurred, and (b) inpatient expenditures. As noted previously, the mean of inpatient expenditures observed in our data is quite similar to the statistics obtained using the NSSO survey, we propose to use this same variable again and estimate the change in expenditures across arms. The aforementioned approach should work since our randomized design ensured that the error-prone measure (positive inpatient expenditure) was similarly distributed across the arms (please see table in next sub-section). More specifically, our primary strategy will be to use only the end line data on inpatient hospitalization to gauge the effect of RSBY on hospitalization. A potential concern is that our sample size calculations were based on much lower hospitalization rates and raises the question about whether we are adequately powered to detect a statistically significant finding given our study design. We maintain that we based our sample size calculations on the "true" rate of hospitalization and hence will be adequately powered in our analysis.

5. Enrolment

Enrolment activity involved getting study households enrolled into different intervention arms. In this section we describe the details of the process.

5.1 Premium and Cash Transfer Amounts

Table 12, panels A and B show the premium amounts that were collected (panel A) and cash transfer amounts that were distributed (panel B).

Table 12, panel A. Government premium amount for Group A households (per household enrolled)

	Premium (to be paid to insurance companies)	Fee (to be paid to TPA/ vendors)	Total premium amount
Gulbarga	133	30	163
Mysore	143	30	173

Table 12, panel B. Cash transfer amount distributed to Group B households and premium amount collected from Group B and C (per household enrolled)

Gulbarga	163
Mysore	203

The cash transfer amount distributed and the premium amount collected from household was supposed to be exactly equal to the total premium amount in each district. But in the case of Mysore, there was a misunderstanding regarding the exact premium amount. In the initial discussions, we were told that premium amount in Mysore of Rs. 173 does not include fees and the total amount would then be Rs. 203. After completing enrolment activities, we realised that Rs. 173 was the total premium amount. So, we ended up collecting an extra Rs. 30 as premium amount and paying an extra Rs. 30 as cash transfer in Mysore.

5.2 Enrolment Process Across Intervention Arms

The overall process of enrolling study households into RSBY scheme included the following steps:

i. Call before visit one

The intention of this call was to inform households that we would be visiting them in a day or two and that they should be available. This call was normally made one day or two days before visit one.

ii. Visit One

- During this visit, we went to the households and informed them of their treatment assignment i.e. whether they were getting RSBY for free, getting an opportunity to buy RSBY and a cash transfer, only an opportunity to buy RSBY or were not being offered anything.
- They were given a chit which explained their treatment assignment in writing.
- IEC material which consisted of the list of hospitals and hotline number for RSBY beneficiaries.
- The surveyors read out the FAQs to give respondents some details on the scheme and its benefits verbally.
- Arm B households were given their cash transfer amount.
- The households were given a tentative data for when the enrolment trucks would visit their villages so that they could get enrolled and were asked to ensure that their family members who were to be enrolled should be available and their money for enrolment should be ready.

iii. Call before Visit two

This call was done about three days before enrolment was to happen in a particular village. The intention of this call was to remind the households that we would be visiting them and they should ensure that their family members should be available on the date of enrolment and they should keep the money ready as well.

iv. Visit two

- During this visit, we set up enrolment stations at the community centres in the villages.
- Surveyors went to households, administered the visit number two surveys and then brought the respondents to the community centres to get them enrolled.
- The premium from Arm B and C was collected from the households who wanted to get enrolled inside their houses.
- FAQ sheet which listed all the FAQs related to RSBY was distributed to each household during this visit.

- In the beginning, cards were printed and issued in the field itself but due to issues with printers and the fact that this was a time consuming process, the work of printing and issuing cards was left till the end.

v. Card printing

This process involved printing smartcards. This process required the smart card of a Field Key Officer (FKO).

vi. Cards issuing

After the cards were printed, they had to be issued or validated to make them active. This required the thumb impression of the person who had actually carried out the enrolment (coordinators in our case) or the thumb impression of one of the household members who had been enrolled from that household. The households were randomly assigned to four intervention arms for the study. Arm specific enrolment activities are described below:

Arm A: The households in this arm were offered RSBY for free. They did not have to pay the fee amount or premium amount and simply had to present their chit at the enrolment station and were enrolled. The entire premium amount including fee had to be borne by the study.

Arm B: The households in this arm were first given a cash transfer of the amount of Rs. 203 in Mysore and Rs. 163 in Gulbarga. This cash transfer was given during visit one and the respondent's signature was taken on a payment sheet while giving the cash. In addition, they were offered the opportunity to purchase RSBY during visit two and get their household enrolled during that time. During visit 2, we collected Rs. 203 in Mysore and Rs. 163 in Gulbarga inside the homes of the respondents who wanted to get enrolled and then they were taken to the enrolment stations for enrolment.

Arm C: The households in this arm were simply offered an opportunity to purchase RSBY if they wished to. They were informed about this during visit one and for the households who wanted to get enrolled, Rs. 203 in Mysore and Rs. 163 in Gulbarga was collected and enrolment was done during visit two.

Arm D: The households in this arm were not offered anything and were informed during visit one that they had been randomly selected to not receive anything. In addition, a short survey was administered to them during visit one and they were not visited during visit two.

6. Findings

In this section, we summarize only or main findings following our analysis of the baseline and enrolment data.

6.1. Randomization worked well

In this section we examine whether the randomization of households across arms worked to ensure comparable households across the various arms. In order to gauge the success of randomization, we examined characteristics of households and individuals (Table 13). We find a very striking balance across arms on each one of the characteristics.

Table 13: Balance across arms: household- and individual-level characteristics

	A	B	C	D
Household level characteristics				
Average HH size	6.03	6.14	5.99	6.02
Mean annual total expenditure (in Rs)	114,366	116,791	116,155	114,493
Mean annual inpatient health care expenditures	15,392	15,739	16,115	16,053
Religion (%)				
Hindu	92.0	93.1	92.4	92.1
Muslim	7.1	6.0	6.6	6.6
Caste (%)				
Scheduled caste (SC)	10.6	12.0	10.4	10.9
Scheduled tribe (ST)	4.5	4.6	3.5	4.6
Other health insurance coverage (%)	5.7	5.6	5.8	5.3
Inpatient expenditures/Total expenditures (%)[a]	10.4	10.6	10.6	10.3
Positive inpatient expenditures (%)	49	49	48	49
Individual level characteristics				
Health (Males) (%)				
Heart disease	5.6	4.5	4.8	4.7
Hypertension	12.0	13.2	11.9	13.9
Diabetes	7.2	7.5	7.5	8.7

Poor health	9.5	10.3	7.8	9.5
Health (Females) (%)				
Heart disease	4.3	4.2	3.9	3.8
Hypertension	10.5	10.4	10.8	11.0
Diabetes	3.2	3.4	3.1	3.7
Poor health	14.7	14.8	14.7	14.4

Notes: Total expenditures include expenditures on food, clothing, footwear, wedding, miscellaneous as well as inpatient expenditures. Heart disease, hypertension and diabetes pertain to whether or not a doctor has diagnosed the individual with these conditions. More specifically, heart disease question is in response to "Has any health professional ever told you that you had/have a heart attack, angina, coronary heart disease, congestive heart failure, or any other heart problems? We create a dichotomous, indicator variable "poor health" that equals 1 if individual's self-reported health status (on a 5-point scale) is rated as poor or very poor.

In Table 14, we present data on key summary characteristics of Arm E households and reproduce the summary statistics for Arm A households for the sake of easy comparability. Although the summary statistic for Arm E diverges from Arm A for several variables, we note that this was possibly because of the small sample size (150 households) in Arm E. To reiterate, these households were not followed up at end line and will not be included in the analysis that estimates the causal effect of RSBY on health and financial status.

Table 14: Summary Statistics: Arm E versus Arm A

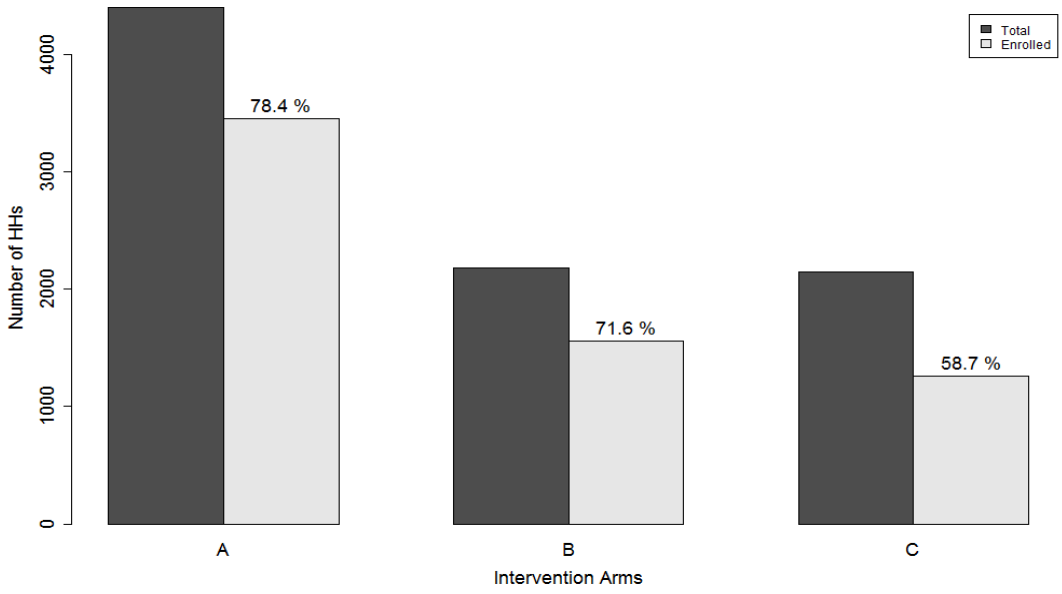
Variables	**A**	**E**
Average HH size	6.03	5.2
Mean annual total expenditure (in Rs)	114,366	120,939
Mean annual inpatient health care expenditures	15,392	30,277
Religion (%)		
Hindu	92.0	98.0
Muslim	7.1	1.7
Caste (%)		
Scheduled caste (SC)	10.6	5.5
Scheduled tribe (ST)	4.5	7.4
Other health insurance coverage (%)	5.7	14.8
Inpatient expenditures/Total expenditures (%)[a]	10.4	14.6
Positive inpatient expenditures (%)	49	53.7

Health (Males) (%)		
Heart disease	5.6	3.8
Hypertension	12.0	19.2
Diabetes	7.2	5.6
Poor health	9.5	15.3
Health (Females) (%)		
Heart disease	4.3	7.5
Hypertension	10.5	13.2
Diabetes	3.2	5.6
Poor health	14.7	11.1

6.2 Enrolment Rates across Arms

We find that about 78.4 percent of the households choose to enrol in Arm A (Figure 3). We note that households randomized into this Arm were essentially offered "free" health insurance and were asked to pay no premiums and were waived the Rs. 30 enrolment fee as well. However, this result should be placed in the context of the overall observation that RSBY has averaged enrolment rates of about 51 percent. The enrolment rate we observe in Arm A (78.4%) is about 27 percentage points higher, plausibly because of the added incentive (no enrolment fee or premiums). In Arm B, we find that 71.6 percent of the HH choose to enrol. Arm C is the arm that is closest to the "status-quo" in the sense it approximates the incentive given to BPL households- they were given the option to enrol but were asked to pay the full premium. Enrolment rates in this arm 58.7 percent are higher than what is observed in RSBY enrolment for BPL households (around 50-52 %). Once again the slightly higher enrolment could be because HH were explained that this was an unique opportunity to enrol in RSBY, a health insurance program that would cover hospitalization expenses upto Rs. 30,000 per family per year.

Figure 3: Enrolment Rates across Arms



The enrolment rate in Arm B (cash-transfer group) is 72 percent and only about 7 percent lower than in Arm A (free health insurance) while the enrolment rate is about 59 percent in Arm C. We further note that the rate in Arm C (59%) is higher than the average RSBY enrolment rate in the country although Arm C households were asked to pay the full cost (premium and registration fee) of RSBY. The relatively high enrolment rate in Arm B and Arm C could be due to multiple reasons. First, the cash transfer provided was approximately about Rs. 200. Households may have perceived this amount to be too low to purchase any goods and services that they value more than health insurance. Second, a possible barrier to enrolment in RSBY is potential procrastination because of the time cost involved in travel to the enrolment station. At the time of the enrolment visit, households were told the following: *"Only the family members who accompany you to the enrolment station can be covered under this health insurance plan. Please gather all the family members (up to 5 only) who want to enrol, and I will walk with you to the enrolment station now. Please remember that you are receiving this benefit as part of a research study. Not everyone in your village received this opportunity. Please be sensitive to this".*

Third, explicit nudges were provided by letting the households know that this was an "unique" opportunity that was not normally available to similar households in the village. In addition, Arm B households were provided the additional incentive of a cash transfer that was offered as a "labelled cash transfer" (Behassine et al., 2015) since encouragement to enrol was provided along with the cash transfer.

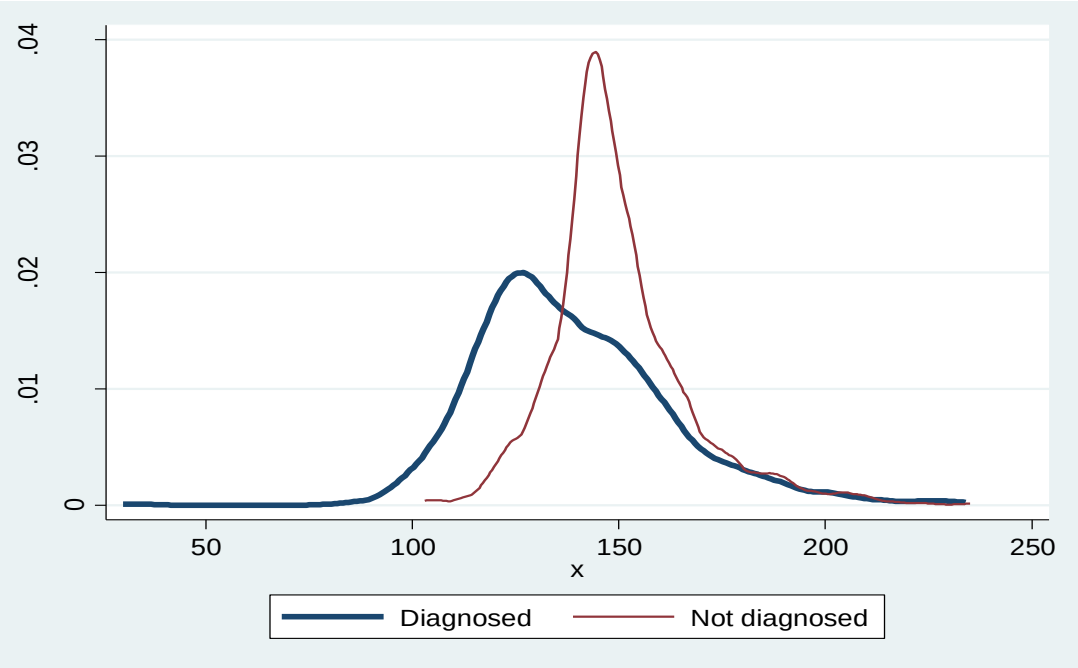
Although the enrolment rates were relatively high in both Arms B and C, they do not in any way affect the validity of our study design. From section 2.2, we plan to compare the outcomes between households in Arms A, B and C relative to their counterparts in Arm D. Thus, the first-stage- the difference in RSBY enrolment rates- is extremely strong in each case. More specifically, we are not comparing outcomes between Arms A and B, or between Arms A and C.

6.3 Hypertension Diagnosis and Smoking Cessation

The threat of hypertension looms in India. If left untreated, hypertension is an extremely costly disease and results in many adverse health outcomes including heart disease and kidney failure. A commonly raised concern about large-scale screening for chronic diseases is that a positive diagnosis may not lead to corresponding changes in health improving behaviour on the part of the individual.

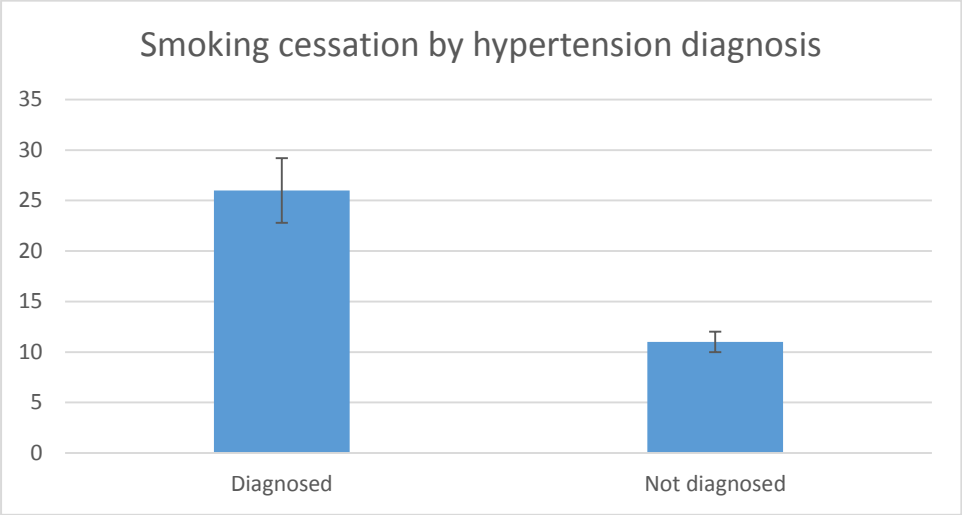
We find that individuals that report a diagnosis of hypertension have a distribution of systolic blood pressure that is substantially better than their counterparts who were not previously diagnosed but are found to have hypertension based on objective data collected in the IHIE (Figure 4).

Figure 4. Distribution of Systolic Blood Pressure



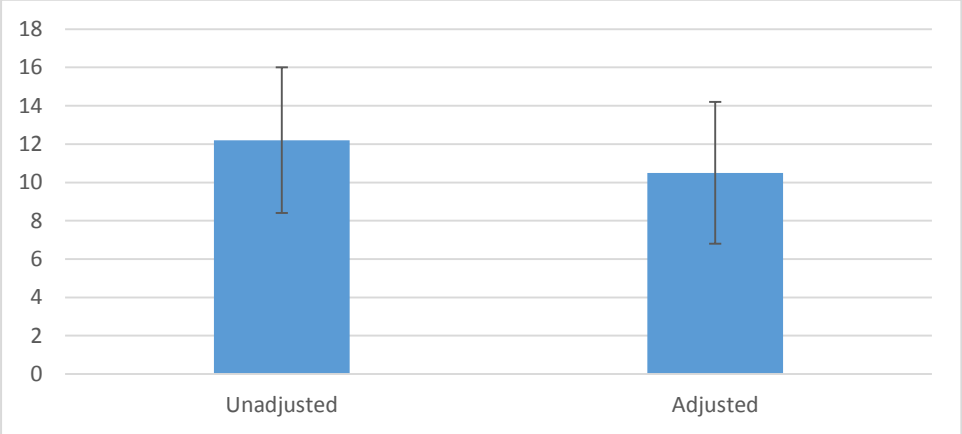
Furthermore, we also find an association between smoking cessation and the likelihood of hypertension diagnosis. More specifically we find that individuals diagnosed with hypertension have substantially higher smoking cessation rates than their counterparts that have not been diagnosed (Figure 5).

Figure 5. Distribution of Smoking Cessation by Hypertension Diagnosis



In Figure 6, we graph the differences in smoking cessation between individuals diagnosed with diabetes and their counterparts who are not diagnosed. We find that this difference in smoking cessation rates is almost 10 percentage points, even after adjusting for socio-economic characteristics. This finding suggests that to the extent that RSBY leads to hospitalization and the consequent detection of chronic diseases, there may be some consequent changes in health promoting behaviour as well.

Figure 6. Differences in smoking cessation (percent) between individuals diagnosed and counterparts that are not diagnosed



6.4 Gender and Enrolment

The enrolment questionnaire asks each household to list the members that they will enrol into RSBY. The number of enrolees is independent of the premium amount up to a maximum of 5 members per household. In our enrolment data, we have both the age and gender of the member. We calculate the percent of males that enrol- both overall and by age group. We find that for younger (age<20) and working-age (age between 20 and 60), the proportion of males and females enrolling are quite similar (~50 percent each) except for group A where even the younger age group has a higher proportion of males enrolling (0.55 to 0.45). We are not entirely sure why there are gender differences for the group of older individuals (age>60), but it is finding that we propose to explore further. Figure 7, panels A-C plot these data for HH in arms A,B and C respectively.

Figure 7, panel A. Gender differences in enrolment in group A: by age-group.

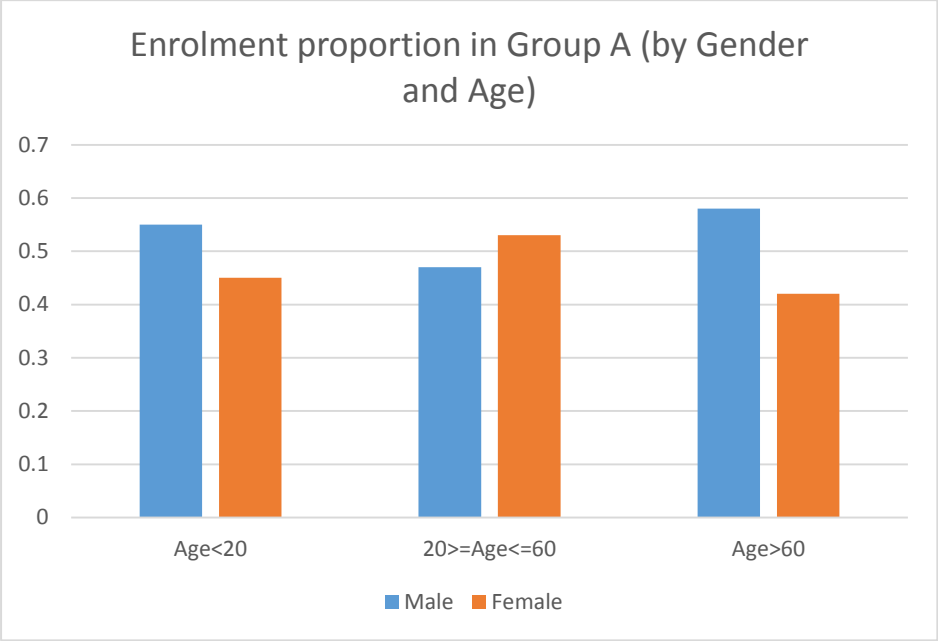


Figure 7, panel B. Gender differences in enrolment in group B: by age-group.

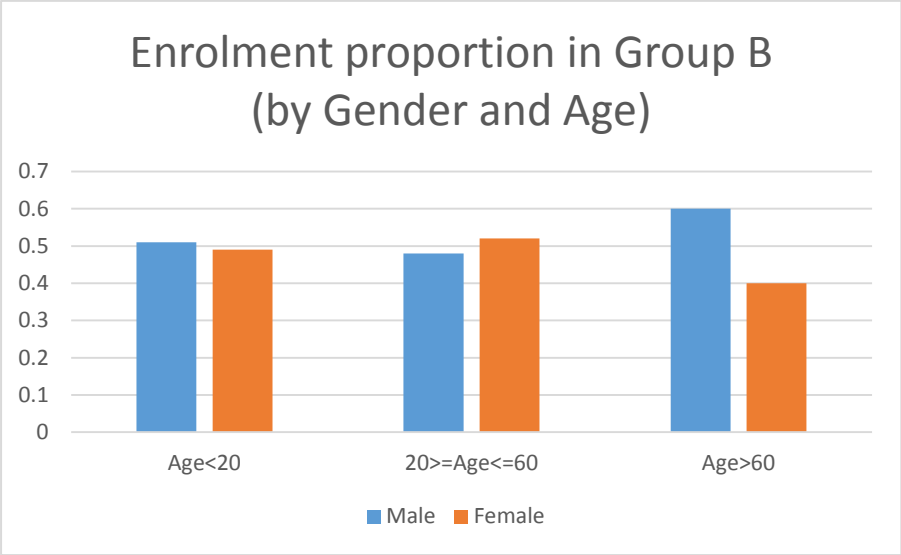
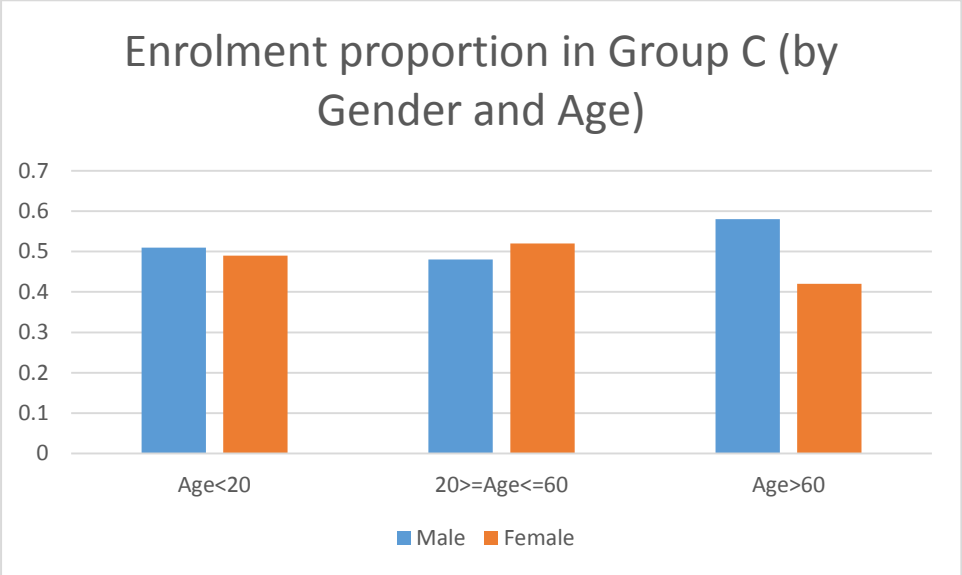


Figure 7, panel C. Gender differences in enrolment in group C: by age-group.



7. Discussion and Conclusions

In this report, we have summarized the baseline survey and enrolment exercise for our Indian Health Insurance Experiment- a unique experimental study that seeks to understand the impact of expanding health insurance coverage. The study is the first of its kind in India, and joins the small list of experimental studies to evaluate the effectiveness of health insurance expansions.

Recently, the Government has proposed the National Health Protection Scheme (NHPS) that seeks to increase the coverage amount of RSBY (to rupees one lakh (100,000) with an additional amount provided to the elderly (60 years or older). Furthermore, the new program intends to more precisely target the poor by relying on very recently collected data from the Socio-economic and Caste Survey to identify eligible households. Currently RSBY eligibility is largely for households that were in poverty more than a decade ago (2002). Clearly, this type of targeting is inefficient. Our study relies on concurrent data to identify poor households and the experiment is therefore rolled out to the type of households that the government intends to cover. Moreover, the government is interested in determining whether it should provide this expanded population free insurance, provide only premium supports for private insurance, or simply offer a public insurance option that individuals can purchase with their own money. Some even propose replacing in-kind benefits like health insurance with

an unconditional cash transfer. Our study is designed to evaluate the relative benefits of these alternate policy options. If we find that RSBY has had only limited effects on the outcomes, then it would suggest that the government must revisit the structure and rollout of RSBY. On the other hand, if we do find that RSBY has had beneficial impacts, then the government may want to consider expanding this type of health insurance to uncovered populations. Till date, RSBY does not cover all poor people because of a multitude of factors such as poor knowledge and awareness on part of the population, and/or weak government efforts at enrolment. A positive finding in our study would also suggest that the government must ramp up efforts to raise awareness of the population regarding the RSBY program while simultaneously increasing the enrolment of the poor.

The RAND health insurance experiment (RAND HIE) in the United States, in the late 1970s-early 1980s continues to remain the gold standard for evidence on the causal effects of health insurance in the United States. In terms of the promise of informing Government policy, our study has a crucial advantage over the RAND HIE. The RAND experiment was done after the United States introduced both Medicare and Medicaid- the cornerstones of public health insurance in the United States. Therefore, the RAND HIE has not ushered in changes in the scope and coverage of either Medicare or Medicaid. On the other hand, since our study is being conducted right at the beginning of proposed expansions in health insurance coverage in India, it is plausible that the findings from this study could be used to inform subsequent health insurance expansions in India.

In summary, our analysis of the baseline and enrolment data has resulted in the following findings: (a) Randomization worked well, (b) Enrolment Rates are lower than expected in Arm A (free health insurance arm) and arguably higher than expected in Arm B (labelled cash transfers). However, we find that a part of the reason for this could be that behavioural factors (e.g., laziness) are important determinants of the decision to enrol. As the Government ramps up its efforts to increase enrolment (thereby driving down premiums), these findings on enrolment could be important to consider.. The sense, in general, is that health insurance coverage can be used as a tool that improves the financial well-being of households. However, since enrolment into health insurance is often a choice of the household, it is not possible to draw convincing conclusions with existing secondary data. At the time of submission of this report, we have wrapped up the collection of the end line data. In the summer of 2017, we plan to begin our analysis of our end line data (in conjunction with the baseline and enrolment data). The findings should provide convincing evidence on whether

the expansion of RSBY to APL households resulted in (a) improved financial well-being of the household and (b) increases in hospitalization rates and health outcomes. Our results could become available tantalisingly close to the time when the Government decides to roll out the NHPS scheme. We hope that the findings from our study can be used to inform and frame some of the discussion about health financing policies in India.

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Data Annexure

This help file outlines the data sets as well as the associated STATA .do files used to generate the data sets.

The original file from the baseline data that we received from IFMR is labelled **ReconciledData_withRespondent.dta.** This file contains all the variables in the baseline data. There are no labels for the variable names making this data a bit hard to decipher. However, in general the variable names are prefixed by the Groups (i.e., G1 for group 1, G2 for group 2, etc.) and the variable name that follows corresponds to the variable names in the questionnaires.

We also upload a bit more "user-friendly" data sets (5 in number corresponding to the 5 groups)- labelled **group1_clean.dta, group2_clean.dta, group3_clean.dta, group4_clean.dta and group5_clean.dta**. These files were generated by the corresponding .do files that use as input the master baseline data ReconciledData_withRespondent.dta. The .do files are also uploaded and are labelled Group1_cleaning.do, Group2_cleaning.do, Group3_cleaning.do, Group4_cleaning.do, and Group5_cleaning.do.

We also upload the Enrolment data that contains variables relevant to household enrolment in the RSBY. The data is labelled **Enrolment.dta**.

The baseline questionnaires are in the **PDF file Group_1to5.pdf**