PM-JAY: Impact on in-patient Out-of-Pocket Expenditures

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February 2022

Background

Launched in 2018, Ayushman Bharat Pradhan Mantri Jan Aarogya Yojana (AB PM-JAY) aims to provide financial protection against catastrophic health expenditures to the bottom 40% of the Indian households (National Health Authority, 2020). These households are identified based on the Socio-Economic Caste Census (SECC) of 2011.

While the program has covered more than 1.5 crore treatments since its launch, the impact on Out-of-Pocket (OOP) expenditure is yet to be estimated. **This study aims to assess the impact of the program, i.e., PM-JAY on in-patient OOP expenditures among the currently eligible populations.**

Given that the main objective of PM-JAY is to reduce catastrophic health expenditures incurred by the Indian households, this will be critical for the National Health Authority (NHA) as it strengthens the program in the years to come.

Highlights

- PM-JAY covers about 90% of the medical OOP costs among the covered populations
- Majority of individuals who are hospitalized do not use insurance – insurance covers around one-third of all hospitalizations among the eligible. While these estimates seem low, they are relatively higher as compared to utilization of public insurance in pre PM-JAY era
- With PM-JAY, the share of families with hospitalizations that have to spend more than 10% of their consumption on hospital expenses falls by about 24%
- Protection under PM-JAY rises for those families that spend more on in-patient care. In particular, share of families spending more than 25% of their consumption on hospital expenses falls by 34%
- Assuming national take-up is be closer to the best performing states, the financial protection provided by PM-JAY against catastrophic health expenditures significantly increases

Key Findings and Implications

OOP Expenditures of the Eligible Prior to Insurance

To assess the impact of PM-JAY on OOP exposure, we begin by measuring in-patient OOP expenditures of the eligible households before they are insured. This entails identifying the current eligible pool, as defined by SECC. While we map all four categories in our analysis, the imputation is not perfect as some variables are not recorded in the NSS. For example, the NSS has information on socio-demographic variables such as age, gender, caste, and occupation, but does not include variables covering household characteristics such as kuccha walls and roofs, scavenger families, bonded labor, among others. Our approach provides the best possible match of SECC criteria to the available data.

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Box 1: Methodology

Time period for analysis: Financial Year, i.e., April 2019 to March 2020.

Data source: National Sample Survey (NSS), Social Consumption: Health, 2018. It is the most recent comprehensive data source available for a nationally representative cross-section of the Indian population. It covers a random sample of 1,13,823 households spread over rural and urban areas of every district in the country. Moreover, the data for the survey is collected over a period of one year from July 2017 to June 2018 (National Statistical Office, Ministry of Statistics & Program Implementation, Government of India, 2018).

Claims data, by state, age and gender, are extracted from PM-JAY's Transaction Management System (TMS) claims database. Data for Rajasthan and Gujarat is not available at disaggregated level, and hence are included at the state level.

Box 2: Definitions

Definition of PM-JAY Beneficiaries: Current eligibility criteria into PM-JAY is defined by the Socio-Economic Caste Census (2011). In particular, SECC is defined in four criteria categories:

- Six deprivation criteria (D1 to D7, excluding D6) defined on the basis of socio-demographic and household characteristics for rural areas
- Urban households based on primary occupation
- Automatic inclusion based on tribe, income etc.
- Automatic exclusion based on ownership of different forms of assets

While all four categories are included in our analysis, the match is not perfect as some variables are not recorded in the NSS. For example, the NSS has information on socio-demographic variables such as age, gender, caste, and occupation, but does not include variables covering household characteristics such as kuccha walls and roofs, scavenger families, bonded labor, among others. Our approach provides the best possible match of SECC criteria to the available data.

Definition of in-patient OOP: It includes package component of the hospitalization costs, doctor's fees, diagnostics, medicine costs during hospitalization, and excludes any amount reimbursed by insurance.

To assess the medical expenses incurred by this group, we focus on inpatient medical OOP expenditure, as PM-JAY provides coverage for this aspect of total expenditure. We define medical inpatient OOP expenditures using the equation below:

Inpatient Medical OOP expenditure = Medical Expenditure - Reimbursed

Both medical expenditure and reimbursed amount are reported in the NSS. The former includes the package component of the hospitalization costs which covers the specific surgical or non-surgical medical procedures, operation theatre charges, consumables, medicines, doctor fees, bed charges, etc. (National Statistical Office, Ministry of Statistics & Program Implementation, Government of India, 2018). In addition to the package costs, medical expenditure includes the doctor's fees chargeable for the period of treatment within the reference period during the stay in hospital, costs of medicines, diagnostic tests, bed charges and other medical expenses (attendant charges, physiotherapy, personal medical appliances, blood, oxygen, etc.). We look at medical expenditure related to hospitalization as PM-JAY only covers inpatient care. We define inpatient OOP expenditures at the household level.

Table 1 shows the distribution of OOP costs for the currently eligible population. It is critical to note that to assess that impact of insurance, i.e., PM-JAY, we look at states that are enrolled into the program and within those, at eligible households that have been hospitalized but not been reimbursed by any other insurance. We only include those households with members reporting a hospitalization because PM-JAY

is a hospitalization focused program. In addition, in order to assess the pressure that OOP expenditures place on household finances, we consider OOP spending relative to total household consumption.

In Table 1, we show the distribution of OOP costs relative to consumption for those hospitalized SECC households who have not been reimbursed by any other insurance. This presentation is cumulative, so the first row shows the share of households that are eligible and have a hospitalization spending more than 10% of their consumption on OOP spending, the second row those spending more than 15%, and so on. We find that one-third of total eligible households with a hospitalization spend more than 10% of their consumption expenditure on inpatient medical care. In addition, 7% of them spend more than 50% of their consumption expenditure on inpatient OOP expenditures.

In addition to inpatient medical OOP expenditures, we also analyze a relatively expansive definition of OOP costs, which includes other non-package components. This broader definition of OOP expenditures includes transport for patients – by ambulance or other vehicle for the journey to the hospital and/or other for medical services such as diagnostics – and other non-medical expenses incurred by the household including registration fee, food, transport for others, expenditure on escort, lodging charges if any, etc.

Broader Definition of inpatient OOP Expenditures = Medical Expenditure + Non-Medical Expenditure - Reimbursed

Table 2 presents the distribution of OOP costs with this broader definition for the currently eligible pool.

Here, we find that 38% of total eligible households with a hospitalization spend more than 10% of their consumption expenditure on inpatient medical care. In addition, 8% of them spend more than 50% of their consumption expenditure on inpatient OOP costs.

Assessing Reduction in OOP Spending Associated with Insurance

The next step in our analysis is to assess the reduction in OOP spending associated with public insurance. In particular, we look at the share of medical expenditure covered by insurance among those who have (a) government insurance, (b) been hospitalized, and (c) been reimbursed against their inpatient medical

Table 1: Share of SECC Households Spending more than Threshold (cumulative) with Medical Inpatient OOP Costs, Prior to Insurance

Share of OOP Costs/Consumption	As a share of Eligible Households with Hospitalization
Greater than 10%	33.26%
Greater than 15%	24.65%
Greater than 20%	19.41%
Greater than 25%	15.60%
Greater than 50%	6.86%

Table 2: Share of SECC Households Spending more than Threshold (cumulative) with Broader Definition of OOP costs, Prior to Insurance

Share of OOP Costs/Consumption	As a share of Eligible Households with Hospitalization
Greater than 10%	37.70%
Greater than 15%	27.72%
Greater than 20%	21.85%
Greater than 25%	17.93%
Greater than 50%	8.01%

expenditure. The health round of NSS captures this information and the rationale for looking at this subset of the population is as follows:

(a) The NSS provides information on the type of insurance held by the individual and household – such as public, employer provided or private. For the purpose of our analysis, we use government sponsored central schemes such as Rashtriya Swasthya Bima Yojana (RSBY), and state schemes such as Aarogyasri etc. as they align well with PM-JAY. As per the NSS, 12% of the Indian population are covered by this type of insurance.

now shed 15% of 65% of the base expenses, leading to a savings of ~90%. Table 3 presents the reductions at different levels of medical expenditure. These estimates broadly align with other secondary studies conducted for different brownfield states. For example, a study conducted in a public sector hospital in Kerala suggests coverage of health insurance was around 74% (Ravindran, et al., 2020). Another study assessing the impact of Aarogyasri in Andhra Pradesh suggests that the program significantly reduced per capita inpatient spending (Fan, Karan, & Mahal, 2012).

Table 3: Share of Inpatient Medical Expenditure Covered by PM-JAY

Inpatient Medical Expenditure	Share Covered
Less than 5000	100.00%
5000-10000	92.56%
10000-25000	84.97%
25000-50000	83.25%
50000 & Above	75.00%
Weighted Average	**90.25%**

(b) Only those who have been hospitalized incur inpatient OOP expenditures. Therefore, to assess the impact of insurance, in terms of reduction in OOP costs, we look at those who have been hospitalized, incurred medical expenditures and reimbursed.

To assess what share of expenditure is covered, we look at two variables reported in the NSS, (1) medical expenditure incurred during hospitalization, and (2) amount reimbursed by insurance. We estimate the share of reimbursed over total medical expenditure at different levels of medical spending using the equation below.

Share of Medical Expenditure Covered = Reimbursed / Medical Inpatient Expenditure

Overall, public insurance is expected to cover ~85% of inpatient medical costs incurred by households. However, given that PM-JAY, with its massive scale has managed to reduce the package rates charged by hospitals by almost 65%[6], we scale overall reduction, as estimated using the equation above, to reflect this decline. In particular, rather than incurring 15% of OOP expenses, insured individuals

While PM-JAY is intended to be a cashless program, households have to bear some costs, i.e., ~10% of total medical in-patient costs. This includes, for example, any outpatient care, drug rehabilitation, cosmetic treatments, organ transplants and fertility treatment among others (National Health Authority, 2021).

Estimating Hospital Take-up

Not everyone eligible for PM-JAY will use it to cover their inpatient costs, for at least two reasons. First, individuals may not be aware of their entitlement. Second, public insurance programs only empanel a share of hospitals, and individuals may choose to forgo insurance to go to other hospitals that are not empaneled due to accessibility and availability. This has important implications for estimating the OOP costs covered by the program. In particular, the lower the enrolled share of hospitalizations, the less OOP protection is provided.

We therefore use the early experience of PM-JAY to estimate the "hospital uptake", or the share of hospitalizations that will be paid for by PM-JAY. In particular, we use the number of claims under PM-JAY, relative to the number of reported hospitalizations in the NSS, to estimate hospital uptake. More

6 Based on discussions with NHA

specifically, we use the following equation to define hospital uptake:

Hospital Uptake = (State only Adjustment * Number of Claims) / Number of Hospitalizations among SECC

Our analysis proceeds in five steps:

Step 1: State only Adjustment

State only adjustment is included to address a limitation in the NHA claims data that we use: these data include claims from both those who are SECC eligible and covered under PM-JAY, and those who are eligible under other state programs. In most brownfield states, state programs are relatively more expansive than SECC. For example, in Chhattisgarh, the state scheme Dr. Khoobchand Baghel Swasthya Sahayata Yojana provides coverage to 100% of the state population (Government of Chhattisgarh, 2020). The factor, defined at the state level, therefore, aims to reduce the claims data totals to focus just on the spending on the SECC eligible paid for by NHA. It is estimated by the following equation:

State Only Adjustment = (SECC eligible HH / (SECC + state eligible HH)

Here the numerator is derived from the SECC 2011, and the denominator is extracted from the NHA's state portal[7] (National Health Authority, 2020). This factor is based on the underlying assumption that the SECC eligible are very close to the broader pool of state eligible in terms health demographics and claims.

Step 2: Number of Claims

The next component in our equation is the number of claims, which spans across all[8] states that have enrolled into PM-JAY for a period of 1 year. We use claims for a full year to align with the duration of NSS, and we focus on 2019 to capture a stable year pre-COVID.

Step 3: Number of Hospitalizations among SECC Eligible

The NSS reports data on hospitalizations. To accurately estimate the hospitalizations among SECC eligible households, we re-weight the NSS – by applying an adjustment factor. The factor, estimated at the state-sector level scales our imputed SECC eligibility on the NSS to true eligibility as defined by the Census 2011, as per the equation below:

Adjustment Factor = Imputed SECC eligible HH in NSS / Eligible HH as per SECC 2011

It is critical to note that the adjustment factor is applied such that the total population remains unchanged.

Step 4: Overall Uptake Rate

Finally, we estimate take-up at the state level to account for utilization variation associated with whether the state is a brown or a greenfield, general receptiveness of the beneficiaries to government programs, supply-side differences among others.

Our analysis suggests that hospital uptake is estimated to be 32.59% on average across the nation. That is, the number of claims covered by the program amounts to almost one-third of all hospitalizations among the SECC and state eligible.

While the uptake seems low, several studies assessing different types of insurance provided in the country also suggest limited uptake and utilization of government sponsored insurance among beneficiaries. For example, a World Bank study indicates the hospitalization frequency under Yeshasvini Co-operative Farmers Healthcare Scheme in Karnataka was 2% per beneficiary, 0.6% per beneficiary under Rajiv Aarogyasri Community Health Insurance Scheme in Andhra Pradesh, and 2.5% under Rashtriya Swasthya Bima Yojana (RSBY) – with high variation across states ranging from 0% to 5%[9] (La Forgia & Nagpal, 2012). In addition, while evaluating the Rajiv Aarogyasri community health insurance scheme in Andhra Pradesh, Rao M et al. found that 111 beneficiaries per 100,000 BPL population had utilized the program (Rao, et al., 2012). This secondary literature provides insights on covered hospitalizations per person as opposed to total hospitalizations. In terms of share of eligible persons, our uptake is estimated to be 1.3% - which aligns with the estimates provided by these studies.

Moreover, comprehensive secondary research also indicate that utilization of public insurance schemes prior to the launch of PM-JAY were relatively lower than our estimate[10]. For example, the Vajpayee Aarogyasri scheme, launched in Karnataka in 2009, had a utilization rate (in terms of beneficiaries) of 0.25% in 2011 (Rajasekhar & Manjula, 2012), which is significantly lower than the current estimate of 1.59% for the state.

Similarly, in Maharashtra from July 2012 to August 2014, 269934 therapies were approved among a total of 20794249 eligible families, indicating a take-up

7 State eligible includes eligible households covered by the state upto INR 5 lacs

8 Rajasthan and Gujarat do not provide claims data to NHA at a disaggregated level, and hence it is included only in corporate data at an aggregated level for these states

9 From inception i.e., 2007 to 2011

10 While most schemes including RSBY were launched in the 2000s and we would ideally want to compare our estimates with more recent take-up values, there is limited data and literature available

of 0.12%[11] in terms of beneficiaires (Wagle & Shah, 2017). This is also significantly lower as compared to the current estimate of 0.62%.

A comparative study in Kerala suggests that only 40% of the hospitalization among the insured was covered by insurance in 2012 (Philip & Kannan, 2012). Whereas, our data on current utilization estimates this number to be ~60%. Thus, evidence suggests that while uptake into PM-JAY is modest, the program has increased utilization trends across brownfield states.

As Table 4 indicates, this definition enables us to plot the distribution with respect to different levels of inpatient medical expenditure. Moreover, to ensure this proxy aligns with our estimate above, we create an adjustment factor such that the weighted average comes to be 32.59%. For the first row, i.e., inpatient medical expenditure less than INR 5000, we assume the share to be the weighted average of the rest of the observations due to low value observations.

Table 4: Share of Hospitalization Reimbursed

Inpatient Medical Expenditure	Share of Hospitalizations Reimbursed
Less than 5000	32.59%
5000-10000	23.86%
10000-25000	27.40%
25000-50000	34.77%
50000 & Above	66.59%
Weighted Average	**32.59%**

Step 5: Accounting for Variation by Claim Size

The existing analysis does not differentiate the impact on OOP by level of medical expenditures. But in fact, individuals are more likely to use insurance coverage as hospital expenditures rise, since the value of out of pocket protection rises. We therefore take the additional step of turning our overall national estimate into an estimate that varies by size of hospital claim.

To do so, we use the NSS survey data on reimbursement of hospitalizations. Since the NSS survey was carried out before PM-JAY was introduced in many states, we instead focus on the experience of SECC eligible individuals in brownfield states that already had insurance programs. To ensure that the pre-existing schemes are comparable to PM-JAY, we only look at those brownfield states that provide a minimum coverage of INR 1 lac. We then estimate the following:

Share of Hospitalizations reimbursed = Number of Hospitalizations Reimbursed / Number of Hospitalizations

Of course, this estimate of take-up rate reflects the very early years of social health insurance programs and PM-JAY in a number of states, and therefore, may understate the long run enrollment in the program. In particular, the current estimate of take-up is based on the claims output from 2019-2020. However, as the program has strengthened over the last 3 years, we expect a larger share of population to be mobilized as indicated by the number of Ayushman Bharat cards issued by state authorities. Moreover, we also expect existing state programs to have had a greater impact in terms of utilization, given the coverage limit per household has increased significantly (to INR 5 lacs) with the onset of the program.

Therefore, we consider as all an alternative upper-bound estimate of take-up: the rate of take-up in the best performing states.

In particular, we use PM-JAY claims output to identify a potential steady state for take-up – as indicated by two better performing states, Gujarat and Chhattisgarh (Perappadan, 2019). In Gujarat, for example, the existence of a similar scheme Mukhyamantri Amrutam Yojana since 2012 has played a critical role (Business Today, 2018). Moreover, Gujarat is known to be at the forefront of establishing and maintaining good health infrastructure – with 2,917 hospitals empanelled under

11 Assuming that therapies were evenly distributed in the 2 years and average household size of 5

the scheme, and more than 80,000 beds (Chandna, 2019). Similarly, Chhattisgarh is a brownfield state with a universal public health insurance scheme. The state has also optimized the number of both qualified human resources and hospitals empaneled to ensure availability of health infrastructure (KPMG, 2019).

Our analysis suggests a take-up of ~87% for states such as Gujarat and Chhattisgarh. Therefore, we scale all our proxy, as indicated in Table 4, such that the weighted average aligns with this benchmarked steady state rate[12].

definition which includes non-medical costs incurred by the household. However, it is critical to note that the reduction will only be applied to medical part of OOP expenditures as PM-JAY only covers the medical components.

As noted above, we compare OOP spending to total household consumption to get a sense of how much of a burden OOP spending puts on household financings. The first column of Table 5 replicates the analysis shown in Table 1, focusing on those households that experienced at least one hospitalization.

Table 5: Share of SECC Households Spending more than Threshold (cumulative) with Medical Inpatient OOP Costs

Share of OOP/Costs Consumption	Prior to Insurance	After PM-JAY
Greater than 10%	33.26%	25.32%
Greater than 15%	24.65%	17.92%
Greater than 20%	19.41%	13.54%
Greater than 25%	15.60%	10.26%
Greater than 50%	6.86%	3.84%

Translating Reduction in OOP Expenditures to Impact

Once we have our distributions of (a) share of medical expenditure covered by public insurance, and (b) share of hospitalization reimbursed as a proxy of hospital take-up, we translate the reduction associated with insurance on inpatient medical OOP expenditures among the insured households using the following equation:

*Revised Inpatient OOP Expenditures = Medical OOP (1 - (Hospital take-up * share of expenditure covered by insurance))*

Revised OOP costs is estimated for different levels of underlying inpatient medical expenditure (in INR), i.e., (a) 0-5000, (b) 5000-10000, (c) 10000-25000, (d) 25000-50000, and (e) Above 50000. The main objective is to assess how the share of households incurring different levels of OOP spending vis-à-vis consumption change as these households are provided coverage.

Moreover, we look at both definitions of inpatient OOP expenditures, i.e., a relatively conservative one including only medical components, and the expansive

Table 5 shows a sizeable reduction in the risk of high out-of-pocket medical spending due to PM-JAY. For example, the share of eligible households insured spending more than 10% of their consumption expenditure on inpatient medical OOP costs falls from 33% to 25%. This trend is consistent across all levels of inpatient medical OOP costs relative to consumption expenditure as indicated in the table. While the share spending more than 10% of their consumption on OOP costs falls by 24%, the share spending more than 25% of consumption falls by 34%. And we see a 44% reduction in the share spending more than 50% of their consumption on OOP spending. Therefore, PM-JAY is serving its role of providing the most protection to the most vulnerable.

Stronger Effects of Increasing Take-Up

While the effects of PM-JAY are impressive, they could be even stronger through efforts to raise take-up of the program. As noted above, we estimate that only about one-third of eligible hospitalizations are reimbursed by PM-JAY, due to barriers such as lack of information about the program and insufficient empanelment of hospitals. If these issues can be addressed, the protection provided by the program will be even more pronounced. For example, Table 6 repeats Table 5, but adds a third column where take-up is benchmarked to the best performing states (~87%).

12 To ensure reasonable values of take-up, we apply a ceiling of 100% for expenditures greater than 50000

Table 6: Share of SECC Households Spending more than Threshold (cumulative) with Medical Inpatient OOP Costs

			Take-up
Share of OOP/Costs Consumption	**Prior to Insurance**	**Existing**	**Upper Bound**
Greater than 10%	33.26%	25.32%	4.30%
Greater than 15%	24.65%	17.92%	2.47%
Greater than 20%	19.41%	13.54%	1.57%
Greater than 25%	15.60%	10.26%	1.16%
Greater than 50%	6.86%	3.84%	0.32%

We see that increasing take-up offers substantial increases in out-of-pocket expenditure protection. In particular, if we assume national take-up to be aligned with the best performing states, the share of households spending more than 10% of consumption on OOP cost falls by 87%, and the share that spends more than 50% of their consumption on OOP inpatient costs falls by 95%.

More Expansive Definition

As noted above, for the analysis thus far we focused on OOP spending just on inpatient medical costs, since that is the aspect that is impacted by PM-JAY. But it is useful to examine the distribution of households using the more expansive definition of inpatient OOP expenditures, i.e., including non-medical costs, the results are as follows. Here again, in Table 7, the first column replicates the analysis presented in Table 2.

Table 7 suggests that the trends are consistent i.e., the share of households (that are eligible and have members hospitalized) spending more than any share of their consumption expenditure on medical inpatient OOP costs falls consistently, and the decline is the most significant for households that spent the most on OOP expenditures. Once again, the effects are much larger if we can increase take-up among those who are hospitalized.

Table 7: Share of SECC Households Spending more than Threshold (cumulative) with Broader Definition of OOP Expenditure

			Take-up
Share of OOP/Costs Consumption	**Prior to Insurance**	**Existing**	**Benchmarked**
Greater than 10%	37.70%	30.12%	9.78%
Greater than 15%	27.72%	21.50%	5.48%
Greater than 20%	21.85%	16.67%	3.60%
Greater than 25%	17.93%	12.61%	2.43%
Greater than 50%	8.01%	4.68%	0.84%

Conclusion

Our analysis suggests that PM-JAY, aimed at reducing catastrophic health expenditures among Indian households, is expected to significantly reduce inpatient medical OOP costs. The share of SECC eligible households that have members incurring a hospitalization and that spend more than say, 25% of their consumption expenditure on medical expenses is expected to fall from 16% to 10%. This is based on the assumption that the take-up into the program aligns with what was prevalent among brownfield states before the launch of PM-JAY.

While this reduction is significant, it is limited due to constrained utilization of the program among those who are hospitalized. If PM-JAY, with its the scale and attraction it has received, manages to increase take-up into the program – such that it aligns with the better performing states – the reduction in the share of eligible households spending more than 25% of their consumption expenditure on inpatient medical care is expected to be even more drastic – from 16% to 1%. Moreover, the gains exponentially increase with the share of OOP cost vs. consumption expenditure.

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Acknowledgements:

We acknowledge with gratitude the contribution and support extended by NHA colleagues for providing the required procedure-level data from PM-JAY data warehouse. We also gratefully acknowledge the inputs of the monitoring and research team in helping to provide the data for the analysis. Special thanks to CEO, Additional CEO and Deputy CEO at NHA for their overall strategic guidance and facilitating the necessary approvals. In addition, we acknowledge ACCESS Health International for their funding support and Maulik Chokshi's inputs on the study.

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