Review Article

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The need for better evidence to evaluate the health & economic benefits of India's *Rashtriya Swasthya Bima Yojana*

Arindam Nandi[*,†], E. Phoebe Holtzman[**], Anup Malani[**] & Ramanan Laxminarayan[*,†]

[*]The Center for Disease Dynamics, Economics & Policy, Washington DC, [**]The University of Chicago Law School, Chicago IL & [†]The Public Health Foundation of India, New Delhi, India

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In this review the existing evidence on the impact of *Rashtriya Swasthya Bima Yojana* (RSBY) is discussed in the context of international literature available on health insurance. We describe potential pathways through which health insurance can affect health and economic outcomes, discuss evidence from other developing countries, and identify potential biases and inconsistencies in existing studies on RSBY impact. Given the relatively recent introduction of RSBY, lack of quality, verifiable data on utilization patterns, and the absence of reliable evaluation studies, there is a need to exercise caution while assessing the merits of the programme. Considering the enormous potential and cost of the programme, we emphasize the need for a rigorous impact evaluation of RSBY. It will not only help capture the real impact of the scheme, but may also be able to estimate the extent of systemic inefficiencies at the level of the consumer.

Key words Financial risk protection - impact evaluation - RSBY - social health insurance

Introduction

India's phenomenal economic growth during recent decades has yet to be matched by commensurate improvements in health care access and health. India's infant mortality rate of 41 per 1,000 live births and maternal mortality rate of 190 per 100,000 live births are still among the world's highest[1], and widespread inequality in health outcomes exists across income groups[2]. Poor health outcomes and inequality are exacerbated by high rates of out-of-pocket (OOP) medical expenditure. Over 75 per cent of health care costs are financed OOP in India, a higher rate than in many developing countries[3], and medical expenses push as many as 63.2 million Indians into poverty every year[3-6].

With a rising burden of non-communicable diseases (NCD) in India, OOP medical expenditure associated with chronic and hospital care will continue to increase. In 2008, 5.2 million Indians died of non-communicable diseases, accounting for 53 per cent of all deaths[7]. The number of potentially productive years of life lost due to cardiovascular diseases for the 35-64 yr age group in India is predicted to be 17.9 million by 2030[7]. The median 15-month OOP expenditure for treating cardiovascular diseases in 2011 was ₹ 145,850 (assuming 1$= ₹ 50)[8] - an enormous burden

for most Indian households - and during 2012-2030, the economic cost of cardiovascular disease, cancer, chronic respiratory disease, diabetes, and mental health in India is estimated to be ₹ 279 trillion (assuming 1$= ₹ 45) in 2010.

Historically, India has addressed these challenges through targeted supply-side health care delivery mechanisms. However, in 2008, the Indian government launched the *Rashtriya Swasthya Bima Yojana* (RSBY), an inpatient health insurance scheme for the poor. With a cumulative enrolment of more than 37 million poor families, and an annual budget of ₹ 10.97 billion (US$ 182.8 million, assuming 1$ = ₹ 60) in 2012-2013, RSBY is among the world's largest hospital insurance schemes[10].

Although RSBY is relatively recent, there have been several studies on its impact on health care utilization and financial outcomes[11-19]. Considering the non-randomized nature of RSBY rollout across the Indian districts, all these studies are based on observational data, which has led to a debate among researchers on methodological challenges in understanding the true impact of RSBY[12,15,18,19].

In this paper, we review the existing evidence on RSBY's impact in the context of the international literature on health insurance. We describe potential pathways through which health insurance can affect health and economic outcomes, discuss evidence from methodologically strong (*e.g.*, randomized) studies from other developing countries, and point out the potential biases and inconsistencies in existing studies on RSBY impact.

An overview of India's health policy

Until the National Health Policy (2002), health policy in India was focused on individual diseases or conditions and lacked a unifying framework. This policy and its successor, the National Rural Health Mission (2005), aim to streamline public health care by integrating existing stand-alone policies, decentralizing service delivery (*e.g.* through community health workers), and focusing more on States that lag on health indicators[20]. The report by the High-Level Expert Group (HLEG) of the Planning Commission's[20] on universal health coverage[20] advocates the integration of individual policies into a National Health Package, emphasizing the need for more supply-side resources. The report also encourages provision of private care under contract from the government in locales where public health care delivery is inadequate. In 2008, RSBY, a large-scale national hospital insurance scheme for the poor, was launched.

At a nominal out-of-pocket enrolment fee of ₹ 30 per year (US$1 = ₹ 65, approximately in 2015), officially poor (below the national poverty line, or BPL) families can cover up to five members for more than 700 medical treatments and procedures at government-set prices under RSBY. The scheme only covers inpatient health care up to a maximum of ₹ 30,000 per year per family but requires no deductible or copay (copayment). However, additional near-poor groups such as domestic, construction, and *beedi* industry workers, rickshaw pullers, and taxi drivers have been recently brought under the purview of RSBY, and the scheme is being pilot-tested for outpatient coverage[21,22]. Health care services are provided nationwide by government-contracted hospitals, both public and private, and beneficiaries use a RSBY biometric identity card, without the need for cash transactions or insurance claims.

Coverage and payouts under RSBY are provided by private and State-run health insurance companies, while the government pays a significant proportion of the insurance premiums. The premiums are based on negotiated contracts between the State government and insurance companies and vary by district. After conducting procedures, health care providers are directly reimbursed by the district level insurer. The total cost of the programme is divided between the Central and State governments, with the centre bearing 75 per cent of the cost. (For Jammy and Kashmir and the northeastern States, the contribution of the Central government is 90 per cent). RSBY was introduced, and implemented until mid-2015, by the Ministry of Labour, Government of India. Subsequently, it was transferred to the Ministry of Health and Family Welfare[10].

Potential benefits of RSBY and challenges in evaluation

While the actual benefits of RSBY are not yet known, literature available on health insurance in developing countries has indicated some potential benefits. Most studies on the impact of health insurance look at health (either process measures such as utilization or direct health measurements) or financial outcomes. There is some evidence that insurance improves objective

health[23], but because health is difficult to measure without a large sample size and repeated surveys to detect effects that emerge over time, the evidence is not strong. The extensive literature on the impact of insurance on utilization is not conclusive. Studies from other countries have found that insurance increases overall health care consumption[24-26], though the results are not uniformly positive[27].

Prior studies have examined financial outcomes related to insurance provision. While some studies have reported that insurance lowers OOP expenditure[23,28,29], others have found the opposite effect and that insurance induces health care utilization beyond coverage limits[30,31]. Also, growing evidence indicates that individuals respond to health shocks by selling assets, borrowing money, and using savings[32-37], but there is little evidence that insurance mitigates these behaviours in developing countries[38]. Finally, health shocks affect non medical consumption[39-42] and may induce poverty[3-5], but it is unclear how insurance addresses these problems. Increased medical expenditures may not imply reduced non medical expenditures if individuals have access to savings, loans, or informal insurance. Wagstaff and Pradhan[23] did not find any effect of insurance on the variability of non medical consumption in Vietnam; although in a different context, Finkelstein and McKnight[43] found that insurance could have an independent negative effect on the welfare of risk-averse individuals in the United States.

A large number of studies use observational data to study the effectiveness of health insurance programmes. Such analysis may have limitations. If enrolment in health insurance is voluntary or if the scheme targets a particular population subgroup, beneficiaries of programme may be systematically different from non-beneficiaries. Comparing the outcomes of these two groups will lead to biased estimates of the impact of health insurance[25,44-46].

There are various econometric tools that can mitigate some of the biases of observational studies, such as instrumental variables, natural experiments[47,48], regression discontinuity analysis, or matching methods[23,29,49–51]. Difference-in-difference methods may also eliminate the time-invariant systematic differences in unobservable characteristics between the beneficiary and non-beneficiary groups[23,52]. However, individuals may choose to insure themselves based on changes in their health outcomes or wealth status over time (instead of initial levels). In such a case, even this sophisticated difference-in-difference approach may not entirely eliminate selection bias or account for unobservable, time-varying factors[53].

Another way of addressing selection bias and estimating the causal impact of policy interventions may be to employ random assignment to programme participation. Five large-scale health insurance studies across the world have employed random assignment until now – the RAND health insurance experiments in the United States[54] and China[55], the Seguro Popular health insurance experiment in Mexico[56,57], the Oregon Medicaid lottery study[58,59], and a voluntary health insurance study in Nicaragua[60]. Two important but smaller experimental studies in other countries have recently been completed, though all results have not been released. A group in the Philippines is studying the effect of insurance provided through microfinance companies[61]. Levine and colleagues studied the SKY Insurance Plan in Cambodia[38].

Although randomization is accepted as a useful method for estimating causal inference, it is not free from criticism. Randomized trials are often conducted in localized small-scale settings. Thus, while the selection of study participants may be randomized, the first stage selection of study sites themselves may not be random. This leads to the concerns about the external validity or generizability of the findings of randomized studies[62,63]. In addition, randomized studies may suffer from performance biases such as Hawthorne and John Henry effects, attrition bias that may result in a non random follow up sample, assesment and reporting biases, and lack of statistical power of the sample, all of which may result in inacruate estimates[64]. Finally, there may be some ethical concerns about withholding the intervention from the control group in a randomized study[65,66], particularly for high-value health insurance coverage which may mean a difference between life and death for the poor. The ethical dilemma is generally tackled by delaying the intervention implementation in the control group until the completion of the study.

Evaluation of RSBY

Although existing RSBY evaluation studies are based solely on observational data, yet RSBY is supposed to be both means-tested, with eligibility initially restricted to BPL populations and recently

expanded to include some other socio-economically marginalized groups, and voluntary, with enrolment rates that vary depending on socio-economic and institutional factors or regional bottlenecks[21,67]. RSBY is designed to follow targeted implementation and not a randomized framework. While this is highly desirable from a societal perspective, it poses a challenge for evaluating the impact of the scheme. Participation in RSBY will suffer from some level of selection or programme placement bias. Therefore, claiming the success or failure of the programme in improving health and economic outcomes on the basis of observational estimates is risky.

Most studies of RSBY compare outcomes before and after receipt of insurance[13-16]. However, secular trends affecting individual health or wealth can confound causal inferences in these cases[68]. For instance, some areas may be more likely to adopt insurance when they anticipate rapid growth for other reasons or may adopt insurance when the incomes of the poor are expected to stagnate. Other studies of RSBY compare the insured to the non-insured in cross-sectional studies[11], yet this design suffers from selection bias, as these two groups may be inherently different. One randomized controlled trial involved RSBY, but it evaluated the effect of an information campaign on enrollment and utilization rather than the effect of the scheme itself[69].

A study[15] argues that RSBY and other health insurance schemes may have increased OOP expenditure for the poor in the State of Tamil Nadu. On this basis, the authors pronounce RSBY a failure and call for a replacement health financing mechanism. Another study[12] raise some methodological concerns about this above study, which are further contested by the original authors[17]. Other researchers[18] also question the validity of the original study, and propose analytical refinements. Findings from two cross-sectional studies of RSBY in Gujarat[11,70] showed no significant difference between the OOP expenditure of insured and non-insured groups. Further, the authors found that almost 60 per cent of RSBY beneficiaries had to make a median OOP payment of ₹ 4000 ($80) in 2011 for hospitalizations, primarily related to drug purchases. Another study[71] examined a State health insurance scheme similar to RSBY, called *Rajiv Aarogyasri*, in Andhra Pradesh. Using both difference-in-difference methods and matching, it was found that the scheme significantly reduced OOP medical expenditure, more so for inpatient cases. Finally, Rao *et al*[72] used similar difference-in-difference method to evaluate the *Rajiv Aarogyasri* scheme in Andhra Pradesh and RSBY in Maharashtra. The authors found that after the implementation of these health insurance schemes, hospitalization rates increased, along with OOP expenditure and borrowings related to inpatient care. The benefits of the insurance scheme was greater in Andhra Pradesh. However, these studies also used observational data and might suffer from methodological problems.

In any case, the implications of higher OOP spending among insurance beneficiaries are uncertain. Just as a government subsidy for purchase of a house might increase private expenditures on housecleaning supplies, a public hospital insurance programme may increase private expenditures on postoperative drugs. Unless there is a serious concern with moral hazard or irrational decision-making caused by a government programme, the increase in spending on complementary products may be evidence of efficacy, not failure, of the programme. Moreover, the proper remedy for higher OOP spending under RSBY might be to expand coverage to include medications or physician services rather than scrap the programme altogether.

Two health insurance evaluation studies in India have followed a randomized design. A cluster-randomized community-based health insurance (CBHI) study in Bihar and Uttar Pradesh by the Microinsurance Academy is currently in progress[73,74]. Preliminary findings from this study show the dynamics of enrolment into the CBHI, particularly in the presence of RSBY in these States[74]. Another new study has been recently launched in Karnataka. Using a randomized design, the study aims to evaluate the impact of RSBY on the health and financial outcomes of the above-poverty-line population[75].

Systemic inefficiencies

There are some additional concerns about RSBY that are not directly related to the impact of health insurance, but are very important for the overall effectiveness of the programme. First, there is a lack of administrative data on various aspects of the scheme, including time trend data on enrolment rates, rates of attrition and re-enrolment, and uptake and benefit utilization rates. While presumably these data are collected at a frequent interval by insurance companies or third party administrators, these need to be made

widely available to researchers and other policymakers. Without such data, the debate on the merits of RSBY cannot be addressed.

Second, there is considerable uncertainty surrounding the sustainability of the scheme in the medium and long term. A study by Dror and Vellakkal[19] estimated that it would cost the Central Government as much as ₹ 33.5 billion, or 0.3 per cent of India's union budget in 2010-2011, in insurance premiums for complete RSBY coverage (all BPL families). In comparison, the scheme was severely underfunded, with actual union budget allocations being only ₹ 3.15 billion in 2010-2011 and ₹ 4.6 billion in 2011-2012[19]. The enrolment under RSBY in 2010-2011 was estimated to cost ₹ 9.29 billion, and the budgeted resources could cover only about a third of it[19]. Furthermore, the budget allocation for RSBY may be even more inadequate when we consider the potential utilization patterns of the scheme. Since RSBY only covers the poor who are generally more vulnerable to most ailments, its utilization rates might be higher than other health insurance programmes that cover a wider population. The unfavourable risk pool (known as the adverse selection problem) may reduce the financial viability of RSBY. Therefore, along with increasing budgetary allocations, the risk pool should also be normalized by enrolling more non-BPL people.

Third, as with many government schemes, RSBY faces problems with system leakage, insurance frauds, and other inconsistencies. For example, there have been reports of fraudulent claims[76] or out of pocket medical expenditure by beneficiaries[11,70]. RSBY suffers from various structural shortcomings, preventing it from fully protecting the poor from health and financial shocks[16,21,76,77]. It is well known that BPL lists, which form the main basis for eligibility into RSBY, also suffer from inaccuracies in many States[78]. Surveys of health care providers reveal problems related to poor functioning of the "paperless" mechanism of claims, inadequate reimbursement, and lack of training[70,77,79]. The additional cost of doing business is often passed onto the consumer, which can lead to higher OOP payments or unnecessary medical procedures[80].

A systematic evaluation of RSBY would provide data on most of these systemic inefficiencies and a basis for targeted improvement. And ideal evaluation should also look beyond the regular questions asked by researchers, such as its impact on health care utilization and medical expenditure. Data should also be collected on softer measures of the success of the scheme, such as enrolment and hospitalization experience, trust in the programme, and perceived well-being.

Conclusion

RSBY is India's ambitious hospital insurance programme, but the evidence on its intended effects remains inconclusive. Further research is required before the programme's merit can be judged. For example, in the absence of natural experiment settings involving exogenous variations in RSBY implementation or coverage, future roll out of RSBY may be randomized in some regions, even if only on a small scale[10,21]. Alternatively, randomized studies of RSBY coverage can also be conducted among people who are near poverty but not officially on the BPL list and, therefore, not eligible for RSBY. This would allow researchers to answer important questions about the programme's true benefit, much of which is currently masked by the methodological problems in observational studies.

Rigorous impact evaluation of RSBY will not only capture the real impact of the scheme, but may also be able to estimate the extent of systemic inefficiencies at the level of the consumer. The microlevel evidence should be used to determine the future of the programme. Budget inconsistencies also need to be addressed, as a resource-starved programme may be beneficial in principle but not in practice. This is particularly important if RSBY plans to also cover outpatient treatment in future, as indicated by pilot studies in Odisha and Gujarat. The potential for RSBY or an RSBY-like scheme is enormous as the need to improve health outcomes and decrease financial shocks is great. At this point, knowing how to grow or alter the scheme so it can achieve these objectives is paramount.

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Reprint requests: Dr Arindam Nandi, The Center for Disease Dynamics, Economics & Policy 1400 Eye St NW, Ste 500
Washington DC, 20005, USA
e-mail: nandi@cddep.org