

Analyzing variation in Breast Cancer service utilization, supply and underlying causes under PM-JAY

Authors:

Dr Vipul Aggarwal^[1], Shrayya Malik ^[1], Lakshya Arora ^[1], Dr. Ruchira Agrawal^[1]

February 2021



[1]- National Health Authority (NHA)

Disclaimer

The main objective of the working paper series of the National Health Authority (NHA) is to help staff, consultants, advisors and partners to speedily share their research findings based on AB PM-JAY experience with professional colleagues and test their research findings at the pre-publication stage. The opinion(s), view(s) and conclusion(s) expressed in the working paper are those of the authors and do not reflect the view of any author's employer, official policy or position of any agency of the NHA. The AB PM-JAY data used in the analysis should not be utilized/quoted without prior permission of NHA. The papers do not themselves represent policy advice. The paper implies AB-PMJAY and allied schemes wherever AB-PMAY is mentioned.

Acknowledgements

We acknowledge with gratitude the contribution and support provided by all NHA colleagues, especially the IT team for helping in getting the required package related data from PM-JAY data warehouse and HNQA team for providing information about the packages for treatment of Anemia under PM-JAY. Special thanks to the Dr R S Sharma, CEO, NHA and Dr Paveen Gedam, Addl CEO, NHA for their overall strategic guidance and facilitating the necessary approvals.

Abstract

Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) is the world's largest health assurance scheme aimed at providing a health coverage of Rs. 5 Lakh (USD 6,851) per family each year to approximately 50 Crore (500 Million) beneficiaries that form the bottom 40% of the Indian population. Launched in September 2018, the scheme has recently entered its third year of implementation and is providing quality healthcare to India's poor and vulnerable.

Over the years, Cancer has emerged as a major public health issue in developing nations like India. Slightly more than 1 Million new cases of cancer and around 800K deaths are reported every year in India in a population of 1.23 Billionⁱ. One of the most fatal and prevalent Cancers in India is Breast Cancer. Under PMJAY Oncology services are offered across different types of cancers under four broad categories- Medical, Surgical, Radiation and Pediatric Oncology. This paper is an attempt to understand the drivers for Oncology Services for Breast Cancer in India under PM-JAY through an exploratory analysis to analyze the trends of Breast Cancer utilization and supply. The analysis also aims to identify potential areas for a deeper analysis to affect policies to improve the service utilization and supply for Breast Cancer under PM-JAY.

Introduction

According to the World Health Organization (WHO), Cancer is the second leading cause of death globally. In 2018, approximately 18 Million cases of Cancer existed globally, of which, 1.5 Million were in India alone. 8.3% of the total deaths and 5% of the total DALYs in India in 2016 were due to Cancer, which was double the contribution of Cancer in 1990ⁱⁱ. In India, the top-5 cancers based on the proportion of population affected are Breast, Oral, Cervical, Gastric and Lung Cancerⁱⁱⁱ.

Cancer care in India comes with its fair share of problems related to economic burden, lack of awareness, late-stage presentation and lack of access to quality hospitals. According to the National Sample survey conducted during 2017-18, the average cancer care expenditure per person was around ~Rs. 1.16 Lakh (USD 1,588) out of which 93% was out-of-pocket expenditure^{iv}. According to a WHO report, between 30-50% of all Cancer cases are preventable but the percentage of patients undergoing Cancer treatment in India is much lower than the international standards^v.

Breast Cancer in India is the most common cancer both in rural and urban areas. The mortality rate in 2018 for Breast Cancer in India stood at 11.1% with an incidence of 1.6 Lakh (160K) cases in the year^{vi}. The 5 years survival rate for Breast Cancer in India is lesser when compared to countries like the US. One of the major factors for this is late-stage presentation i.e. due to lack of awareness most women get diagnosed in advanced stages. Screening of common Oral, Breast and cervical cancers is also an integral part of service delivery under Ayushman Bharat- Health and Wellness centres^{vii}.

Under PMJAY, Oncology services are the 4th most utilized specialty consisting of ~9% of the total utilization by both count and amount till date [PMJAY internal database, November 2020]. There are ~138 packages for Breast Cancer treatment under PM-JAY under four specialties- Medical Oncology, Surgical Oncology, Radiation Oncology and General surgery.

Purpose/Objectives

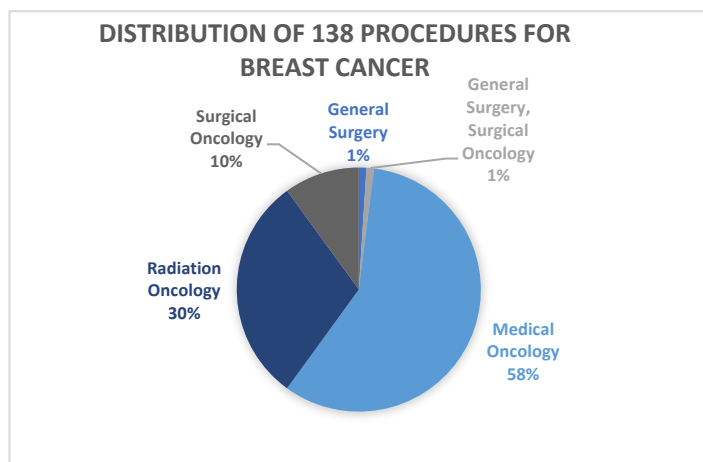
This paper is an exploratory analysis to examine cross-state utilization patterns of Breast Cancer services, using simple but robust methods to identify areas for further study. The analysis is largely restricted to PM-JAY data and thus cannot point to cause, it simply highlights where there are potential challenges in demand and supply to investigate further. The analysis will also form the base for a further, more rigorous deep-dive analysis that will engage greatly with non PM-JAY data to test specific hypotheses on drivers of utilization and causes of service delivery shortfall.

The key questions with respect to Breast Cancer service delivery under PM-JAY addressed in this paper include:

- Is utilization equitable across demographic characteristics of age, gender and geography?
- Keeping with clinical expectations, what types of services are most utilized?
- Is the supply of services for breast cancer aligned to utilization?
- Are hospitals providing the services they are empaneled to provide?
- Is utilization particularly concentrated in certain types of hospitals, and why?
- Does the supply landscape show any gaps in access, by geography or service type? If so, what are some key factors at play?

Methodology and data

Data Sources- The analysis utilizes the transaction data for 138 Breast Cancer packages from the data stored in the central data repository called National data warehouse PM-JAY data warehouse



via NHA's Transaction Management System or via APIs from implementing states. At the time of the analysis, procedure-level data was unavailable for Rajasthan and hence it has been excluded from the analysis. Given the low volume of claims, union territories and the state of Goa have also been excluded from this analysis. To exclude the effect of Covid-19 on service utilization from the analysis, only the data for the financial year FY 2019-20 was considered for the analysis unless

mentioned otherwise in the paper. Out of the 138 packages mapped for Breast Cancer, majority are categorized under the specialty Medical Oncology, followed by Radiation Oncology and Surgical Oncology.

Results

The results of the analysis are divided into two parts:

- A. Utilization of services for Breast Cancer
- B. Supply landscape for Breast Cancer services

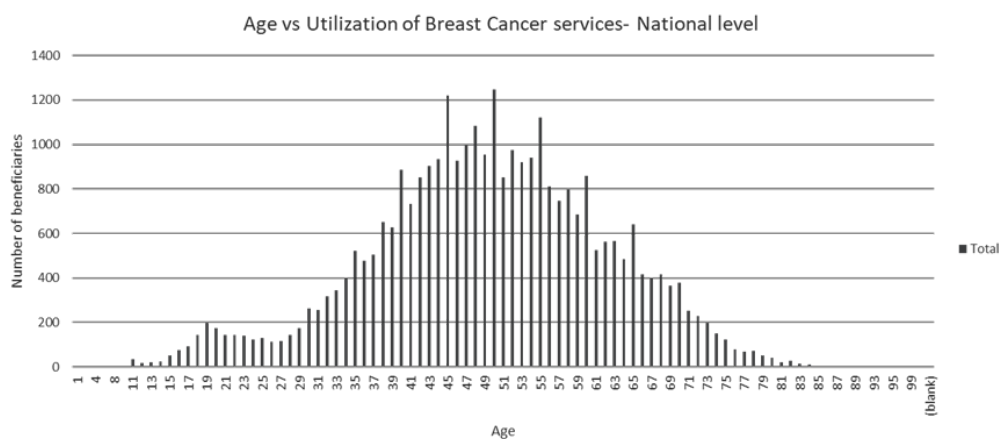
A. Utilization of Services

For the financial year 2019-20, there were ~86K admissions for Breast Cancer treatment across India amounting to Rs. 51 Crores which is 1% of the total admissions under PM-JAY by count and 0.5% by amount. There were approximately 29K beneficiaries who availed Breast Cancer services. In the year 2016, the number of Breast Cancer cases prevalent in India were ~525K^{viii}. According to various public health reports, the burden of Breast Cancer in India is increasing every year. Compared to the expected utilization and given how Breast Cancer is common in both urban and rural populace, the overall utilization in FY 2019-20 seems relatively lower.

The utilization of services varies considerably across states with states like Kerala, Tamil Nadu and Mizoram having the highest number of Breast Cancer beneficiaries per 100,000 eligible female population and states like Meghalaya, Bihar and Arunachal Pradesh having the lowest. The utilization is also guided by the public health schemes functional in the states before PM-JAY. Hence, for brownfield states like Tamil Nadu, Andhra Pradesh and Maharashtra the utilization is more skewed towards Breast Cancer service utilization compared to overall scheme utilization as the state health schemes before PM-JAY were more focused on tertiary care which affects both beneficiary and provider behavior. The utilization trends are described more in detail in the sections below.

Utilization by demographic factors

A review of utilization by age and sex yielded results in-line with expectations. Statistically, rate of

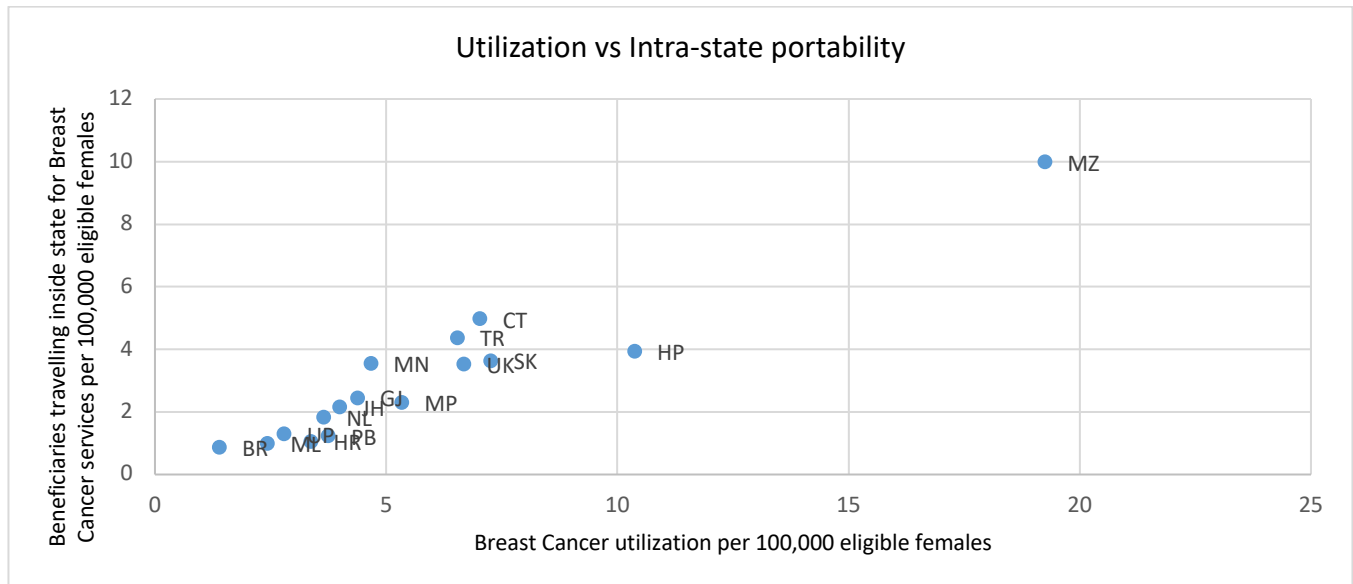


prevalence of Breast Cancer amongst males in India is 1.03% of the total breast cancer cases; utilization under PM-JAY for Breast Cancer shows 3% males around 2% of which could be

attributed to data errors. In India, the age of development of Breast Cancer is a decade earlier than in countries like the US, with the disease peaking in women aged between 40-50 years. A review based on income or education status could not be done due to lack of information.

Utilization by geography

17% of all beneficiaries travelled within their state and 2.4% of all beneficiaries travelled across states to avail services for Breast Cancer. Portability information is unavailable for brownfield states like Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka and Tamil Nadu.



The highest percentage of intra-state portability is observed in the state of Manipur followed by Chhattisgarh, Tripura, Bihar and Gujarat. Prima-facie there is a close to linear relationship observed between Breast Cancer service utilization and the percentage of beneficiaries in the state travelling intra-state to avail Breast Cancer services indicating a potential increase in utilization with an increase in mobility opportunities available for beneficiaries.

The states with the highest percentage of beneficiaries travelling to another state for availing Breast Cancer services is Haryana followed by Bihar, Madhya Pradesh, Nagaland and Jharkhand. The three states where the majority incoming beneficiaries are observed are Assam, Chandigarh and Maharashtra.

State	Hospital
Assam	Dr B Borooah Cancer Institute
	Cachar Cancer Hospital And Research Centre
Chandigarh	PGIMER Chandigarh
	Government Medical College and Hospital Chandigarh
Maharashtra	Tata Memorial Hospital & Research Centre
	Govt. Medical College Hospital Nagpur
	Advanced Centre for Treatment Research & Education in Cancer (ACTREC)
	Tata Memorial Centre

The table on the left indicates the top hospitals where the maximum number of beneficiaries from other states availed treatment for Breast Cancer. In Assam and Chandigarh, most of the utilization for Breast Cancer services besides the portability cases is concentrated in these hospitals as well.

In Assam and Chandigarh, most of the utilization for Breast Cancer services besides the portability cases is concentrated in these hospitals as well.

Utilization by hospital type

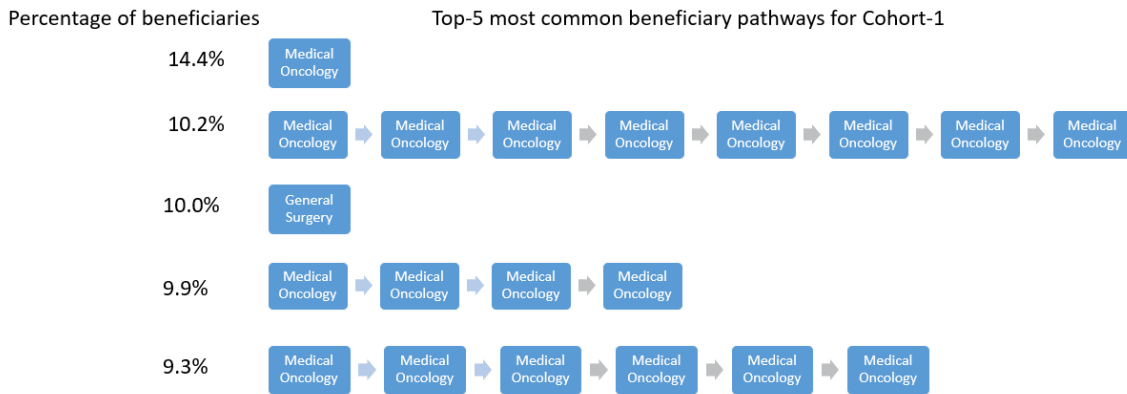
At a national level, the share of private hospitals for utilization of breast cancer services is 55%, which is in line with that of overall PM-JAY services utilization i.e. 51% utilization in private hospitals. Bihar shows a significant skew toward private hospital use with 66% utilization in private hospitals for Breast Cancer compared to 32% for all PM-JAY services. Bihar also has the second highest percentage of beneficiaries travelling to other states for Breast Cancer treatment at 23%. Bihar is an outlier in terms of active Breast Cancer hospitals per 100,000 eligible females with the lowest number of active hospitals. Active hospitals here is defined as hospitals that have provided services for Breast cancer to at least one beneficiary. Another important factor to consider here is that in Bihar, out of the 26 hospitals that provided services for Breast Cancer in Bihar in FY 2019-20, 21 only provided services for the specialty 'General Surgery'. This is in contrast with the admissions, as 92% of all admissions by beneficiaries from Bihar were for the specialty 'Medical Oncology'. Therefore, there appears to be a huge gap in availability and access to facilities providing services in Bihar.

States like Haryana, U.P, Manipur and Assam show significant skews in utilization toward public hospitals. Primarily, there is no observed relationship between Breast Cancer utilization and share of either private or public hospitals in service delivery.

Utilization by service type

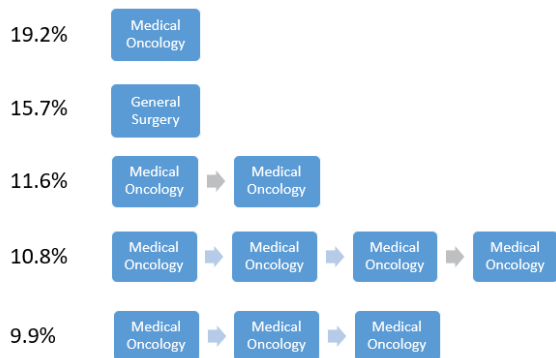
Services for Breast Cancer under PM-JAY are categorized under four specialties- Medical Oncology, Surgical Oncology, Radiation Oncology and General Surgery. Around 92% of all the admissions for Breast Cancer are under the specialty 'Medical Oncology' compared to 4% under 'General Surgery'. This is contrast with the supply as around 50% of hospitals that have provided services for Breast cancer till date have provided services only for 'General surgery' specialty with variation across states.

Since the inception of the scheme in September 2018 till September 2020, 65% of the beneficiaries that have availed treatment for Breast Cancer have availed more than one procedure in their entire patient pathway. The beneficiary pathway was analyzed from the moment of entry of beneficiary in the PMJAY system for Breast Cancer treatment till their final or tenth admission (whichever came first) for Breast Cancer treatment to identify the most common treatment pathways followed by the beneficiaries. A cohort analysis was done by dividing the beneficiaries in two cohorts based on the time of entry in the PM-JAY system for Breast Cancer treatment to account for variability in the time spent in the PM-JAY system. The first cohort (C1) included around 17K beneficiaries that had more than one year to avail treatment i.e. beneficiaries who availed their first package for Breast Cancer between September 2018 to August 2019 and the second cohort (C2) included around 20K beneficiaries that had less than or equal to a year to avail treatment for Breast Cancer i.e. beneficiaries who availed their first package for Breast Cancer between September 2019 to September 2020.



For C1, the most common pathway being followed was a single Medical Oncology procedure availed by 14.4% of beneficiaries as the only procedure in their entire pathway followed by 10.2%

Percentage of beneficiaries Top-5 most common beneficiary pathways for Cohort-2



beneficiaries availing 8 Medical Oncology procedures in their pathway and 10% beneficiaries availing only one General Surgery procedure. Similarly, for C2, the most common pathway was a single Medical Oncology procedure availed by 19.2% of the beneficiaries followed by 15.7% beneficiaries availing one General Surgery

procedure and 11.6% beneficiaries availing two Medical Oncology procedures.

The specialty Medical Oncology includes procedures related to Chemotherapy and drugs like BreastAdriamycin/Cyclophosphamide (AC) – per cycle (Maximum 4 cycles), Breast5- Fluorouracil A-C (FAC) – per cycle (Maximum 6 cycles), CM0100-f-II : BREAST CANCER - Paclitaxel - weekly - Preceded by FAC ; Paclitaxel 80mg/m2 IV ; Repeat Cycle weekly for 12 weeks; General Surgery includes procedures related to surgical excision of lumps like Breast Lump - Left – Excision, Breast Lump - Right – Excision and reconstructive surgery procedures.

Some key questions that arise from analyzing the beneficiary pathways that would need to be reviewed in deep would be:

- Since majority of beneficiaries are only availing one service of 'Medical Oncology' as a part of their complete beneficiary pathway for Breast Cancer treatment there is a question of if just one procedure of Medical Oncology (that might include just one round of Chemotherapy or Chemotherapy drugs) sufficient treatment for a beneficiary suffering from Breast Cancer. Primary research conducted on Oncology experts has suggested that at least 4-5 rounds of

Chemotherapy are required even for relatively less advanced Breast Cancer cases. Hence, this gap could signify a barrier in demand or supply.

- It is observed that almost all the beneficiaries availing surgical procedures for Breast Cancer like Excision (Left, Right, Both) are not following it up with any follow-up procedure. Primary and secondary research has suggested there could be five potential reasons for the same:
 - The lump excised is a benign lump
 - The lump excised is a malignant lump that is small and has not spread the cancer to other parts of the body, and thus no follow-up procedure is required
 - Malignant lump but no proper technical advice was given to beneficiary to follow it up with chemotherapy or drugs
 - Malignant lump and follow-up advice for chemotherapy/drugs given to beneficiary but no follow-up was done by beneficiary
 - Fraudulent cases

There is a need for a deeper dive analysis to determine the type of lumps excised by beneficiaries to diagnose the reason of not availing any follow-up procedures and finding solutions to bridge this gap, if needed.

B. Supply of Services

Similar to the utilization of services for Breast Cancer, there is heterogeneity in the level, type and concentration of supply available across states. It is difficult to gauge whether current supply is sufficient to match the need for Breast Cancer and hence this paper simply looks at any challenges within currently available supply. The paper also looks at the level of activity and empanelment of the hospitals belonging to the National Cancer Grid (NCG).

Supply by geography

The top-5 states with the highest number of active hospitals for Breast Cancer per 100,000 eligible population are Sikkim, Mizoram, Kerala, Himachal Pradesh and Nagaland. A hospital is defined as active if it has provided service for Breast Cancer to at least one beneficiary. Although the north eastern states have a relatively lower number of hospitals- Sikkim has 2 active hospitals for Breast Cancer, Nagaland and Mizoram have 8 and 10 respectively- they emerge at the top when normalized by the eligible female population. The bottom 5 states in this list are Bihar, Andhra Pradesh, Tripura, Arunachal Pradesh and Madhya Pradesh. The beneficiaries of Bihar and Madhya Pradesh also show relatively higher level of inter-state movement for availing Breast Cancer services with 23% of all Breast Cancer beneficiaries from Bihar travelling majorly to Maharashtra and Uttar Pradesh for treatment and 19% of all Breast Cancer beneficiaries from Madhya Pradesh travelling to Maharashtra and Gujarat for treatment. Even though there is heterogeneity, no relationship is observed between the active supply of hospitals and utilization of services for Breast Cancer for beneficiaries.

Supply by hospital type

The National Cancer Grid is a network of 224 major cancer centers, research institutes, patient groups and charitable institutions across India started by the Government of India with the mandate of establishing uniform standards of patient care for prevention, diagnosis, and treatment of cancer, providing specialized training and education in Oncology and facilitating collaborative basic, translational and clinical research in cancer. Out of the 224 hospitals, till September 2020, 58% of the hospitals were empanelled under PMJAY with a wide variation across states.

Out of all the active hospitals for Breast Cancer from inception to September 2020, 5% are NCG hospitals and 29% of all admissions are observed in NCG hospitals. There is a scope of strengthening the provider network for Oncology services further by empaneling the remaining 42% of the hospitals as well.

Supply by service type

There is a wide gap observed in service availability on the basis of the type of specialty for which service is provided. Around 50% of all the active hospitals for Breast Cancer have only provided services for 'General Surgery' specialty that consists of procedures like Excision and Reconstruction of Breast. This is in contrast with the utilization trends which show that 92% of all admissions are under the 'Medical Oncology' specialty. Prima facie, a relationship is observed between the proportion of hospitals that provide services beyond 'General Surgery' in the state and the utilization of Breast Cancer services in the state. There is a scope for a deeper analysis here to determine if the kind of supply present in a state is sufficient for the need for Breast Cancer services especially 'Medical Oncology' services. A deeper analysis would also help diagnose why many facilities are able to offer General Surgery but not Medical Oncology services? Is there a gap in resources like equipment and staff? Or is there an issue of equity, where hospitals have these services available and availed by private and other patients but are not empaneled to offer Medical Oncology under PMJAY?

It is also observed that many hospitals initially empaneled to provide Medical and Radiation Oncology services have not been actively providing those services. 17% of the hospitals that declared Medical Oncology as a service provided during the time of empanelment have actively provided these services for Breast Cancer. The proportion is even lower for Surgical and Radiation Oncology i.e. 6% and 1% respectively. For Radiation Oncology, the services were only availed in the state of Karnataka and Manipur. A deeper analysis to examine the reasons for a gap between declared vs. provided specialty would lead to understanding and solving for supply-side barriers. This analysis does not include the public hospitals of Gujarat as all of those had declared services for every specialty during empanelment.

Supply by service concentration

It is observed that in five out of the sixteen states in which at least ten active Breast Cancer hospitals are present, around 90% of all admissions are concentrated in three hospitals of the state. Concentration of services in a few hospitals might lead to challenges related to the access of timely healthcare for all due to limited resources and case management especially for follow-up care. An analysis was done to diagnose the correlation of the high concentration with factors like hospital type, NCG membership, bed-strength and location of the hospitals where service is concentrated- but no such relationship was found from the PM-JAY data that could result in possible reasons for concentration of services.

Conclusion/Discussion

With an alarming rate of increasing incidence of Breast Cancer in India over the last few years, it has become the need of the hour to not only create awareness about the disease but provide avenues for affordable Cancer care. PM-JAY has an increasingly important role to play in this landscape with its ability to bring treatment facilities to the lowest economic strata in the country.

There is a wide difference between the utilization of Breast Cancer services across states and compared to the incidence of Breast Cancer in India the utilization of Breast Cancer services is relatively lower. For states like Haryana, Uttar Pradesh and Bihar where the utilization for Breast Cancer per 100,000 eligible female beneficiaries is one of the lowest amongst all the states, there is a need for more awareness campaigns both for the scheme and the disease amongst the beneficiaries. Given the relatively late-stage presentation of Breast Cancer in India compared to other countries which makes treatment more difficult, awareness and screening programs for Breast Cancer are necessary at the primary care level. With a disease like Breast Cancer, early detection and action is key to increase chances of survival. Targeted awareness campaigns will make women who are eligible under PM-JAY aware of the symptoms of Breast Cancer and the guidelines on self-diagnosis.

It is also observed that prima facie there is a relationship between intra-state mobility and the utilization for Breast cancer services. Interventions to enhance the mobility of people like provision of PM-JAY specific transportation for allowing them to travel for treatment between districts might further increase the utilization of Breast Cancer services. Interventions like periodic screening camps with provision of transportation especially in states with lower utilization like Bihar, Uttar Pradesh and Haryana will also be helpful.

Analyzing the journey of a beneficiary right from their first treatment for Breast Cancer under PM-JAY to their last or tenth treatment (whichever came first) raises some interesting insights that warrant a deeper analysis. While it is recommended both by primary and secondary research sources that a beneficiary suffering from Breast Cancer should at least take 4-5 rounds of Chemotherapy, this is not what is observed on analyzing the beneficiary pathway under PM-JAY with majority of beneficiaries only availing a single 'Medical Oncology' service which might include

Chemotherapy or other drugs. This indicates potential barriers to demand like awareness and accessibility and the need to compare the beneficiary pathways under PM-JAY with recommended guidelines for Breast Cancer in India. The analysis also results in the observation of beneficiaries availing Breast Lump Excision procedures under the specialty 'General Surgery' and not availing any follow-up treatments like chemotherapy or other drugs. While follow-up treatments are recommended after Excision, the lack thereof may be due to various reasons varying from the malignancy level of the tumor/lump to the potential of fraud. A deeper analysis that includes primary research through talking to the beneficiaries and the healthcare providers would help diagnose the reasons for the gap and interventions to reduce it.

There is a discrepancy in the type of services availed for Breast Cancer and the type of services provided actively by most hospitals. Utilization trends show that 92% of all admissions are under the 'Medical Oncology' specialty. This is in contrast with the supply trends that show around 50% of all the active hospitals for Breast Cancer have only provided services for 'General Surgery' specialty that consists of procedures like Excision and Reconstruction of Breast. And prima facie, there is a relationship between utilization for Breast Cancer services and proportion of hospitals that go beyond 'General Surgery' services. This raises potential concerns like if there is a gap in resources like equipment and staff needed to provide 'Medical Oncology' services in hospitals. Or if there is an issue of equity, where hospitals have these services available and availed by private and other patients but are not empaneled to offer Medical Oncology under PMJAY. Hospital surveys to diagnose this barrier in supply can potentially lead to an increase in utilization.

Besides the heterogeneity in active supply for Breast Cancer across states, the analysis also yielded insights about the concentration of services in a few hospitals. In five out of the sixteen states in which at least ten active Breast Cancer hospitals are present, around 90% of all admissions are concentrated in three hospitals of each state. This could indicate challenges with respect to access and quality of services. Concentration of services in a few hospitals might also lead to challenges related to the access of timely healthcare for all due to limited resources and case management especially for follow-up care. A deeper analysis to diagnose the cause of inactivity in other hospitals in the state empanelled for Oncology services through audits and surveys will lead to a more robust supply ecosystem.

The analysis also puts focus on key states where there seem to be many challenges and thus, they could be a part of a more focused analysis. There appears to be a huge gap in availability and access to facilities for Breast Cancer in Bihar. Bihar shows a significant skew toward private hospital use for Breast Cancer compared to other PM-JAY services. It also has the second highest percentage of beneficiaries travelling to other states for Breast Cancer treatment and has the lowest number of active Breast Cancer hospitals per 100,000 eligible females. Additionally, in Bihar, out of the 26 hospitals that provided services for Breast Cancer in Bihar in FY 2019-20, 21 only provided services for the specialty 'General Surgery'. This is in contrast with the admissions, as 92% of all admissions by beneficiaries from Bihar were for the specialty 'Medical Oncology'. There needs to be a special focus on increasing access for Breast Cancer services in Bihar. States like Haryana and Uttar Pradesh have a lower utilization for Breast Cancer services compared to other

states despite relatively higher active supply for Breast Cancer- these states could potentially benefit from awareness campaigns for both the scheme and the disease. In terms of the active supply present in both Haryana and Uttar Pradesh, even though it is higher compared to other states a major proportion of the supply in these states have only provided 'General Surgery' procedures, hence along with awareness there is a need to look for supply-side barriers in these states as well. Similarly, Jharkhand is in the bottom-10 states based on utilization and has only 16% of its active supply for Breast Cancer providing services for procedures beyond 'General Surgery' indicating possible supply side challenges in the state.

Next Steps

This exploratory analysis presents a lot of insights that can be researched upon further to improve the access and utilization of Breast Cancer services as well as undertake similar assessments for other services. A few potential areas from this analysis where there is a deeper scope of research would be:

- **Assessment of the demand and supply gap**
The baseline aim of this research area would be to measure the gap between disease prevalence of Breast Cancer in the PMJAY eligible population and the number of beneficiaries availing the service for a given time-period. There is also scope to perform a qualitative but rigorous assessment of the main supply and demand side contributors of this gap.
- **Utilization- Deep-dive on the beneficiary pathway**
The aim of this research would be to determine if treatment under PMJAY for Breast Cancer is in-line with recommended guidelines in India. If not, there would be a need to design interventions to ensure proper and complete treatment is provided for Breast Cancer under PM-JAY.
- **Supply- Assessing hospital inactivity and types of services provided**
There is a need to look at the supply ecosystem for Breast cancer more in-depth to diagnose reasons for why large number of facilities offer surgical oncology procedures but not other services? It could also aim to investigate inactivity in supply for hospitals that have declared 'Medical Oncology' as a service at the time of empanelment but are not actively providing these services.

References:

ⁱ India: Globocan 2020, World Health Organization, <https://gco.iarc.fr/today/data/factsheets/populations/356-india-fact-sheets.pdf>

ⁱⁱ The burden of cancers and their variations across the states of India: The Global Burden of Disease Study 1990–2016, The Lancet, [https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045\(18\)30447-9/fulltext](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(18)30447-9/fulltext)

ⁱⁱⁱ The burden of cancers and their variations across the states of India: The Global Burden of Disease Study 1990–2016, The Lancet, [https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045\(18\)30447-9/fulltext](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(18)30447-9/fulltext)

^{iv} National Sample Survey 2017-18, Ministry of statistics and Program Implementation, http://mospi.nic.in/sites/default/files/publication_reports/

^v Facts in picture detail, Cancer, World Health Organization, <https://www.who.int/news-room/facts-in-pictures/detail/cancer>

^{vi} Cancer statistics in India, ICMR, <http://cancerindia.org.in/cancer-statistics/>

^{vii} Press release, PIB Government, <https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1601831>

^{viii} Appendix, The Global Burden of Disease Study 1990-2016, The Lancet, [https://www.thelancet.com/cms/10.1016/S1470-2045\(18\)30447-9/attachment/be2fa46e-760c-4771-9bc2-fae78a332c40/mmc1.pdf](https://www.thelancet.com/cms/10.1016/S1470-2045(18)30447-9/attachment/be2fa46e-760c-4771-9bc2-fae78a332c40/mmc1.pdf)