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Analysis of health insurance scheme of Maharashtra, India: Economic and public health implications.

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ABSTRACT:
This is a comprehensive analysis of the insurance based health scheme of Maharashtra from 2012to 2020. It looks at the demographic, epidemiological, and economic outcomes of the eligible beneficiaries who have accessed healthcare in the empaneled network hospitals, both public and private. Beneficiaries form 35 percent of the population and the scheme has been accessed by 28 percent. They are mostly adults and have accessed secondary and tertiary care for largely chronic diseases on a cashless, fee for service basis as treatment is paid for by the government. More than 60 percent patients were treated for Non Communicable Diseases (NCDs) like Cardiovascular Cancer and nephrological problems. This paper analyses the outcomes of the scheme basis the data provided.
Keywords: MJPJAY, Health insurance scheme, economic study, claims data, Maharashtra.

I. INTRODUCTION

Universal health coverage (UHC) is now accepted as a goal under the sustainable development goals (SDGs) for the country. Countries have reached universal health coverage by different paths and with varying health systems. Savedoff W, Ferranti D, Smith A, et al [1] describe common patterns in countries that have successfully provided universal health care and considers how economic growth, demographics, technology, politics and health spending have intersected to bring about this major development in public health. It concludes by saying that countries are more likely to succeed if they take advantage of cost effective approaches and cost constraining strategies.

Rajiv Gandhi JanArogya Yojana (RGJAY) scheme uses ration card issued by the state's Department of Food and Civil Supplies along with photo id as an identification of beneficiaries. Each year this department updates the list of families which are under the annual income level of USD 1500 for varying benefits including food security, unemployment and pension payments, which also forms the basis of the health benefits under this scheme. There is no separate health card for the beneficiary.The scheme was later renamed to Mahatma JyotiraoPhule Jan Arogya Yojana (MJPJAY).

The network of hospitals includes both public and private hospitals with a ratio of 20:80. As of January 2021, around 977 hospitals are empaneled. District Coordinators are appointed for operationalizing the scheme at each district; every empaneled hospital has an Arogyamitra or Health Assistant as first point of contact for patient who helps them enroll in the hospital for treatment. The digital portal facilitates online pre-authorisation and claim settlement processes.

Objectives
In order to determine the outcomes of this scheme, the following research questions have been framed.

1. Has the scheme met its intended objectives of providing quality health care services to the target beneficiaries? This is important for both financial sustainability of the scheme and the intended outcomes.
2. What are the demographic and epidemiological outcomes? This can help to see the impact of the scheme on the health outcomes of the target beneficiaries
3. What are the economic and public policy issues emerging out of the outcomes? This can help understand the current gaps and how they can be addressed.

Methods

This is a retrospective analysis of MJPJAY data from November 2012 to March 2020, a period of 89 month where 30,40,950 cases of illnesses were treated.The data was obtained from the IT cell of State Health Assurance Society (SHAS) which manages the MJPJAY scheme under the department of Public Health, Government of Maharashtra and the data analysis was carried out using the statistical software SPSS

International Journal Dental and Medical Sciences Research
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20·0.Claims data of the scheme detailing the illnesses treated, health and economic background of the patient was collected from empaneled hospitals and analyzed to investigate the research objectives of the study.Utilization of the scheme on the basis of ration card held by the beneficiaries was also analyzed to assess the impact. Following categories of ration cards [website reference 1] were considered for the study:

- Yellow: Issued to families having annual income up to USD 196
- Orange: Issued to families having annual income of USD 197 to USD 1,306.
- White: Issued tofamilies having annual income more than USD 1,306

The outcome variables identified for the study were:

- Change in tertiary care expenditure of the beneficiaries for chronic diseases
- Increased focus on wellness and prevention of chronic diseases. We noted that people from 40-60 years age group suffered from chronic diseases
- Focus on increase of women beneficiaries for NCDs such as cancer. Our study revealed that detection of cancer was more in women compared to men, however, treatment availed was less

Permission of the Institutional Review Board (IRB) of Harvard T.H. Chan School of Public Health was obtained on February 20, 2018.

Limitations:

There is no specific provision of enrollment of beneficiaries under this scheme. The ration cards are family based and the patient database is individual beneficiary. Further, there is no updated data set for total hospitalization in the state with details of treatment and mortality against which the claim data can be compared. National Sample Survey Office (NSSO) data sets are sample based. Details of awareness about the scheme were available only for the enrolled households.

II. DISCUSSION

Share of the ration card holders of Maharashtra and share of the patients who used MJPJAY is presented in Table 1.

Table 1: Ration card-wise population[1]

Year	**Yellow BPL %**	**Yellow Antyodaya* %**	**Orange %**	**Annapurna* %**	**White %·**	**Total (In hundred Thousand)**
2011-12	16·4	10·0	73·3	0·3	0·0	5
2012-13	15·7	9·8	74·2	0·3	0·0	5
2013-14	20·5	11·5	67·6	0·4	0·0	21
2014-15	20·7	11·2	67·8	0·3	0·0	22
2015-16	20·5	11·1	67·4	0·3	7·4	22
2016-17	22·0	11·1	65·8	0·3	0·8	22
2017-18	22·7	11·2	65·5	0·3	0·3	22
Ration card-wise use of MJPJAY						
Year	**Yellow BPL %**	**Yellow Antyodaya* %**	**Orange %**	**Annapurna** %**	**White %**	**Total (In Thousand)**
2012-13	21·4	2·8	75·6	0·2	0·0	31
2013-14	19·8	2·0	78·0	0·1	0·0	115
2014-15	25·6	1·4	72·9	0·1	0·0	291

1Table 1 – Percentage distribution of ration card-wise population and users of MJPJAY

International Journal Dental and Medical Sciences Research
Volume 4, Issue 3, May-June 2022 pp 190-199 www.ijdmsrjournal.com ISSN: 2582-6018

2015-16	26·3	0·8	72·8	0·1	0·0	382
2016-17	26·1	0·7	73·1	0·1	0·0	471
2017-18	26·2	1·1	72·6	0·1	0·1	534

Annapurna**: It is a scheme under which food grains are provided free of cost to the card holders (old destitute people over 65 years of age) (website reference 2)

Antyodaya*: The poorest of the poor households from the BPL are provided food grains (Wheat at Rs.2/- per kg and Rice at Rs.3/- per kg) under this scheme (website reference 3)

Note:

For 2019-20 data is available up to October 2019

For 1067 claims type of ration card is not available.

Although 28·2 percent of the population forms the lowest wealth quantile, but only 1·3 percent have availed the scheme. Three fourths of the claims belong to those who are not in the lowest income quantile. Share of orange card holders is less in the population (65·5 percent) but is more in the use of MJPJAY (72·8 percent). Share of Annapurna and Antyodaya card holders needs to be increased.

Kruk[2] argues that to ensure that the poor people are not left behind insurance must prioritize coverage for most common disease for the population. It is both right and smart thing to do because estimates suggest that increasing share of prepaid funds in health spending by ten percentage points would result in 15 fewer deaths in children under five per 1000- equivalent to 5,00,000 children's lives saved each year in India and Niger alone without increasing total spending.

More males (58·2 percent) utilized the scheme than females (41·8 percent). Share of claims for patients over 40 years was more than two-thirds (68·2 percent). A little over four percent were children below five years of age. Sizeable gender difference is seen among the children. In patients who were below 15 years of age, it was observed that more boys were treated than girls. Similar trend was observed in patients above 60 years of age. Share of children among the treated patients was more in the lowest quantile.

The state has regional imbalance in terms of health service delivery capacity. Out of eight health circles, maximum utilization is from two circles, Thane and Mumbai (20·0 percent) and Nashik (19·2 percent); whereas lowest utilization is from two circles, Nagpur (6·9 percent) and Aurangabad (8·4 percent). The highest two come from the urbanized and developed part of the state and the lowest ones come from the socially as well as economically backward regions of the state.

Table 2: Percentage distribution of patients by age and gender[2]

Age group	**Gender %**		**Total (In thousand)**
	Female	Male	
Below one year	38·9	61·1	77
1-4	38·2	61·8	49
5-11	39·1	60·9	70
12-18	35·0	65·0	76
19-40	38·9	61·1	694
41-59	45·6	54·4	1,102
60 and above	40·9	59·1	969
Total	41·8	58·2	3,040

[2]Table 2 – Percentage Distribution of patients by age and by gender

International Journal Dental and Medical Sciences Research
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Travel out of the district causes additional transport costs, loss of livelihood and overcrowding in sought after facilities.

Table 3: Percentage distribution of patients by type of treatment received[3]

Treatment	Number of patients (In thousand)	Percentage
Surgical	720	23·7
Medical	2,320	76·3
Disease type		
Cardiac	514	16·9
Malignancy	926	30·5
Renal	419	13·8
Orthopedic	82	2·7
Pediatric	134	4·4
Poly trauma	201	6·6
E.N. T	145	4·8
Genitourinary	250	8·2
Others	366	12·1
Outcome		
Survived or cured	3,009	99·0
Died	31	1·0
Total	3,040	100·0

Amongst the total beneficiaries, less than a quarter underwent surgery and remaining three-fourths were managed medically. The top three diseases (60 percent) are cancer (30·5 percent) cardio-thoracic (16·9 percent) and nephrology (13·8 percent) respectively. Share of male beneficiaries is more than that of females.

A major finding is also that more women are affected by some form of cancer (43.8 percent) as opposed to men (20·9 percent). State needs to focus attention on early detection of cancer amongst women.

Similarly, more men (66·9 percent) had cardiac problems compared to women (33·1 percent). For other problems, the differentials were marginal.

34·7 percent patients have migrated from their district to avail treatment. Such movement was largely for treatment of cancer and cardiac problems. Most beneficiaries opt for private hospital within the district, if available or migrate to another district, especially for cancer treatment.

Ninety nine percent recovered after treatment. Mortality was just one percent. Highest share of deaths was due to cardiac problems (21·9 percent) followed by renal and pediatric problems (12·2 percent). Deaths due to cancer are 5.8 percent.

Preference for treatment in private facilities is huge, considering the nature of the problems and required specialized tertiary care.

A large number of cancer patients are treated by Tata Memorial Hospital in Mumbai, which is a public Trust hospital. This explains the large share of cancer patients seeking care in a public facility for its affordability along with the expertise and quality of treatment. Though share of cancer patients is more among the beneficiaries, average claim amount settled is less than that of the patients suffering from Orthopedic, Pediatric, and Genitourinary System problems. Cardiac treatment is most expensive and per capita expenditure for cardiac treatment is highest at USD 704.

The share of cancer patients is increasing whereas share of cardiac patients is decreasing over the time among the patients accessing MJPJAY. All other types maintain the same levels.

Government spending

In terms of settlement of claims, the scheme is working well. The average amount received for treatment was USD 253. Overall money spent on the scheme so far is USD 76,91,80,400. Since the inception of MJPJAY about USD 6.6 Billion have been spent to pay the claims, obviously increasing every year.

3Table 3 - Percentage distribution of patients by type of treatment received

International Journal Dental and Medical Sciences Research
Volume 4, Issue 3, May-June 2022 pp 190-199 www.ijdmsrjournal.com ISSN: 2582-6018

Table 4: Insurance claims paid in various[4]

Year	No. of patients who received insurance money	Share of patients who received insurance money %	Amount received (INR in Thousand)	Amount received (USD in Thousand)*	Per capita amount paid (INR in Thousand)	Per capita amount paid (USD)
2012	31,863	1·0	7,05,706	9,372	22	294·15
2013	1,15,528	3·8	21,49,922	28,553	18	247·16
2014	2,92,014	9·6	53,52,568	71,087	18	243·44
2015	3,82,652	12·6	70,13,401	93,145	18	243·42
2016	4,71,815	15·5	87,85,304	1,16,678	18	247·29
2017	5,35,065	17·6	94,48,144	1,25,481	17	234·52
2018	6,95,040	22·9	1,09,91,208	1,45,975	15	210·03
2019*	5,16,973	17·0	55,50,469	73,716	10	142·59
Total	30,40,950	100·0	4,99,96,725	6,64,011	16	218·35

*Conversionrate: 1 USD to 75 INR
https://www.westernunion.com/us/en/currency-converter/usd-to-inr-rate.html

Note:
For 2019 data is available for eight months

The share of patients getting benefits of the scheme are steadily increasing as is the cost. However, per capita spending is going down each year of implementation of the scheme.

Table 5: Amount paid for patients whose claims are pending[5]

Category	Mean (INR in Thousand)	Mean USD	No. of patients (In thousand)	Sum (INR in Thousand)	Sum (USD in Thousand)	Share of amount paid
Cardiac	45	606	461	21,117,118	2,80,059	42·2
Cancer	11	151	843	96,18,401	1,27,561	19·2
Renal	8	108	379	30,96,842	41,071	6·2

4Table 4 - Insurance claims paid in various years

5Table 5 - Amount paid for patients whose claims were sanctioned

Orthopedic	13	179	71	9,69,087	12,852	1·9
Pediatric	20	267	115	2,329,510	30,894	4·7
Poly Trauma	11	155	176	2,065,229	27,389	4·1
ENT	4	61	134	6,18,940	8,208	1·2
Genito urinary System	16	221	221	3,705,879	49,148	7·4
Others	20	274	312	64,75,716	85,882	13·0
Total	18	244	2·716	4,99,96,725	6,63,067	100

Most of the expenditure (61·4 percent) of the government is on cardiac and cancer patients of the state.

Demographic characteristics of the recipients of the insurance claims show that about 58 percent recipients are males, across all ages. It is striking that same is true for children below five years as well as for elderly. No differentials in the illnesses at least in these ages by sex of the person exist. A little less than half the recipients belong to socially deprived class of the society.

Among over three million insurance claims, over 61·4 percent comprise of Cardiac, Cancer and Renal problems. These are the major emerging threats to the population with the changing lifestyle and nutrition. In a span of seven years, it has increased: 53 percent in 2012 and 63 percent in 2019. Treatments for these problems are cost intensive. This share is gradually increasing from 61·4 percent in 2012 to 68 percent in 2019.

Roberts et al [3] developed the Flagship Framework with control knobs to be a model that incorporates ethical, political and policy cycle analyses. The control knobs are (i) financing; (ii) payment; (iii) organization; (iv) regulation and (v) persuasion. Policymakers can conduct a diagnostic study to pinpoint which control knobs caused the problems. They can be adjusted to yield best results as per the stated objectives. In the case of MJPJAY, the results show that there is a need to fix all the five control knobs above. The financing knob can be fixed by creating fiscal space for full coverage of all eligible beneficiaries, the payment knob by ensuring adequate budget, by initiating co-payments by those who are able to pay or by levying a service fee to generate funds, the organization knob by creating an effective mechanism to reach out to all beneficiaries. The regulation knob by regulating the private sector through the legislations such as Clinical Establishment Act[4] and ensuring a standardized data system while also promoting national programs such as immunization, child, and maternal health care by all. Lastly, the persuasion knob by involving all key stakeholders to participate in the program for its success.

The scheme is for those belonging to lower economic strata of the society; however, it is seen that just over a quarter of the claims are paid to them vis-à-vis remaining three-fourths for the others. Among the problems, cardiac and renal problems are significantly less among the lower income category recipients compared to higher, though cancer does not vary with income. Amount spent on the lower category beneficiaries is USD 19,74,82,386 vis-à-vis higher category is USD 57,16,98,014. Share of the amount paid to them also matches to their share in the total recipients. Perhaps there is a need to offer insurance benefits to only the low -income families.

The empanelment system for private hospitals includes highly specialized National Accreditation Board for Hospitals & Healthcare Providers (NABH) accredited tertiary Government and private hospitals. Specialized protocols are prepared on similar lines of All India Institute of Medical Sciences, Delhi and patients receive standardized treatments. A manual detailing these procedures has been prepared. There is a call center to do follow up calls with patients who received treatment and there is a functional grievance redressal system. This call center also randomly calls beneficiaries to get information on out of pocket expenditure by them and the respective reasons.

Preventive health care needs strengthening as does building capacity in the public health facilities for treatment of chronic health diseases. District wise disease profiling can help. Increasing NCD burden will impact a rapidly urbanizing state

International Journal Dental and Medical Sciences Research
Volume 4, Issue 3, May-June 2022 pp 190-199 www.ijdmsrjournal.com ISSN: 2582-6018

like Maharashtra very negatively as its productive age group is afflicted by chronic diseases which are also expensive to treat.

The scheme is providing episodic medical intervention. There is no record of any screening or first point contact of the patient with the health care providers. Total coverage of the intended beneficiaries in the target groups remains a cause of concern, especially the lowest income quantiles. The department needs to hold camps, not the hospitals, to reach to the intended beneficiaries. Follow up procedures need to be strengthened as there is high incidence of mortality in certain categories- cardiac and cancer treatments. There is also a need to align mental health care and counselling with the treatment of chronic diseases, especially cancer.

Utilization under private hospitals outweighs that of public facilities, which is leading to double provisioning by Government. The revenue flow from the scheme for the public hospitals needs to be used for building capacity and creating improved facilities and faculties for delivery of care. The public health care system should focus on more awareness; screening and counselling along with providing follow up and free medicines to patients who have undergone treatment. The state's Public health department should focus on increased coverage for vaccination, maternal care, nutritional support and mental health issues, and additional measures to cover the target beneficiaries fully through its own facilities.

Data variables on which information of the patient is collected requires improvement. For example, information on pre-screening, drug consumption patterns, hospitalization patterns etc. should be collected for evidence-based policy in future. Data should be shared with the research wing of the Government for quarterly review and real time feedback to society. Data has revealed important facts like migration to tertiary hospitals bypassing nearby hospitals thereby increasing indirect costs, transport costs and loss of livelihood. This pattern needs to be studied through a survey of patients who have travelled the farthest from their place of residence.

Table 6: Categorization of strengths and weaknesses[6]

	Grade 1	**Grade 2**	**Grade 3**	**Grade 4**	**Grade 5**
1) Universal Health Coverage for poor		+			
2) Empaneled hospitals, NABH				+	
3) Good protocols				+	
4) Follow up	+				
5) Grievance redressal	+				
6) Migration, Data utilization			+		
7) Infectious Disease Coverage	+				
8) Beneficiary number		+			
9) Private hospital utilization			+		
10) Public hospital utilization		+			
11) Data analysis	+				
12) Costs and out of pocket expenditure reduction		+			

[6]Table 6: Categorization of strengths and limitations

Likert's scale was created by Rensis Likert to measure opinions, perceptions, and behavior in scientific studies and surveys. It has five grades. The grades would indicate the degree of satisfaction received for a modality of treatment, observation, or behavior.

Group 1- would indicate-Very dissatisfied
Group 2- Somewhat dissatisfied
Group 3- Neither satisfied nor dissatisfied
Group 4 - Somewhat satisfied
Group 5 - Extremely satisfied

In the chart above, Grade 1 denotes the least achieved and Grade 5 denotes the best in qualitative terms of the insurance coverage. This categorization was done basis personal experience and assessment of the scheme.

Key Messages

Implications for policy makers

It must be mentioned that the state cannot only depend upon health insurance schemes to improve the health outcomes in any state or region. These schemes mainly take care of secondary prevention, i.e. diagnosis and treatment. India also requires primary prevention in terms of health promotion. There is a need for overall improvement in the quality and delivery of health care services in the public health sector, awareness, and promotion of wellness through more focus on lifestyle, habits, and regular health checkup. The control knob framework can be used to bring about much needed changes in policy to support equity and access by the intended beneficiaries.

Bump[5] believes that the rising burden of non-communicable diseases shows that the political economy of industrial interest is profoundly different that leads to a contest of economic and health interests, including food, firearms, alcohol, tobacco, and pharmaceuticals. This holds true for Maharashtra also. However, a deeper analysis is required into the cancer registry and claims data of the state to arrive at concrete conclusions.

MJPJAY can benefit greatly from a proper outreach program led by public health department i.e. use the annual lists released by the Food department to ensure that the families are made aware of their rights and benefits under the scheme. The Health department should fix accountability of each health facility to reach out to the target groups and do screening and health counselling as per requirement and ensure that those requiring specialist care are directed to the right empaneled facilities. Each member of the eligible family must be screened and advised health care regimen. For children and elderly, special care needs to be taken for ensuring their wellbeing, all the facilities available under primary care and various disease control programs as well as post medical episode counselling and follow up which should include medicine and drug support. Since cancer and cardiovascular disease dominates, mental health services need to be aligned for patient care along with treatment.

The role of the call center needs to be enlarged to do random surveys and prepare reports region wise on patient satisfaction and quality issues. The fund flow to the public health facilities should be directed for hospital team led improvements and upgradations in those units which are a revenue earner. Over time this will lead to better facilities and quality care in public health facilities also. Team incentives can be thought of for more participation of public health staff in the scheme.

Lastly data management needs to be with common taxonomy and organically linked to available data sources rather than scheme wise which does not give any outputs. The IT team under National Health Mission should be competent to provide weekly and monthly reports to policy makers on trends and outcomes for proper supervision and mid-course correction. Each health unit under the scheme should have a score based on NABH criteria adopted under the scheme for expected outcomes. If National Health Mission (NHM) funded staff additions shall focus on primary care, especially maternal child health, the staff deployment by public health should be strictly as per requirement of MJPJAY. These systems should not be manual for more transparency and accountability. Procurement of drugs and vaccines and as well as equipment should be based on take into account the target beneficiaries and the equipment purchase must also be aligned with the requirements of the health units as per the disease spread and local requirements of target population. Online systems such as e-aushadhi (e-drug inventory tool) with complete transparency in supply chain management must be the hallmark of public health department and should be made compulsory as health systems strengthening tool.

III. CONCLUSIONS

Data analysis reveals that the number of patients with infectious diseases, such as tuberculosis, did not take benefit of the insurance scheme. They probably took treatment under Government run National Disease Control programs or in private hospitals. Similarly, issues related to women and child health, immunization are not covered as there are covered under different National Health Programs. The total population covered and the percentage of people who access

the services under separate national disease control programs cannot be retrieved from this dataset. Therefore, it is important that there is one state level databank for patients availing such services with a common taxonomy so that it can be compared with the claim data to see the trends and usage in future for evidence based policy setting.

Main areas covered by insurance are cardiac, cancer and renal diseases. Share of cardiac patients is decreasing over the period; whereas share of cancer patients is increasing, and renal problems maintain the same level. Since the cost of treatment for these is high, the policy implication would be prevention of some of these by awareness drives, screening for early detection and counselling for lifestyle changes. Proper interventions for NCDs can help avoid surgeries like coronary angioplasty, coronary bypass, renal transplant etc.

The study also shows patient preference for Grade 'A' hospitals and their unavailability at district level which means more expenditure on logistics and transport. Creation of quality parameters for district level facilities would automatically reduce the movement of the patients across districts.

Despite several states running insurance based health care schemes in some form and shape, the results of the claim data for Maharashtra and the study by Tamil Nadu[6] are showing similar trends. However, insurance scheme is one block in the overall health framework. Countries expanding UHC will have to focus on creating efficient and responsive health systems that deliver quality services to every citizen. India is developing wellness centres which focus on preventive care as well as curative care.

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