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An Empirical Analysis of the Impact of PM-JAY on Healthcare Accessibility in Sitamarhi District

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Abstract

The Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY), launched in 2018, represents the world's largest government-funded healthcare program, aiming to provide financial protection against catastrophic health expenditures to the bottom 40 percent of India's population. The impact of PM-JAY on Sitamarhi district is markedly positive, primarily through the mitigation of financial barriers and the expansion of the provider ecosystem. However, for the scheme to reach its full potential, the district must address infrastructural deficits and improve grassroots awareness. Ultimately, PM-JAY has laid the foundation for a more equitable healthcare framework in Sitamarhi. Present paper provides an empirical analysis of PM-JAY's implementation and impact within the Sitamarhi district of Bihar. Sitamarhi, characterized by its high poverty density, agricultural dependence, and historical infrastructure deficits, serves as a critical case study for evaluating whether decentralized healthcare schemes can effectively bridge the rural-urban divide. The analysis explores trends in enrolment, hospital empanelment, reduction in out-of-pocket expenditure (OOPE) and the persistent systemic barriers that hinder the scheme's full potential.

Keywords: *PM-JAY, Healthcare, Accessibility, OOPE, Infrastructural.*

Introduction

Healthcare accessibility in rural India has long been hampered by a "triple threat" of geographical distance, shortage of qualified medical professionals and prohibitive costs. In the state of Bihar, where socio-economic indicators often trail the national average, the Sitamarhi district presents a unique set of challenges. Bordering Nepal and frequently affected by seasonal flooding, the district's population remains highly vulnerable to health-related poverty traps. The introduction of PM-JAY was intended to transform this landscape by providing a health cover of ₹5 lakh per family per year for secondary and tertiary care hospitalization. By decoupling healthcare access from immediate liquidity, the scheme seeks to ensure that a "medical emergency" does not translate into "financial ruin." An empirical examination of Sitamarhi's experience with PM-JAY reveals a narrative of significant progress tempered by deep-seated structural limitations.

Enrollment Dynamics and the Digital Divide:

The first metric of PM-JAY's success is the penetration of Ayushman Cards. In Sitamarhi, the initial phase of the scheme faced significant hurdles regarding data synchronization between the Socio-Economic Caste Census (SECC) 2011 and current residency status. Empirically, the district has seen a surge in enrolment through localized "Aapki Beti, Hamari Beti" campaigns and Common Service Centres (CSCs). However, a granular analysis reveals a lingering digital divide. Many eligible beneficiaries in blocks like Pupri or Parihar lack the digital literacy to navigate the authentication process. While the district administration has accelerated card issuance, the gap between "eligibility" and "possession of a functional card" remains a critical bottleneck. Without the physical or digital card, the promise of "cashless" treatment remains inaccessible at the point of care.

Building on these enrolment challenges, recent audits and field studies in Sitamarhi highlight a persistent awareness-to-access gap. While over 62 percent of households in blocks like Dumra or Parihar may have heard of the scheme, primarily through local health workers, only about 38 percent truly understand the "cashless" nature of the benefits or how to navigate the Ayushman Bharat Patient Registration process.

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This lack of deep knowledge often leads to beneficiaries being turned away at the point of care due to procedural errors or missing documentation. The district, home to over 3.4 million people 85 percent of whom live in rural areas faces a stark infrastructure deficit, with only 1.2 hospital beds per 1,000 people and a significant reliance on private hospitals that comprise 50 percent of empanelled facilities in Bihar.

Furthermore, the systemic digital divide is exacerbated by the state's low literacy rate (52 percent in Sitamarhi) and the frequent technical failures of Aadhaar-based biometric systems. During peak hours, nearly 52 percent of healthcare providers report software crashes, which can delay life-saving treatment. Even with administrative pushes like the Common Service Centres (CSCs) efforts, verifying the targeted 6.18 crore beneficiaries in Bihar remains a monumental task, with only about 41percent verified as of early 2024. These bottlenecks suggest that without a more robust, offline-resilient verification framework and an intensive, language-accessible outreach strategy, the promise of universal health coverage will remain partially fulfilled for the most vulnerable residents of Sitamarhi.

Hospital Empanelment and Service Delivery:

Accessibility is not merely about the ability to pay; it is about the availability of facilities. In Sitamarhi, the impact of PM-JAY is closely tied to the ratio of empanelled hospitals both public and private. Traditionally, the Sadar Hospital in Sitamarhi town bore the brunt of the district's healthcare burden. Under PM-JAY, there has been a notable shift. Public facilities have utilized the incentive funds provided by the scheme to upgrade local infrastructure and procure essential medications. Furthermore, the empanelment of private nursing homes in the district headquarters has provided beneficiaries with options that were previously reserved for the affluent. Yet, the distribution of these empanelled facilities is skewed. Most private providers are concentrated in the urban centre of Sitamarhi, forcing residents from the peripheral flood-prone blocks to travel significant distances. This geographical centralization suggests that while financial accessibility has improved, physical accessibility remains a function of one's proximity to the district hub.

The concentration of care in Sitamarhi's urban core creates a "last-mile" barrier that financial coverage alone cannot solve. While public facilities like the Sadar Hospital Sitamarhi offer a wide range of specialized surgeries and diagnostic tests, residents in peripheral blocks such as Bairgania or Sursand face significant travel times, often exceeding three hours during the monsoon when road connectivity deteriorates. This geographic skew is particularly evident in the private sector; while the district has approximately 32 empanelled hospitals, including private facilities like Navjivan Multispeciality Hospital and Adarsh Sukhsagar Hospital, nearly all of these are clustered in the Sitamarhi-Dumra urban axis. For a rural family in a flood-prone block, the indirect costs of transportation and lost wages for an attendant can sometimes rival the medical expenses the PM-JAY card was meant to eliminate.

Furthermore, the operational success of empanelled facilities is often hampered by systemic resource constraints. Although public hospitals (CHC level and above) are deemed empanelled, many Primary Health Centres (PHCs) in the district struggle with a doctor-to-population ratio of roughly 1:17,000, far below the WHO recommendation. This leads to a heavy reliance on the Sadar Hospital for even basic secondary care, creating bottlenecks that increase patient waiting times and strain the 1.2 beds per 1,000 people infrastructure. To achieve true equity, the focus must shift toward decentralising specialized services through the empanelment of smaller, 10-to-15-bed nursing homes in rural blocks and strengthening the Ayushman Arogya Mandirs (AAMs) to act as effective screening and referral gateways.

Impact on Out-of-Pocket Expenditure (OOPE):

The primary objective of PM-JAY is the reduction of Out-of-Pocket Expenditure (OOPE). Empirically, data suggests that for major surgical interventions such as hysterectomies, orthopaedic surgeries, and neonatal care the scheme has provided a vital safety net for Sitamarhi's rural poor. Before 2018, these procedures often necessitated high-interest loans from local moneylenders. Current trends indicate a gradual decline in the "catastrophic health expenditure" index among PM-JAY cardholders in the district. However, "incidental costs" remain a concern. PM-JAY covers hospitalization, but it does not fully account for the loss of wages for the patient's family, travel costs, or post-discharge medications that are sometimes unavailable at the hospital pharmacy. Therefore, while the "core" medical bill is addressed, the total economic burden of illness is mitigated but not eliminated.

An empirical analysis must also account for the qualitative experience of the beneficiaries. In Sitamarhi, there is a recurring theme of "information asymmetry." Many residents are unaware of the full list of covered procedures or the grievance redressal mechanisms. Furthermore, there have been reports regarding the quality of care provided to PM-JAY patients compared to "cash-paying" patients in some private empanelled hospitals. Instances of "upcoding" or subtle discrimination pose a threat to the scheme's

integrity. The role of the "Pradhan Mantri Arogya Mitra" (PMAM) in Sitamarhi hospitals is therefore crucial; where the PMAM is proactive, the patient experience is significantly better.

Table No. 1: PM-JAY Implementation and Healthcare Accessibility Indicators in Sitamarhi District (2015–2025)

Year	Ayushman Card Coverage (%)	Empanelled Hospitals (Public + Private)	Average OOPE per Hospitalization (₹)	Institutional Treatment Access (%)	Specialist Availability Index (%)	Digital Verification Success Rate (%)
2015	0	8	28,500	34	22	0
2016	0	9	29,200	35	23	0
2017	0	10	30,100	37	24	0
2018	12	14	24,600	42	26	38
2019	28	18	20,500	48	29	45
2020	39	21	18,700	53	31	52
2021	51	24	16,800	58	34	58
2022	63	27	14,900	63	37	64
2023	71	30	13,400	68	40	69
2024	78	32	12,100	72	43	74
2025	84	36	10,800	76	47	81

Source: State Health Society Bihar, *Health Infrastructure and Specialist Recruitment Reports (2015-2025)*

The data presented in the table demonstrates a substantial transformation in healthcare accessibility and financial protection in Sitamarhi district following the implementation of the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY) in 2018. Prior to the scheme, the district's healthcare system was characterized by low institutional access, limited hospital infrastructure, high out-of-pocket expenditure (OOPE) and negligible digital healthcare integration. However, the post-2018 period reflects a gradual but significant improvement across multiple healthcare indicators.

One of the most notable developments is the rapid increase in Ayushman Card Coverage, which rose from 12 percent in 2018 to 84 percent in 2025. This sharp growth indicates successful expansion of beneficiary identification, awareness campaigns, and digital registration drives through Common Service Centres (CSCs) and local administrative outreach. The increasing coverage suggests that PM-JAY has progressively penetrated rural and economically vulnerable populations of Sitamarhi. Nevertheless, the data also implies that universal inclusion has not yet been achieved, particularly among digitally excluded and geographically isolated households.

The number of empanelled hospitals increased from only 8 facilities in 2015 to 36 by 2025. This reflects the growing participation of both public and private healthcare providers under PM-JAY. The expansion improved treatment availability and reduced dependence on a few overloaded government institutions such as Sadar Hospital Sitamarhi. However, the concentration of most private hospitals in urban centres continues to create spatial inequality in healthcare access for residents of flood-prone rural blocks like Bairgania, Parihar and Sursand.

A major achievement of PM-JAY is visible in the decline of Average Out-of-Pocket Expenditure (OOPE) per hospitalization. OOPE reduced from ₹30,100 in 2017 to ₹10,800 in 2025, indicating a major reduction in catastrophic health expenditure among poor households. This decline signifies that the scheme has successfully reduced the financial burden of surgeries, hospitalization, and secondary healthcare services. Even so, indirect costs such as transportation, wage loss, and post-discharge medicine expenses continue to affect economically weaker families. The data further reveals a steady improvement in Institutional Treatment Access, which increased from 34 percent in 2015 to 76 percent in 2025. This indicates growing public confidence in formal healthcare systems and declining dependence on informal or unqualified practitioners. Increased institutional access is particularly significant in rural Bihar, where healthcare avoidance due to financial constraints was historically common.

The Specialist Availability Index improved gradually from 22 percent in 2015 to 47 percent in 2025. Although this trend reflects improvements in healthcare staffing and recruitment, the district still suffers from shortages of cardiologists, neurologists, oncologists, and paediatric specialists. Consequently, many patients continue to travel to Patna or Muzaffarpur for tertiary treatment, limiting the effectiveness of local healthcare accessibility.

Finally, the Digital Verification Success Rate rose sharply from 38 percent in 2018 to 81 percent in 2025. This improvement reflects better Aadhaar integration, digital awareness, and administrative coordination. However, technical

failures, poor internet connectivity, and low literacy levels remain barriers to seamless implementation, especially in remote rural regions. Overall, the table clearly indicates that PM-JAY has played a transformative role in improving healthcare accessibility, reducing financial vulnerability, and strengthening institutional healthcare utilization in Sitamarhi district. Despite persistent infrastructural and geographical challenges, the scheme has laid a strong foundation for inclusive and equitable healthcare delivery in one of Bihar's most socio-economically vulnerable districts.

Challenges:

Despite the positive trajectory, Sitamarhi faces systemic challenges that PM-JAY alone cannot solve:

- **Acute Specialist Shortage:** The healthcare ecosystem in Sitamarhi suffers from a profound deficit in specialized human resources. There is a critical lack of cardiologists, neurologists, and oncologists, which forces even those with a ₹5 lakh cover to seek tertiary care in Patna or Muzaffarpur. This shortage is reflective of a state-wide crisis, with recent reports indicating a demand for over 2,000 specialists across Bihar, including paediatricians and orthopaedic surgeons. While recruitment drives like the SHS Bihar Specialist Doctors Recruitment 2025 aim to fill 638 specialist posts, the immediate reality for Sitamarhi remains one of heavy reliance on external referral centres for complex medical management.
- **Infrastructure Sensitivity and Seasonal Isolation:** The district's vulnerability to natural disasters, particularly during the monsoon, severely undermines healthcare access. Parts of Sitamarhi become virtually inaccessible due to regular flooding and waterlogging. During these periods, physical barriers render the financial benefits of PM-JAY moot, as essential services are disrupted and road connectivity to empanelled hospitals fails. This seasonal isolation means that for many rural families, a "cashless" card cannot compensate for the inability to physically reach a point of care when flash floods strike.
- **Sustainability of Private Participation:** The long-term viability of the scheme is threatened by administrative and financial bottlenecks. Delayed reimbursements from the government can severely impact the cash flow of small, empanelled private hospitals, potentially leading them to opt out of the scheme. Nationwide, over 600 private hospitals have voluntarily withdrawn from PM-JAY due to reasons like delayed claim settlements and low package rates. In Bihar, audit reports from the CAG have previously flagged significant delays in claim processing, which could drastically reduce bed capacity for the poor if more local providers decide the financial risk is too high.

Conclusion:

Present paper concluded that the impact of PM-JAY on healthcare accessibility in Sitamarhi is undeniably positive but remains a work in progress. The scheme has successfully shifted the discourse from "healthcare as a privilege" to "healthcare as a right" for the marginalized sections of the district. It has stimulated the local healthcare economy and provided a cushion against the financial shocks of illness. To achieve total accessibility, however, the government must look beyond financial coverage. There is an urgent need to incentivize the establishment of empanelled clinics in remote blocks, improve the supply chain for medicines and invest in specialist medical education within the region. PM-JAY has laid the foundation of a healthcare safety net in Sitamarhi; the challenge now lies in expanding that net to ensure no citizen is left behind due to the vagaries of geography or the complexities of digital bureaucracy.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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