RSBY Working Paper

Performance Trends and Policy Recommendations

An Evaluation of the Mass Health Insurance Scheme of Government of India*

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Summary

India's health sector is characterized by modest health indicators, a paucity of medical financing schemes that have successfully scaled, high per capita out-of-pocket health expenditure, and very low levels of public health spending. The lack of financing options, especially when the population is facing burdens of frequent communicable, as well as catastrophic lifestyle diseases leads to poor health outcomes and to poverty traps. Given this scenario, there existed a strong case for introducing public health financing schemes aimed at improving national health outcomes, and reducing the vulnerability of the masses.

The *Rashtriya Swasthya Bima Yojana*

The *Rashtriya Swasthya Bima Yojana* (RSBY) was launched by the Ministry of Labour and Employment (MoLE) of the Government of India in 2008 with the primary objective of shielding low-income households from the burden of major health expenses. By May 2011, the scheme had completed one year of operations in 229 districts in 22 states across the country, including 47 districts that completed two. It provides hospitalization expense cover of up to INR 30,000 (USD 667) per family for a majority of procedures at any of the national network of 8,686 private and public empanelled hospitals. A total of 18 million BPL families - adding up to 47 million individuals - have been insured by nine insurers, which includes four public sector companies. The annual premium per family ranges from INR 331 (USD 7), to INR 697 (USD 16), with the beneficiary paying a nominal fee of INR 30 (USD 0.67). A total of 1.5 million hospitalization cases were covered by the scheme till May 2011.

The Salient Features of RSBY

Although other government-run public health insurance schemes existed in India, RSBY was a pioneering scheme in many aspects. Some of its key design features are:

1. Public-Private Partnership (PPP): Public and private medical facilities, Third Party Administrators (TPA) and insurers partner with the State Nodal Agencies (SNAs) that set the guidelines, quality standards, and monitors programme implementation.
2. Central-State Government Collaborative Model: While the programme was designed by a department of the central government, the implementation and management is undertaken in collaboration with respective state governments. The premium subsidies are co-financed by the centre and the states, thus ensuring mutual ownership and control.
3. Leveraging of Technology: Since the scheme targeted Below Poverty Line[1] (BPL) families with low literacy levels, paperwork was minimized by using biometric identification that enabled instant enrolment, and control over fraud.
4. Demand-side Financing: The scheme financially empowers the patient through the provision of a value-loaded smartcard that offers cashless access to medical facilities covering almost all procedures. The smartcard can be used at any empanelled hospital in the national network, allowing the convenience of flexibility to the considerable migratory population in the country.
5. Premium Subsidy: The premium is subsidised 100% from government funds, with only a nominal enrolment cost paid by the beneficiary.

[1] The Government of India's Below Poverty Line is a threshold to identify poor households that need government aid. The present assessment is based on a survey undertaken in 2002. It uses 13 socio-economic parameters such as food security, literacy and sanitation and uses different criteria for rural and urban geographies to identify BPL families. It is considered a weak targeting tool, as corruption has allowed many non-poor households to have BPL cards.

6. Setting incentives, and encouraging and leveraging competition at two levels - among hospitals and among insurers- to improve quality of outcomes.
7. Collection, Storage and Maintenance of Data: Data collected from the administration of the scheme is stored and maintained by the Government agency, thereby facilitating future actuarial calculations and market development.

Objectives of the Study

The primary objectives of this study were to analyze the key performance indicators (KPIs) of the scheme and compare KPIs across various homogenous groups using administrative data on enrolments and claims, and socio-economic and health data from secondary sources. We focus on three KPIs – Conversion Ratio[2] to measure depth of outreach subject to the quality of the BPL list; Hospitalization Ratio[3] to gauge utilization; and Total Expense Ratio[4] to evaluate profitability to the insurer. These KPIs are analyzed from aggregated district level data for the first year of operations from 229 districts. Trends are analyzed from the second year data on 47 districts that have completed two policy terms. We present other village level analysis on 11 districts by using client level data, and analyze gender-based trends in Conversion and Hospitalization Ratios. We also interviewed selected insurers, TPAs, and RSBY staff to gather their views. Data limitations prevented us from investigating renewals, claim denials, customer satisfaction, rural-urban differences, and from conducting a deeper analysis of the empanelled hospitals.

Key Findings and Recommendations

We find large variations in the KPIs across states and districts, and across years for those districts that have completed two years of the scheme. In this section, we present factors that influence these variations.

Outreach in Year One

In year one, the overall Conversion Ratio for 229 districts was 51% of targeted BPL families. It ranged from 11% in Assam to 87% in Tripura. We found that Conversion Ratios have a high degree of correlation to state specific characteristics. The key findings are:

- Usage drives future uptake: Analysis of data from districts that completed two years revealed that the Conversion Ratio in year two is higher in districts where the Hospitalization Ratio is higher in the first year (after controlling for first year conversions and other factors that influence second year enrolments). This indicates that word-of-mouth endorsements from early adopters encouraged others to join the scheme. However, ideally we would have expected conversion in year one to be higher due to pent-up demand from BPL families who might have postponed hospitalization before RSBY was launched due to lack of affordability. This finding also suggests that the adoption and diffusion process takes place over a period of time. RSBY's widespread presence, on-the-ground enrolment process, and rising number of claims will increase insurance awareness in the coming years. This, together with the creation of an actuarial database, will help private insurers evaluate opportunities for offering other insurance products through a PPP model in the future.
- Government interest and on-ground presence is important for greater coverage, even when the enrolment process is contracted out to insurers through the PPP model:

[2] Ratio of number of individuals enrolled to number of eligible BPL persons

[3] Percentage of individual policy holders who claim (ignoring multiple claims per person which is very low)

[4] Ratio of sum of claims paid out plus smartcard cost plus service taxes to gross premium collected

Conversions are higher in districts with more active Gram Panchayats (GPs)[5] (measured by the number of times the GP meets in a year). SNAs could provide incentives to GPs to improve enrolments.

- TPAs influence outreach more than insurers: District level Conversion Ratio is correlated more to the reach of TPAs than that of insurers. Conversions are higher in districts that have TPAs with a larger national presence in terms of total number of districts covered in the country. While we would expect that TPAs or insurers with larger number of assigned districts within a given state would have better Conversion Ratio due to economies of scale, better knowledge of local environment, and reuse of investments, we do not find strong evidence to support this assumption. Currently the SNA is contracted with the insurer, allowing for little direct leverage on the TPA, or ability to set appropriate incentives for them. It appears that including contracts with specific TPAs, and reducing the situations where TPAs in turn contract third party vendors to do enrolments, may influence conversions favourably.
- Conversion Ratio is inversely proportional to number of BPL families: Conversion Ratio is lower in districts with higher number of BPL families and larger geographical size, but not correlated to remoteness of the villages, overall population, percentage of Scheduled Tribes, or to the socio-economic characteristics of the district. Hence, it appears that Conversion Ratio can be improved by dividing larger districts into smaller units for improved efficiency, or by extending the enrolment duration.

Usage in Year One

RSBY's overall Hospitalization Ratio of 2.4% (of all enrolled individuals in all 229 districts) in the first year is higher than the historically recorded hospitalization rates of low-income segments (1.7% as per National Sample Survey, 2004). It ranges from 0.1% in Assam to 5.2% in Kerala in year one. The average amount claimed is INR 4,480 (USD 100). The higher proportion of claims received in the first half of year one than in year two (though in differing districts) provides suggestive evidence that the scheme is servicing the pent-up demand of BPL households for healthcare that they may have otherwise foregone or delayed. We find a substantial drop in claims in the rainy season. The key findings are:

- On-the-spot verification-based smartcards increase usage: TPAs are required to issue smartcards on the spot at enrolment camps. However, sometimes issuance gets delayed due to operational reasons such as shortage of smartcard printing capacity. The likelihood of a village having at least one claimant is lower if the elapsed number of days between enrolment and issuance of the card to the household is higher. Delayed card issuance carries the risk that the card may not get delivered to the intended beneficiary.
- Large number of villages with zero utilization: Two-thirds of villages (in the 11 selected districts with client level records) where the scheme has been launched did not have a single hospitalization case. This statistic is very high compared to the historical (4% as per National Sample Survey, 2004) village-level zero hospitalization rates, and hence is likely due to issues with programme implementation rather than due to lack of demand in these villages. The likelihood of a village having at least one claimant is lower where the total number of enrolments in the village is smaller. Hence it will be useful to monitor villages with no claims to find out the specific factors dissuading usage, to avoid delays in card issuance, and to verify that delayed cards do reach the

[5] Gram Panchayats are local self-governments at the village or small town level in India. Typically two or more villages are clubbed together to form a group Gram Panchayat when the population of the individual villages is less than 300.

intended beneficiaries.

- Primary care usage is correlated to less hospitalization: We find that the Hospitalization Ratio in a district is negatively correlated to primary care usage (but not correlated to the availability of primary care facilities in the district, or other factors such as sanitation and other amenities that prevent sicknesses), suggesting that accessing primary care can reduce the need for hospitalization. A district that has 1% higher usage of primary care has lower Hospitalization Ratio of 0.03 percentage points. There is hence a case for SNAs to assess the costs and benefits of increasing usage of primary care to improve the financial sustainability of the scheme.
- Incentives matter in design: Expectedly, utilization is positively correlated to the presence of more empanelled hospitals per district. It is more so in districts with a higher percentage of private hospitals that are empanelled with the scheme. Two factors may be at play here. Firstly, patients might perceive the quality of care at private hospitals to be better, and hence prefer to get treated there. Secondly, private hospitals have more incentives to treat (the poorer) RSBY patients since they have more flexibility in reallocating the funds generated through procedures covered under RSBY. Currently private hospitals are allowed to utilize 100% of their revenue from RSBY for staff wages, whereas public hospitals can only use 25% for the same purpose. Hence private hospital staff have more direct financial incentives to treat RSBY patients despite the low prices fixed by RSBY for medical procedures. It can also be argued that this might lead to better customer service, and hence higher usage rates. Another reason could be that public hospitals might lack adequate diagnostic and treatment infrastructure required to conduct many medical procedures.
- More awareness campaigns are needed in districts with lower literacy levels: Information about the scheme's features and benefits, and list of empanelled hospitals are provided to the beneficiary in the form of a pamphlet. We find that utilization is lower in districts where the literacy rate and educational attainment is lower. Hence awareness generation through audio-visual media such as street plays should increase customers' propensity to utilize.

Total Expense Ratio

Year one was profitable for insurers with an average Total Expense Ratio of 77%, implying that 23% of the total premium after expenses remained with the insurer. There is however wide variation between states (ranging from 28% in Assam and Goa to 136% in Nagaland) and districts, and also between insurers (ranges between 39% and 92%).

Out of 229 districts that have completed one year, 47 have been unprofitable for insurers with Total Expense Ratios higher than 100%. The lack of profitability in these 47 districts can be explained by higher claim rates more than any other factor. The average premium in districts with Total Expense Ratio greater than 100% is only marginally lower at INR 566 (USD 12.6) when compared to the profitable districts that have average premium of INR 588 (USD 13.1). The average amount claimed in the unprofitable districts is also only marginally higher compared to the rest (INR 4,882 or USD 109 vs. INR 4,769 or USD 106). However, the Hospitalization Ratios in the unprofitable districts is considerably higher when compared to districts with less than 100% Total Expense Ratio (6.1% vs. 1.8%).

Trends from Year One to Year Two

In this section, we discuss the KPIs of the 47 districts that completed two years of the scheme in May 2011. Though these 47 districts are not representative of the whole programme, this analysis provides us with a sense of the overall direction and performance of the scheme. It is possible that we might get a different interpretation when all 229 districts complete year two.

While the KPIs varied dramatically between states, districts and villages, we found that Conversion Ratio, utilization, and female-to-male enrolment ratio rose in year two. In the 47 districts that completed two years of the scheme, the enrolment has increased from 2.5 million families in the first year to 3.2 million in the second year. This is because the number of households targeted has increased from 5.74 million to 6.32[6] million, with the Conversion Ratio increasing from 43% in the first year to 50% in the second. Female-to-male enrolment ratio was 80% in year two compared to 59% in year one. Hospitalization Ratio has also increased from 4.1% to 6.3%. Thirty-six out of the 47 districts had higher hospitalization in year two. Nine districts had Hospitalization Ratios of more than 9.9% in year two compared to just five districts in year one, which, being much higher than average, merits further investigation.

Overall, Total Expense Ratio for the 47 districts that have completed two years has risen substantially from 77% in year one to 143% in year two with insurers moving from high profitability to losses in the second year. This shift is largely due to the rise in Hospitalization Ratios since the drop in premiums (from INR 537 or USD 12 to INR 497 or USD 11), and rise in average amounts claimed (from INR 3,311 or USD 74 to INR 3,627 or USD 81) are small. The spike in utilization in year two is the main factor behind the losses in two-thirds of the 47 districts[7].

Insurers reduced premiums in year two in all 47 districts. The statistical correlation between premiums in year two and the Total Expense Ratios in year one suggests that the drop in premium was driven by higher profitability in year one. We fail to find strong correlation between premiums and Hospitalization Ratios in year one, though premiums vary significantly across insurers, suggesting that in the absence of sound historical data, premiums have been based on operational cost structures more than on expected utilization.

The lesson for policy makers and insurers is that the utilization rates of a new pro-poor scheme rises every year during the initial years as awareness of the scheme increases, the programme implementation improves, and possibly because the stakeholders learn how to game the system. *Yeshasvini,* the mass health insurance scheme in Karnataka state also witnessed rising hospitalization rates in the first five years of operation[8]. Hence, a new scheme should be closely monitored in the initial years, anticipating and appropriately planning for rise in usage. Care should be taken while adjusting premiums based on the previous year's utilization data, especially during the early years. Insurers should be encouraged to set realistic premiums while policy makers should invest in systems to record and maintain historical data for public good.

Rising claim ratios in RSBY will push future premiums higher, hence increasing the cost to the government and putting the scheme in jeopardy. It is therefore vital that we understand the factors that influence enrolments and utilization.

6 Due to revisions to the BPL list

7 We note that the profitability comparison between years is only available for 47 districts currently, and hence not representative of the country

8 Based on data obtained from Med Assist

Addressing Gaps: Initiatives Being Undertaken

RSBY has proposed to take many steps to further improve the scheme's Conversion and Hospitalization Ratios. The following measures are being planned by the central nodal agency for the common good of all stakeholders. Some are in line with our findings.

1. The programme will partner with development agencies to conduct awareness campaigns using street plays, wall paintings, and banners with better visual and graphical content that is more intuitive. These initiatives seek to leverage the agencies' existing capacities and goodwill in the community. Impact assessment for the campaigns will also be conducted to gauge their efficiency and effectiveness.
2. An initiative to increase the coverage of the scheme to include outpatient treatment in selected pilot districts is also being undertaken. This is consistent with our finding on the impact of the usage of primary care.
3. A grading system for hospitals will be implemented to categorize them based on their infrastructure and capacity. A tiered fee structure is also being introduced, which will be linked to the grades assigned to the hospital, thereby incentivising them to invest in better facilities and to improve quality of care.
4. A surveillance system based on real-time data will be implemented to detect and control fraud. The SNA and the insurer would de-empanel hospitals that are found to be involved in fraud. Hospitals in districts with more than 10% Hospitalization Ratio would be screened to check for fraud. The fraud control systems would be enabled by real time data that will allow investigations to be conducted while the patient is still admitted in the hospital.
5. Various staff training initiatives will also be undertaken to increase capacity and knowledge of hospital and SNA staff.

Future Research

This report is intended to inform mass insurance policy makers at large, and to encourage further policy-oriented research into RSBY. There is ample scope for further in-depth research into RSBY, for which this study provides a basis. The following are potential areas to focus on:

1. States and districts that have unusually high or low KPIs.
2. The large number of villages with no utilization.
3. The rationale for determining premiums, using third and fourth year data when they become available.
4. Reasons for fraud in enrolment and utilization, especially in high utilization districts.
5. Sample surveys to investigate patient satisfaction, patterns in ailments, claims denials, renewal, usage by migrants, gender bias, and hospital capacity and infrastructure
6. Validation of the trends that were revealed, and explanation of the KPI trends using primary data.

I Introduction

It is acknowledged that low public health spending and the lack of healthcare financing mechanisms are significant causes of poor health outcomes and financial burden on low-income households in India. The *Rashtriya Swasthya Bima Yojana* (RSBY), a subsidized hospitalization insurance scheme for BPL families launched by the Government of India's Ministry of Labour and Employment sought to address these two problems.

In this paper we discuss the challenges facing the healthcare sector in India, and how the key design principles of RSBY address them. We use administrative data to present the progress of the scheme and analyze trends of key performance indicators (KPIs) such as Conversion, Hospitalization, and Total Expense Ratios. We explain the factors that influence the KPIs using secondary district-level socio-economic and health data. We conducted interviews with selected insurers and TPAs in order to understand field-level experiences.

This paper is organized into five sections. The remainder of this section provides a background of the healthcare finance scenario in India. Section II describes the RSBY programme, its key design principles, its performance in year one, and trends in year two. Section III describes the data and the study methodology. Section IV analyzes the Conversion, Hospitalization and Total Expense Ratios, and the environmental and programme-specific factors that influence their outcomes, and makes recommendations. Section V suggests future research areas.

The Indian Context

India has expanded its social protection programmes since the mid-2000s. The Common Minimum Programme and the Eleventh Five Year Plan (2007-12), which commit to the institutionalization of social protection programmes as legal rights, are an indication of the growing importance of social protection in government policy. The allocation of 4.3% of Gross Domestic Product (GDP) to social sector spending (Weigand & Gros, 2008) compares favourably with other countries with similar GDP per capita.

However, public health spending in India is very low. India ranks 171 out of 175 countries in per capita public health spending[9] . According to UNDP's Human Development Report of 2003, as a percentage of GDP, Indian public health spending is 0.9%, which is lower than that of smaller neighbours like Bangladesh (1.5%) and Sri Lanka (1.4%). The importance of public expenditure in improving health outcomes is well established in the literature. Not surprisingly, India's health indices have reflected the low levels of public spending on health with a high Infant Mortality Rate and low life expectancy at birth. India is ranked 145 among 193 countries for infant mortality, and 136 among 193 for life expectancy at birth[10].

According to the World Health Organization[11], health insurance covers less than 10% of the Indian population. The low penetration levels of market-led insurance, and the presence of only a few community risk-pooling initiatives place a huge burden of healthcare financing on the poor. India has one of the highest rates of out-of-pocket health spending in the world at 78% of total health spending, and 94% of all private health spending (Rao, 2005). This, however, does not imply that the quality of private care is good (Das& Hammer, 2007), or that it is equitably distributed. Private financing implies that access is limited only to those who can afford it. Twenty-four percent of all Indians who are hospitalized each

[9] Retrieved from http://globalcenters.columbia.edu/content/model-districts-health-project-0

[10] Authors' calculations from various reports from www.who.int

[11] Retrieved from http://www.searo.who.int/linkfiles/social_health_insurance_an2.pdf

year fall below the poverty line due to hospitalization (Peters, Yazbeck, Sharma, Ramana, Pritchett & Wagstaff, 2002). Data from the National Sample Survey (2004) shows that from the bottom two quintiles of the rural population, 47% borrowed to finance hospitalization, often at high interest rates and from informal sources. Moreover the level of leakage in health spending in India is high due to the prevalence of unqualified doctors, spurious drugs, high inflation of medical costs (the rate is higher than the overall inflation rate), and incidental expenses such as transportation costs.

Hence, an increase in public health spending would help to improve health outcomes, as well as to decrease the financial burden on low-income households.

Traditionally, public heath financing in India has been largely restricted to the supply-side, focussing on hospital infrastructure and staff costs. However, public hospitals face high rates of doctor absenteeism, shortage of consumables, and do not focus on low-income families alone. Further, the quality of public healthcare is adversely affected by the lack of accountability and incentives (Das& Hammer, 2007).

There are however a growing number of programmes that offer demand-side financing mechanisms (World Bank, 2011) that allow poor households to choose and access care from a larger pool of available and proximate facilities, be they private or public. These programmes also attempt to improve the quality of service through competition. Demand-side financing also has the potential to attract market forces to invest in health infrastructure in rural regions, as evidenced in some districts since the advent of RSBY. According to Rural Health Statistics in India (2006), India has a shortfall of 20,000 Sub Centres, 4,800 Primary Health Centres, and 2,653 Community Health Centres. Given this considerable gap in public health infrastructure, any financing programme should include private and public hospitals to ensure that all beneficiaries have adequate and proximate access.

Health expenses per capita in India are high in part because it suffers from the double-disease burden. While it ranks among the top ten countries for communicable diseases[12], it also has increasing cases of lifestyle diseases like coronary heart disease, diabetes and hypertension, the treatment expenses of which are of high value and low periodicity, with a potentially catastrophic impact on household finances. Given this scenario, financing is better done in the form of insurance rather than as reimbursement of treatment costs since many patients might not even have the liquidity necessary to make payments upfront.

Finally, given that safety nets are most valuable to the most vulnerable, the best social sector programmes should ensure that the benefits reach the most vulnerable through appropriate targeting, and should control leakages through sound identification processes.

Since the mid-2000s, several large-scale state-subsidised accident, life, and health insurance schemes have been launched to address the problems listed above. The four main government health schemes are *Arogyashri* in Andhra Pradesh (launched in 2007), *Yeshasvini* in Karnataka (in 2003), *Kalaignar Kappeedu Thittam* in Tamil Nadu (in 2009) and RSBY (in 2008), which is pan-India.

[12] Retrieved from http://articles.timesofindia.indiatimes.com/2009-08-11/india/28154929_1_healthcare-spending-health-tourism-health-budget

Table 1. **Comparison of Major Government Health Insurance Schemes in India**

Name of the Scheme	Yeshasvini Co-operative Farmers Health Care Scheme (Karnataka 2003)	Arogyashri Community Health Insurance Scheme (AP 2007)	Kalaignar's Insurance Scheme for Life Saving Treatments (TN 2009)	RSBY (2008)
Unit of enrolment	Individuals	Families	Families	Families
Funds	Contribution: Beneficiary 58% + Govt. 42% (in 2009-10)	by state	by state	USD 0.67setup fee by beneficiary + 75% by Centre and 25% by State govt.
Premium in 2009-10	USD 5 per person	USD 6 per family	USD10 per family	Avg. USD 12 per family
Max. insurance cover	USD 4,444 per person	USD 3,333 per family with additional USD 1,111 buffer	USD 2,222 over 4 years per family with additional buffer of USD 3,333 in case of cardiac surgery	USD 666 per family
Common procedures	Cardiac, ENT, General Surgery, Pediatric, Obstetric, Ophthalmic	Oncology, CVS, Polytrauma, Uro-genital and General surgeries	Orthopedic, Oncology, Urology, ENT, Cardiac, Hysterectomy, Ophthalmology	Medical treatment, Ophthalmic, Neurology, Infectious diseases, OBGYN

Sources: https://www.aarogyasri.org/ASRI/index.jsp, http://www.ilo.org/public/english/region/asro/bangkok/events/sis/download/paper18.pdf,http://cirm.in/images/panel-mass%20health-vijayakumar.pdf

II The Scheme

The RSBY scheme was launched in 2008 with the aim of protecting low-income households from the financial burden of hospitalization expenses. Several key features of the scheme were instrumental in addressing the challenges discussed in the preceding section of this paper. Some of these features are discussed in more depth in this section.

Premium Subsidies: The RSBY provides 100% premium subsidy to its beneficiaries, with the premium costs being shared between the central and state governments. The central government finances up to 75% of the premium while respective state governments pay the remaining 25%[13] . The premium is paid to the insurer selected for each district. With the willingness and the ability to pay insurance premiums being low due to the low insurance awareness of the target group, it was decided that the beneficiaries would only pay INR 30 as a one-time enrolment fee. This token amount would serve to enhance the feeling of community ownership among the target group.

Public-Private Partnerships: The RSBY is implemented through a Public-Private Partnership model. SNAs belonging to either the Department of Health (DoH) or the Department of Labour (DoL) of the state governments are appointed to implement the scheme.

[13] The ratio is 90% to 10% in the case of the North-Eastern states and Jammu & Kashmir

Each year, one insurer is selected for each district through a competitive bidding process. A technically qualified insurer with the lowest premium bid is selected. Insurers contract TPAs to issue biometric smartcards to the targeted BPL families, and to empanel a list of public and private hospitals that adhere to minimum standards of quality and capacity as specified by RSBY. The scheme partnered with ten insurers (who in turn have contracted 17 TPAs/ smartcard providers) to reach out to 24 million BPL households in all. TPAs specialize in the programme implementation, while insurers bring in much needed risk capital.

Using the capacity of existing hospitals (private as well as public) has helped the scheme achieve sizeable outreach (enrolments increased 30% from 2.46 million in year one to 3.16 million in year two in the 47 districts that completed two years of operations in May 2011). There are currently 8,686 empanelled hospitals, of which 6,148 are private and 2,538 are government hospitals (a ratio of 2.4 to 1), providing choice and better access to beneficiaries. We gather from anecdotal evidence that the requirements for being eligible for empanelment with RSBY have led to some hospitals upgrading their facilities. In its three years of operations, the scheme has gone through multiple iterations, and the PPP model has allowed it the necessary flexibility[14].

Targeting: The RSBY is targeted at BPL households, providing financing for healthcare to those who cannot afford it otherwise. It typically uses the official BPL list for enrolments[15], although the lists were developed in 2002 in most states. Operationally, the insurers, through TPAs, work with the SNAs to identify and enrol families from the list. To overcome the concerns of exclusions in this list, some state governments, like in Kerala, cover additional households that are deemed vulnerable according to the state. This approach may address concerns that the BPL list does not cover all low-income segments.

Identification: TPAs, sometimes partnering with NGOs or private media firms, conduct awareness campaigns in the communities. They coordinate with GPs[16] to identify and distribute tokens to beneficiaries for attending RSBY enrolment camps. TPAs are required to issue fingerprint-authenticated smartcards at the camps with a policy period of one year. Only those household members who are present at the camp can be enrolled. While the need for physical presence may exclude household members who are unable to attend the camps, the process reduces possibilities of identification fraud.

The Field Key Officers (FKOs) are government staff assigned by the SNA to monitor and oversee the process, and to authenticate each enrolment using their smartcards. This process helps in isolating errors and frauds in card issuance, and also creates greater accountability. Physical verification of beneficiaries against the BPL list, use of biometric authentication, and instant distribution of cards at the camps all serve to address the challenges of leakage and fraud.

Wide Coverage, Cashless and Portable: The scheme covers almost all procedures and pre-existing conditions, with no age limits. A maximum of five members per family are covered for a total sum of INR 30,000 (USD 667)[17] per year. An additional transportation

[14] Social protection programmes such as the Public Distribution System have shown that government implementation is fraught with inefficiency, leakages and comes at a high cost to the exchequer. The policy debate is leaning towards the government's role as a financier and monitoring body rather than as implementer. RSBY by leveraging the potential of PPP circumvented the need to create a massive national infrastructure for implementation of a new experimental scheme which may require multiple modifications.

[15] There are concerns about exclusion criteria in the 2002 BPL list. To overcome this, some states cover additional households that they consider poor.

[16] GPs are local self-governments at the village or small town level in India. Typically two or more villages are clubbed together to form a group gram panchayat when the population of the individual villages is less than 300

[17] At USD1 = INR. 45

allowance of up to INR 100 (USD 2.2) per visit is also covered by the scheme. Augmenting insurance with a transportation allowance further decreases the financial burden on the patient.

The smartcard is in effect similar to a prepaid card that empowers the patient at the point of service. RSBY mandates that usage by the insured is cash-free for the value stored in the card at any empanelled hospital. Theoretically, having a national network of empanelled private and public hospitals increases the options for the patient in addition to fostering competition and encouraging private hospitals to provide better service. Each hospital is required to have an RSBY desk equipped with a smartcard reader. The real time connectivity between the hospitals and the TPAs' (or insurers') database systems permit nation-wide portability of the card, thereby supporting the needs of the large and vulnerable migrant population of the country.

Record Keeping and Data Creation: The use of technology is not restricted to the front-end. All enrolments, patient admissions, procedures, and discharge details are uploaded to the RSBY central servers to aid real-time monitoring of the system, and to detect fraud. This also allows the creation of a massive health database with wide scope for application in social sciences as well as medical research.

Federated Scheme Management: RSBY is a scheme of the central government of India. The central Ministry of Labour defines the programme features, procedures, technology, data storage methods, and monitoring & evaluation, which are standardized across states. The SNA is responsible for implementation on the ground, targeting, facilitation, and monitoring, making it a collaborative scheme between the central and state governments.

These features of RSBY, combined with its massive scale and wide reach have enabled the scheme to have a major impact on not only its target audience, but the entire health insurance landscape in the country. An in-depth study and understanding of this programme will yield deep insights for other insurance and social protection programmes.

III Data and Study Methodology

RSBY data was obtained from two sources. Firstly, we used consolidated district level performance indicators of 229 districts that completed one year, and of 47 that completed two. This includes data on enrolments, premiums, and Conversion, Hospitalization, and Total Expense Ratios. Enrolment figures are believed to be approximations due to inaccuracies in the BPL list. However they are estimated to have a low margin of error, thereby permitting analysis[18]. Most overall performance indicators in this paper are from the 229 districts that completed one year. Where we measure the second year performance and compare it against the first year, we only use data from the 47 overlapping districts.

The 229 districts on which analysis has been performed make up one-third of the country. While the analysis provides us with an understanding of the on-ground scenario, it should be noted that not all districts in a state were covered by RSBY. Specific districts may have been selected due to their greater need for the scheme, or because the implementation mechanism is better in those districts. Hence the current areas of outreach of RSBY may not necessarily be representative of a nation-wide scheme.

To address this concern, we compared economic indicators, such as household income from secondary data, between RSBY and non-RSBY districts. We do not find differences that suggest that the 229 districts are significantly different from the remaining districts.

[18] Based on discussions with RSBY and World Bank teams.

Secondly, we used client level records[19] from the RSBY backend, which has enrolment and transaction data electronically uploaded by TPAs. This unit data contains information on client characteristics, utilization, procedures, hospitals, and claims from 3604 villages from 11 selected districts[20]. We present selected performance figures from these 11 districts for variables that do not exist in the district data set. This is for illustrative purposes only, since despite the large sample size, these districts are not representative of the entire country.

Secondary district level data on socio-economic and health characteristics was obtained from the NSSO 60th round unit level data (2004), and from the third round of the District Level Household Survey (DLHS) conducted in 2007-08 by International Institute for Population Sciences.

We use quantitative techniques[21] including regression analysis to draw correlations between KPIs and explanatory factors.

Empirical Strategy

Client Level Data

We aggregate unit level client data into village-level averages, and use the Tobit model for determining factors that influence scheme utilization at the village level. This is to account for the fact that large numbers of villages have zero utilization, possibly due to lack of hospitals nearby, lack of transport options, or even lack of accompaniers. The two-part model used in Duan, Manning, Morris & Newhouse (1983), and World Bank (2010) and the Heckman selection model were evaluated, but not used due to high collinearity between regressors, the Inverse Mills ratio in the second stage, and also because we find no theoretical premise to link the selection model with the second step of utilization as two distinct processes.

Due to the small number (11) of districts for which unit level data is available, we perform analysis using only programmatic control variables. We use programmatic variables averaged at the village level as controls, and include fixed effects for TPA, insurer and district.

The model is as follows:

$$Y_{id} = \acute{a}_i + \hat{a}*X_{id} + D1_d*DIST + D2*YEAR + D3_d*TPA + D4_d*INS + D5_d*POLICYDATE + \mu_d + \mathring{a}_{id} \ldots (1)$$

where the dependent variable Yid is the percentage of claims in village i including zero utilization; X_i is a vector of village level programmatic control variables in village i; *YEAR*, *DIST, TPA* and *INS* are time, district, TPA and insurer fixed effects; and *POLICY DATE* is a control for the time of launch of the scheme in the district, hence implicitly controlling for other policy level factors at play in the sequence of selection of districts. Error terms are correlated within districts, and also contain an idiosyncratic component. Standard errors are clustered at the district level.

District Data

District level data is used with district level control variables from secondary sources.

[19] Client names were deleted to preserve anonymity.

[20] These include Punjab (Hoshiarpur, Roopnagar, Moga, Sangrur), Uttarakand (Dehradun, US Nagar), West Bengal (Burdwan), Karnataka (Bangalore), and Kerala (Kasargode, Kannur, Wayanad).

[21] Refer to Appendix for regression outputs.

We use the following model:

$$Y_{is} = \acute{a} + \hat{a}*X_{is} + D1_s*STATE + D2*YEAR + D3_s*TPA + D4_s*INS + D5_s*POLICYDATE + \mu_s + \mathring{a}_{is} \quad \ldots \quad (2)$$

where Y_{is} is an outcome variable of interest such as Conversion or Hospitalization Ratio in district i in state S; X_{is} *is* a vector of district level control variables from secondary sources; *YEAR* is the fixed effect of the round (1st or 2nd) of the scheme; and *STATE*, *TPA* and *INS* are state, TPA and insurer fixed effects; and *POLICY DATE* is the date of launch of the scheme in the district to control for unobserved factors that determined or influenced when a district was selected. X_i optionally includes the lagged dependent variable to analyze those districts that have had two years of the scheme. μ_s and $\mathring{a}_{is}$ are error terms common to states, and idiosyncratic at the district level respectively. Control variables include demographics, socio-economic characteristics, amenities available, general public and health infrastructure, and morbidity and government schemes[22]. The household level control variables used were computed largely from DLHS data on BPL respondents.

The variation between outcome variables of interest is considerably more across states than within states. We use state level fixed effects to soak up state specific time-invariant effects that drive the district level outcomes, and to prevent omitted variable bias. We further use a fixed effect for time since some of the districts have completed year two, some of them have different insurers operating (though other control variables do not change), and the scheme has improved considerably due to the experience gained by the SNAs, insurers, and TPAs from previous rounds.

As is common in the literature, we cluster standard errors by state. From Cameron's (2007) survey of using fixed effects with clustering, we know that standard errors are downward biased even when using the standard Huber-White style robust errors due to the small number of clusters relative to the number of observations. Hence we do t-stat boot strapping to confirm inferences. We do not use multi-way clustering since the fixed effect for states is highly correlated to controls for TPA and insurer, and variation is largely explained by state clusters rather than by TPA and insurer clusters.

National Sample Survey Organization Data

National Sample Survey Organization's (NSSO) unit level data is used to generate some district level control variables. Due to the small sample sizes in NSSO, the margins for error are high. To obtain more precise estimates, we do Small Area Estimation using the Prasad-Rao technique for estimating standard errors (Rao, 2003) using Census 2001 data to "borrow strength".

We include statistics significant at the 90th percentile, since with a small number of observations (274) and a large number of dummy regressors, we lose close to 45 degrees of freedom.

[22] Only significant coefficients are reported in the Appendix.

IV Discussion of Findings

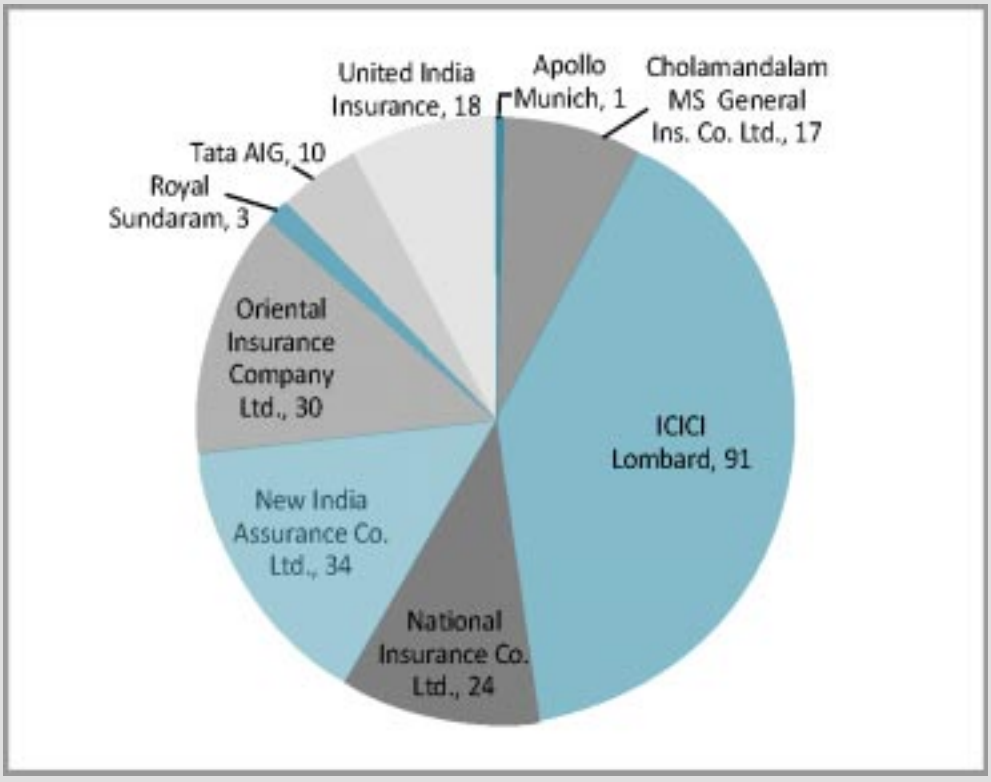
In this section, we discuss the performance of RSBY across years, analyze the trends observed in KPIs, and explain programmatic and environmental factors that influence them. The comparison of KPIs across years is done only for the 47 districts that have completed two years. Though these 47 districts are not representative of the entire programme, this analysis provides us with a sense of the overall direction. It is possible that an analysis of KPIs across years will yield different results once all 229 districts complete two years.

Performance Snapshot

We present the performance of RSBY using district-wise data on the completed yearly policy periods as on May 2011.

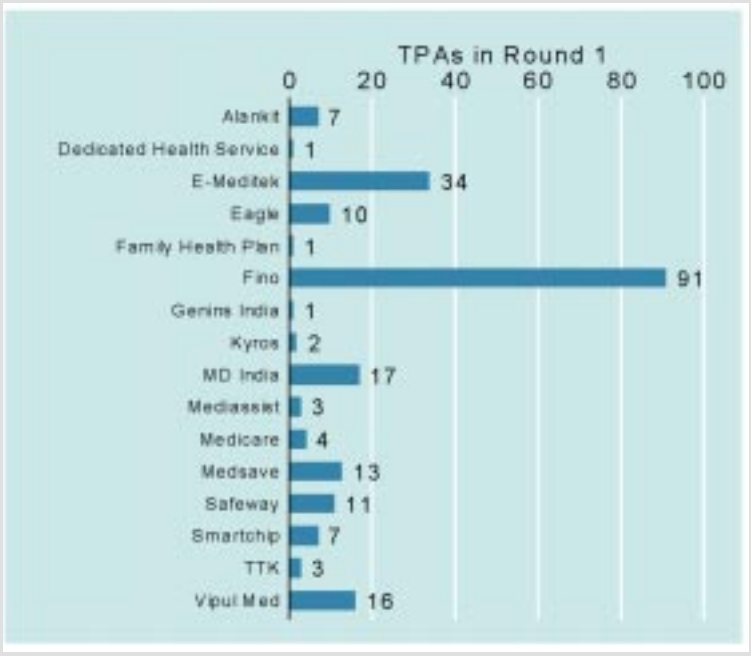
Since its inception in 2008, the scheme has completed one year in 182 districts (out of a total of 640 districts in India) in 22 (out of 35) states, while another 47 districts have completed two years of operation. A total of 18 million BPL families adding up to 47 million individuals have been insured, and a total of INR 10 billion (USD 220 million) has been paid as premium by the government. Insurers have paid out close to INR 6 billion (USD 130 million) for 1.47 million hospitalization cases, and INR 2.9 billion (USD 64 million) for smartcard issuance expenses. The average amount per claim was INR 4,480 (USD 100).

Figure 1. **Number of Districts per Insurer – Year 1**



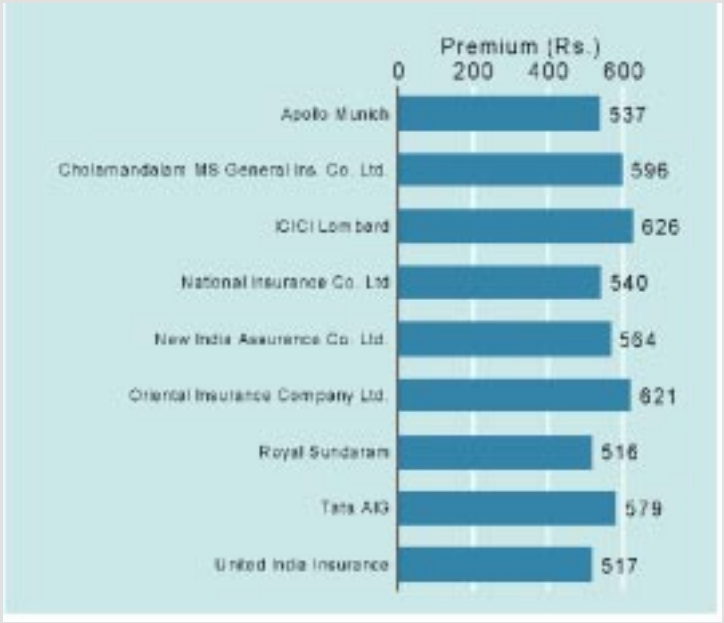
Nine[23] insurers, including four public sector insurers - New India Assurance, Oriental Insurance Company, National Insurance Company, and United India Assurance - bid in the first year of operations in each district. Three of the nine - ICICI Lombard, New India Assurance and Oriental Insurance Company - accounted for about 75% of the districts covered. Of the 17 TPAs servicing the scheme, FINO (91) and E-Meditek (34) are the largest in terms of number of districts covered, followed by a number of others operating in fewer districts. Insurers often partner with different TPAs depending on the region.

Figure 2. **Number of districts by TPA – Year 1**



Premiums ranged between INR 331 (USD 7.4) and INR 697 (USD 15.5) depending on the district.

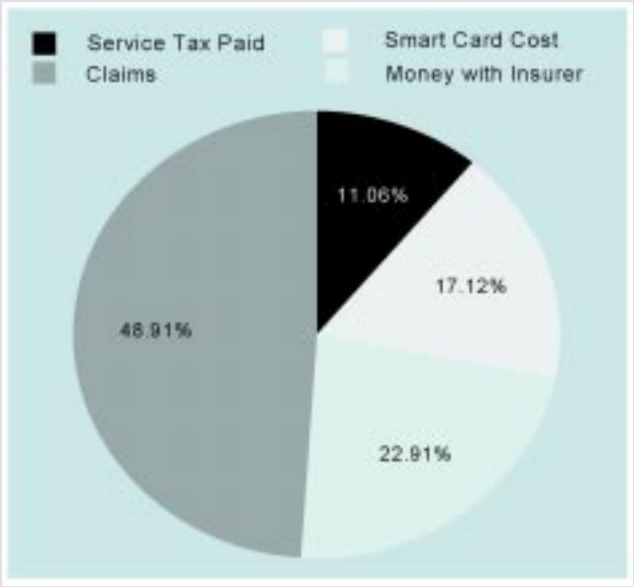
Figure 3. **Average Premium per Insurer – Year 1**



[23] This rose to ten in the 47 year two districts

Figure 3 presents the break-up of the financials. Out of the total premium paid in year one, the share spent on claims was 49%, smartcard costs accounted for 17%[24], and service tax was 11%, leaving the remaining 23% with the insurer. The scheme was profitable for insurers in year one, though profitability dropped significantly in year two as seen from the trends in expense ratios.

Figure 4. **Break-up of Premium – Year 1**

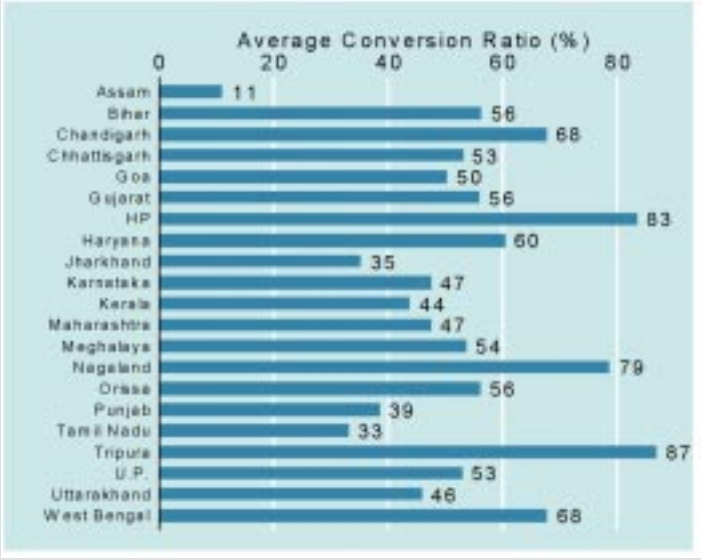


Conversion Ratio

Conversion Ratio (ratio of number of households enrolled to total number of eligible BPL families per district) is an indicator of the depth of reach of the programme. Overall Conversion Ratio in year one was 51.2%.

There is significant variation across districts and states. It ranges from over 80% in Tripura and Himachal Pradesh to less than 35% in Assam, Jharkhand, and Tamil Nadu. There are significant district level variations – ranging from 10% to 92% with the median at 53%.

Figure 5. **Conversion Ratio by State – Year 1**



[24] Smartcard issuance costs are estimates provided by MoLE. Actual costs per company may be lower.

The female to male enrolment ratio was low at 59% in year one, but rose to 80% in year two. Data from secondary sources reveal that this ratio is not correlated to the actual gender ratio of the BPL population in the districts. An examination of the RSBY BPL list (generated prior to enrolment) in the 11 selected districts reveals a female to male ratio of 46%, implying that fewer females than males were eligible to enrol in the first place. Data errors in the BPL list notwithstanding, although the BPL household list may be modified by the SNA and further updated during enrolment based on the actual members residing in the household at that time, the skew in the BPL list towards males might partly explain the low female-to-male enrolment ratio.

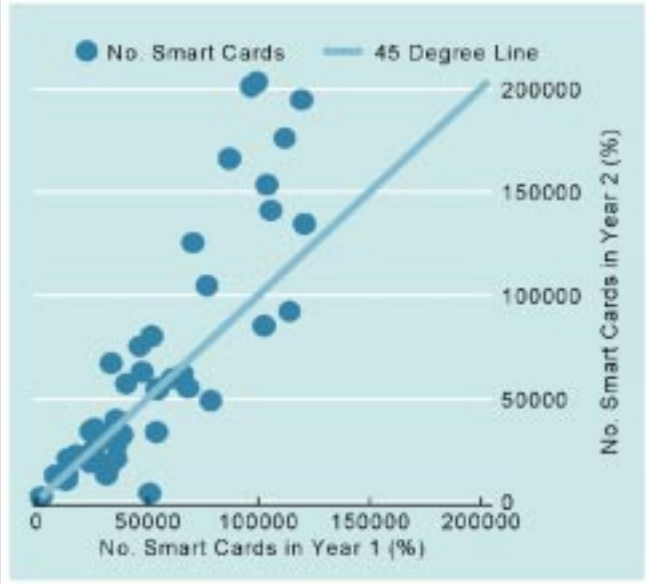
Factors Influencing Conversion Ratio

We would theorize that the Conversion Ratio is determined by the implementation capacity of the SNA and GPs; the accuracy of their BPL lists; the premium amounts and incentive structures of the TPA and insurer; efficacy of the scheme's awareness campaigns; and physical accessibility of the villages. The factors influencing conversion from the customers' perspective are attitude towards government schemes; interest in insurance; and historical morbidity and hospitalization rates.

Comparison of Conversion Ratio between Years One and Two

The number of families enrolled[25] has increased from 2.46 million in year one to 3.16 million in year two for the 47 districts used in this analysis.

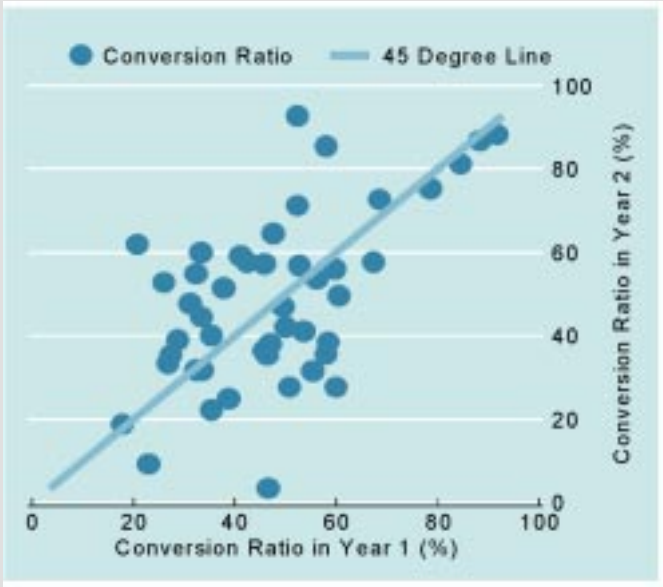
Figure 6. **Number of Smartcards Issued – Year 1 & Year 2**



This can be partly explained by a rise in the number of families targeted, as well as a rise in the Conversion Ratio. The number of households targeted in the 47 districts has increased from 5.74 million in the first year to 6.32 million in the second due to revisions to the BPL list, and due to the additional inclusion of non-BPL families to the programme in some states. The Conversion Ratio has also increased from 43% to 50%. Figure 7 compares Conversion Ratios from year one with year two. While there is statistical correlation between the outcomes in the two years, a matter for concern is that 21 districts have lower Conversion Ratios in the second year.

[25] The terms number of cards and number of families covered are used interchangeably since each family gets one card except in a few cases of split cards, where the value of the card is divided into two cards for the benefit of migrant members of a household

Figure 7. **Conversion Ratio – Year 1 & Year 2**



Interviews with Selected TPAs and Insurers

In this section, we summarize interviews with selected TPAs and insurers to understand operational factors that influenced conversion rates.

Firstly, the BPL list prepared by the SNA should be accurate and complete. BPL lists, in most states, were last updated in 2002 and hence, large numbers of people may have died, migrated, or not been recorded. Some erstwhile BPL citizens may have graduated economically, and hence may prefer to opt out of a scheme targeted towards a lower income group. The high rate of migration among the target population also made it difficult to track down beneficiaries. Secondly, awareness about the scheme must be generated amongst the target population. Typically, TPAs work with the local GPs to generate awareness and run camps in the villages. They undertake initiatives like public announcements, street plays, etc., in the village. Some TPAs enlist local organizations such as *Kudumbashree*[26], or train local people like Accredited Social Health Activist (ASHA) workers. Some insurers like ICICI-Lombard also employ professional marketing firms to conduct awareness campaigns.

Cooperation of the SNA is vital. Enrolments can be done only in the physical presence of FKOs assigned by the district administration to validate each enrolment using smartcards. Given their critical role in the enrolment process, incentivizing them for each enrolment is likely to influence conversions favourably.

Enrolment being a time and effort intensive process, the strength of TPA staff on the ground, and their ability and commitment were basic drivers of its success. Further, sound MIS systems and well-defined processes would have made the activity more efficient. Some TPAs outsourced the issuance of cards to other vendors, further reducing their control over Conversion Ratios. Not only does the quality of the TPA staff matter, but their size (especially the permanent staff that moves from district to district) also plays an important role in improving efficiency. Furthermore, the scheme stipulates that the smartcards be printed at the camps, making it necessary to have sufficient capacity to service all enrolees

[26] ASHA is Accredited Social Health Activist, a village resident trained as part of the National Rural Health Mission to be the interface between the community and the health system. *Kudumbashree* is the Kerala State government's Self Help Group programme.

who attend camps in reasonable time. TPAs also felt that they could achieve better conversion rates in subsequent years in the same districts due to the familiarity and experience gained in the preceding years, if they were contracted for longer terms in a given district.

Finally, the provisions of the contract between the insurer and the TPA, and the compensation structures defined therein played a key role in improving their performance. The incentives paid for each enrolment to TPAs and to other vendors influenced their efforts to maximize Conversion Ratio since marginal cost per enrolment is not likely to remain constant for the duration of the camp. However, larger TPAs might view RSBY as a long-term business opportunity, and bear a reputational risk in which case their Conversion Ratios might not be as sensitive to incentives on each enrolment.

It should be noted that the enrolment periods varied between year one and year two, which may also have influenced Conversion Ratio, although the TPAs interviewed do not consider this a significant factor. Some TPAs believed that larger districts should have two phases of enrolments with a longer duration for each.

In terms of demand factors, the mentality among rural communities was that a government scheme should include a cash transfer for it to be seen as valuable enough to enrol. Understanding the value of the scheme is important, particularly if the head of the household is not present at home, requiring the spouse or other household member to communicate the details of the scheme to them. Physical access to the site of the enrolment camp is also important, not only for the beneficiaries, but also for the TPA staff.

Key Factors

The factors best correlated with Conversion Ratio are all supply side factors, except two. As regards demand side factors, we would expect that districts with higher historical hospitalization rates would have higher demand, and hence better conversion. However, we do not find strong evidence to support this hypothesis.

Role of Government Oversight

Even in a PPP model, the capacity of the government to oversee the implementation impacts outcomes. Typically, a TPA in the first instance informs the local GP about the scheme, shares the BPL list, and seeks their support for the enrolment process. The SNAs provide oversight, liaison and monitoring of the entire process. Often, the camps are held in the GPs, indicating the importance of their role in conversions. We use the number of times the GP meets in a year (as reported in the DLHS village survey) as a proxy for the effort that it expends. We average the number across the GPs in a district to create a district level indicator. We find that districts where the GPs met more often are also the districts with higher Conversion Ratios. It is useful for the SNA to take note of this, perhaps with a view to designing incentives for the GPs as well.

Table 2. **Conversion Ratio and GP Meetings – Year 1**

Quartile of number of GP meetings per year	Conversion Ratio (%)
Lowest	49.9
2	53.9
3	57.1
Highest	69.4

Conversion Ratio is lower in states where the SNA is with the Department of Health (DoH) (51%), compared to the states where it is with the Department of Labour (DoL) (55%). It is believed that the DoL is better placed to implement RSBY due to its better ability to coordinate with the central Ministry of Labour and Employment (MoLE), which administers the scheme. However, this difference (not statistically significant) should be investigated further, as it may be a consequence of other state and district variations.

Finally we also find correlations between Conversion Ratio and the World Bank's Doing Business Index for a state, providing suggestive evidence that the prevailing business environment facilitates the enrolment process.

Table 3. **Conversion Ratio and Doing Business Index – Year 1**

Quartile of % Doing Business Index	Conversion Ratio (%)
Lowest	50.2
2	48.8
3	55.5
Highest	57.2

Administrative Challenges: Conversion Ratios and Number of BPL Families per District[27]

There is large variation in the number of BPL families in each district, ranging from as low as 3,000 to as high as 500,000. There is a negative correlation between the number of BPL families and conversion. While the average Conversion Ratio is 55% for the top two quartiles by number of BPL families, it comes down to 50% for the bottom half. We further find that Conversion Ratio is negatively correlated to the geographical size of the district, but not correlated to the remoteness of the villages, population, or socio-economic characteristics of the district. This may be because it is more difficult for the TPA to manage a larger district operationally, due to longer wait times in more crowded camps, or because bigger districts are more spread out thereby increasing transportation costs for the TPA to cover more remote beneficiaries.

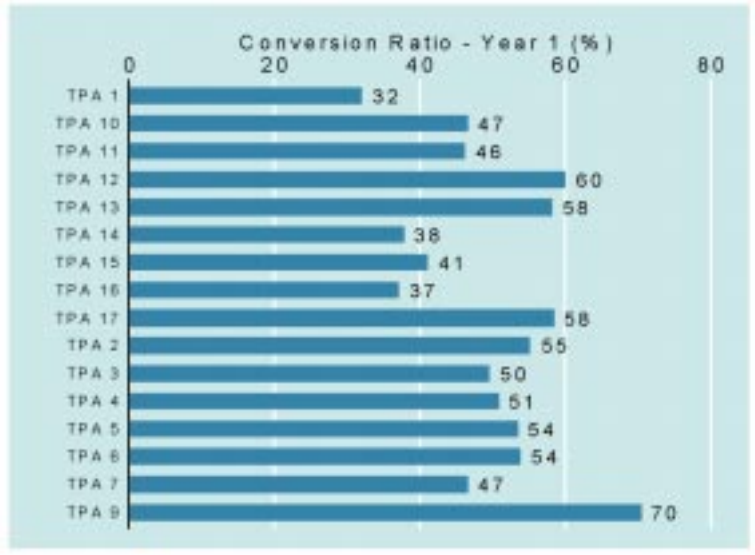
There is a case for subdividing districts with a larger enrolment base, or to put in place other policies to improve the technology and business processes to increase conversion rates in districts with large numbers of BPL families. However, we note that these districts may be harder for the local government to administer in general, which may have led to more mistakes in the BPL list, thereby affecting conversions.

[27] Refer to Sun (2010) for findings on conversion rates and village size.

Economies of Scale of TPAs and Insurers

Comparison of Conversion Ratios for TPAs and/or smartcard providers reveals that it ranges from 32% in the case of Alankit, to 70% for Kyros (a smartcard provider). We find that the choice of TPA, and hence their ability and effort, matters more than the choice of insurance company.

Figure 8. **Conversion Ratio by TPA – Year 1**

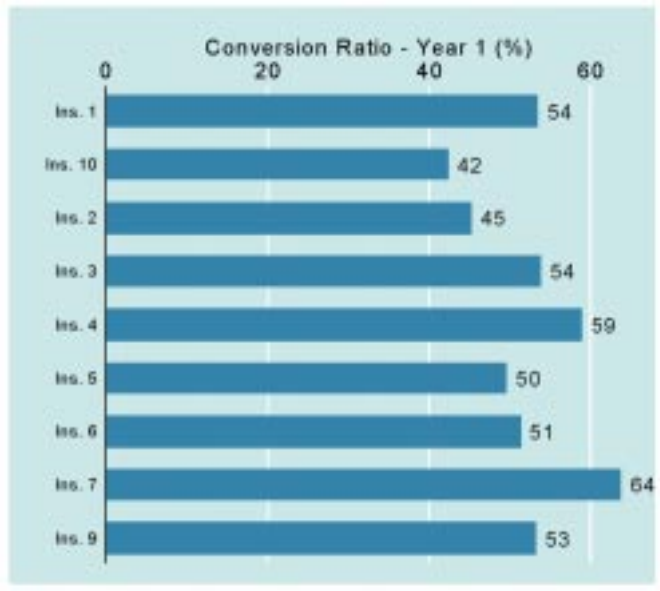


We would expect TPAs or insurers that have won contracts for a large number of districts in a state to have better conversion due to more experience in operating in the region, economies of scale, and lower cost of travel from one district to another. However, we do not find strong evidence to support this assumption. We find instead that TPAs that have a larger national presence in terms of number of districts awarded have slightly higher Conversion Ratios at 55.7% compared to the rest at 52.8%. This may be due to investments that have high set-up costs such as MIS systems, which improve overall efficiency of enrolments.

Currently, the SNA is contracted only with the insurer, allowing them little direct leverage on the TPA, or ability to set appropriate incentives for them. It appears that contracting directly with specific TPAs, and reducing situations where TPAs in turn contract third party vendors for enrolments may influence conversions favourably.

Figure 9:

Conversion Ratio by Insurer - Year 1



Conversion Ratios and Previous Year's Hospitalization Ratios

We compare Conversion Ratio in year two with Hospitalization Ratio in year one, with the premise that word-of-mouth and recommendations by people who have utilized the scheme from one's social network will increase interest in enrolment for the next policy period. We find significant correlation after controlling for initial conditions, such as Conversion Ratio in the first year, and other identified explanatory variables. This partly explains the drop in Conversion Ratios for the second year in a large number of districts.

While this may reflect a typical process of adoption and diffusion of a new scheme, this staggered adoption may also be partly due to lack of familiarity with the concept of insurance. This finding is consistent with the thinking that the rural insurance market has to be developed over a period of time. The on-the-ground enrolment process of RSBY, along with rising usage by beneficiaries will help increase insurance awareness among BPL households, and make the market more receptive for private insurers to offer other insurance products in the future. The creation of a large-scale actuarial database through RSBY will help insurers design better products and make more accurate market assessments.

Table 4.

Conversion Ratio and Year 1 Hospitalization Ratio – Year 2

Quartile of % Last year's Hospitalization Ratio	Conversion Ratio (%)
Lowest	41.9
2	39.5
3	48.4
Highest	63.7

Explaining the Outliers

We isolate selected factors that best explain why some districts have very high or very low Conversion Ratios.

Table 5. **Variation in Conversion Ratio and Key Explanatory Factors**

	Year - 1	Year - 2		
Range of Conversion Ratio	**No. of BPL families by 1000**	**No. of times GP met in a year**	**% of children's sickness**	**Hospitalization Ratio in Year 1**
CR < 21%	142	2.9	30	3.3
21%<= CR < 80%	128	2.8	29	3.6
80%<= CR	50	3.2	42	5.8

Table 5 presents averages of the most relevant explanatory factors by range of Conversion Ratios in three brackets – districts with Conversion Ratio less than 21%, from 21% to 80%, and finally, above 80%. In year one, the number of BPL families targeted is substantially negatively correlated to the Conversion Ratio, while activity of the GP, the high percentages of children's sicknesses, and Hospitalization Ratio in the previous year best explain the outcome in year two.

Gender-wise Comparison of Enrolment & Utilization

Female to male enrolment ratio has improved to 80% in year two from 59% in year one. The Hospitalization Ratio in year two among males (6.6%) is higher compared to the female Hospitalization Ratio (5.7%). This data when compared to year one (3.9% male hospitalization vs. 4.4% female hospitalization) hints at a normalization of hospitalization trends over a longer period of time.

Hospitalization Ratio

Hospitalization Ratio[28] was 2.4% in the 229 districts that completed one year. To place the figure in perspective, we must note that the hospitalization rate as per the National Sample Survey Organization (NSSO) in 2004 was 1.7% for the bottom two quintiles by income (Hou & Palacios, 2011), though this figure includes those with health insurance (which in any case is very low). Further, we note that the all India rate for all income groups is 2.7%. While the true population ratios may have changed since 2004, prima facie, it appears that RSBY is enabling people to undergo hospitalization more than they could have afforded to in the absence of the scheme. Overall in year one, hospitalization was higher among women (2.51%) compared to men (2.34%) although the Conversion Ratio is lower for women. This is contrary to historical rates as per NSSO, where men have marginally more hospitalization incidences than women.

A simple comparison of claims behaviour in year one and year two in 11 districts is shown in Table 6. Our hypothesis is that, all other things being equal, there would be more pent-up demand for RSBY in year one by some low-income households who postponed procedures identified through past diagnosis because they could not afford it. This "pent-up", but not necessarily total, demand should reduce in year two since the number of new

[28] Hospitalization Ratio - the ratio of the number insured to those who claimed at least once

enrolments in year two is expected to be small. Hence, we would expect a higher fraction of year one claims to occur earlier in that year compared to year two, if there were no teething problems which prevented hospitals from providing service during the early days of the scheme.

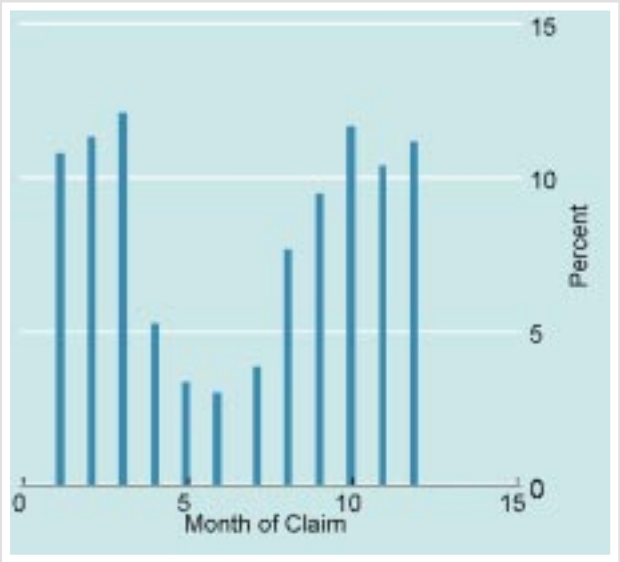
Table 6. **Quarter of Occurrence of Claims in 11 Selected Districts**[29]

Year	Claims break-up by quarter				
	Q1	Q2	Q3	Q4	Total
1	11%	24%	25%	40%	100%
2	4%	15%	32%	49%	100%

While the comparability of year one and two figures representing different districts is limited, we note that while 35% of the claims in year one occurred in the first two quarters, this reduces to 19% in year two. The average number of days between enrolment and claims is 192 in year one compared to 248 in year two, suggesting that the scheme is permitting people to undergo procedures which may have otherwise been postponed or not undertaken at all.

We also notice seasonal trends in hospitalization. There is a marked drop in utilization from April through August, coinciding with the rainy season as can be seen from Figure 10. Though one expects higher morbidity rates during rains, this drop may be due to pre-occupation with sowing and related activities in farms.

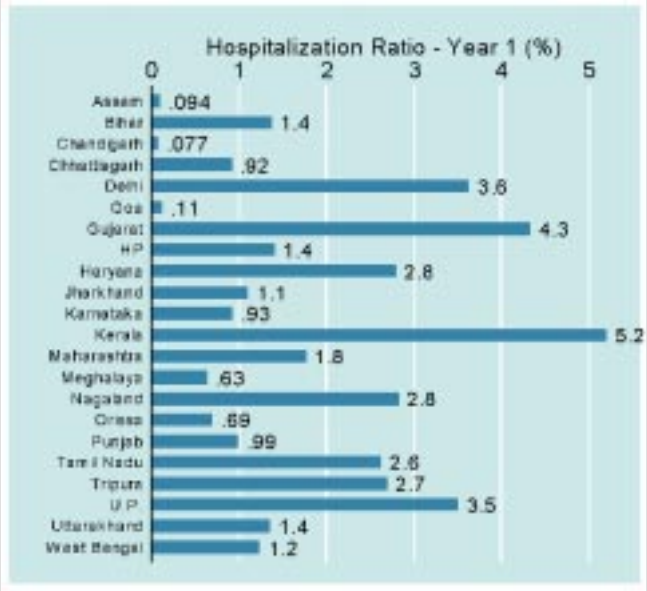
Figure 10. **Month of Claim in 11 Selected Districts – Year 1 & Year 2**



[29] Figures and tables represent district data from all districts unless specified as from 11 selected districts.

There are large variations in hospitalization between states, ranging from 5.2% in Kerala to less than 0.1% in Assam and Chandigarh. Controlling for states, the choice of TPA or insurer seems to matter less in determining Hospitalization Ratios[30], suggesting that other state and district level characteristics explain this variation more, as we will see in detail later in this section.

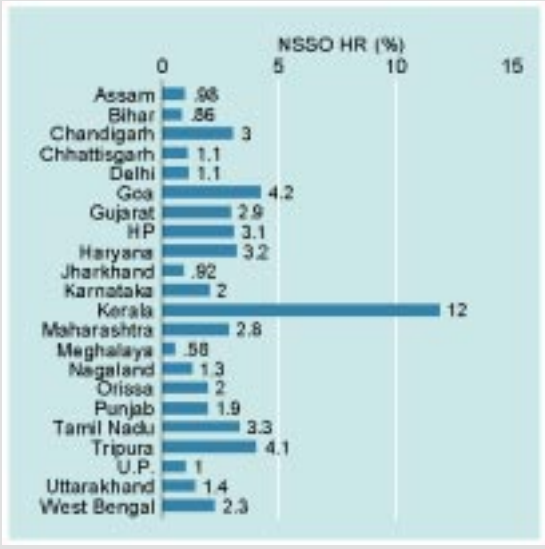
Figure 11. **Hospitalization Ratio by State – Year 1**



Even between districts in a state, there are large variations ranging from 0.07% to 17.4%, with the median district at 1.74%.

However, this is to be expected since the NSSO also throws up large variances in Hospitalization Ratio suggesting that some districts are historically more prone to hospitalization than others.

Figure 12. **NSSO Hospitalization Rates by State (2004)**



[30] Note that our analysis is based on claims approved by the TPA and does not include rejections.

Procedures

The most commonly occurring procedures named in the database (in 11 selected districts) are urogenital (33%), gastro-intestinal (11%), delivery (7%) and ophthalmic (6%).

Table 7.

Diagnoses

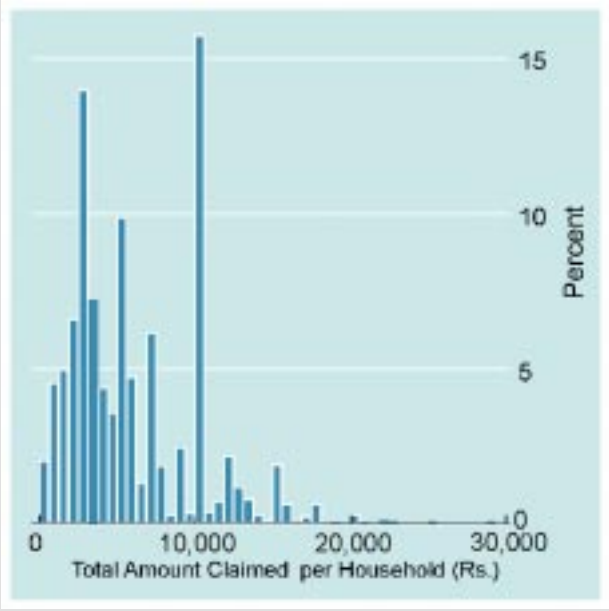
Diagnosis	Percent
Urogenital	33.4
General Medicine	16.6
General Ward (Non-surgical)	11.6
Gastrointestinal	11.2
Delivery	7.2
General Surgery	6.8
Ophthalmology	6.0
Orthopedics	2.5
ENT	2.3
Respiratory	0.8
Oncology	0.7
Cardiovascular	0.7
ICU	0.1
Nephrology	0.1

Amounts Claimed

The average amount claimed was INR 4,480 (USD 99.6) in year one, compared to the NSSO average expense per person per year for hospitalization, which is INR 4,730 (USD 105) for the two lowest quintiles by income.

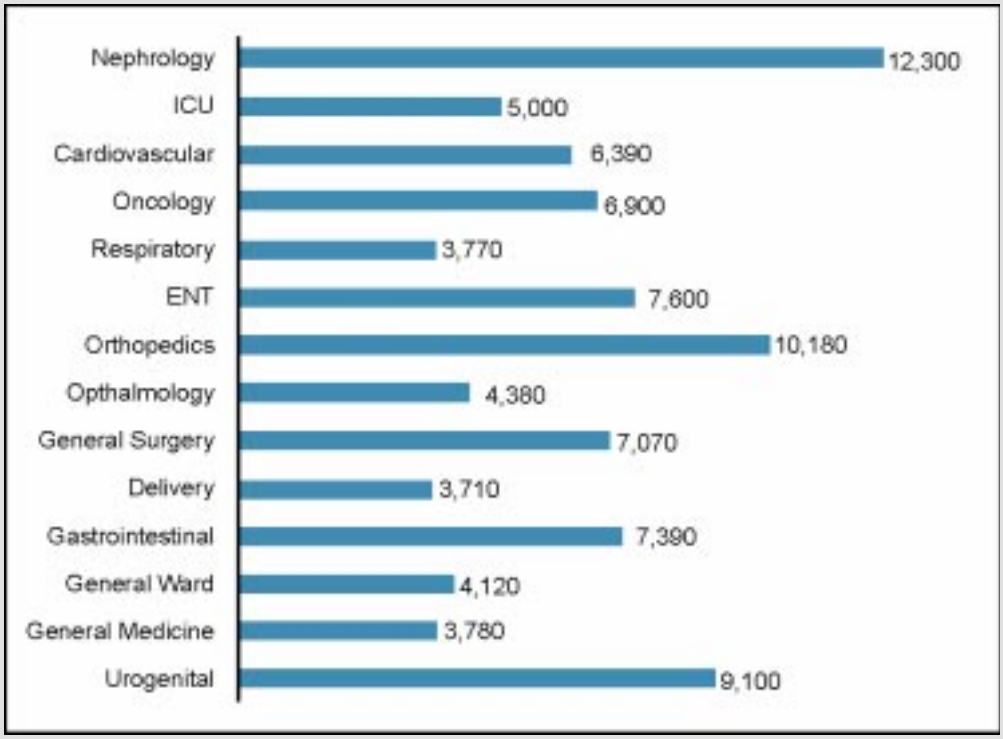
Figure 13.

Amount Claimed (in INR)



We see that very few families in the 11 selected districts have used the maximum cover. The most commonly claimed amounts are INR 10,000 (USD 222) followed by INR 3,000 (USD 67). The average amount claimed for women is higher at INR 8,057 (USD 179) than for men at INR 6,260 (USD 139). Prima facie, this suggests that the sum assured is not too low for most of the population.

Figure 14. **Amounts Claimed by Procedure Type (INR)**



The most expensive procedures are in the departments of Nephrology, Orthopaedics, and Urogenital.

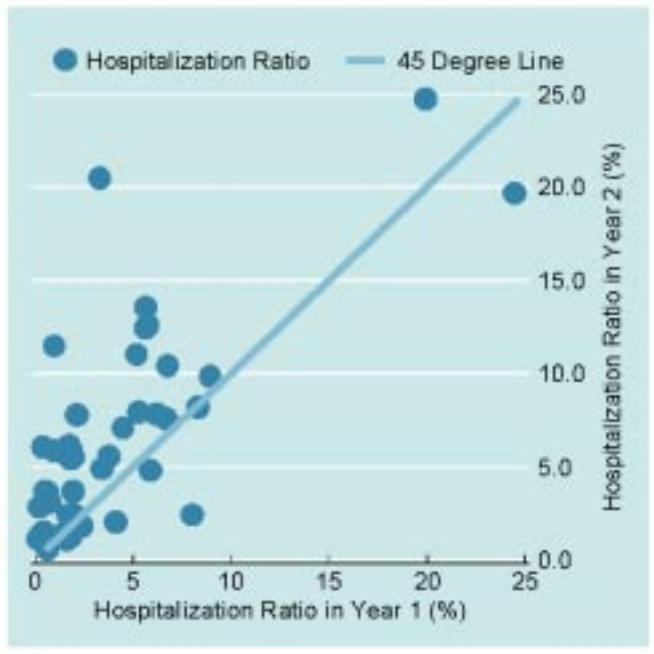
What Explains Hospitalization Ratio?

We theorized that historical hospitalization and morbidity rates, access to good amenities, preventive practices, income and education levels, access to good primary care, and quality of hospitals would play a part in influencing hospitalization rates and amounts claimed.

Comparison of Hospitalization Ratio between Years One and Two

Hospitalization Ratio has increased from 4.1% in year one to 6.3% in year two. This increase occurred in 36 out of the 47 districts as can be seen in Figure 15. Nine districts have Hospitalization Ratios of 9.9% or higher, with the highest being 25% in year two. This is up from 5 districts with Hospitalization Ratios higher than 9.9% in the first year. The districts with the high Hospitalization Ratios are in UP, Gujarat and Kerala.

Figure 15. Hospitalization Ratio – Year 1 & Year 2



Interviews with Selected TPAs and Insurers

Based on our interviews with TPAs and insurers, we list the factors that they believe are important based on their field experiences.

Awareness of the scheme as propagated through NGOs, and campaigns undertaken through marketing firms at the time of enrolment plays a part. It is believed that people are more likely to use hospitals within a 10 km radius of habitation. This may explain higher usage in the more urbanized district headquarters where there are more hospitals. Hence proximity matters, as does having an adequate number of empanelled hospitals. The quality of smartcards will affect their durability and longevity, and ensure that they work smoothly at the point of care. In some states like Kerala it is believed that people in hilly areas have lower propensity to get hospitalized compared to coastal areas.

On the government side, the department that constitutes the SNA (DoH or DoL), and good coordination with the central MoLE are important factors that impact hospitalization.

Finally, fraudulent claims may also be a factor. In fact, while private hospitals have more utilization, it is not clear what percentage of this is due to frauds. Insurers should be given the authority to de-empanel hospitals that are found to be involved in fraud.

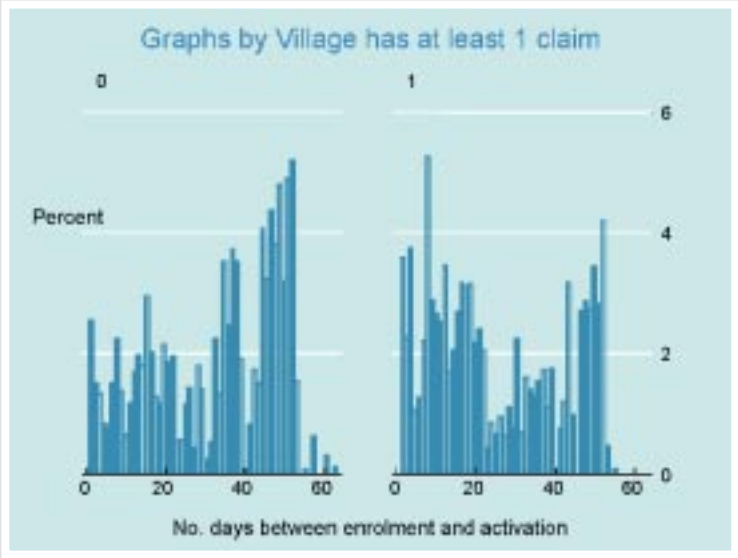
Key Factors

Immediate Issuance of Cards

Immediate, on-the-spot verification and issuance of cards is a factor that influences successful enrolment. RSBY stipulates that all cards have to be issued on-the-spot during enrolment, and that the policy period would start on the first day of the month following the month of enrolment. The card is active for use at hospitals from the start of the policy period. However, cards were not always issued at the enrolment camps on the same day. There were cases where there were delays in issuance and actual activation of the card. The typical reason was that more beneficiaries turned up for a particular enrolment than was planned for by the TPA, resulting in shortage of card printing capacity. Operational reasons including unavailability of the FKOs may also lead to delays in card issuance.

We find that the time delay between enrolment and card issuance decreases the probability that there will be claims in a village, while the delay between enrolment and card activation decreases the percentage of claimants in that village.

Figure 16. **Claims and Delays in Card Activation**



From Figure 16 we see that the villages that have at least one claim have a higher percentage of cards activated within the first 20 days of enrolment. Further, we find that claims behaviour is sensitive to this delay. The average number of days of delay in card issuance in villages without any claims is 24 days, while it is 21 in villages with at least one claim. It may be the case that for some households, immediate card issuance and activation is important to increase their propensity to use it. It could also be that the TPA or NGO may be more available to answer queries about usage to those to whom the card was issued at the camp, aiding subsequent usage. Also possible is that delayed cards fail to reach the intended beneficiary. Moreover, the delay in card issuance could also be a proxy for other indicators of poor programme implementation that dissuade utilization, such as poor awareness campaigns.

Usage of Primary Care

There is a negative correlation between the percentages of people using Primary Health Care (as derived from the DLHS data set, 2006) and RSBY hospitalization rates, controlling for other factors that affect hospitalization such as income, historical morbidity rates, sanitation practices, and quality of amenities. All other things being equal, a district with 1% higher usage of primary care (as per DLHS) has 0.03% fewer hospitalizations. This suggests that people with lower access to primary care are failing to treat some illnesses in time, culminating in hospitalization, or that outpatient cases are being escalated to hospitalization in order to claim under the scheme, or that the PHCs in a given district are of low quality, leading to people seeking treatment elsewhere. This preliminary finding merits further research. A cost-benefit analysis of the investments in increasing usage of preventive care and hospitalization is worth conducting to justify expansion of coverage of the scheme to include primary care.

Table 8. **Hospitalization Ratio and Primary Care Usage - Year 1**

Quartile of PHC usage	Hospitalization Ratio (%)
Lowest	3.1
2	2.2
3	2.1
Highest	2.0

Moreover, access is not the same as usage. We find no correlation between the mere presence of primary facility in a village and utilization, suggesting that accessibility does not imply usage. Awareness campaigns to encourage people to use primary care may help in reducing hospitalization rates. However, we fail to find any links between good hygiene and other amenities such as clean water, sanitation, and good housing, and Hospitalization Ratios.

Role of Awareness in Utilization

It is acknowledged within the sector that education is positively correlated to insurance literacy, which in turn is correlated to usage. We find a positive relationship between literacy rates (and educational attainment) and Hospitalization Ratios. All other things being equal, a district with 1% higher literacy rate within the BPL community has 0.08% higher usage. There is no evidence that this correlation is driven by other economic characteristics such as income. Enrolled families are given written information about empanelled hospitals and scheme utilization. This information can be put to better use by those who are more literate.

This has two policy implications. First, increasing awareness and understanding of the scheme will improve its usage. Second, if literacy (and hence understanding of the scheme and usage) matters even for a (almost fully) subsidized scheme, then we can reasonably expect less take-up if the sector graduates to a market-based model as users would not pay for a product they do not understand. Hence, this supports the usefulness of high subsidies in this scheme, at least in the early years.

Role of Private Hospitals

Insurers empanel a set of public and private hospitals in each district. Expectedly, the Hospitalization Ratio is higher in districts with higher number of empanelled hospitals per capita, suggesting that proximity and accessibility leads to higher usage.

Table 9. **Hospitalization Ratio and Number of Empanelled Hospitals per District - Year 1**

Quartile of empanelled hospitals per 1000 enrolled	Hospitalization Ratio (%)
Lowest	3.15
2	3.00
3	2.95
Highest	4.10

Further, Hospitalization Ratio is higher where the percentage of private hospitals is higher. The average Hospitalization Ratio is 2.3% in the bottom half of districts by percentage of private empanelled hospitals, and 2.5% in the top half. Two factors may be at play here - firstly, patients might perceive private hospitals to provide better quality of care and hence prefer to get treated there, and secondly, hospital incentives are structured differently for private and public hospitals. While the amounts claimed under RSBY is reimbursed by the insurer directly to all the empanelled hospitals, private hospitals are free to reallocate 100% of the amount for expenses like staff wages, while public hospitals are restricted to using only 25% for staff incentives. Hence, private hospitals are more incentivized to treat RSBY patients. Another reason could be that public hospitals may not have sufficient consumables, and diagnostic and other infrastructure needed to conduct many medical procedures.

Two-thirds of Villages have no Claims

Utilization is not uniform across villages. Close to two-thirds of the villages (in the 11 districts for which client level data was obtained) do not have any utilization at all. This is much higher than the data from NSSO 2004, according to which only 4% of the villages had no hospitalization in the year preceding the survey. Hence, the high rate of non-utilization appears to be due to programmatic issues, and is not an indication of lack of demand. This finding is consistent with Sun (2010).

The probability that a village had at least one claim is higher when the size of the village is larger, and the number of days of delay between enrolment and cards issuance and activation is lower. The average population of a village with no claims was 246 compared to 421 in a village with at least one claim. While the reason for this is not obvious, we hypothesize that smaller and more remote villages would have had less efforts placed on awareness campaigns, and also that a larger village has a higher chance that there will be a pioneering user who will in turn make it more likely that others will utilize. Further, smaller villages are more likely to have worse connectivity to hospitals, and therefore potential patients need to incur higher upfront transportation costs, thereby dissuading usage.

Explaining Outliers

We divide districts into three groups - with Hospitalization Ratio less than 0.5%, between 0.5% and 9.9%, and above 9.9%. We isolate selected factors that are best correlated to the very high and very low values of Hospitalization Ratio in year one and year two.

Table 10. **Variation in Hospitalization Ratio and Key Explanatory Factors**

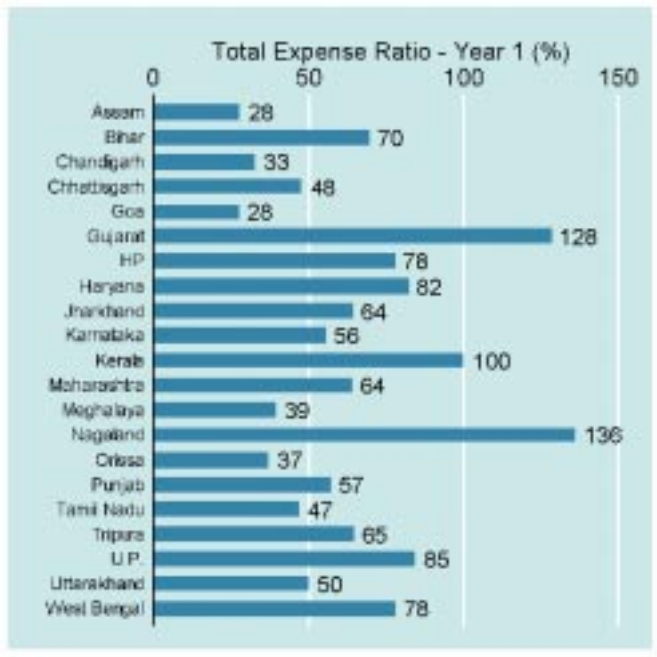
	Year 1		Year 2
Range of Hospitalization Ratio	**Hospitals per 1,000,000 enrolled**	**% Private hospitals**	**Hospitals per 1,000,000 enrolled**
Hospitalization Ratio<= 0.5%	0.263	0.53	
0.5%< Hospitalization Ratio< 9.9%	0.407	0.65	0.329
9.9%<= Hospitalization Ratio	0.730	0.76	0.650

We see from Table 10 that districts with high Hospitalization Ratios in year one and two have a higher number of hospitals per capita, while year one also has higher percentage of private hospitals. This is consistent with the opinion that accessibility to hospitals drives Hospitalization Ratio, and that frauds are more likely to occur with private hospitals due to the incentive structures.

Total Expense Ratio

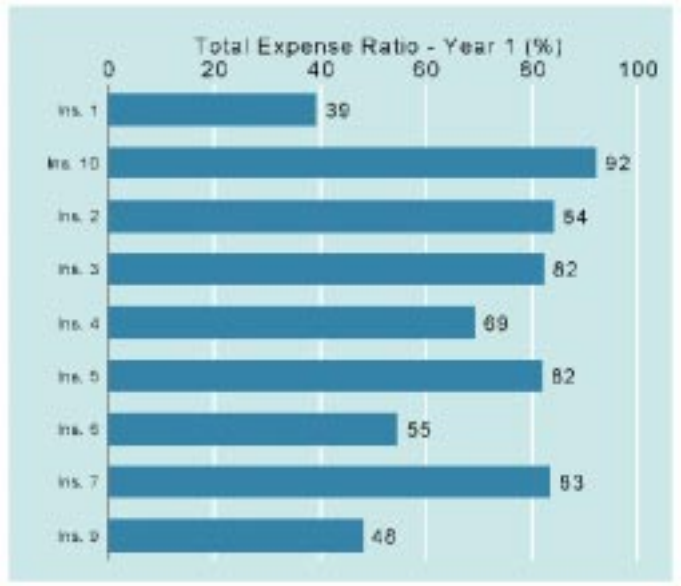
Year one was profitable for insurers with an average Total Expense Ratio of 77%, implying that 23% of the total premium remained with the insurer after expenses. There are however large variations between states (ranging from 28% in Assam and Goa, to 136% in Nagaland), between districts, and between insurers (from 39% to 92%).

Figure 17. **Total Expense Ratio by State – Year 1**



[31] Ratio of sum of total claims paid out plus cost of smartcards and taxes to total premium collected.

Figure 18. **Total Expense Ratio by Insurer[32] - Year 1**



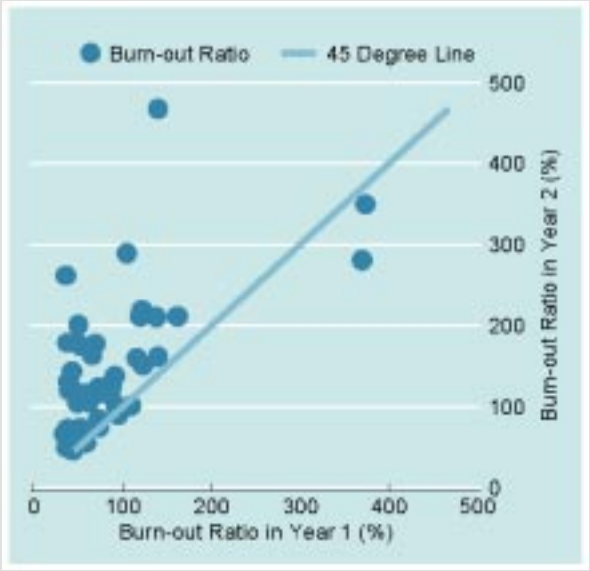
Out of 229 districts that have completed one year, 47 have Total Expense Ratios higher than 100%, implying unprofitability, while the remaining districts have been profitable. The lack of profitability in these 47 districts can be explained by higher claim rates more than by any other factor. Districts that have higher than 100% Total Expense Ratio have only marginally lower premium (INR 566 or USD 12.6) compared to other districts (INR 588 or USD 13.1), and marginally higher average amounts claimed (INR 4,882 or USD 109 vs. INR 4,769 or USD 106) but have considerably higher hospitalization rates (6.1% vs. 1.8%) compared to districts with less than 100% Total Expense Ratio.

Comparison of Total Expense Ratio between Years One and Two

Fourteen of the 47 districts have Total Expense Ratios less than or equal to 100%, while the remainder have ratios higher than 100% and hence have incurred losses. Average Total Expense Ratio has increased from 89% in year one to 143% in year two.

[32] Names of insurers masked for anonymity.

Figure 19. **Total Expense Ratio - Year 1 & Year 2**



The second year witnessed a drop in average premium (from INR 537 or USD 12 to INR 497 or USD 11). This decrease is consistent throughout the 47 districts. However, average amount per claim increased from INR 3,311 (USD 74) in year one to INR 3,627 (USD 81) in year two.

The rise in the Hospitalization Ratio (from 4.1% to 6.3%) can explain most of the increase in Total Expense Ratio since the changes in amounts claimed and premiums are small. Based on anecdotal evidence, we can attribute the increase in Hospitalization Ratios to increased awareness of the benefits of the programme through positive feedback from claimants from the first year, as well as to increase in fraudulent claims. Other reasons for higher Hospitalization Ratios are mostly related to supply-side dynamics. Factors like reduction in delay in card issuance in the second year (as evidenced from data in 11 districts), and hospitals being better equipped would also have led to better usage in year two (Rajasekhar, Berg, Ghatak, Manjula, & Roy, 2011).

We find statistical correlation between premiums in year two, and the Total Expense Ratios in year one in the 47 districts, suggesting that the higher profitability in year one has put downward pressure on the premiums. We failed to find strong correlation between Hospitalization Ratios and premiums in year one. Premiums are however correlated to the insurer, suggesting that in the absence of sound historical data, premium calculations have been based on operational cost structures more than on expected utilization.

The lesson from the losses in year two for policy makers and insurers is that the utilization rate of a new pro-poor scheme increases in the initial years as awareness of the scheme increases, the programme implementation improves, and possibly also because stakeholders learn how to game the system better. The *Yeshasvini* government mass health insurance scheme in Karnataka state also witnessed rising hospitalization rates in the first five years of operations[33]. Hence, a new scheme should be monitored in the initial periods and rise in usage should be anticipated. Care should be taken while adjusting premiums based on the previous year's utilization data in the early years and insurers should be encouraged to set realistic premiums while policy makers should invest in systems to record historical data as a public good.

Rising claim rates in RSBY will put upward pressure on future premiums, and hence increase the cost to the government, which may jeopardize the scheme. Therefore, an in-depth understanding of the factors that influence enrolments, utilization and viability of the scheme is vital.

[33] Based on data obtained from Med Assist

V Conclusions and Future Research

This study seeks to shed light on factors that influence the KPIs of RSBY. The key findings and inferences are summarized below:

- Conversion Ratio in year two is higher in districts where the Hospitalization Ratio is higher in the first year. RSBY's widespread presence, on-the-ground enrolment process, and rising number of claims will increase insurance awareness in the coming years.
- Conversions are higher in districts with more active GPs. SNAs could provide incentives to GPs to improve enrolments.
- District level Conversion Ratios vary more by TPA than by insurer. Conversions are higher in districts that have TPAs with a larger national presence in terms of total number of districts covered. It appears that using the services of specific TPAs, and reducing instances of further subcontracting of the enrolment process may influence conversions favourably.
- Conversion Ratios are lower in districts with higher number of BPL families and larger geographical size. Conversion Ratios could possibly be improved by dividing larger districts into smaller units for improved efficiency, or by extending the enrolment duration.
- There is a negative correlation between delay in issuance of smartcards and hospitalization. Hence it will be useful to monitor villages with no claims to find out specific factors dissuading usage, avoid delays in card issuance, and to verify that delayed cards have reached the intended beneficiary.
- Hospitalization Ratio is negatively correlated to usage of primary care facilities, suggesting that encouraging use of primary care facilities will reduce the need for hospitalization.
- Utilization is positively correlated to the number of private empanelled hospitals per district. Patients might perceive the quality of care at private hospitals to be better, and hence prefer to get treated there.
- Utilization is lower in districts where the literacy rate and educational attainment is lower, suggesting lower awareness about the benefits of the scheme. Audio-visual media such as street plays should be used for awareness generation in such districts.
- Out of 229 districts that have completed one year, 47 have been unprofitable for insurers with Total Expense Ratios higher than 100%. The lack of profitability in these 47 districts is explained by higher claim rates more than any other factor.
- Total Expense Ratio for the 47 districts that have completed two years has risen substantially from 77% in year one to 143% in year two, with insurers moving from high profitability to losses. This shift is largely due to the rise in Hospitalization Ratios. New schemes should be closely monitored during the initial years, anticipating and appropriately planning for rise in usage.

We summarize below, other explanatory factors that were tested, but were not found to be significant. However, we must note that a follow-up study using a larger sample size may throw up different results. Any social protection scheme should address the needs of identified vulnerable segments. However, we find no correlation between the percentages of Scheduled Caste or lower income families in a district, and KPIs. We find no correlation between gender ratios in Hospitalization or Conversion Ratios, and the existence of Self Help Groups or *Mahila Mandal* Committees in the villages. We attempted to calculate KPIs of migrant populations but could not do so due to data limitations. This is a potential area

for future work since the portability of the smartcard benefits migrants. We find only moderate evidence that accessibility to hospitals is a factor in influencing Conversion or Hospitalization Ratios, while there is no correlation to the overall quality of hospitals. We fail to find evidence of correlation between districts that have higher usage of good amenities such as clean water, toilets and good housing, and lower incidents of hospitalization. Awareness of other government schemes does not seem to influence enrolments.

We suggest the following future research based on our analysis:

1. States and districts that have unusually high or low KPIs.
2. The large number of villages with no utilization.
3. The rationale for determining premiums, using third and fourth year data when they become available.
4. Reasons for fraud in enrolment and utilization, especially in high utilization districts.
5. Sample surveys to investigate patient satisfaction, patterns in procedures, claims denials, renewal, usage by migrants, gender bias, and hospital capacity and infrastructure
6. Validation of the trends that were revealed, and explanation of the trends in KPIs using primary data.

This report is intended to inform mass insurance policy makers at large, and to motivate further policy-oriented research into RSBY.

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APPENDIX A

Explanatory Variable	**Mean**
Hospitalization Ratio - year 1 (unweighted)	3.27 [3.816]
District literacy rate	65.25 [12.296]
District % using primary care	57.74 [23.075]
Fraction of private empanelled hospitals	0.64 [.297]
Conversion Ratio (unweighted)	53.03 [16.361]
No. BPL families by 1000	124.98 [97.952]
No. times GP meet a year	3.28 [1.617]
Observations	274

Standard deviations in brackets

APPENDIX B-1

Dependent Variable: Conversion Ratio (year 2) per district			
	(1)	**(2)**	**(3)**
Conversion Ratio Year 1	0.630*** [0.142]	0.679*** [0.128]	0.546*** [0.109]
Hospitalization Ratio Year 1		1.713*** [0.496]	1.981*** [0.391]
State 1			-13.32 [10.03]
State 2			-13.04 [14.34]
State 3			-19.86** [9.208]
State 4			-1.411 [15.33]
State 5			-33.17*** [9.515]
State 6			-6.135 [9.108]
Observations	47	47	47
R-squared	0.304	0.452	0.762

Standard errors in brackets
Only significant regressors are displayed
*** $p<0.01$, ** $p<0.05$, * $p<0.1$*

APPENDIX B-2

Dependent Variable: Conversion Ratio (Year 1) per district

	(1)	(2)	(3)	(4)	(5)	(6)
No. BPL families by 1000	-0.0423**	-0.0412**	-0.0418**	-0.0412**	-0.0344**	-0.0423**
	[0.0199]	[0.0182]	[0.0193]	[0.0197]	[0.0123]	[0.0199]
No. times GP meet	1.334**		1.670**	1.548**	1.606**	1.334**
	[0.558]		[0.656]	[0.616]	[0.605]	[0.558]
Monthly per capita HHD expenses	-0.283			-0.0263	-0.301	-0.283
	[0.850]			[0.777]	[0.977]	[0.850]
% of children's sickness	0.173*			0.150*	0.139	0.173*
	[0.0948]			[0.0815]	[0.0802]	[0.0948]
TPA 1					-16.76***	
					[3.986]	
TPA 2					-4.195*	
					[2.226]	
TPA 3					-11.05***	
					[2.451]	
TPA 4					-2.65	
					[3.611]	
TPA 5					0	
					[0]	
TPA 7					-10.59**	
					[4.118]	
TPA 8					-0.0911	
					[3.872]	
TPA 9					-0.683	
					[3.380]	
TPA 10					-9.642**	
					[3.398]	
TPA 11					-12.64***	
					[2.743]	
TPA 12					1.334	
					[3.676]	
TPA 13					-0.649	
					[2.245]	
TPA 14					-24.45***	
					[2.486]	
TPA 15					-12.83***	
					[3.313]	
TPA 16					-27.01***	
					[2.762]	
TPA 17					-11.57***	
					[2.859]	
Is year 2	-14.89*	-14.70*	-13.97*	-13.76*	-17.10***	-14.89*
	[7.351]	[7.452]	[7.567]	[7.440]	[5.275]	[7.351]
District scheme start date	6.482***	6.121***	5.820***	5.795***	6.063***	6.482***
	[1.351]	[1.767]	[1.814]	[1.643]	[1.275]	[1.351]

Insurer 1	0					0
	[0]					[0]
Insurer 2	1.408					1.408
	[2.732]					[2.732]
Insurer 3	9.000***					9.000***
	[1.555]					[1.555]
Insurer 4	11.29***					11.29***
	[1.409]					[1.409]
Insurer 5	-1.07					-1.07
	[2.239]					[2.239]
Insurer 7	0.279					0.279
	[2.282]					[2.282]
Insurer 8	-7.716					-7.716
	[5.901]					[5.901]
Insurer 9	-8.478***					-8.478***
	[2.058]					[2.058]
Insurer 10	18.12***					18.12***
	[6.321]					[6.321]
Observations	264	273	269	264	264	264
R-squared	0.286	0.191	0.208	0.225	0.358	0.286
Number of states	20	21	20	20	20	20

Robust standard errors in brackets
**** p<0.01, ** p<0.05, * p<0.1*

APPENDIX B-3

Dependent variable: District Level Conversion Ratio				
	(1)	**(2)**	**(3)**	**(4)**
No. BPL families by 1000	-0.0398**	-0.0392**	-0.0392**	-0.0396**
	[0.0188]	[0.0186]	[0.0192]	[0.0191]
No. times GP meet	1.574***	1.656***	1.605***	1.597***
	[0.581]	[0.578]	[0.603]	[0.610]
Monthly per capita household expenses	-1.221	-1.291	-1.149	-1.176
	[0.909]	[0.948]	[0.959]	[0.945]
District scheme start date	4.908***	4.943***	4.932***	4.844***
	[1.582]	[1.597]	[1.538]	[1.641]
TPA has large number of districts nationally		7.997***		
		[1.948]		
Insurer has large number of districts nationally			-1.918	
			[2.619]	
Insurer is public				-1.293
				[3.255]
Observations	220	220	220	220
R-squared				
Number of States	20	20	20	20

Standard errors in brackets
**** p<0.01, ** p<0.05, * p<0.1*

APPENDIX C:

Village level PROBIT estimation: Dependent variable - Does village have at least one claim

Days delay from enrolment to card activation	**-0.00649*** **
	[0.00177]
Days delay from enrolment to card issuance	-0.0113***
	[0.00342]
No. of individuals enrolled in village	0.000776***
	[0.000134]
% age < 10	–
	–
% 10 < age < 20	0.218
	[0.140]
% 20 < age < 30	0.201***
	[0.0767]
% 30 < age < 40	–
	–
% 40 < age < 50	0.0868
	[0.0937]
% 50 < age < 60	0.0483
	[0.138]
% age > 60	0.0341
	[0.0774]
% female	-0.145**
	[0.0596]
Observations	3,603
R-squared	0.195

Robust standard errors in brackets
FE coefficients not shown
*** $p<0.01$, ** $p<0.05$, * $p<0.1$*

APPENDIX D

Village level TOBIT regression: Dependent variable - % claims per village

Days delay from enrolment to card activation	**-0.00954*** **
	[0.00279]
Days delay from enrolment to card issuance	-0.021
	[0.0169]
No. of individuals enrolled in village	0.000436***
	[0.000127]
% age < 10	1.141***
	[0.386]
% 10 < age < 20	0.710**
	[0.348]
% 20 < age < 30	0.506***
	[0.183]
% 40 < age < 50	0.217
	[0.217]
% 50 < age < 60	0.0706
	[0.345]
% age > 60	0.0198
	[0.192]
% female	-0.448***
	[0.171]
Is round two	0.421***
	[0.104]
TPA1	-0.381***
	[0.0707]
TPA5	-0.516***
	[0.144]
District 2	0.285***
	[0.0377]
District 4	-0.648***
	[0.0653]
District 5	0.0626
	[0.0554]
District 13	-6.199
	[0]
Observations	3,604

Robust standard errors in brackets
**** p<0.01, ** p<0.05, * p<0.1*

APPENDIX E

Dependent Variable: Hospitalization Ratio per district

	(1)	(2)	(3)	(4)	(5)	(6)
Literacy Rate (%)	0.794***	0.969***	0.908***	0.697***	0.704***	0.730***
	[0.185]	[0.286]	[0.201]	[0.193]	[0.136]	[0.200]
Primary care usage (%)		-0.776***	-0.692**	-0.844**	-0.793*	-0.858**
		[0.230]	[0.290]	[0.367]	[0.402]	[0.371]
% private hospitals			1.750**	1.556***	1.439***	1.529***
			[0.674]	[0.408]	[0.491]	[0.403]
Log hospitals per 1000 enrolled				1.198***	1.144**	1.257***
				[0.401]	[0.428]	[0.422]
TPA 1					-0.628	
					[1.531]	
TPA 2					0.695	
					[1.839]	
TPA 3					-1.961	
					[1.504]	
TPA 4					-2.561	
					[2.334]	
TPA 7					-1.412	
					[1.692]	
TPA 8					1.152	
					[1.740]	
TPA 9					-0.737	
					[1.610]	
TPA 10					-0.577	
					[1.686]	
TPA 11					-1.563	
					[2.088]	
TPA 12					-4.513*	
					[2.237]	
TPA 13					-1.663	
					[1.674]	
TPA 14					-0.846	
					[1.540]	
TPA 15					-1.928	
					[2.162]	
TPA 16					0.322	
					[1.660]	
TPA 17					-1.987	
					[1.375]	
Is year 2	3.319	3.188	3.38	3.213*	3.841**	3.642**
	[1.949]	[1.885]	[2.028]	[1.706]	[1.610]	[1.591]
District scheme start date	-0.36	-0.329	-0.377	-0.204	-0.275	-0.209
	[0.367]	[0.340]	[0.400]	[0.281]	[0.287]	[0.263]

Insurer 1						0
						[0]
Insurer 2						-0.876
						[0.822]
Insurer 4						0.397
						[0.756]
Insurer 5						-0.369
						[0.804]
Insurer 6						0.217
						[0.698]
Insurer 7						0.421
						[0.800]
Insurer 8						-3.892***
						[1.255]
Observations	269	269	261	261	261	261
R-squared	0.105	0.128	0.221	0.293	0.331	0.312
Number of states	20	20	20	20	20	20

Standard errors in brackets
**** p<0.01, ** p<0.05, * p<0.1*