PROJECT REPORT

AYUSHMAN BHARAT
COSTS AND FINANCES OF THE
PRIME MINISTER'S JAN AROGYA YOJANA (PMJAY)

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ABBREVIATIONS

PMJAY	Prime Minister's Jan Arogya Yojana
RSBY	Rashtriya Swasthya Bima Yojana
SCHIS	Senior Citizen Health Insurance Scheme
SHA	State Health Agencies
SECC	Socioeconomic and Caste Census
UT	Union Territory
OOPS	Out-of-Pocket Spending
GDP	Gross Domestic Product
GSDP	Gross State Domestic Product
NSS	National Sample Survey
UHC	Universal Health Coverage
USA	United States of America
PHI	Primary Health Insurance
VHI	Voluntary Health Insurance
NHIS	National Health Insurance Scheme
CHE	Current Health Expenditure
GHE	Government Health Expenditure
PVT	Private Health Expenditure
SHIS	Social Health Insurance Scheme
HIA	Health Insurance Act
REF	Risk Equalization Fund
DTC	Diagnosis Treatment Combination
DRG	Diagnosis Related Group
MCO	Managed Care Organization
OECD	Organization for Economic Co-operation and Development
CSS	Centrally Sponsored Scheme
BPL	Below Poverty Line
SNA	State Nodal Agencies
MoLE	Ministry of Labour and Employment
MOHFW	Ministry of Health & Family Welfare

INR	Indian Rupee
PPP	Public-Private Partnership
TC	Total Cost
NSSO	National Sample Survey Office
CPI	Consumer Price Index
HR	Hospitalisation Rate
AME	Average Medical Expenditure
ESIC	Employees' State Insurance Corporation
CMCHIS	Chief Ministers Comprehensive Health Insurance Scheme
VAS	Vajpayee Arogyashri Scheme

EXECUTIVE SUMMARY

Ayushman Bharat comprises mainly the National Health Protection Scheme of the Government of India – now called Prime Minister's Jan Arogya Yojana (PMJAY) - which proposes to cover 10 crore poor and vulnerable families (approximately 50 crores beneficiaries) through insurance with the aim of providing coverage up to Rs 5 lakh per family per year for secondary and tertiary care hospitalisation. With a design similar to the other major hospitalisation scheme - RSBY- the PMJAY is designed to subsume the on-going centrally sponsored schemes: RSBY and the Senior Citizen Health Insurance Scheme (SCHIS). States running similar schemes have opted to merge with PMJAY or run it in a parallel manner. The states have set up State Health Agencies (SHA) wherein they have an option to use either an existing trust or set up a new Trust/Society/Not for Profit/State Nodal Agency for the scheme's implementation. Transfers to state government is being made using an escrow account. The intended impact that the government wants to have is the reduction of out-of-pocket spending (OOPS) and extensive coverage of the poor and vulnerable sections of the society.

The main objective of this research was to estimate the costs of the PMJAY for 5 years - 2019-2023 - nationally as well as for each of the states. To do this, the specific research areas/questions that were addressed in this research are as follows.

a. Global evidence on cost implications of an insurance model
b. Analysis of the Rashtriya Swasthya Bima Yojana or RSBY
c. Rates of hospitalisation and average medical expenditure on hospitalisation
d. Impact on insurance premiums
e. Impact on health finances for the Centre and the states
f. Total costs in share of GDP/GSDP and health spending

The methodology of estimations involved the following steps:

- Drawing up the list of target beneficiary households based on the Socioeconomic and Caste Census (SECC) of 2011.
- For arriving at the total number of individual beneficiaries, the number of households is multiplied by the household size as given in the 2011 Census.
- Two rounds of the NSS (60th and 71st) were used to analyze
  o Hospitalisation rates over time
  o Average expenditure on hospitalisation
- Consumer Price Index (CPI) was used to adjust for inflation wherever required

- Projected hospitalisation rates for 2019-2023 were estimated based on alternative assumptions
- To estimate shares in health expenditure and GSDP/GDP, projections were made for 2019-23 based on past trends of health spending and GSDP/GDP
- Total costs of PMJAY were estimated as B*H*E, where B is realized target beneficiaries, H is the hospitalisation rate and E is the average expenditure on hospitalisation
- A literature review was undertaken to understand administrative costs and a 15% top-up was used to estimate premiums
- Notional premium was calculated as (Total Costs of PMJAY/Target beneficiary households), with 15% added as administrative costs

Three alternate scenarios were based on different assumptions about hospitalisation and per capita expenditure on hospitalisation. Scenario I assumes the same hospitalisation rates and per capita hospitalisation expenditures for all the states as evidenced from NSS 2014. In Scenario II, the 2023 rate is taken as 8%, which is close to Tamil Nadu's 2014 rate, assuming a slight increase. The intermediate years are pro-rated. In the last scenario, the 2019 and 2020 rates are taken to be 2% as gleaned from ESIC, 3% next year which is the highest evidenced under RSBY and 5% for the last year of the projection based on literature review of hospitalisation rates. Thus, 2022 is assumed to be 4%.

The results indicate that the total costs (Centre + states) of PMJAY for the 5 years, on the assumption that all beneficiaries targeted, are actually covered, could range from Rs 28,000 to Rs 74,000 crores in 2019 and go up to between Rs 66,000 and Rs 1,60,089 crores in 2023, depending on which set of assumptions is adopted.

As a share of total health spending, anywhere between 11 and 30 percent of total projected health spending could be on PMJAY in 2019. However, the share will go down over the years, and in 2023, is estimated to be between 12 and 29 percent as per the first two scenarios, but not for the third scenario.

As a share of GDP, estimated costs of PMJAY could range between 0.15 to 0.4 percent of projected GDP in 2019.

The estimates of notional premiums indicate that in 2019, the range could be between Rs 2500 to Rs 6400. For scenarios 2 and 3, the premiums rise over the years, whereas for Scenario I it

remains more or less the same, between Rs 5000-5800. The most expensive scenario is the second one, where the premium is around Rs 6400 in 2019 and more than doubles by 2023.

The total costs and share in GDP and GSDP as well as notional premiums have also been estimated for the country as well as for each state under the three scenarios. Deducting centre's contribution towards PMJAY, some states can spend as much as 20% of their health expenditure on PMJAY in 2019 under Scenario 1. For Scenario 2, this share is higher, though for Scenario 3, it comes down somewhat, and in 2019, the highest share is about 10%.

As for the Centre's share, with full coverage, the centre's share under the most modest scenario – Scenario 3 – could be as much as 74% in 2019, and it is likely to increase over the years. For the other scenarios, the shares would exceed MOHFW's estimated health spending.

The research estimated the costs with a gradual coverage of the target households. Instead of full coverage from 2019 itself, it calculated the costs of varying coverage in 2019 and the concomitant notional premiums for every scenario. The results indicate that if only 10% of the target households are covered, the total cost would be at least Rs 2,775 crores in Scenario 3 and as much as Rs 7,325 crores in the Second scenario. For another 10% coverage, the total costs would rise to Rs 5,550 crores (Scenario 3) and Rs 14,651 crores for Scenario 2 and so on.

Based on these calculations, the estimated notional premiums would also be lower: if the coverage is kept low at 10%, the notional premiums could be as low as Rs 244 (Scenario 3). Increasing the coverage to 20%, can hike up the premium to Rs 487 in the same scenario. Full coverage would require Rs 2,437 as the notional premium in this scenario.

The results indicate that if the programme achieves <u>full coverage</u> and is able to reach the message of health coverage to all its beneficiaries, the costs of the programme at the national level would be substantial, and the notional premium – after factoring in administrative costs – could range between Rs 2500-6400 in 2019. If the programme achieves full coverage only gradually, the costs will be substantially less in the initial years. For example, with only a 20% coverage, the premiums would be between Rs 500 and Rs 1300. Thus, with the proposed premium of Rs 1100, between 15% - 40% of the targeted beneficiaries would be covered.

Apart from coverage, the two other critical variables are hospitalisation rates and per capita expenditure on hospitalisation. With lower rates of hospitalisation, the total costs would be lower, but evidence from around the world indicates that hospitalisation rates are much higher in countries with UHC.

Similarly, cost per hospitalisation can be kept low with the reasonable package rates that currently exist; however, in an unregulated private health sector, there is always the possibility of some moral hazard and supply induced demand factors to occur. With increasing burden of non-communicable diseases, it may be a challenge to keep the hospital expenses low. Participation of the private sector would depend on profitability, and too low a premium and modest package rates may lower the participation of private sector hospitals, as has been evidenced by the RSBY experience. The concerns with high costs of the programme would be the current low health spending across states and also at the centre. A high bill of PMJAY has an adverse effect on health spending on other areas of the health sector. While most states have opted for the trust model, this might impose challenges, especially on states that have no experience with running schemes based on this model. Administrative costs and challenges apart, the possibility of moral hazard is also real, which in turn would drive up the costs.

These are early days yet, and for further clarity on how the various variables would play out we will have to wait for another year or so. However, if the scheme is really to reach 40% of the population, these estimates do raise some cause for concern given a serious and continuing budget constraint in the health sector.

Finally, these are estimates, and how the PMJAY is rolled out and accepted will determine to a large extent the costs of the programme. However, these estimates indicate that it might be prudent to budget sufficient funds to cover a much scaled up programme in the times to come.

1. Background

Ayushman Bharat of the Government of India comprises the Health and Wellness Centres and the National Health Protection Scheme, renamed Prime Minister's Jan Arogya Yojana or PMJAY. This scheme is designed to cover 10 crore poor and vulnerable families (approximately 50 crore beneficiaries) through insurance with the aim of providing coverage up to Rs 5 lakh per family per year for secondary and tertiary care hospitalisation. With a design similar to the other major hospitalisation scheme – Rashtriya Swasthya Bima Yojana (RSBY) - the PMJAY is to subsume the on-going centrally sponsored schemes: RSBY and the Senior Citizen Health Insurance Scheme (SCHIS). States running similar schemes were given an option to merge with PMJAY or run it in a parallel manner. The states have been required to set up State Health Agencies (SHA) but were free to decide whether they want to run PMJAY as an insurance model or a trust model – the latter by setting up a new Trust/Society/Not for Profit/State Nodal Agency for the scheme's implementation for those states that did not have a trust model for their earlier schemes. The states can also opt for a hybrid model.

The identification of the beneficiaries is being done on the basis of the 2011 Socioeconomic and Caste Census (SECC). The centre-state financing mode is as in the National Health Mission. For 8 North-Eastern states and Himalayan states, the sharing is 90:10. For other states, it is 60:40. For Union Territories (UTs) with legislature (Delhi and Pondicherry) and for those without legislature (Chandigarh, Dadar & Nagar Haveli, Daman and Diu, Lakshadweep and Andaman and Nicobar Islands) the sharing patterns are 60:40 and 100:0 respectively. Transfers to state government will be made using an escrow account. The intended impact that the government wants to have is the reduction of out-of-pocket (OOP) expenditure and extensive coverage of poor and vulnerable sections of the society.

While the scheme has already been rolled out, the costs and finances of PMJAY remain somewhat unclear at the national as well as state level. For the financial sustainability of the scheme and for planning ahead, it is critical to know the aggregate resource envelope required to run the scheme, the distribution of costs between the centre and the states, and the ability of states to absorb this additional cost.

With these broad questions in mind, this exercise estimates the possible costs of running the scheme based on alternative scenarios, calculates the notional premium per beneficiary household based on each of these scenarios and arrives at the magnitude of the costs as shares

in GDP/GSDP as well as in health expenditure of centre and states. The specific objectives are given below.

Objectives and research questions

The main objective of this research is to estimate the costs of the PMJAY for 5 years - 2019-2023 - nationally as well as for each of the states. To do this, the specific research areas/questions that were addressed in this research are as follows.

Research questions

a. **Global evidence on cost implications of an insurance model**: a literature review on global evidence on the cost implications of an insurance-based model for Universal Health Coverage was undertaken. This was done keeping in mind the long-run financial sustainability of a large scheme like PMJAY, especially in an environment of low levels of public finances for the health sector in India.

b. **Analysis of the Rashtriya Swasthya Bima Yojana or RSBY**: this was important since PMJAY is basically a scaled up RSBY hospitalisation model.

c. **Rate of hospitalisation and out-of-pocket spending**: we looked at the evidence from existing national data sources like the National Sample Survey (NSS) on hospitalisation rates and average out-of-pocket spending (OOPS) on hospitalisations. Two rounds of the NSS (60th and 71st) were used to understand how the hospitalisation rates and OOPS on hospitalisation may have changed over time, nationally as well as across states. The possibility of increase could be due to multiple factors like increase in income, availability of services, changing disease profile of respondents or a general improvement in the health seeking behaviour. Alternate scenarios of costs of PMJAY were estimated based on these two parameters.

d. **Impact on insurance premiums**: one of the factors that could affect the sustainability of a publicly funded insurance scheme is the behaviour of premiums over time. The government's total finances for the scheme are based on an estimated or notional premium which is around Rs 1100 as of now. In this research, the notional premiums were calculated based on the alternative scenarios of rate of hospitalisation and per capita expenditure on hospitalisation.

e. **Impact on health finances for the centre and states**: being a Centrally Sponsored Scheme, a substantial share of the total costs of the PMJAY has to be borne by the state governments. This implies an additional fiscal burden on the states due to PMJAY. Thus, we estimated the fiscal burden of PMJAY on the centre as well as the states.

f. **Share of costs of PMJAY in GDP/GSDP and health expenditure:** finally, the total costs were examined relative to GDP and GSDP as well as health expenditure of centre and states to get an idea about the fiscal burden and future sustainability of the scheme.

Section 2 presents some global case studies of experiences of countries with UHC and insurance. In Section 3 we present results from a brief analysis of the RSBY. The methodology and data used in the analysis are discussed in Section 4. A brief overview of the results and their implications are presented in the last section, Section 5.

2. Literature review on insurance-based health coverage

Countries have different health care models and schemes which cover a varied proportion of people. We took a sample of countries which consists of developing and developed countries from all the continents to analyse their healthcare systems. The countries are Australia, Belgium, Bulgaria, Canada, Chile, France, Germany Ghana, Japan, Mexico, Netherlands, Nigeria, Russia, Singapore, Switzerland, Taiwan, Thailand and United States of America (USA). Some examples from India have been added to the review for comparison.

Most of these countries have a primary (social) health insurance (PHI) provided by the government with a voluntary (supplementary) health insurance (VHI) provided by private health insurers for coverage of services not covered under the PHI. There are further differences such as the type of model used, wherein some countries use tax-funded health insurance scheme, others have an earmarked fund. Countries like Bulgaria and Ghana have earmarked funds, whereas Australia, Belgium, Chile, Japan, Mexico, Thailand and USA sustain their public health insurance schemes by raising taxes. Social Security contributions are collected from employers and employees. Taiwan has a National Health Insurance Scheme (NHIS) wherein the premium contributions are distributed among employees, employers and government which varies for different categories specified by the government. The NHIS in Ghana covers all Ghanaians, provides a membership card, covers cost of medicine and provides exemption for the elderly, pregnant women and children.

Figure 2.1: Average of Government Health Expenditure as a percentage of Current Health expenditure and Average of Out-of-pocket payments as a percentage of Current Health Expenditure
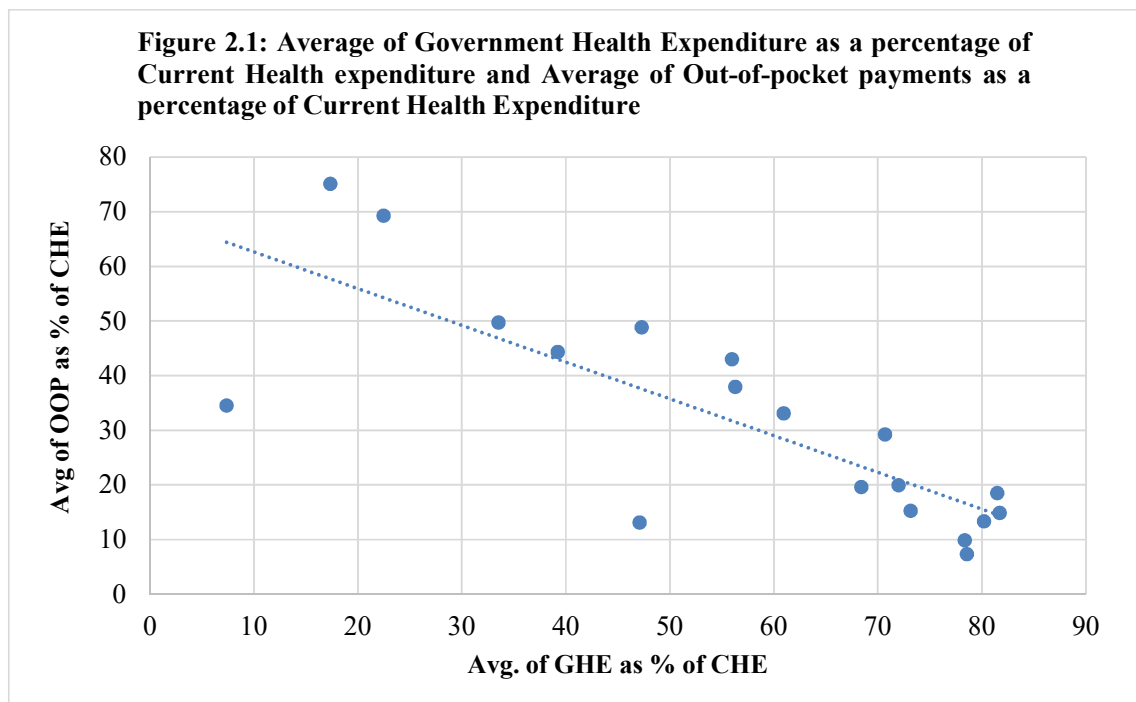
The countries exhibited a decrease in government health expenditure as a percentage of current health expenditure (GHE-CHE) when out-of-pocket payment as a percentage of CHE (OOP-CHE) increased (Figure 2.1). Countries with a higher level of government spending have a lower level of out-of-pocket payments and vice-versa. Nigeria has a low percentage of GHE-CHE but has a very high OOP-CHE (75%). India has a GHE-CHE of 22% and OOP-CHE of 70% (Table B1). Belgium (81%), Netherlands (78%) and Switzerland (70%) have a high government health spending whereas the out-of-pocket payment is low at 18%, 9% and 29% respectively. Taiwan is a peculiar case wherein both the government spending (7%) and out of pocket payments (35%) are low. Mexico has the same percentage of government spending and OOP at 48%.

Figure 2.2: Average of Out-of-pocket Payments as a percentage of Current Health Expenditure and Average of Private Domestic Expenditure as a percentage of Current Health Expenditure
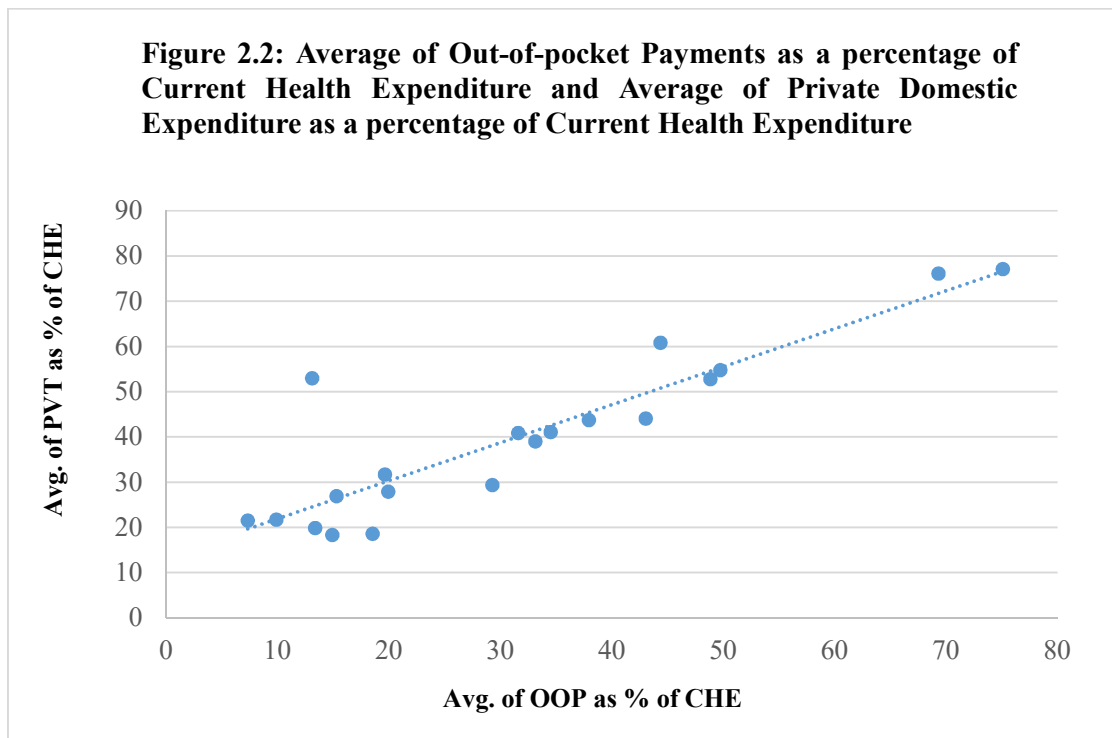
Another important relationship is observed between both the OOP payments (OOP-CHE) and private health expenditure (PVT-CHE) as a percentage of current health expenditure. The OOP-CHE increases as PVT-CHE increases and vice-versa (Figure 2.2). A higher percentage of private spending is used to pay for OOP expenditures. Nigeria has the highest private and out-of-pocket expenditure. India is second with 76% spent from private sources and 70% is OOP expenditure (Table 2.1). USA has a noticeable gap between OOP-CHE and PVT-CHE. This is due to many private insurance companies covering a high proportion of its population, and since USA is one of the most expensive medical markets, the insurers have to bear a

substantial amount of medical expenditure. France boasts of the lowest OOP expenditure whereas Japan has the lowest private expenditure.

Table 2.1: Health financing indicators			
Country	Domestic General Government Health Expenditure as % Current Health Expenditure (CHE)	Average of Out-of-pocket (OOP) as % of Current Health Expenditure (CHE)	Share of Domestic Private Health Expenditure in Current Health Expenditure (CHE)
Australia	68.38	19.62	31.62
Belgium	81.46	18.52	18.54
Bulgaria	55.96	43.03	44.04
Canada	73.15	15.27	26.85
Chile	56.28	37.95	43.71
France	78.56	7.32	21.44
Germany	80.20	13.36	19.80
Ghana	33.52	49.74	54.75
India	22.47	69.30	76.07
Japan	81.70	14.91	18.30
Mexico	47.29	48.83	52.71
Netherlands	78.34	9.88	21.66
Nigeria	17.36	75.10	77.08
Russia	60.95	33.12	38.98
Singapore	39.22	44.37	60.78
Switzerland	70.69	29.28	29.31
Taiwan	7.37	34.52	41.04
Thailand	71.99	19.93	27.87
USA	47.07	13.11	52.93

Source: World Health Organization (WHO) Global Health Expenditure Database

Government and Social health Spending

Spending on Social Health Insurance Schemes (SHIS) has witnessed an increase (in absolute numbers) over the years with only a recent fall in many countries under analysis. The fall in SHIS can be attributed to higher uptake of private health insurance or a general increase in the level of income of respective countries, increasing the ability of the population to use private health insurance and use private health facilities. SHIS per capita dropped the most (36%) in Netherlands with Belgium registering a drop of 24% over 2014 to 2015. Chile, India, Taiwan, Thailand and USA are the only countries, in the study, with a steady or increasing expenditure on SHIS.

There is a visible clustering of countries for per capita spending on GHS and SHIS. Australia, Canada, Switzerland and USA form one cluster of high GHS countries; the other cluster is of very low per capita GHS countries consisting of India, Nigeria, Ghana, Thailand, Chile. For SHIS expenditure Japan, Germany, Netherlands, Belgium, France and USA form a band of

high per capita spending countries and the rest appear in the lower tier of per capita SHIS spending. Although the overall spending in USA is high, the SHIS per capita spending is not even in the top 10% over the years.

Out-of-Pocket expenses

Health insurance has significantly reduced the OOP spending in these countries but is still capable of potentially posing a burden on households. India has one of the highest OOP expenditure as a percentage of current health expenditure (CHE) averaging 70% over 2000 to 2015 with minute variations over the years (Table 1). France (7%), along with Australia (19%), Belgium (18.5%), Canada (15%), Germany (13%), Thailand (19%), USA (13%), Netherlands (10%) and Japan (15%), have the lowest burden of payments on the members using their healthcare system. Nigeria has a staggering 75% OOP expenditure dwarfing the other countries. Thailand has its population paying only 30 Baht for a wide range of services which has brought down the burden of OOP payment from as high as 35% (2000) to a low of 12% (2015). Ghana is one such country where OOP payments as a percentage of CHE have come down by 30% with the help of a tax-funded insurance scheme wherein all Ghanaians must pay a premium, though a relatively small amount when compared to the actual costs of treatments.

Private health expenditure

PVT-CHE which include OOP spending, private insurance, charitable donations and direct service payment by private cooperation's, follow a similar trend. Here again, India has a high average PVT-CHE of 76% along with 77% in Nigeria (Table B1). Bulgaria (44%), Chile (44%), Ghana (54%), Taiwan (41%) and USA (53%) are in the middle tier with Australia at the lower end at 31% PVT-CHE. Countries like Belgium (19%), Canada (27%), France (21%), Germany (20%), Japan (18%), Netherlands (22%) and Thailand (28%) have a lower level of PVT-CHE because of state tax-funded schemes. Australia has a tax-funded insurance scheme wherein the members are provided rebates for any expenditure on covered health services, resulting in higher private expenditure higher (32%).

Although Belgium and Japan have low PVT-CHE, they have a higher OOP payment out of private spending at 99% and 82% respectively. In USA private spending accounts for a half of CHE, from which only 25% is OOP spending. Switzerland's private health expenditure as a percentage of CHE is 30% out of which 95% is OOP payments. Also, Its CHE per capita is one of the highest at US$ 6888 (Figure 2.3), second only to USA with CHE per capita of US$ 7124. With only US$ 37 CHE per capita, India has the lowest levels of per capita health

spending on its population. The trends of CHE per capita, over the period 2000-2015, show a general fall in the level of CHE per capita for a cluster of countries, namely, Australia, Belgium, Canada, France, Germany, Japan and Netherlands. Switzerland and USA are still showing signs of increasing per capita CHE mainly due to increasing costs of health.

Figure 2.3: Average Current Health Expenditure per capita in US$ from 2000-2015

Country	Value
USA	7,124
Switzerland	6,888
Netherlands	4,269
Germany	4,034
Canada	3,870
Australia	3,831
France	3,803
Belgium	3,712
Japan	3,436
Singapore	1,317
Taiwan	1,144
Chile	708
Mexico	491
Russia	439
Bulgaria	379
Thailand	138
Nigeria	63
Ghana	62
India	37

Figure 2.4: Average Domestic Government Health Spending Per Capita US$

Country	Value
Switzerland	6,644
Netherlands	3,795
USA	3,380
Belgium	3,362
France	3,266
Germany	3,253
Canada	2,834
Japan	2,803
Australia	2,569
Singapore	553
Chile	408
Russia	272
Mexico	250
Bulgaria	207
Thailand	103
Taiwan	83
Ghana	23
Nigeria	11
India	9

India has the lowest average GHE at US$ 9 (Figure 2.4), smaller than the average GHE in Nigeria and Ghana of US$ 11 and US$ 23. Switzerland has the highest average GHE spending at US$ 6644. Netherlands is second with an average spending of US$ 3795. Belgium (US$ 3362), France (US$ 3266), Germany (US$ 3253) and USA (US$ 3380) have comparable government spending on health per capita. Each country under observation experienced an increasing public health spending over the years, although there are some countries that have experienced a slowing down or fall in the per capita government health spending over the years 2012-15.

There are many ways one can learn from the global experiences with UHC as far as the design of a national UHC programme is concerned. For instance, Belgium has a mixed (public and private) health care insurance system. The citizens of Belgium who are employed, or are related to an employed person, or who sustain themselves on a form of replacement income are covered

by health insurance. In practice, anyone who has an official residence in Belgium is eligible for coverage under the scheme. Employers and employees fund the health insurance system with a pre-defined tax in addition to income tax which is managed by insurance associations known as 'sick funds' or 'mutualities'. The patients only pay a co-payment (demotivation fee). Health care providers charge the patients' health insurer who in turn bill the social security system for the money spent along with an additional handling fee.

The sick funds have an incentive to report higher expenditure as their handling fees are a percentage of it and doing so allows them to make more profit. Hospitals are privately owned and there is no government intervention with their functioning. The government and medical care providers negotiate on a yearly basis on the reimbursement rates for medical services. The compulsory public insurance covers medical expenses to varying degrees depending on the type of care, household income and status of patient. However, the OOP payments of the individuals are rising. There is thus a pressure to lower their higher OOP payments by taking up a supplementary health insurance plan. This system serves as an alternative but is not entirely similar in many ways to the PMJAY.

NETHERLANDS

Netherlands is our main country of interest as it has an insurance scheme similar to what the Indian government envisions. The Netherlands government enacted the current health care system in three waves. The first wave was of the Universal Health Coverage wherein they guaranteed a minimum level of quality of healthcare and universal access to 'basic health-services'. The second wave was to regulate the increasing cost of health care spending as it could jeopardize the goal of universal accessibility. The third and final wave was the introduction of managed competition for increasing efficiency.

Coverage

The Dutch government enacted the Health Insurance Act (HIA) on January 1, 2006. A Mandatory Basic Health Insurance must be purchased by everyone (all residents and non-residents who pay Dutch income tax) from a private insurer. Penalties are charged for non-enrolment. There are two social insurance schemes. The first covers curative care where the second covers long-term care for the elderly. The insurance covers general practitioners and specialists along with pharmaceuticals and hospital care. The insurers are obliged to accept each applicant for a basic health insurance contract at a community rated premium. They cannot

deny coverage because of any pre-existing conditions. The insurers also provide supplementary insurance to people.

Financing

A community rated premium is paid directly to the insurer. However, no premium is paid for children (under 18 years). There is a deductible component to payments as well wherein a mandatory annual deductible of Euro 385 is paid[1]. An income-related contribution must be paid to a Risk Equalization Fund[2] (REF). It is a legal obligation of the employers to compensate their employees for these contributions. An income-related 'care-allowance' (subsidy) is provided to about two-thirds of the households from the government. There is guaranteed issue for the community rated premium in all the provinces of Netherlands. For people who belong to a 'group' there is a group discount wherein the insurers can give a 10% discount on premium.

Health-Care Provision

Insurance providers function in a regulated market wherein they compete on the basis of premiums, services and quality of care offered. There are around 14 insurers across the provinces of Netherlands. Hospitals are private non-profit organisations with regulated market entry. All professionals are either employed by the private non-profit companies or are self-employed. Hospitals are paid according to a Diagnosis Treatment Combination (DTC) which is on the same lines as Diagnosis Related Groups (DRGs). Insurers and healthcare providers negotiate with each other over the rates of DTC. General practitioners are paid on a capitation basis and act as gatekeepers for the secondary and tertiary sectors.

Issues with the Netherlands Health-care system

Increasing costs: This system has worked well for a long period but has certain issues with its functioning. The total health care expenditure as a percentage of GDP has been rising continuously over the years and reached approximately 13% in 2013. The per capita amounts are also high and growing due to expensive healthcare services. The per capita expenditure on medical and long-term care grew at a rate of around 40% in 2013, mainly due to introduction of new technology and a greater tendency to use hospital care.

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[1] This deductible comes with an option to raise it to 885 euro in return for a premium discount.
[2] REF pays a risk-equalisation payment to the insurer for open enrolment. For high-risk insured people, a higher payment is made to the insurer as compared to the low-risk insured individual.

Spending on senior-citizens: A significant amount of money is spent on the elderly. Because of an ageing population this expenditure is likely to increase further. Most of this expenditure is spent for long-term care. The population between 74 and 88 is only 0.7% of the entire population but uses almost 1.5% of the total health expenditure. This is primarily due to an increase in the long-term spending. On average, people of ages 65 and above spend US$ 104,000 in the last three years of their life whereas people under 65 spend US$ 80,000 in the last three years of their lives.

Persistence in medical spending: There is high degree of persistence in the large expenses – especially for the elderly - with such patients spending more each year and using more services of the insurance scheme each year.

Market Competition and losses: There are about 14 insurers with several subsidiaries operating across the regions. The largest four insurers control almost 90% of the market. Price competition has increased sharply which has caused the insurers to lose a collective of Euro 563 million. Discounts and subsidies have led to an increasing pressure on the revenues of the government.

Non-payment of premiums: There is a small set of people who do not pay their premium, approximately 1.5% of the population. The insurers can cancel the contract of such people and not enrol such for the next five years. But all the other insurers are free to enrol that person. Cancelling the contracts therefore does not have any effect per se, and it is not in their collective interest.

SWITZERLAND

Another country which has a similar system is Switzerland. It has much in common with the system adopted by Netherlands. The current Swiss healthcare system came into effect in 1996 under the Health Insurance Law of March 18, 1994. It was an effort to introduce a perfectly managed competition scheme across Switzerland, with full coverage in basic health insurance. This system is highly decentralised as there are *26 swiss cantons* which are largely responsible for the provision of healthcare and regulation of the insurance companies and primarily operate on a regional basis.

<u>Coverage</u>

The basic package consists of medical treatment deemed appropriate medically and cost effective. People can seek treatment under this scheme only in their canton of residency and

accredited hospitals. The basic package consists of three categories: Sickness Insurance, Maternity Insurance and Accident Insurance. All individuals must purchase a basic insurance package, or they shall face a penalty. Consumers have a choice of switching their insurers twice a year.

Financing

A standard premium is defined by the government. So long as the insurance companies do not risk select, they are allowed to compete over prices. Insurers are not allowed to charge different price for individuals. To ensure this, a risk equalisation body called 'Foundation 18' is set-up to redistribute funds form low-risk to high-risk health risks, based on the age and gender of the enrolee. A deductible or 'franchise' fee has to be paid before the insurance kicks in and is regulated by the federal government by setting a range of admissible deductibles. Costs exceeding the deductibles are paid by the insurer, although a co-payment of 10 percent must be paid for all remaining costs. Co-payment is capped at 700 swiss francs per year by cantons. In order to discourage over-utilisation of services, people receive an increasing reduction in their insurance premium each year if they do not submit health claims.

Health Provision

Individuals can take up plans that employ Managed Care Organisations (MCO). This helps cut cost by reducing the patient's options. Apart for this basic insurance, the individuals can also buy any supplementary insurance. Online websites help decision making by comparing insurance companies on customer satisfaction, quality of systems, financial reports etc.

Issues with the system

Escalating costs: Health expenditure is at 11% of the GDP and basic package premiums have increased at a rate of 5% per year. The OOP payments are higher than the OECD countries. The costs of the basic package have been increasing rapidly due to increasing comprehensiveness. The benefits have increased over the years which has artificially increased the costs of provision of services.

Inadequate Risk-equalisation: The costs will keep increasing if more sick people self-select for the scheme. This can be tackled by the risk equalisation fund. However, risk equalisation is based on the gender and age of the person and may not fully address the issue.

Fragmentation of Switzerland into Cantons: Switzerland is fragmented into cantons which restrict the individual from using services outside his/her canton. This restricts the options for the individuals and undermines any attempt to create national standards in health care. Another way that they restrict options is by only having a set of accredited service providers which the individuals can use. This fragmentation also leads to formation of cartels. Cartels exist between health providers and insurers which means that the patients have little influence on the price of the services and medical care.

Regressive system: Many studies have concluded that the Swiss insurance system is regressive i.e. the rich pay relatively less than the poor people. There exists an overall regressive effect of the mandatory health insurance (net of premiums) which has been present since the last decade. All cantons are individually regressive with respect to the health insurance scheme as well. The Swiss health care system remains regressive even after the major reform of 1996. The insurance scheme is clearly not functioning well.

3. Rashtriya Swasthya Bima Yojana (RSBY)

Initiated in the year 2008, the RSBY is a government sponsored health insurance scheme under the MOHFW[3]. Under this Centrally Sponsored Scheme (CSS), health insurance coverage is provided to Below Poverty Line (BPL) families and 11 other categories[4] of unorganized workers. The coverage is in the form of hospitalisation expenditure of up to Rs. 30,000 per annum (including maternity benefits), incurred in any Government empaneled public or private hospital to each enrolled family (a unit of five), on a family floater basis. More than 1500 standard packages are included under this scheme, which mostly deals with secondary care hospitalisation procedures. There is no age bar and pre-existing conditions are covered from day one. Transportation cost up to Rs. 100 is also provisioned under the scheme. The beneficiary family pays Rs. 30 per annum per family as registration/renewal fee (smart card), the amount being used by the State Government to finance administrative cost for the scheme.

The scheme is implemented at the state level through a contract between the insurance companies and the State Nodal Agencies (SNA's), on behalf of the State Governments. Maximum premium payable has been fixed at INR 750 per family. Since 2015-16, Central Government bears 60% of total premium costs, the rest being borne by respective State Governments[5]. Currently there are 41,331,073 active smart cards. Till 31st March 2016, there has been 11,841,283 hospitalisations under this scheme[6].

RSBY is not universal, in the sense that not all states participate fully in it. That is because either they already have a better state level scheme (e.g. Andhra Pradesh has the Rajiv Arogyashri, Karnataka has Vajpayee Arogyashri and Yeshaswini while Tamil Nadu has the Chief Minister Health Insurance Scheme) or are in the early stages of rolling out RSBY e.g. J&K, Madhya Pradesh and Rajasthan.

The PMJAY is an extension of the RSBY in terms of coverage – both physical and financial. However there have been very few analytical reviews of the RSBY, largely because of unavailability of data. The pros and cons of a scheme like RSBY could have potentially

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[3] The scheme was initially launched under the Ministry of Labour and Employment (MoLE). The scheme has now been transferred to the Ministry of Health & Family Welfare on an "as is where is" basis with effect from 01.04.2015.

[4] MGNREGA workers, construction workers, domestic workers, sanitation workers, mine workers, licensed railway porters, street vendors, beedi workers, rickshaw pullers, rag pickers and auto/taxi drivers

[5] In case of North Eastern and three Himalayan States the Centre pays 90% of insurance premium cost. In respect of Union Territories (without legislature), the Central Government share is 100% while in those with legislature, the Central share will be 60%.

[6] http://www.rsby.gov.in/about_rsby.aspx, accessed on 13th November.

informed the design of PMJAY in an objective manner. In this section, we do an exploratory analysis of the RSBY data[7], provided by the ministry, to try and answer the following questions.

i. Has the RSBY covered all potential beneficiaries? What has been the trend over years and across states?

ii. How has the average premium behaved over time? What is the extent of inter-state variation in average premiums?

iii. What has been the public-private mix of empaneled hospitals and its variation across rich-poor states?

iv. What has been the trend in hospitalisation rates over time and across states?

v. What has been the trends and patterns in claims ratio and claims settlement ratio?

a. Beneficiaries and Coverage

In the year 2016-17, 3.6 crore families were enrolled for RSBY which amounts to only 62% of the total target of 6 crore families (Figure 3.1). The share of enrolled families had been declining steadily between 2011-12 and 2014-15 and picked up thereafter. The average enrolment percent during the years 2011-12 to 2016-17 was 56%. State with the highest average enrolment in these 6 years was Kerala, followed by Andhra Pradesh, Chhattisgarh, Rajasthan and Orissa. States with lower enrolment were Delhi, Haryana, Uttar Pradesh, Uttarakhand and Karnataka.

Figure 3.1: Enrollment as % of Target (Households) All-state average

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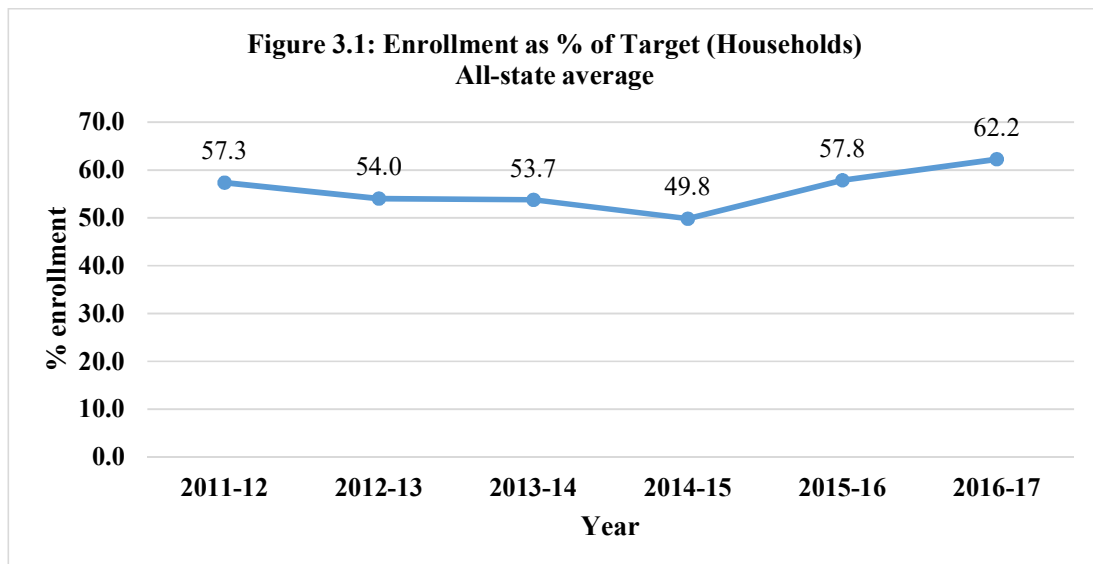
[7] The data has been provided by the Ministry of Health & Family Welfare (MOHFW)

b. Empanelment of Hospitals

The total number of empaneled hospitals have declined progressively from 11,898 in 2011-12 to 8537 in 2017-18. In 2011-12, 70 % of all empaneled hospitals were private hospitals, the rest being public hospitals (Figure 3.2). The share of private hospitals thereafter declined steadily and currently, 57% of all empaneled hospitals are owned by private entities. There are wide inter-state differences in the share of private (or public) hospitals in total enrolled hospitals. While 92% of all enrolled hospitals in Haryana are private hospitals, the corresponding number for Tripura is 2.5% only. States with the lowest share of private sector hospitals are Tripura, Meghalaya, Himachal Pradesh, Mizoram and Assam. Incidentally, all these states are hilly with a difficult terrain, which could have had a bearing on the degree of private sector participation. However, Manipur, with largely similar geographical attributes, had all its empaneled hospitals in the private sector – a fact that is hard to explain.

Figure 3.2: Percentage composition of empanelled hospitals by type (public/private)
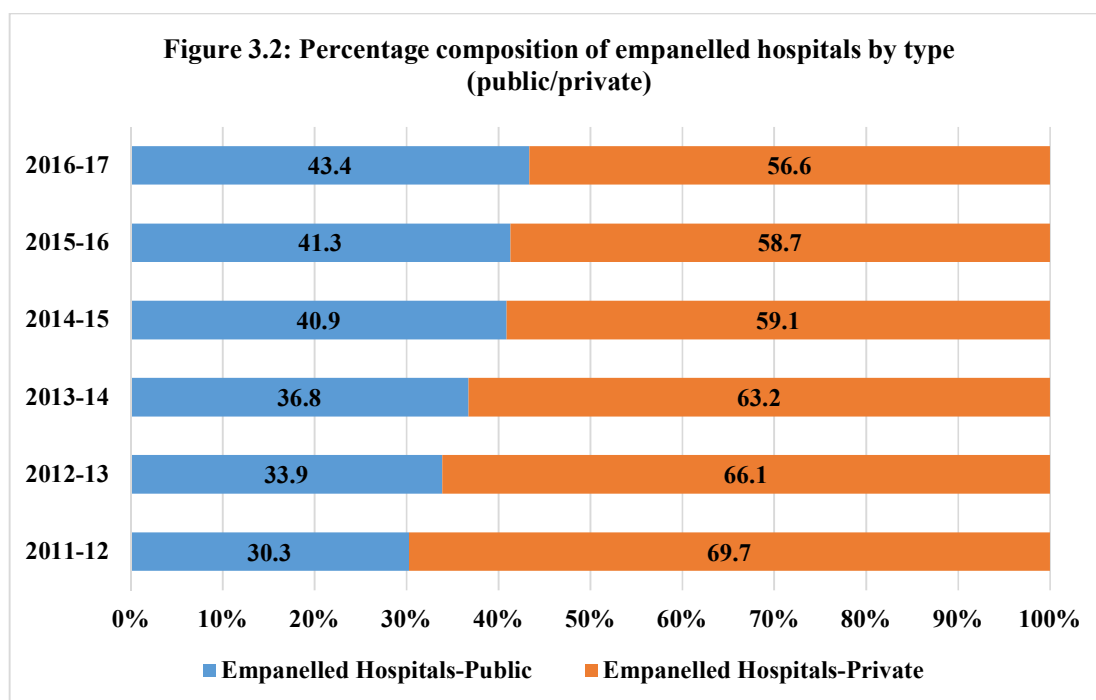
On an average, around 1.5 lakh beneficiaries were hospitalized in 2016-17. This denotes utilization under RSBY, in absolute terms. Utilization of RSBY is seen to decline during 2011-12 to 2014-15 and improve thereafter (Figure 3.3).

The rate of utilization under the scheme, denoted by the share of hospitalisations in total number of beneficiaries, has been declining almost steadily since 2011-12. This indicates poor response towards the scheme, especially since the all India hospitalisation rates, available from the National Sample Survey data has been increasing over time. It is important to understand

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the reasons for this declining trend in hospitalisation within RSBY beneficiaries because the same set of reasons can affect a largely similar programme like the PMJAY. Possible reasons for a low response could be non-dissemination of information regarding entitlements under the scheme, denial of RSBY entitlements (e.g. cashless facility at hospital) by empaneled hospitals to the beneficiaries, harsh and unwelcome behavior by service providers (e.g. higher waiting time for RSBY card holders vis-à-vis others), additional spending out of pocket that renders RSBY ineffective etc.

Figure 3.3: Hospitalisations among RSBY beneficiaries
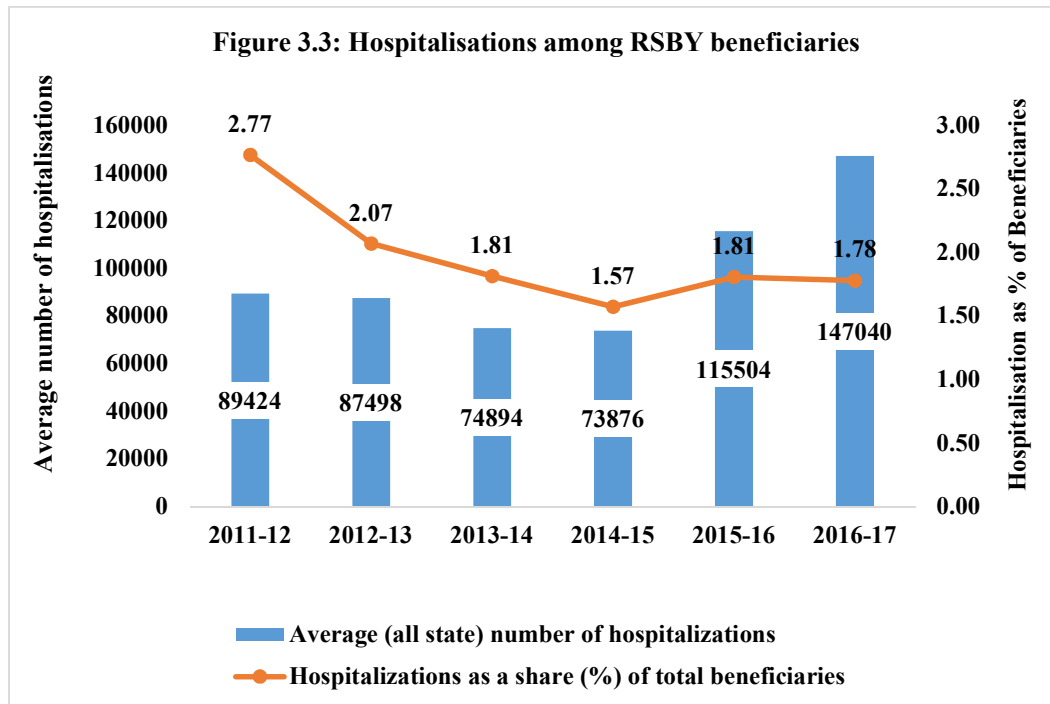
States with some of the highest rates of utilization were Kerala (5.6%), Chhattisgarh (5.2%), Meghalaya (2.9%), Mizoram (2.8%) and Himachal Pradesh (2.4%) in 2016-17. In fact, these states, especially the top 2 has been consistently doing well in terms of utilization of RSBY. On the other hand, Bihar (0.3%), Karnataka (0.3%), Manipur (0.1%), Nagaland (0.01%) and Uttarakhand (0.01%) were the states where the share of hospitalisations among RSBY beneficiaries were the lowest. Bihar and Karnataka have actually figured among the bottom 5, consistently since 2014-15.

c. Premiums

The all-state average premium in the year 2015-16 was INR 366 (Figure 3.4). The premium varies from a low INR 191 per family in Karnataka to INR 745 in Mizoram. Along with Mizoram, Kerala was another state with a premium over INR 700. The difference of these two states with the state (Manipur) with the next highest premium was more than INR 200 per

family. Over time, the all state average premium has been declining consistently, from INR 479 in 2011-12 to 342 in 2016-17. The total premium bill has been declining too[8]. However, the inter-state variation in average premium has been increasing, as shown by the orange line in figure 3.4 which plots the coefficient of variation[9] of average premiums. So, the fiscal implications of RSBY are different for different states.

Figure 3.4: RSBY premium over time and its variation across states
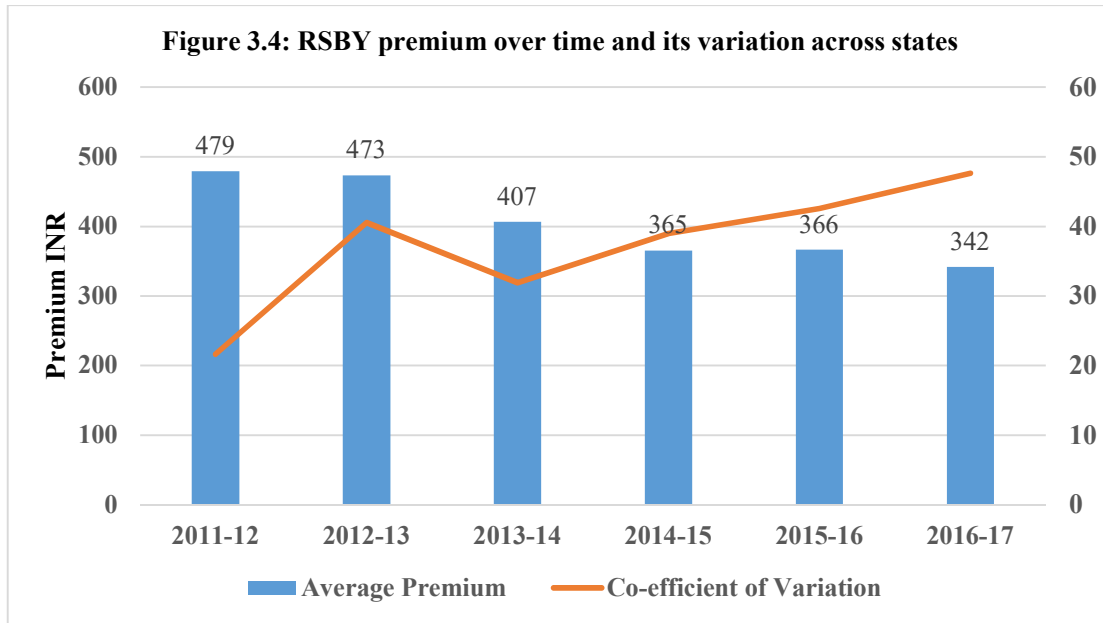
d. Claims

The all state average of total settled claims in the year 2016-17 was INR 51 crores, which translates to an average claim per hospitalisation of INR 2874 (Figure 3.5). Chhattisgarh with a total settled claim amount of INR 281 crores tops the list among states. The top states in terms of aggregate settled claim amounts during 2011-12 and 2016-17 were Chhattisgarh, Kerala, West Bengal, Bihar, Orissa, Gujarat and Uttar Pradesh. Five of these states together accounted for 87% of total claims settled in 2016-17. The highest average claims (per hospitalisation) in 2016-17 was noticeable for states like Meghalaya, Mizoram, Himachal Pradesh and Assam. Figure 3.5 shows that the average claim per hospitalisation has been declining over the years. However, the inter-state variation in average claim amount has been steadily increasing. This is depicted by a rising coefficient of variation (orange line).

An important indicator of the quality of claims is the claims settlement ratio. It is defined as the ratio of total claims settled to total claims made and therefore can be conversely interpreted

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[8] The sum needs to be interpreted with caution as data for all states is not available for all years.
[9] Coefficient of variation = (Standard Deviation/Mean)*100.It is a relative measure of dispersion.

as the rate of claim rejections. Insurance claim rejections are however not always about quality of claims. There have been increasing instances of rejection of claims by health insurance companies by applying finely worded sub-clauses within insurance policies. The incentive to do so clearly lies with the insurance companies who can then retain a larger chunk of the premium collected.

Figure 3.5: Trends in RSBY claims (settled) per hospitalisation, and its inter-state variation
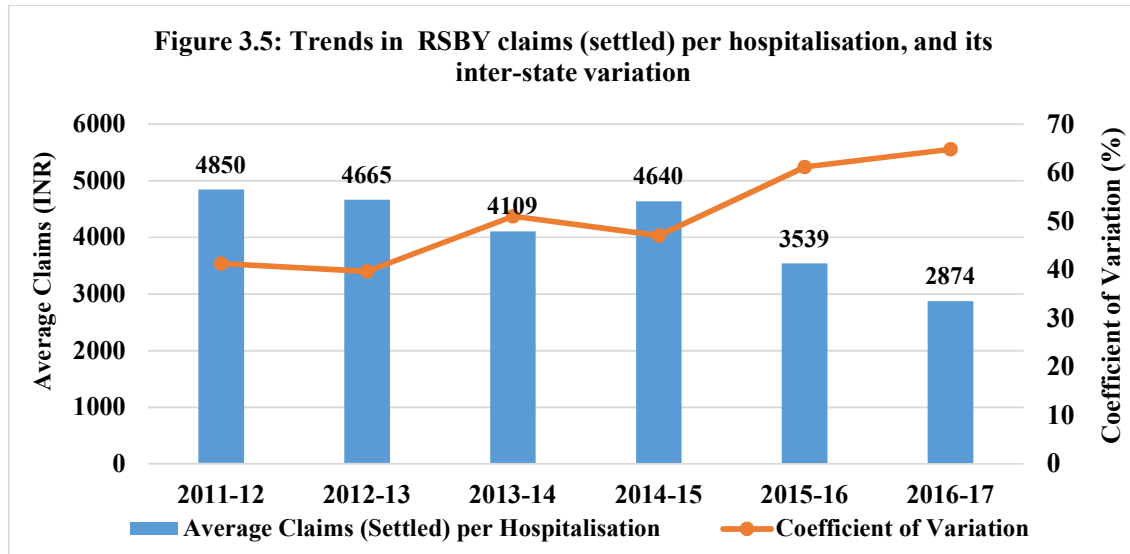
Figure 3.6 plots the all-state average of claims settlement ratio for six years. The ratio has declined steadily from a high 88% in 2011-12 to 57% in 2016-17. What this means is that currently just above half of claims made under RSBY are being paid. While the reasons for this high rate of rejection is not known and cannot be explored with the available data, the implications of these rejections for a poor family with an indisposed member, can be severe. The PMJAY must consider seriously the issue of declining claims settlement ratios and incorporate suitable interventions to prevent such a decline.

Figure 3.6: Claims Settlement Ratio (%)
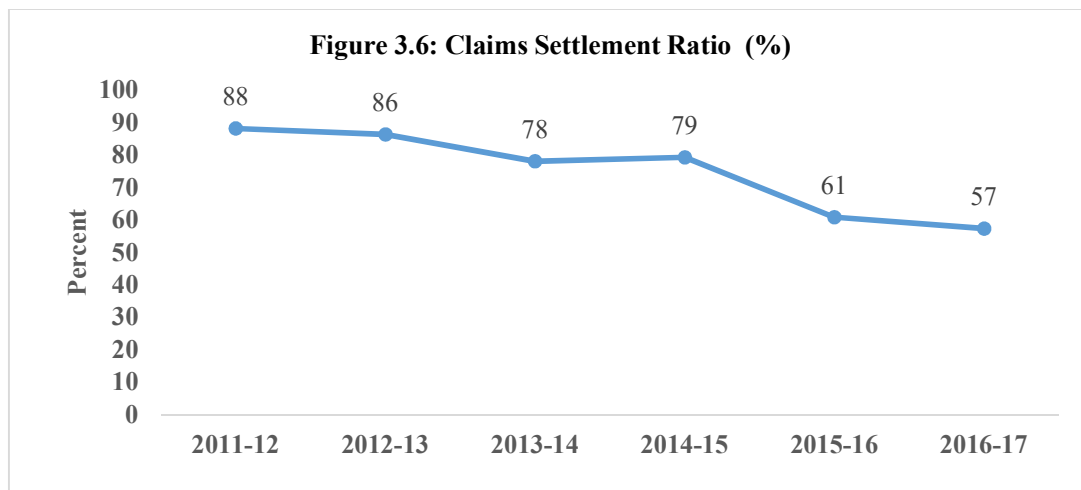
Probably the most important indicator of sustainability of health insurance business is the claims ratio. Claims ratio is the ratio of total claims settled to the total premiums collected. Higher the claims ratio, lower is the profitability (larger payout vis-à-vis premium income) of the insurance business and therefore greater the chance of an insurance company opting out of a scheme like PMJAY. It therefore makes sense to analyze claims ratio in RSBY and see if suitable lessons emerge for the impending scheme.

The average claims ratio in the year 2016-17 was 66%. This implies that insurance companies had to payout 66% of their total revenue (premium collected from the government), to the empaneled hospitals. Even after allowing for some administrative expenses, it means profit for the insurance companies. At 229% of total premium, claims ratio was the highest for Meghalaya. The other states with a claims ratio above 100% were Chhattisgarh (187%), Himachal Pradesh (141%), Kerala (115%) and West Bengal (106%). Chhattisgarh is odd in the sense that its claims ratios has been much above the 100% mark in all but just one year between 2011-12 and 2016-17. The inter-state variation in claims ratio is on the rise after a brief period of decline between 2011-12 and 2013-14. The all-state average claims ratio has largely remained in an around 50% except in 2011-12 (65%) and 2016-17 (66%).

This exploratory analysis of RSBY data generates some instructive lessons, which might have implications for the PMJAY.

First, enrolment in RSBY has been woefully short of target. This was the responsibility of the insurance companies who had agreed to be a part of the scheme. The PMJAY however takes care of this issue by making it an entitlement-based scheme rather than an enrolment based one. The task of identifying eligible households however remains.

Second, while a purpose of RSBY was to integrate the services of the private sector under a public-private partnership (PPP) mode, we see a gradual decline in the share of private hospitals in the list of empaneled hospitals over time. This is largely due to a reduction in the number of private hospitals, in absolute terms, rather than an increase in the number of public empaneled hospitals. The reasons could range from lack of profitability from enrolling in RSBY, regulatory actions of state governments or simply administrative hassles during empanelment and reimbursements. The PMJAY has in fact tried to address this issue by keeping provisions

for incentives to hospitals in backward/rural/LFE[10] affected areas and those that have a NABH accreditation. The success of these measures remains to be seen.

Third, the analysis finds that while hospitalisation rates have been increasing for the country as a whole, it has been falling for RSBY beneficiaries. A quick look at the ccorrelation between share (%) of private hospital in total empanelled hospitals and rate (%) of hospitalisation among RSBY beneficiaries indicated that hospitalisation rates are consistently negatively associated with the share of private hospitals in total empaneled hospitals at the state level. This points towards an exclusionary private sector which may not be extending its full co-operation to the RSBY beneficiaries. Of course, this claim merits further investigation.

Fourth, both the average premiums and claims (per hospitalisation) is showing a declining trend. While a decline in average premium is welcome and could be on account of an ever-increasing risk pool, the issue of declining claims per hospitalisation needs to be studied carefully. This could essentially point towards a predominance of low value procedures which may or may not fetch health gains for the beneficiary but could be an avenue of access to easy money, especially for the smaller private hospitals.

Fifth, inter-state disparity in average premiums and average claims (per hospitalisation) is on the rise. This is not surprising given the heterogeneity in health outcomes, disease burden, health system characteristics and general economic status of the states. However, this calls for a more decentralized approach to health service provisioning, even if through the insurance route.

Sixth, claims settlement ratio has been declining alarmingly in the last few years and is currently just below 60%. It needs to be remembered that the part of the claim that is rejected is nothing but the OOP expenditure of the beneficiaries, especially if one visits a private service provider. This probably is one of the reasons why a number of studies have shown a negligible (and often negative) impact of such public insurance programmes on financial protection.

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[10] Left Wing Extremism

4. Methodology

The short-term projections are for the years 2019-2023. The objective is to arrive at the possible total costs of PMJAY for hospitalisation of beneficiaries for 2019-2023. For this, there are three important variables that would impact on the total costs (TC) incurred. These are:

- Target number of beneficiaries (B)
- Rate of hospitalisation (H)
- Average medical expenditure (E)

Essentially, in any year, the total costs of hospitalisation would be estimated as:
$$\text{TC} = \text{B} * \text{H} * \text{E}$$
Currently, each of these three variables are not readily available for the current year. Moreover, to estimate the costs incurred for the next 5 years, one will have to make assumptions about the rate of change in B, H and E. In this report Andra Pradesh is inclusive of Telangana.

Alternative scenarios of total costs can be estimated by varying each of these parameters. Below, we take each of these parameters and discuss the various assumptions that can be made to initiate the total cost estimations.

(i) Target number of beneficiaries (B)

The beneficiaries under PMJAY are to be based on the Socio-economic and Caste Census data (SECC) of 2011. The SECC-2011 is a study of socio-economic status of rural and urban households and allows ranking of households based on pre-defined parameters. SECC 2011 has three census components: Census in Rural Area has been conducted by the Department of Rural Development, Census in Urban areas is under the administrative jurisdiction of the Ministry of Housing and Urban Poverty Alleviation, and the Caste Census is under the administrative control of Ministry of Home Affairs. Overall, the coordination was done by the Ministry of Rural Development.

The aim of the SECC is to arrive at measures of deprivation. Households are excluded from such calculations based on 14 parameters of exclusion. Similarly, 5 parameters are used for automatic inclusion (households without shelter, destitute living on alms, manual scavenger families, primitive tribal groups and legally released bonded labour). From among households considered for deprivation, the SECC calculates the number of households with up to 7 deprivation, separately. Thus, the number of households with at least one deprivation is greater than those with 2 which is in turn greater than those with 3 deprivation parameters etc.

Overall, the government plans to cover 40% of the population or 10 crores households by PMJAY. The list with the actual numbers that the government aims to cover across states is available and is given in Table 4.1.

Table 4.1: Number of Beneficiaries covered			
State	Beneficiary Households	Estimated BPL household size	Beneficiary Individuals
Andaman and Nicobar Islands	21390	4.8	102672
Andhra Pradesh	8142000	5	40710000
Arunachal Pradesh	88920	5.5	489060
Assam	2701000	5.3	14315300
Bihar	10800000	5.9	63720000
Chandigarh	71270	4.9	349223
Chhattisgarh	3729000	4.6	17153400
D & N Haveli	32610	5.9	192399
Daman& Diu	10190	6.3	64197
Delhi	588000	6.1	3586800
Goa	36970	5.3	195941
Gujarat	4485000	5.7	25564500
Haryana	1551000	5.9	9150900
Himachal Pradesh	277000	5.4	1495800
Jammu & Kashmir	613000	6	3678000
Jharkhand	2805000	5.5	15427500
Karnataka	4131000	5.1	21068100
Kerala	1858000	5.2	9661600
Lakshadweep	1460	6.2	9052
Madhya Pradesh	8381000	5	41905000
Maharashtra	8363000	5	41815000
Manipur	277000	5	1385000
Meghalaya	347000	5.7	1977900
Mizoram	101000	5.1	515100
Nagaland	202000	5.1	1030200
Orissa	6100000	4.6	28060000
Pondicherry	103000	5.1	525300
Punjab	1496000	5.6	8377600
Rajasthan	5971000	6	35826000
Sikkim	39790	5.6	222824
Tamil Nadu	7771000	4.6	35746600
Tripura	494000	4.9	2420600
Uttar Pradesh	11800000	6.5	76700000
Uttarakhand	537000	5.4	2899800
West Bengal	11200000	5	56000000
TOTAL	**105125600**	**5.3**	**562341368**

Source: PMJAY website, Census, and authors' calculations

In the estimations, we assume full target coverage in 2019 and also that this number does not change over the 5 years. In other words, the projections are based on the assumption that total number of beneficiaries do not go up over the 5 years.

(ii)   Hospitalisation rates and medical expenditures on hospitalisation

The main concern is the expected hospitalisation rate and expenditures after the PMJAY is implemented. An expected scenario is that with insurance coverage, there will be an opening up of pent up demand for treatment with those who needed treatment now being encouraged to seek care. However, exactly what that impact would be is difficult to judge right now. Also, the average medical expenditure on hospitalisation may also go up due to the high coverage ceiling of Rs 5 lakhs.

The NSS indicates a lower rate of hospitalisation among BPL population. However, it stands to reason that with the advent of PMJAY, the BPL rate of hospitalisation may rise. Therefore, we use the average hospitalisation rate over the entire sample as the baseline in our calculations.

Since the idea is to estimate the minimum possible costs that the system will have to bear, we make 3 sets of assumptions that are extremely conservative.

We use mainly the 60th and 71st NSSO rounds, conducted in 2004 and 2014 respectively, used to calculate the hospitalisation rates and average medical expenditure of states.

The following assumptions are applied across all the three scenarios:

Firstly, all the 3 scenarios use Consumer Price Index (CPI) to adjust the projections of average medical expenditure for inflation. The years 2017 and 2018 were used to calculate a growth rate for CPI of states and project CPI for the period 2019-2023[11]. CPI projections were done using the following formula:

$$CPI^*_{x,i} = CPI_{2018,i} * \left(1 + \frac{\{\text{growth rate of CPI}_i\}}{100}\right)^{x-201}$$

where $x = \{2019,2020,2021,2022,2023\}$ represents the year for which we wish to project the CPI and i represents the $i'th$ state. So, if $x = 2019$, the formula simplifies to:

$$CPI^*_{2019,i} = CPI_{2018,i} * \left(1 + \frac{\{\text{growth rate of CPI}_i\}}{100}\right)$$

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[11] The growth rate is calculated by: Growth rate of CPI $= \left(\frac{CPI_{2018}-CPI_{2017}}{CPI_{2017}}\right) * 100$

The base year of CPI is 2012, hence, average medical expenditure in 2014 was deflated to 2012 level[12]. Average medical expenditure, deflated to 2012 level, is inflated accordingly to projected average medical expenditure for the period 2019-2023. The total medical expenditure and premiums for the four scenarios were calculated as follows:

$$Total\ medical\ expenditure_x = \sum_{i=1}^{35} [No.\ of\ Beneficiaries_i * H_{x,i} * E_{x,i}]$$

$$Premium_x = \frac{Total\ Medical\ expenditure_x}{Total\ no\ of\ Beneficiaries}$$

where total no of beneficiaries $= \sum_{i=1}^{35}(No.\ of\ Beneficiaries_i)$.

Table 4.2 presents the details on the 3 scenarios used in the estimations.

Table 4.2: Alternative assumptions about hospitalisation rate and average hospitalisation expenditure		
Scenario	**Hospitalisation Rate**	**Average Medical Expenditure**
I	$H_{x,i} = H_{2014,i}$	$E_{x,i} = E_{2012,i} * \frac{CPI^*_{x,i}}{100}$
II	$H_{x,i} = \begin{cases} H_{2014,i}; for\ year = 2019; \\ H_{2019,i} * (1 + h_i)^{x-201}, \\ for\ year = \{2020,2021,2022\}; \\ 8; for\ year\ 2023; \end{cases}$ (excluding Kerala) where $(h_i) = \left[\left(\frac{H_{2023,i}}{H_{2019,i}}\right)^{\frac{1}{5}} - 1\right] * 100$	$E^*_{x,i} = E_{x,i} * (1 + g_i)^{x-2014}$ where $(g_i) = \left[\left(\frac{E_{2014,i}}{E_{2004,i}}\right)^{\frac{1}{10}} - 1\right] * 100$
III	$H_{x,i} = \begin{cases} 2; if\ x = 2019\ or\ 2020 \\ 3; if\ x = 2021 \\ 4; if\ x = 2022 \\ 5; if\ x = 2023 \end{cases}$	Same as in Scenario II

The cost calculations are done at the individual level. Once the total individual costs for running the PMJAY are obtained, we need to divide the numbers with the household size to arrive at the cost per household. However, the census gives only the overall household size and not household size by economic category, but this is available from the NSS. Thus, we make the assumption that the ratio of household size for BPL and general population in the NSS is same as in the Census and apply the algorithm to arrive at the household size of the BPL population.

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[12]The formula used is: Avg. med. expenditure in 2012 $= \frac{(E_{i,2014})*100}{CPI_{i,2014}}$.

In Table 4.3 we present the NSS hospitalisation rates for the general population as well as for the bottom 40% for the two rounds.

Table 4.3: Hospitalisation rates (per 1,000 persons) from NSS					
State	**71st round**		**60th round**		**Average Med. Expenditure**	
	Bottom 40%	**All**	**Bottom 40%**	**All**	**2014**	**2004**
A & N Islands	5.5	7.3	7.1	6.4	4629	1250
Andhra Pradesh	5.5	6.6	2.1	2.7	17473	6396
Arunachal Pradesh	3.5	3.5	2.7	2.9	6053	2534
Assam	2.6	3	1	1.2	9617	4181
Bihar	3.1	3.5	0.9	1.1	10005	7117
Chandigarh	2.5	3.9	2.1	2.7	25552	10701
Chhattisgarh	2.8	3.4	1.5	1.7	11929	5926
D & N Haveli	6.4	5.6	1.9	8.3	5943	2105
Daman& Diu	19.9	7.3	7.5	2.9	8464	4385
Delhi	3.7	3.7	1.2	1	29315	11269
Goa	4.1	4.6	4.5	3.7	24786	4443
Gujarat	4.5	5.3	2.9	3.6	14205	6133
Haryana	4	4.9	2.6	3.9	19848	9129
Himachal Pradesh	5.4	6	3.7	3.6	16880	7776
Jammu & Kashmir	4.4	4	1.3	1.9	7941	4584
Jharkhand	2.9	3.5	1	1.2	7808	4626
Karnataka	5.3	5.8	2	2.5	15086	6159
Kerala	9.6	13.4	11.6	12.2	16538	3798
Lakshadweep	6.6	9.2	7.3	8	8008	6891
Madhya Pradesh	4.2	4.5	2	2.3	11953	4735
Maharashtra	4.6	5.6	3.2	3.8	20789	6885
Manipur	3.6	4	1.5	2	7349	4606
Meghalaya	3	2.9	0.7	1	4445	3524
Mizoram	3.1	3.8	2.5	2.2	8564	2968
Nagaland	1.5	1.9	1.5	1.3	7090	4620
Orissa	4.6	5	2.2	2.6	9821	3806
Pondicherry	5.9	6.7	6.1	6.2	11589	5385
Punjab	3.4	4.5	1.8	3.3	24294	13672
Rajasthan	4.6	5	2.1	2.2	9926	7174
Sikkim	3.1	3	2.1	1.7	6851	3160
Tamil Nadu	6.3	6.8	3.5	4.2	17039	7137
Tripura	5.1	5.8	4.3	4.2	6782	4591
Uttar Pradesh	3.2	3.9	1.2	1.6	16965	8285
Uttarakhand	2.3	3.3	1.2	1.8	10131	10264
West Bengal	5.2	5.6	2.5	2.8	13491	5292
INDIA	**4.1**	**5.1**	**2.1**	**2.8**	**15242**	**6332**

Source: NSS 60th and 71st rounds

The average rates are 5.1 and 4.1 respectively for the general population and BPL population in 2014 (71st round). It can be assumed that when financial constraints are lifted it would bring demand up even for the BPL population. Thus, in the estimations, we do not use the hospitalisation rates of the BPL but use the general hospitalisation rates for the beneficiary population.

Table 4.3 also presents the average medical expenditure on hospitalisation for the general population in the last two columns. The same rule as in the case of hospitalisation is applied – instead of average expenditure of the lowest 40%, we use the average expenditure in the entire sample.

We use three scenarios for our projections of total costs, given in a summary in Table 4.4. Since these assumptions are critical, we also discuss each in detail below.

Table 4.4: Alternative assumptions about hospitalisation rate and average hospitalisation expenditure		
Scenarios	Hospitalisation rate	Average health expenditure
I	• 2014 NSS rate used for all 5 years	• 2014 NSS expenditure used for all 5 years after accounting for inflation
II	• 2014 hospitalisation rate for entire population used for 2019. • For hospitalisation, we use 8% as the upper limit and pro-rate using 2019 as the base. • Kerala already had rate more than 8% for the BPL population and more than 13 for general population in 2014. We cap it to 13 for this state only for 2021-23.	• 2014 expenditure for the entire population pro-rated for the period 2019-23 taking into consideration the rate of growth and inflation.
III	2019, 2020: 2% (ESIC) 2021: 3% (RSBY) 2022: 4% (Pro-rated from the remaining %) 2023: 5% (Literature Review)	Same as in Scenario II

Scenario 1: This scenario pertains to minimal variation in the hospitalisation rate and average medical expenditure. The hospitalisation rate on 2019 is the same as that for year 2014 for the entire sample of NSS 2014. This rate is kept the same for successive years, up to 2023. The average medical expenditure, on the other hand, is adjusted annually for inflation only, using projected CPI for the period 2019-23 (steps for CPI projection in 'Methodology' section). The number of household beneficiaries is converted into individual beneficiaries. Once the adjustments are done it is used for calculation of the total medical expenditure of a state accruing to the PMJAY. The total cost arrived at allows estimation of per household premium by dividing it by the number of beneficiary households.

Scenario 2: This case is one which takes into account the possible changes that can occur over the period of 2019-23. These changes pertain to the variation in the state hospitalisation rates and average medical expenditures. The hospitalisation rate in 2019 is taken to be the rate of the entire sample from NSS 2014 for every state, on the assumption that with insurance hospitalisation rates for the bottom 40% will not be artificially lower. Subsequently, we take hospitalisation rate of 8% in 2023 as the upper cap for all states, except Kerala. This is done based on the 2014 rates for South Indian states which were already running health coverage schemes; Kerela had already reached more than 9% hospitalisation rate in 2014. In the case of Kerala, the 2014 rate is 13.4% (hospitalisation rate for all in 2014) which is used as such from 2019 for successive years up to 2023. Once capped, the rate of growth of hospitalisation is calculated for 2020, 2021 and 2022.

Scenario 3: This case, like case 2, considers the changes in both hospitalisation rates and average medical expenditures. For the first two years, i.e. 2019 and 2020, the rate is fixed at 2%, which is the rate for the ESIC scheme. This is the lowest hospitalisation rate for an existing health insurance scheme in India. For the following year (2021), the RSBY rate, which is 3%, is used. The hospitalisation rate in the last year 2023, is set at 5% based on the literature review of rates of hospitalisation in countries with UHC. The rate for the year 2022 was set at 4% which was arrived at by using the rate of increase between 2021 and 2023.

As for the average medical expenditure in case 2 and 3, it is adjusted for inflation and the growth rate over the years, calculated using NSS round 60 (2004) and 71 (2014). Once the average expenditure has been revised for inflation and growth, we use it to calculate the total medical expenditure, which then is used to estimate per household/family premium using the number of beneficiary households.

5. Results

a. Total costs

The total costs per year for the 3 scenarios are given for each state in Tables A2, A3 and A4. As expected, scenario II gives the higher estimates. Also, there are significant state level variations as expected. Table 5.1 gives the total costs for India for each of the 5 years under the three scenarios.

Table 5.1: Total costs (in crores) for India over 2019-2023					
Scenario	2019	2020	2021	2022	2023
I	57,478	59,524	61,649	63,857	66,151
II	73,254	88,787	1,07,836	1,31,249	1,60,089
III	27,750	30,205	49,345	71,699	97,724

Source: Authors' calculations

The total costs vary from Rs 27,750 crores to Rs 73,254 crores in 2019 for India. Table 5.2 presents the lower and upper limit of the total costs.

Table 5.2: Lower and Upper levels of Total costs (in crores)					
State	**Range of Expenditure cost for PMJAY**		**State**	**Range of Expenditure cost for PMJAY**	
	Lower level	Upper level		Lower level	Upper level
A & N Islands	2.1	14	Lakshadweep	0.2	0.8
Andhra Pradesh	2704	16169	Madhya Pradesh	1831	10605
Arunachal Pradesh	11	60	Maharashtra	3474	21623
Assam	480	2681	Manipur	30	143
Bihar	1739	7970	Meghalaya	23	100
Chandigarh	32	180	Mizoram	17	105
Chhattisgarh	668	3534	Nagaland	21	99
D & N Haveli	4.4	27	Odisha	1018	5950
Daman and Diu	1.7	9	Puducherry	21	112
Delhi	390	2287	Punjab	624	3141
Goa	26	210	Rajasthan	962	4382
Gujarat	1271	7114	Sikkim	5.2	28
Haryana	616	3361	Tamil Nadu	2165	12263
Himachal Pradesh	86	467	Tripura	46	215
Jammu and Kashmir	88	441	Uttar Pradesh	4283	22818
Jharkhand	360	1775	Uttarakhand	67	267
Karnataka	1144	6548	West Bengal	2775	16137
Kerala	767	9256	**INDIA**	**27750**	**160089**

Source: Authors' calculations

The lowest total cost is accrued in scenario 3 in 2019 whereas the highest total cost is observed for scenario 2 in year 2023. Also, EAG and major states make up to 98% of the total costs.

Average costs over 5 years

In table 5.3, we present the average total costs over the 5 years for each state; for example, for Andhra Pradesh, the average costs over 5 years vary from Rs 5,614 crores to Rs 12,279 crores. The total costs averaged over the 5 years for India range from Rs 55,345 crores to Rs 1,12,243 crores.

Table 5.3: Average Total Costs (in crores)			
States	**Scenario I**	**Scenario II**	**Scenario III**
A & N Islands	6	11	5
Andhra Pradesh	6991	12279	5614
Arunachal Pradesh	19	36	21
Assam	656	1544	952
Bihar	3328	5215	3032
Chandigarh	52	113	64
Chhattisgarh	1035	2168	1278
D & N Haveli	9	19	9
Daman& Diu	6	8	3
Delhi	572	1394	799
Goa	34	124	67
Gujarat	2756	5068	2525
Haryana	1343	2344	1203
Himachal Pradesh	221	354	167
Jammu & Kashmir	197	294	163
Jharkhand	648	1130	658
Karnataka	2672	4797	2307
Kerala	3411	7047	1808
Lakshadweep	1	1	0.3
Madhya Pradesh	3288	6984	3721
Maharashtra	7274	15088	7410
Manipur	87	96	53
Meghalaya	37	62	39
Mizoram	23	64	36
Nagaland	22	52	37
Orissa	2074	4069	2082
Pondicherry	61	89	40
Punjab	1363	2186	1156
Rajasthan	2569	3320	1671
Sikkim	7	16	10
Tamil Nadu	6358	9656	4335
Tripura	141	171	81
Uttar Pradesh	7487	14692	8236
Uttarakhand	144	180	107
West Bengal	6839	11574	5655
INDIA	**61731**	**112243**	**55345**

Source: Authors' calculations

b. *Notional premiums per beneficiary household inclusive of administrative costs*

The premiums are calculated by dividing the total costs per year by the number of household beneficiaries, and as stated before, the assumption is that the total number of beneficiaries will remain the same over the 5 years.

Table 5.4: Five-year average notional premiums per beneficiary household (in INR)			
States	**Scenario 1**	**Scenario 2**	**Scenario 3**
A & N Islands	2597	5000	2218
Andhra Pradesh	8586	15081	6895
Arunachal Pradesh	2189	4056	2370
Assam	2428	5717	3526
Bihar	3082	4828	2808
Chandigarh	7289	15864	8913
Chhattisgarh	2775	5814	3428
D & N Haveli	2761	5793	2839
Daman& Diu	5927	7484	3226
Delhi	9731	23709	13593
Goa	9173	33546	18019
Gujarat	6146	11300	5630
Haryana	8658	15110	7759
Himachal Pradesh	7983	12775	6032
Jammu & Kashmir	3207	4794	2655
Jharkhand	2311	4027	2346
Karnataka	6468	11611	5584
Kerala	18359	37926	9729
Lakshadweep	7342	5444	2046
Madhya Pradesh	3923	8334	4440
Maharashtra	8697	18042	8860
Manipur	3156	3478	1924
Meghalaya	1066	1780	1110
Mizoram	2308	6324	3595
Nagaland	1095	2558	1838
Orissa	3400	6671	3412
Pondicherry	5939	8634	3886
Punjab	9108	14613	7729
Rajasthan	4303	5560	2799
Sikkim	1882	4114	2537
Tamil Nadu	8182	12425	5578
Tripura	2858	3470	1641
Uttar Pradesh	6345	12450	6979
Uttarakhand	2675	3361	1994
West Bengal	6106	10334	5049
INDIA	**5373**	**10058**	**4942**

Source: Authors' calculations

A review of evidence from insurance literature indicated that a 15% top up over per beneficiary costs is a modest assumption – the mark up could even be 20%. However, we assume a 15% mark up to arrive at the notional premiums. Table 5.4 presents the average premium costs over 5 years for the states and India.

Figure 5.1: Notional premiums per beneficiary household (in INR)
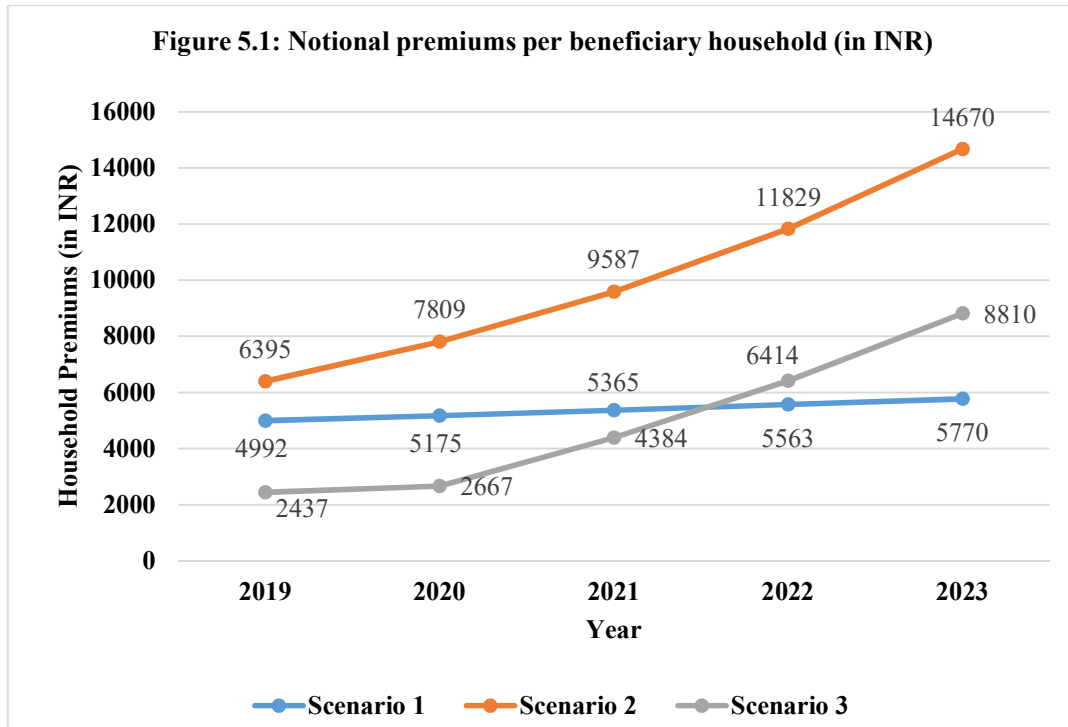
Under scenario I, the five-year average premium is Rs 5,373 per beneficiary household, whereas it is Rs 10,058 per beneficiary household if we go with scenario II. It is lower in scenario III at Rs 4,942. Among the major states, the premium is highest for Kerala even for Scenario I at Rs 18,359, followed by Punjab and Maharashtra. The annual premiums are increasing at a very modest rate for scenario I (Figure 5.1), since there is no cost driver except inflation and the parameters are fixed at 2014 levels. For scenario II, the increase in rate of hospitalisation is driving the costs. Figure 5.1 presents these trends for India and in Table A1 we present the premiums for the first and last year i.e. 2019 and 2023 and also the average premium for both the scenarios.

c. Share of notional premium costs in total health expenditure

Table 5.5 gives the share of notional premium costs in total health expenditure of states as well as for the country as a whole. The average cost as a share of health expenditure over 5 years for India is slightly less than 17% under scenario I, about 30% for scenario II and 15% for scenario III. There are significant state level variations: even under the more conservative

scenario I, backward states like Madhya Pradesh and Maharashtra would spend about 24 and 36 percent of their total health expenditure in 2023 if they were to run the programme. The shares would go up much more under scenario II. The share of costs are much lower for states like Himachal Pradesh Jharkhand and Rajasthan.

STATES	Scenario I		Scenario II		Scenario III	
	2019	2023	2019	2023	2019	2023
Andhra Pradesh	21.3	4.6	28.5	10.2	8.6	6.4
Arunachal Pradesh	4.2	8.3	4.6	22.1	2.6	13.8
Assam	6.2	1.6	7.7	5.8	5.1	3.7
Bihar	33.0	15.2	32.6	33.7	18.6	21.1
Chhattisgarh	22.6	14.2	26.5	45.6	15.6	28.5
Delhi	14.1	15.0	18.7	57.1	10.1	35.7
Goa	3.8	2.6	7.2	15.2	3.1	9.5
Gujarat	26.3	18.5	33.6	45.6	12.7	28.5
Haryana	32.6	23.7	39.4	55.2	16.1	34.5
Himachal Pradesh	10.7	8.5	13.1	17	4.4	10.6
Jammu & Kashmir	3.8	1.5	3.8	2.9	1.9	1.8
Jharkhand	11.5	4.2	12.0	10.6	6.9	6.6
Karnataka	42.5	46.1	55.0	108.3	19.0	67.7
Kerala	45.3	33.5	75.0	83.3	11.2	31.1
Madhya Pradesh	36.6	23.7	48.9	71.8	21.7	44.9
Maharashtra	48.7	35.9	69.7	99.9	24.9	62.5
Manipur	25.1	72.5	20.5	99.3	10.3	62.1
Meghalaya	3.8	2.7	3.6	6.9	2.5	4.3
Mizoram	3.9	3.3	5.8	13.9	3.1	8.7
Nagaland	3.2	2.5	3.1	10.1	3.3	6.3
Orissa	33.4	21.2	43.8	56.9	17.5	35.6
Punjab	35.3	29.2	39.1	62.9	17.4	39.3
Rajasthan	18.2	9.5	17.8	15.6	7.1	9.7
Sikkim	2.6	3.0	2.9	10.5	2.0	6.6
Tamil Nadu	51.1	39.1	63.5	70.3	18.7	44.0
Tripura	19.9	21.0	20.3	29.7	7.0	18.5
Uttar Pradesh	35.0	24.7	42	70.3	21.5	44.0
Uttarakhand	9.6	12.3	7.98	21.3	4.8	13.3
West Bengal	41.2	22.7	52.6	48	18.8	30.0
INDIA	**23.6**	**11.8**	**30**	**28.5**	**11.4**	**17.4**

Table 5.5: Total cost of scheme as percentage of health expenditure

Source: Authors' calculations

We have also estimated the state share of PMJAY in states' health spending by subtracting the Centre's share of PMJAY. These tables are presented in A5, A6 and A7. It shows that some states can spend as much as 20% of their health expenditure on PMJAY in 2019 under Scenario

1. For Scenario 2, this share is higher, though for Scenario 3, it comes down somewhat, and in 2019, the highest share is about 10%.

d. Costs and notional premiums with varying coverage

What would be the cost if not all beneficiaries are covered right away? In other words, a graded approach to total coverage would clearly keep the costs down. It will also indicate the extent of coverage with the estimated premiums. These calculations are done only for the country as a whole.

As Figures 5.2 and 5.3 show, the notional premiums as well as total costs will be lower, lower is the coverage. For example, if only 10% are covered, the total costs of running the programme will be around 1-3% of total health expenditure (figure 5.4). If the coverage is 20% of the target coverage, the total costs will be between 2.3- 6% of total health expenditure.

Figure 5.2: Total cost of PM-JAY for varying coverage - 2019 (in Rs. crore)
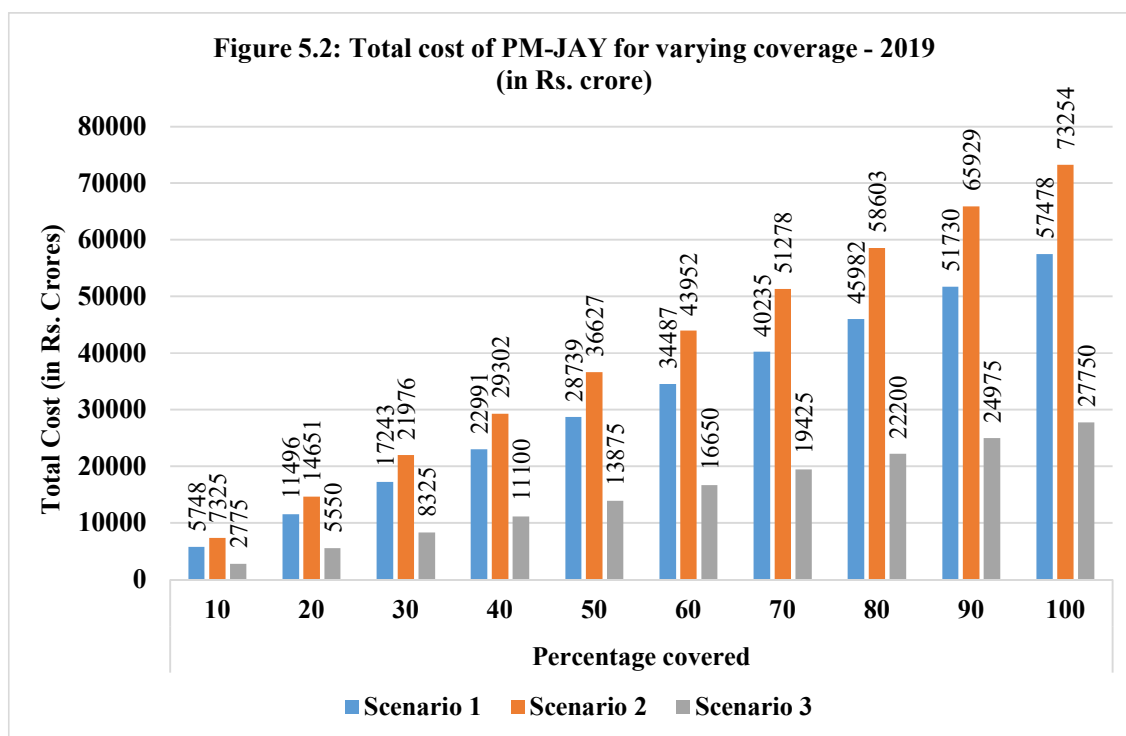
Figure 5.3 indicates the notional premiums if the coverage is not 100%. Thus, for instance, if the coverage is only 10% of the estimated beneficiaries, the premium will be between Rs 244-639. If the coverage increases to 20%, the premium would be between Rs 487-1279. Clearly, larger the target, greater will be the total bill for running the PMJAY.

Figure 5.3: Premiums for varying coverage (2019) (in INR)
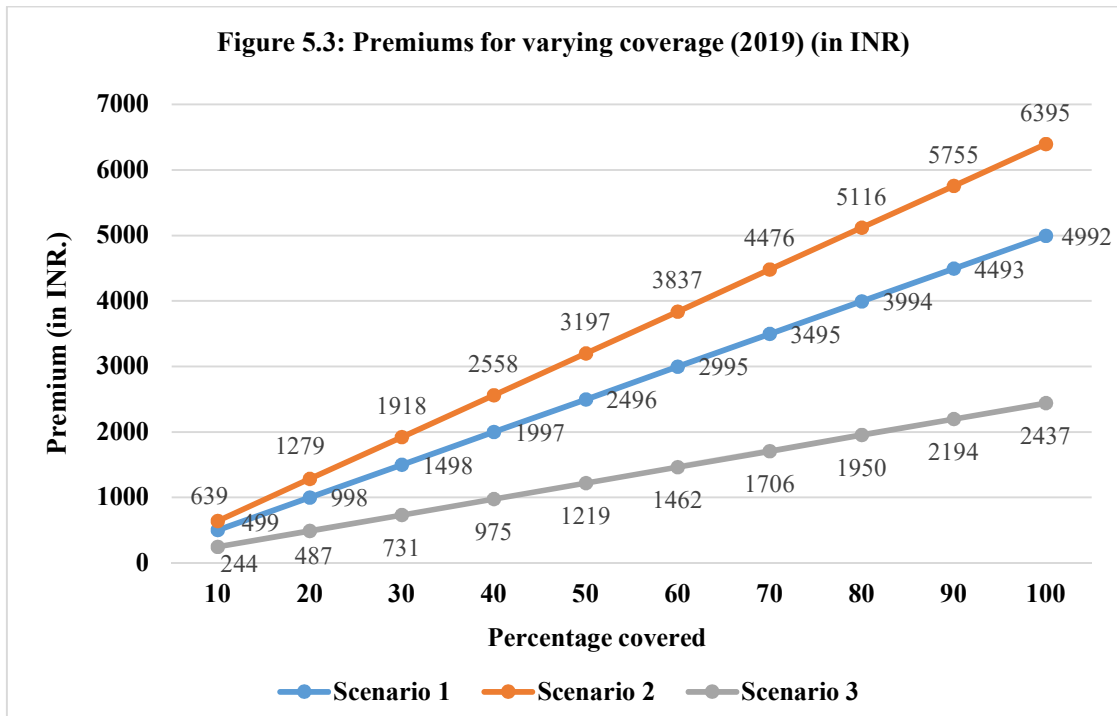
The premium mentioned so far in government pronouncements is around Rs 1000. The above analysis indicates that for a premium amount of Rs 1000, the coverage would be much lower at only about 20%, 16% and 40% in scenario I, II and III respectively (figure 5.3). If the government sets the premium at Rs 1500, then the coverage will increase to 30%, 24% and 62% respectively.

Figure 5.4: Total cost as a percentage of health expenditure (projected) with varying coverage - 2019
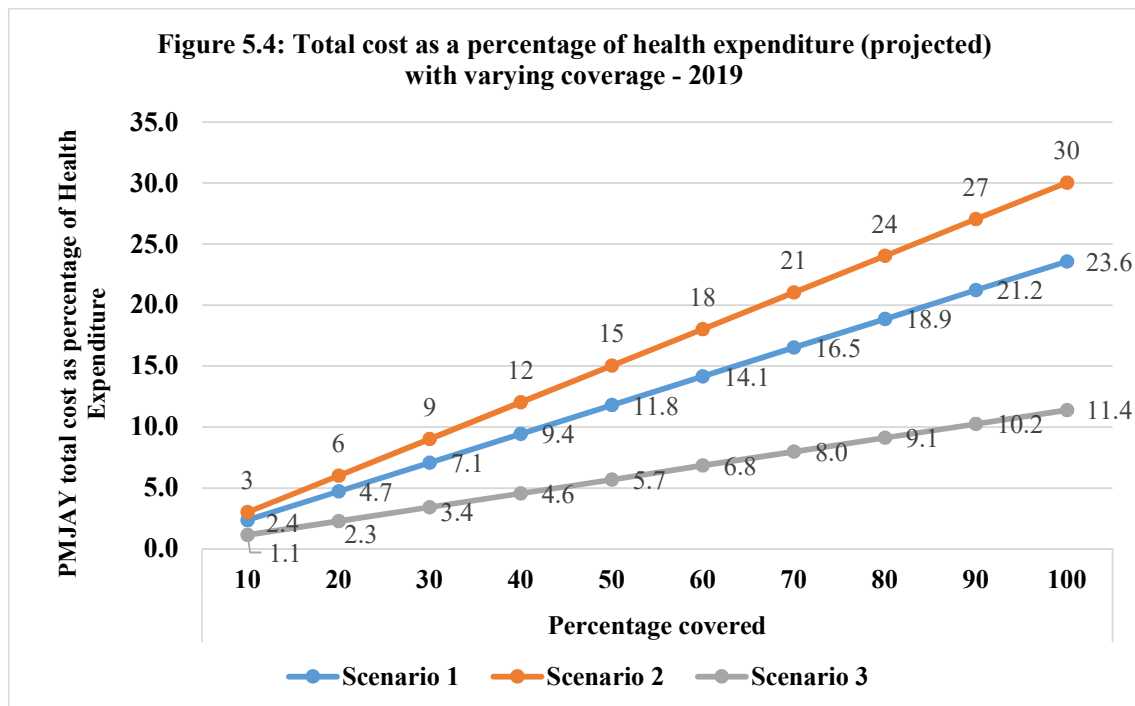
Also, lower the population covered, lower is the share of total cost of PMJAY in the GDP. If the premium is fixed at Rs 1000 then 0.06% of the GDP will be spent on the PMJAY scheme in scenario I (Figure 5.5). Similarly, for scenario II and III if the premium is fixed at Rs 1000 the coverage would result in a 0.07-0.08% and 0.06% being the PMJAY share in the GDP. Tables A8, A9 and A10 provide the share of PMJAY in state GSDP.

Figure 5.5: Total cost as a percentage of GDP (projected) with varying coverage - 2019
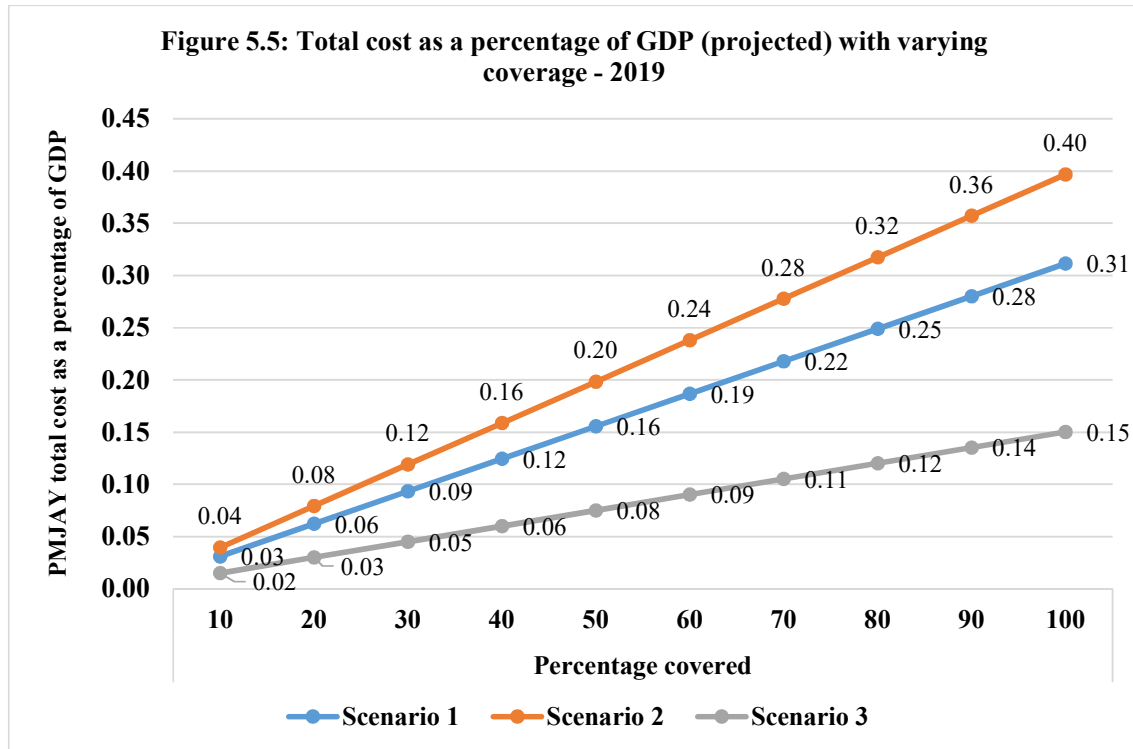
The analysis also indicates that with full coverage, the centre's share under the most modest scenario – Scenario 3 – could be as much as 74% in 2019, and it is likely to increase over the years. For the other scenarios, the shares would exceed MOHFW's estimated health spending.

6. Discussion

The analysis presented estimates of total costs of PMJAY based on 3 alternative sets of assumptions. The results indicate that if the programme achieves full coverage by reaching out the message of the scheme to all those it intends to cover, the costs of the programme at the national level would be substantial and could lie between Rs 28,000 crores to Rs 74,000 crores in 2019. The notional premium – after factoring in administrative costs – could range between Rs 2500-6400 in 2019. As a share in the country's total health expenditure, the total costs could range from about 12 to 30% in 2019.

If the programme achieves full coverage only gradually, the costs will be substantially less in the initial years. For example, with only a 20% coverage, the premiums would be between Rs 500 and Rs 1300. Thus, with the proposed premium of Rs 1100, between 15%-40% of the targeted beneficiaries would be covered.

Three parameters will influence the costs of the programme: hospitalisation rate, expenditure per hospitalisation and the number of beneficiaries covered.

A global literature review of hospitalisation rates of countries with UHC indicate that the actual rate could be much higher after the scheme gathers momentum. A survey of hospitalisation rates across countries with UHC indicated much higher rates: 5.9% in Rwanda, 15.3% in China, 4.6% in Mexico, 12.8% in UK, 25.7% in Germany etc. Data from existing schemes from India indicate that the rates of hospitalisation are much lower than what national surveys and other surveys indicate. The fact that even in 2014, the rates were much higher can only mean that these schemes are not being able to cover a substantial section of the targeted beneficiaries and it stands to reason that with a successful outreach, the suppressed demand for hospitalisation coverage would drive up the hospitalisation rate.

Also, with a high coverage of Rs 5 lakh and in the absence of regulation of facilities (the Clinical Establishment Act has yet to be adopted and implemented in a majority of states), there is a very good possibility of moral hazard and supplier-induced demand taking place, which is also going to drive up the rates of hospitalisation.

As for hospitalisation expenses, clearly, this is the most unpredictable variable, and it will depend to a significant extent on how well the monitoring and oversight functions of the PMJAY work to control costs. While CMCHIS scheme (Insurance model – TN) had about Rs 20,000 as average claim in 2014-15, VAS (Trust model –Karnataka) had a very high average claim of Rs 53,000. The amounts for surgeries in CMCHIS was Rs 42000 (private) and Rs 25000 (public). The projections made here are based on the NSS numbers and are quite low; it is very likely that these costs will be higher.

Neither the hospitalisation rate nor the average claims are directly under the government. It might be able to influence expenditure per hospitalisation via the package rates but will not be able to totally regulate or monitor the number of bed days or procedures for each patient. That would depend on the hospitals.

The dependence on private sector hospitals is another area of concern; the RSBY experience has shown that the profit-making private sector will stop participating if it feels that profits are inadequate, or it is administratively a challenge to participate. Thus, too low a premium or high administrative expense are going to remain important variables that might drive the success of the scheme.

The parameter that the government can directly control would be the number of beneficiaries covered. The RSBY experience indicated that coverage was far short of the targets; though the PMJAY is an entitlement-based scheme – not an enrolment based one – the identification of eligible households would remain a challenge. An intense set of IEC campaigns would in any case be required to step up the coverage. The reason why premiums of existing programmes in some of the states are low is probably because the coverage continues to be less than desired and also, no state is running a programme which has such a high coverage ceiling, and that can also impact beneficiary coverage.

The concerns with high costs of the programme would be the current low health spending across states and also at the centre. A high bill of PMJAY has a negative implication on health spending on other areas of the health sector. Increases in PMJAY costs might also have an indirect adverse impact on investment on public sector hospitals within a constraint resource envelope. While the retention of funds at public sector hospitals is a good feature, one should

also guard against moral hazard issues at government hospitals – something that so far has been avoided.

While most states have opted for the trust model, this might impose challenges, especially on states that have no experience with running schemes based on this model. Administrative costs and challenges apart, the possibility of moral hazard is also real, which in turn would drive up the costs.

These are early days yet, and for further clarity on how the various variables would play out we will have to wait for another year or so. However, if the scheme is really to reach 40% of the population, these estimates do raise some cause for concern given a serious and continuing budget constraint in the health sector.

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Table A1: Notional premiums per beneficiary household under alternative scenarios (in INR)								
State	**Scenario I**			**Scenario II**			**Scenario III**		
	Premium			**Premium**			**Premium**		
	2019	**2023**	**Average**	**2019**	**2023**	**Average**	**2019**	**2023**	**Average**
Andhra Pradesh	8170	9013	8586	10960	19858	15081	3321	12411	6895
Arunachal Pradesh	1882	2518	2189	2071	6706	4056	1183	4191	2370
Assam	2175	2695	2428	2667	9924	5717	1778	6203	3526
Bihar	2854	3318	3082	2817	7380	4828	1610	4612	2808
Chhattisgarh	2601	2955	2775	3044	9477	5814	1791	5923	3428
Delhi	9255	10220	9731	12272	38896	23709	6634	24310	13593
Goa	8528	9842	9173	16414	56775	33546	7136	35485	18019
Gujarat	5875	6423	6146	7510	15863	11300	2834	9914	5630
Haryana	8037	9302	8658	9730	21673	15110	3971	13546	7759
Himachal Pradesh	7575	8402	7983	9267	16846	12775	3089	10529	6032
Jammu and Kashmir	2891	3539	3207	2884	7186	4794	1442	4492	2655
Jharkhand	2137	2493	2311	2246	6328	4027	1283	3955	2346
Karnataka	6201	6741	6468	8031	15851	11611	2769	9907	5584
Kerala	16728	20067	18359	27656	49817	37926	4128	18589	9729
Madhya Pradesh	3672	4182	3923	4914	12654	8334	2184	7909	4440
Maharashtra	8127	9287	8697	11632	25855	18042	4154	16159	8860
Manipur	2609	3755	3156	2135	5148	3478	1068	3217	1924
Meghalaya	1002	1131	1066	949	2872	1780	654	1795	1110
Mizoram	2183	2435	2308	3242	10430	6324	1707	6519	3595
Nagaland	1000	1194	1095	979	4891	2558	1030	3057	1838
Odisha	3181	3626	3400	4172	9754	6671	1669	6096	3412
Punjab	8480	9759	9108	9385	20998	14613	4171	13124	7729
Rajasthan	4132	4477	4303	4028	7338	5560	1611	4586	2799
Sikkim	1740	2029	1882	1949	7083	4114	1299	4427	2537
Tamil Nadu	7610	8775	8182	9471	15781	12425	2785	9863	5578
Tripura	2650	3075	2858	2694	4344	3470	929	2715	1641
Uttar Pradesh	5900	6806	6345	7077	19337	12450	3629	12086	6979
Uttarakhand	2479	2879	2675	2063	4975	3361	1250	3109	1994
West Bengal	5432	6820	6106	6936	14408	10334	2477	9005	5049
INDIA	**4992**	**5770**	**5373**	**6395**	**14670**	**10058**	**2437**	**8810**	**4942**

STATES	2019	2020	2021	2022	2023	Average
Table A2: Scenario I: projections of total costs (in crores)						
A & N Islands	5	5	6	6	6	6
Andhra Pradesh	6652	6817	6987	7160	7338	6991
Arunachal Pradesh	17	18	19	21	22	19
Assam	587	620	654	690	728	656
Bihar	3082	3201	3324	3451	3584	3328
Chandigarh	48	50	52	54	56	52
Chhattisgarh	970	1001	1034	1067	1102	1035
D & N Haveli	9	9	9	9	9	9
Daman& Diu	6	6	6	6	6	6
Delhi	544	558	572	586	601	572
Goa	32	33	34	35	36	34
Gujarat	2635	2694	2755	2817	2881	2756
Haryana	1247	1293	1341	1391	1443	1343
Himachal Pradesh	210	215	221	227	233	221
Jammu & Kashmir	177	186	196	206	217	197
Jharkhand	599	623	647	673	699	648
Karnataka	2562	2616	2671	2727	2785	2672
Kerala	3108	3253	3404	3563	3728	3411
Lakshadweep	1	1	1	1	1	1
Madhya Pradesh	3077	3179	3284	3393	3505	3288
Maharashtra	6797	7027	7265	7512	7766	7274
Manipur	72	79	87	95	104	87
Meghalaya	35	36	37	38	39	37
Mizoram	22	23	23	24	25	23
Nagaland	20	21	22	23	24	22
Orissa	1940	2005	2072	2141	2212	2074
Pondicherry	57	59	61	63	65	61
Punjab	1269	1314	1361	1410	1460	1363
Rajasthan	2467	2517	2568	2620	2673	2569
Sikkim	7	7	7	8	8	7
Tamil Nadu	5914	6128	6350	6581	6819	6358
Tripura	131	136	141	146	152	141
Uttar Pradesh	6962	7215	7477	7749	8031	7487
Uttarakhand	133	138	143	149	155	144
West Bengal	6084	6440	6817	7216	7638	6839
INDIA	**57478**	**59524**	**61649**	**63857**	**66151**	**61732**

Table A3: Scenario II: projections of total costs (in crores)						
STATES	2019	2020	2021	2022	2023	Average
A & N Islands	8	9	10	12	14	11
Andhra Pradesh	8924	10353	12012	13936	16169	12279
Arunachal Pradesh	18	25	33	44	60	36
Assam	720	1000	1390	1930	2681	1544
Bihar	3043	3871	4924	6265	7970	5215
Chandigarh	62	81	105	138	180	113
Chhattisgarh	1135	1508	2003	2660	3534	2168
D & N Haveli	12	15	18	22	27	19
Daman& Diu	6	7	8	8	9	8
Delhi	722	963	1285	1714	2287	1394
Goa	61	83	113	154	210	124
Gujarat	3368	4061	4895	5901	7114	5068
Haryana	1509	1844	2252	2752	3361	2344
Himachal Pradesh	257	298	346	402	467	354
Jammu & Kashmir	177	222	279	351	441	294
Jharkhand	630	816	1057	1370	1775	1130
Karnataka	3318	3932	4661	5524	6548	4797
Kerala	5138	5953	6897	7990	9256	7047
Lakshadweep	1	1	1	1	1	1
Madhya Pradesh	4119	5217	6609	8372	10605	6984
Maharashtra	9728	11878	14503	17709	21623	15088
Manipur	59	74	92	114	143	96
Meghalaya	33	43	57	76	100	62
Mizoram	33	44	59	79	105	64
Nagaland	20	30	44	66	99	52
Orissa	2545	3147	3891	4812	5950	4069
Pondicherry	69	78	88	99	112	89
Punjab	1404	1717	2100	2568	3141	2186
Rajasthan	2405	2794	3246	3771	4382	3320
Sikkim	8	11	15	20	28	16
Tamil Nadu	7360	8362	9500	10794	12263	9656
Tripura	133	150	169	190	215	171
Uttar Pradesh	8351	10737	13804	17748	22818	14692
Uttarakhand	111	138	172	214	267	180
West Bengal	7769	9327	11197	13442	16137	11574
INDIA	**73254**	**88787**	**107836**	**131249**	**160089**	**112243**

STATES	2019	2020	2021	2022	2023	Average
Table A4: Scenario III: projections of total costs (in crores)						
A & N Islands	2	2	4	6	9	5
Andhra Pradesh	2704	2990	4959	7311	10105	5614
Arunachal Pradesh	11	11	19	27	37	21
Assam	480	522	851	1233	1675	952
Bihar	1739	1799	2792	3852	4981	3032
Chandigarh	32	35	57	82	112	64
Chhattisgarh	668	716	1152	1648	2209	1278
D & N Haveli	4	5	8	12	17	9
Daman& Diu	2	2	3	4	6	3
Delhi	390	429	708	1039	1429	799
Goa	26	31	56	88	131	67
Gujarat	1271	1382	2255	3271	4447	2525
Haryana	616	666	1079	1555	2101	1203
Himachal Pradesh	86	92	150	216	292	167
Jammu & Kashmir	88	93	148	208	275	163
Jharkhand	360	379	599	842	1109	658
Karnataka	1144	1251	2053	2993	4092	2307
Kerala	767	888	1544	2385	3454	1808
Lakshadweep	0.2	0.2	0.3	0.4	0.5	0.3
Madhya Pradesh	1831	2008	3304	4833	6628	3721
Maharashtra	3474	3880	6501	9680	13514	7410
Manipur	30	31	49	68	89	53
Meghalaya	23	23	36	49	62	39
Mizoram	17	19	32	47	66	36
Nagaland	21	22	34	47	62	37
Orissa	1018	1119	1846	2706	3719	2082
Pondicherry	21	22	36	52	70	40
Punjab	624	661	1050	1483	1963	1156
Rajasthan	962	994	1540	2121	2739	1671
Sikkim	5	6	9	13	18	10
Tamil Nadu	2165	2361	3864	5621	7664	4335
Tripura	46	48	74	103	134	81
Uttar Pradesh	4283	4601	7414	10620	14261	8236
Uttarakhand	67	67	100	134	167	107
West Bengal	2775	3047	5018	7348	10086	5655
INDIA	**27750**	**30205**	**49345**	**71699**	**97724**	**55345**

States	Scenario I				
	States share of Total PMJAY Expenditure				
	2019	2020	2021	2022	2023
Andhra Pradesh	8.5	5.8	4	2.7	1.9
Arunachal Pradesh	0.4	0.5	0.6	0.7	0.8
Assam	0.6	0.4	0.3	0.2	0.2
Bihar	13.2	10.9	9	7.4	6.1
Chhattisgarh	9	8.1	7.2	6.4	5.7
Delhi	5.6	5.7	5.8	5.9	6
Goa	1.5	1.4	1.3	1.1	1.1
Gujarat	10.5	9.6	8.8	8.1	7.4
Haryana	13	12	11.1	10.3	9.5
Himachal Pradesh	1.1	1	1	0.9	0.8
Jammu & Kashmir	0.4	0.3	0.2	0.2	0.1
Jharkhand	4.6	3.6	2.8	2.1	1.7
Karnataka	17.0	17.3	17.7	18.1	18.4
Kerala	18.1	16.8	15.6	14.5	13.4
Madhya Pradesh	14.6	13.1	11.8	10.6	9.5
Maharashtra	19.5	18	16.7	15.5	14.4
Manipur	2.5	3.3	4.3	5.6	7.2
Meghalaya	0.4	0.4	0.3	0.3	0.3
Mizoram	0.4	0.4	0.4	0.3	0.3
Nagaland	0.3	0.3	0.3	0.3	0.2
Orissa	13.4	11.9	10.6	9.5	8.5
Pondicherry	3.5	3.2	3	2.8	2.6
Punjab	14.1	13.5	12.9	12.3	11.7
Rajasthan	7.3	6.2	5.3	4.5	3.8
Sikkim	0.3	0.3	0.3	0.3	0.3
Tamil Nadu	20.4	19.1	17.9	16.7	15.6
Tripura	2	2	2	2.1	2.1
Uttar Pradesh	14	12.8	11.8	10.8	9.9
Uttarakhand	1	1	1.1	1.2	1.2
West Bengal	16.5	14.2	12.2	10.6	9.1

Table A5: State share of PMJAY in states' health spending (deducting centre's contribution) – Scenario I

Table A6: State share of PMJAY in states' health spending (deducting centre's contribution) – Scenario II

States	Scenario II				
	States share of Total PMJAY Expenditure				
	2019	2020	2021	2022	2023
Andhra Pradesh	11.4	8.8	6.8	5.3	4.1
Arunachal Pradesh	0.5	0.7	1	1.5	2.2
Assam	0.8	0.7	0.7	0.6	0.6
Bihar	13	13.1	13.3	13.4	13.5
Chhattisgarh	10.6	12.1	13.9	15.9	18.3
Delhi	7.5	9.9	13.1	17.3	22.8
Goa	2.9	3.5	4.2	5	6.1
Gujarat	13.4	14.5	15.7	16.9	18.2
Haryana	15.8	17.2	18.7	20.3	22.1
Himachal Pradesh	1.3	1.4	1.5	1.6	1.7
Jammu & Kashmir	0.4	0.4	0.3	0.3	0.3
Jharkhand	4.8	4.7	4.5	4.4	4.2
Karnataka	22.0	26.1	30.9	36.6	43.3
Kerala	30	30.8	31.6	32.4	33.3
Madhya Pradesh	19.6	21.5	23.7	26.1	28.7
Maharashtra	27.9	30.5	33.4	36.5	40
Manipur	2.1	3	4.5	6.7	9.9
Meghalaya	0.4	0.4	0.5	0.6	0.7
Mizoram	0.6	0.7	0.9	1.1	1.4
Nagaland	0.3	0.4	0.6	0.8	1
Orissa	17.5	18.7	20	21.3	22.8
Punjab	15.6	17.6	19.8	22.3	25.1
Rajasthan	7.1	6.9	6.7	6.4	6.2
Sikkim	0.3	0.4	0.6	0.8	1
Tamil Nadu	25.4	26.1	26.7	27.4	28.1
Tripura	2	2.2	2.5	2.7	3
Uttar Pradesh	16.8	19.1	21.7	24.7	28.1
Uttarakhand	0.8	1	1.3	1.7	2.1
West Bengal	21	20.6	20.1	19.7	19.2

Table A7: State share of PMJAY in states' health spending (deducting centre's contribution) – Scenario III					
States	**Scenario III**				
	States share of Total PMJAY Expenditure				
	2019	**2020**	**2021**	**2022**	**2023**
Andhra Pradesh	3.5	2.5	2.8	2.8	2.6
Arunachal Pradesh	0.3	0.3	0.6	0.9	1.4
Assam	0.5	0.4	0.4	0.4	0.4
Bihar	7.4	6.1	7.5	8.2	8.4
Chhattisgarh	6.2	5.8	8	9.9	11.4
Delhi	4	4.4	7.2	10.5	14.3
Goa	1.3	1.3	2.1	2.9	3.8
Gujarat	5.1	4.9	7.2	9.4	11.4
Haryana	6.4	6.2	8.9	11.5	13.8
Himachal Pradesh	0.4	0.4	0.6	0.9	1.1
Jammu & Kashmir	0.2	0.1	0.2	0.2	0.2
Jharkhand	2.8	2.2	2.6	2.7	2.6
Karnataka	7.6	8.3	13.6	19.8	27.1
Kerala	4.5	4.6	7.1	9.7	12.4
Madhya Pradesh	8.7	8.3	11.9	15.1	18
Maharashtra	10	10	15	20	25
Manipur	1	1.3	2.4	4	6.2
Meghalaya	0.2	0.2	0.3	0.4	0.4
Mizoram	0.3	0.3	0.5	0.7	0.9
Nagaland	0.3	0.3	0.4	0.5	0.6
Orissa	7	6.7	9.5	12	14.2
Pondicherry	1.2	1.2	1.8	2.3	2.8
Punjab	7	6.8	9.9	12.9	15.7
Rajasthan	2.8	2.4	3.2	3.6	3.9
Sikkim	0.2	0.2	0.3	0.5	0.7
Tamil Nadu	7.5	7.4	10.9	14.3	17.6
Tripura	0.7	0.7	1.1	1.5	1.9
Uttar Pradesh	8.6	8.2	11.7	14.8	17.6
Uttarakhand	0.5	0.5	0.8	1	1.3
West Bengal	7.5	6.7	9	10.7	12

Table A8: State share of PMJAY in states' GSDP – Scenario I						
State	**2019**	**2020**	**2021**	**2022**	**2023**	**Average total Cost/Average GSDP**
Andhra Pradesh	0.38	0.35	0.32	0.29	0.26	0.31
Arunachal Pradesh	0.07	0.07	0.07	0.07	0.07	0.07
Assam	0.19	0.18	0.17	0.17	0.16	0.17
Bihar	0.56	0.52	0.47	0.44	0.40	0.47
Chhattisgarh	0.30	0.28	0.26	0.24	0.23	0.26
Delhi	0.07	0.07	0.06	0.06	0.05	0.06
Goa	0.04	0.04	0.03	0.03	0.03	0.03
Gujarat	0.18	0.17	0.15	0.14	0.13	0.15
Haryana	0.18	0.17	0.16	0.15	0.14	0.16
Himachal Pradesh	0.14	0.13	0.12	0.12	0.11	0.12
Jammu and Kashmir	0.12	0.12	0.12	0.11	0.11	0.11
Jharkhand	0.20	0.19	0.17	0.16	0.15	0.17
Karnataka	0.18	0.17	0.16	0.15	0.14	0.16
Kerala	0.42	0.40	0.38	0.36	0.34	0.38
Madhya Pradesh	0.35	0.31	0.28	0.25	0.22	0.27
Maharashtra	0.24	0.22	0.20	0.19	0.17	0.20
Manipur	0.30	0.30	0.31	0.32	0.32	0.31
Meghalaya	0.11	0.11	0.10	0.10	0.09	0.10
Mizoram	0.10	0.09	0.08	0.07	0.06	0.08
Nagaland	0.08	0.08	0.07	0.07	0.07	0.07
Odisha	0.41	0.38	0.35	0.32	0.29	0.34
Punjab	0.25	0.24	0.23	0.21	0.20	0.22
Rajasthan	0.27	0.25	0.23	0.21	0.20	0.23
Sikkim	0.03	0.03	0.03	0.02	0.02	0.03
Tamil Nadu	0.40	0.39	0.38	0.36	0.35	0.37
Uttar Pradesh	0.47	0.45	0.42	0.40	0.38	0.42
Uttarakhand	0.06	0.06	0.06	0.05	0.05	0.06
West Bengal	0.58	0.56	0.54	0.53	0.51	0.54
INDIA (GDP)	**0.31**	**0.29**	**0.28**	**0.26**	**0.24**	**0.27**

State	2019	2020	2021	2022	2023	Average total Cost/Average GSDP
Andhra Pradesh	0.52	0.53	0.54	0.56	0.57	0.55
Arunachal Pradesh	0.08	0.10	0.12	0.15	0.18	0.13
Assam	0.23	0.29	0.37	0.46	0.58	0.41
Bihar	0.56	0.63	0.70	0.79	0.89	0.73
Chhattisgarh	0.35	0.42	0.51	0.61	0.73	0.54
Delhi	0.09	0.11	0.14	0.16	0.20	0.15
Goa	0.08	0.09	0.11	0.14	0.17	0.12
Gujarat	0.23	0.25	0.27	0.30	0.32	0.28
Haryana	0.22	0.24	0.27	0.29	0.32	0.28
Himachal Pradesh	0.17	0.18	0.19	0.20	0.22	0.19
Jammu and Kashmir	0.12	0.14	0.16	0.19	0.22	0.17
Jharkhand	0.21	0.24	0.28	0.33	0.38	0.30
Karnataka	0.24	0.26	0.28	0.30	0.33	0.29
Kerala	0.69	0.73	0.77	0.81	0.86	0.78
Madhya Pradesh	0.47	0.51	0.56	0.61	0.67	0.58
Maharashtra	0.34	0.37	0.41	0.45	0.49	0.42
Manipur	0.24	0.28	0.33	0.38	0.44	0.34
Meghalaya	0.10	0.13	0.16	0.19	0.23	0.17
Mizoram	0.14	0.17	0.20	0.23	0.27	0.21
Nagaland	0.08	0.11	0.14	0.20	0.27	0.17
Odisha	0.54	0.59	0.65	0.71	0.79	0.67
Punjab	0.28	0.31	0.35	0.39	0.44	0.36
Rajasthan	0.26	0.28	0.29	0.31	0.33	0.30
Sikkim	0.03	0.04	0.05	0.06	0.08	0.06
Tamil Nadu	0.50	0.53	0.56	0.59	0.63	0.57
Uttar Pradesh	0.56	0.66	0.78	0.92	1.09	0.83
Uttarakhand	0.05	0.06	0.07	0.08	0.09	0.07
West Bengal	0.74	0.81	0.89	0.98	1.08	0.91
INDIA (GDP)	**0.40**	**0.44**	**0.48**	**0.53**	**0.59**	**0.50**

Table A10: State share of PMJAY in states' GSDP – Scenario III						
State	2019	2020	2021	2022	2023	Average total Cost/Average GSDP
Andhra Pradesh	0.16	0.15	0.22	0.29	0.36	0.25
Arunachal Pradesh	0.04	0.04	0.07	0.09	0.11	0.07
Assam	0.15	0.15	0.23	0.30	0.36	0.25
Bihar	0.32	0.29	0.40	0.49	0.55	0.43
Chhattisgarh	0.21	0.20	0.29	0.38	0.46	0.32
Delhi	0.05	0.05	0.08	0.10	0.12	0.08
Goa	0.03	0.04	0.06	0.08	0.11	0.07
Gujarat	0.09	0.09	0.13	0.16	0.20	0.14
Haryana	0.09	0.09	0.13	0.17	0.20	0.14
Himachal Pradesh	0.06	0.06	0.08	0.11	0.14	0.09
Jammu and Kashmir	0.06	0.06	0.09	0.11	0.14	0.10
Jharkhand	0.12	0.11	0.16	0.20	0.23	0.17
Karnataka	0.08	0.08	0.12	0.16	0.20	0.14
Kerala	0.10	0.11	0.17	0.24	0.32	0.20
Madhya Pradesh	0.21	0.20	0.28	0.35	0.42	0.31
Maharashtra	0.12	0.12	0.18	0.24	0.30	0.21
Manipur	0.12	0.12	0.17	0.23	0.28	0.19
Meghalaya	0.07	0.07	0.10	0.12	0.15	0.10
Mizoram	0.08	0.07	0.11	0.14	0.17	0.12
Nagaland	0.08	0.08	0.11	0.14	0.17	0.12
Odisha	0.21	0.21	0.31	0.40	0.49	0.34
Punjab	0.12	0.12	0.17	0.23	0.27	0.19
Rajasthan	0.10	0.10	0.14	0.17	0.20	0.15
Sikkim	0.02	0.02	0.03	0.04	0.05	0.03
Tamil Nadu	0.15	0.15	0.23	0.31	0.39	0.26
Uttar Pradesh	0.29	0.28	0.42	0.55	0.68	0.46
Uttarakhand	0.03	0.03	0.04	0.05	0.06	0.04
West Bengal	0.26	0.27	0.40	0.54	0.67	0.45
INDIA (GDP)	**0.15**	**0.15**	**0.22**	**0.29**	**0.36**	**0.25**