Review Article

Digital Inequity in Health Access: A Literature Review of Ayushman Bharat and ABDM in India

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Abstract

Background: Ayushman Bharat, launched in 2018, is India's flagship initiative toward Universal Health Coverage through the Pradhan Mantri Jan Arogya Yojana (PM-JAY) and strengthened primary healthcare services. The Ayushman Bharat Digital Mission (ABDM), introduced in 2021, further aims to improve healthcare access, efficiency, and transparency through digital health innovations. However, emerging evidence suggests that digital inequities may limit equitable access to these initiatives, particularly among rural, low-income, and digitally marginalised populations.

Objective: This review examines the role of digital barriers in shaping access to and utilisation of Ayushman Bharat and ABDM, with a focus on digital literacy, infrastructure, awareness, trust, and ethical concerns within the Indian healthcare context.

Methods: A narrative literature review was conducted using PubMed, Google Scholar, government reports, and policy documents published between 2018 and 2025. Relevant studies were identified using key search terms related to Ayushman Bharat, ABDM, digital health, and healthcare access in India, and were thematically synthesised.

Results: The review identified persistent gaps in awareness and utilisation of PM-JAY and ABDM, especially in rural and underserved areas. Major barriers included low digital literacy, inadequate internet connectivity, limited access to digital devices, and concerns regarding data privacy and system trust. While digital tools such as ABHA IDs, electronic health records, and telemedicine platforms offer significant potential, their benefits remain unevenly distributed. Community-based intermediaries, including ASHAs and Ayushman Mitras, play a crucial role in bridging digital gaps, though systemic challenges persist.

Conclusion: Despite notable progress, digital inequities continue to constrain the equity goals of Ayushman Bharat and ABDM. Strengthening digital literacy, ensuring data protection, expanding infrastructure, and maintaining offline access mechanisms are essential for achieving inclusive and equitable Universal Health Coverage in India.

Keywords: Behavioural Intervention, Patient Education & Diabetes Management, Nudge Theory, Local Ambassador, Sikkim

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Introduction

India's healthcare system faces persistent challenges, including inadequate infrastructure, urban-rural disparities, and high out-of-pocket health expenditures. In response, the Government of India launched the **Ayushman Bharat** in 2018 to provide financial protection through the **Pradhan Mantri Jan Arogya Yojana (PM-JAY)** and strengthen primary care via

Health and Wellness Centres (HWCs). To further modernise healthcare delivery, the **Ayushman Bharat Digital Mission (ABDM)** was introduced in 2021, promoting digital technologies to improve access, affordability, and transparency.

While these schemes represent important steps toward Universal Health Coverage (UHC), evidence suggests that digital barriers may limit equitable access, particularly among rural, low-income, and less digitally literate populations. Studies report limited awareness and underutilisation of PM-JAY in underserved areas [1], and even among educated groups such as postgraduate health students, awareness of ABDM tools remains low, with ongoing concerns around usability and data privacy [2].

This narrative literature review examines digital barriers shaping access to healthcare under Ayushman Bharat and ABDM. The literature was identified through structured searches in PubMed and Google Scholar, covering 2018–2025, and included peer-reviewed studies, government reports, and grey literature. Key terms included "Ayushman Bharat", "PM-JAY ", "Ayushman Bharat Digital Mission", "digital health", "digital literacy", "digital barriers", and "healthcare access in India". Selected studies were thematically analyzed to assess how digital literacy, infrastructure, awareness, and trust influence uptake. While peer-reviewed and grey literature were synthesized, limitations of unpublished sources, including potential bias and lack of peer review, are acknowledged. By integrating these findings, this review highlights challenges related to digital exclusion and identifies policy-relevant strategies for inclusive healthcare delivery in India.

Review methodology

This study adopts a narrative literature review approach with structured search procedures to enhance transparency and reproducibility.

Search Strategy

A systematic search was conducted in PubMed and Google Scholar for publications between January 2018 and October 2025. Additional grey literature was obtained from government reports, National Health Authority documents, WHO publications, and reputable news sources.

Search terms included:

- "Ayushman Bharat"
- "PM-JAY"
- "Ayushman Bharat Digital Mission"
- "ABDM"
- "digital health India"
- "digital literacy"
- "digital divide"
- "healthcare access India"
- "health data privacy India"

Inclusion Criteria

- Published between 2018–2025
- English-language publications
- Empirical research, peer-reviewed articles, policy analyses, and official reports
- Focus on implementation, access, utilisation, digital tools, equity, governance, or ethics related to Ayushman Bharat or ABDM

Exclusion Criteria

- Commentaries without analytical content
- Studies unrelated to India
- Articles focused exclusively on clinical outcomes without relevance to access or digital health systems

Study Selection

The initial search yielded 112 records. After removal of duplicates and screening for relevance, 46 articles were assessed for eligibility. Of these, 23 sources were included in the final synthesis:

- 15 peer-reviewed journal articles
- 5 government or institutional reports
- 3 grey literature sources (including unpublished reports and media investigations)

Analytical Approach

The selected literature was thematically analysed across five domains:

1. Systemic health system gaps
2. Digital architecture and implementation
3. Equity and utilisation
4. Governance and accountability
5. Data privacy and ethics

Where applicable, findings from peer-reviewed literature were distinguished from grey sources to maintain analytical clarity. Evidence gaps and inconsistencies were explicitly noted where available.

Indian Healthcare System: Gaps and Opportunities

India's healthcare system comprises a complex mix of public and private providers, yet persistent challenges limit equitable access. Public health infrastructure in rural and remote areas remains inadequate, with shortages of primary health centers, sub-centers, and district hospitals essential for basic care[3]. These structural gaps are compounded by a critical deficit of trained healthcare professionals: India has approximately 0.9 doctors per 1,000 population, below the World Health Organization's recommended minimum of 1 per 1,000 [4]. Workforce shortages are particularly severe in rural regions, where the majority of the population resides, resulting in unequal access to quality services.

The system is further fragmented, with private providers delivering over 70% of outpatient care and 60% of inpatient care, often at high cost [5]. This fragmentation complicates patient navigation and contributes to high out-of-pocket expenditure, which constitutes nearly 60% of total health spending, disproportionately affecting low-income households and exacerbating cycles of poverty[1]

Government initiatives such as the National Health Mission and Ayushman Bharat aim to expand financial protection and strengthen public infrastructure; however, public healthcare spending remains low at roughly 1.5% of GDP, limiting the capacity to close systemic gaps [5].

Digitisation has emerged as a strategic response to these challenges. The **Ayushman Bharat Digital Mission (ABDM)** seeks to create a unified digital health ecosystem through initiatives such as digital health IDs, electronic health records, and telemedicine platforms, potentially improving continuity of care, reducing service duplication, and enhancing transparency. Yet, evidence indicates that digital solutions alone cannot overcome structural inequities. Barriers such as uneven internet connectivity, limited access to digital devices in rural areas, and low digital literacy constrain adoption. Trust issues surrounding data privacy and security further limit uptake[1] . Thus, while digital health initiatives present important opportunities, addressing foundational infrastructure, workforce, and equity gaps remains essential to ensure inclusive healthcare access across India.

Ayushman Bharat and ABDM: Vision and Design

The **Pradhan Mantri Jan Arogya Yojana (PM-JAY)**, launched in 2018 under **Ayushman Bharat**, is among the world's largest publicly funded health insurance programs. It provides financial protection of up to ₹5 lakh per family annually for over 100 million vulnerable families, covering secondary and tertiary hospitalization costs[5]. PM-JAY operates through trust or insurance models across states, enabling cashless treatment at empaneled public and private hospitals. Portability across regions allows beneficiaries to access care beyond their home state, reducing catastrophic out-of-pocket expenses and addressing both affordability and fragmented service delivery challenges in India.

Complementing PM-JAY's coverage, the Ayushman Bharat Digital Mission (ABDM), launched in 2021, aims to build an integrated digital health ecosystem that facilitates seamless data exchange while ensuring privacy and security 6,7 Central to ABDM is the Ayushman Bharat Health Account (ABHA) ID, a unique digital identifier that allows individuals to access and share electronic health records (EHRs). The mission also maintains key registries such as the Health Facility Registry (HFR) and the Healthcare Professionals Registry (HPR), which catalogue providers and institutions to enhance transparency, regulation, and coordination. These tools enable teleconsultations, appointment scheduling, and continuity of care, potentially improving healthcare reach and system efficiency.

ABDM's open and interoperable architecture supports a unified digital marketplace through platforms such as the Unified Health Interface (UHI),

facilitating telemedicine, digital pharmacies, and diagnostics across public and private sectors. Patients retain control over their Personal Health Records (PHR), which are portable and interoperable, while anonymized system data can inform policy planning, cost regulation, and disease surveillance.

While the design promises improved quality, access, and efficiency, evidence suggests that real-world adoption is uneven. Implementation varies across states due to differences in infrastructure, administrative capacity, and digital literacy [6,7].

Rural and low-income populations face significant barriers in creating ABHA IDs or accessing digital services, and concerns around data privacy and system usability persist.

Thus, while ABDM exemplifies India's vision for a digitally integrated health system, its impact on equitable healthcare access depends critically on addressing underlying infrastructure, literacy, and governance gaps.

Digital Tools in Implementation

The implementation of Ayushman Bharat and the Ayushman Bharat Digital Mission relies on a suite of digital tools designed to streamline service delivery and enhance accessibility.

Under PM-JAY, the Beneficiary Identification System (BIS) portal and e-cards facilitate enrolment and cashless claim processing, while hospital empanelment is managed digitally to ensure quality standards and regulatory compliance (NHA, 2024).

Within ABDM, the Ayushman Bharat Health Account (ABHA) provides individuals with a unique digital health ID that links electronic health records across providers. Complementary platforms include DigiDoctor, which registers healthcare professionals, and the Health Facility Registry (HFR), which maintains an updated database of health institutions, enabling better coordination, oversight, and regulatory transparency [6].

Despite these technological advances, significant integration challenges remain. Variations in digital infrastructure, interoperability standards, and state-level administrative capacities hinder seamless data exchange and limit the potential for unified service delivery [7].

Moreover, disparities in digital literacy among both patients and providers constrain the effective use of these tools, particularly in rural and underserved regions. These gaps may perpetuate inequities, undermining the mission's goal of inclusive access.

Addressing these challenges requires coordinated strategies, including standardized protocols for digital integration, targeted capacity-building for healthcare workers and beneficiaries, and cross-sector collaboration to ensure infrastructure readiness. Only through these complementary measures can digital health innovations achieve their intended impact across India's diverse healthcare landscape.

Digital Barriers in Access and Utilisation

1. Digital Literacy and Awareness

Priya and Maiya (2021) report limited PM-JAY utilisation in rural Tamil Nadu. Awareness gaps persist even among educated groups8. This suggests that digital health adoption is not solely a function of education but also trust and system usability.[1]

2. Infrastructure Constraints

Connectivity gaps, low smartphone penetration among low-income households, and unstable electricity in remote areas constrain digital participation. Evidence comparing state-level digital infrastructure remains limited, representing another research gap.

3. Fraud and Governance Challenges

A 2025 investigation reported rejection of 3.56 lakh fraudulent claims worth ₹643 crore under PM-JAY 9. While audits demonstrate monitoring mechanisms, such reports highlight systemic vulnerabilities and the need for robust algorithmic and human oversight.

4. Data Privacy, Consent, and Ethical Concerns

Digital health expansion raises significant privacy concerns. India currently lacks a comprehensive digital health-specific data protection framework tailored to ABDM architecture. Although broader data protection legislation exists, its operationalisation in digital health contexts remains evolving.

Under ABDM:

- Consent is designed to be granular and revocable.
- Patients theoretically retain control over Personal Health Records.

- Data exchange occurs through consent managers.

However, empirical research assessing how consent functions in practice is sparse.

Questions remain regarding:

- Digital comprehension of consent forms
- Secondary use of anonymised data
- Data ownership and custodianship
- Grievance redressal mechanisms

Gopichandran (2021) emphasises that ethical legitimacy depends not only on technological safeguards but also on distributive justice and public accountability[10]. Evidence remains weak regarding how marginalised populations understand and exercise digital consent rights.

Policy and Program Responses

Recognising the digital divide in healthcare access, the Government of India has initiated several policy responses to improve the reach and equity of the Ayushman Bharat and the Ayushman Bharat Digital Mission initiatives. However, the persistence of disparities in digital literacy, infrastructure, and institutional trust indicates that platform-based solutions alone are insufficient. Bridging digital inequity requires coordinated efforts that combine community-level engagement, offline access mechanisms, infrastructure investment, and strengthened governance frameworks. In this context, existing programmatic measures and future reforms must prioritise inclusion, accountability, and capacity-building to ensure that digital health transformation advances, rather than undermines, equitable healthcare access.

Current Programmatic Measures

• **Community health workers (ASHAs):** Accredited Social Health Activists (ASHAs) play a pivotal role in raising awareness, identifying beneficiaries, and assisting with enrolment, particularly in rural and tribal areas where digital literacy and infrastructure are limited.

• **Offline enrolment and verification**: Common Service Centres (CSCs) and health facility kiosks enable beneficiaries without smartphones or internet access to register for PM-JAY.

• **Digital intermediaries (Ayushman Mitras):** Stationed at hospitals, they guide patients through the Beneficiary Identification System (BIS), support e-card generation, and assist in claim processing.

• **Capacity-building programs**: Initiatives such as ASHA Kirana empower ASHAs with digital tools for maternal risk assessment, while SAMBHAV supports frontline workers' mental health through digital stress-reduction interventions.[11,12]

Recommended Policy Enhancements

1. **Targeted Digital Literacy Interventions**
   - Focus on women, elderly populations, and rural households.
   - Leverage community health workers and self-help groups for training.
   - Use vernacular-language audiovisual tools and mobile-based learning modules.
2. **Infrastructure Investments**
   - Expand broadband and mobile connectivity under rural digital inclusion initiatives.
   - Subsidize smartphones and digital devices for low-income households.
   - Ensure stable electricity supply at Health and Wellness Centres (HWCs).
3. **Governance and Accountability Reforms**
   - Establish independent digital health audit authorities
   - Maintain public dashboards tracking grievance redressal and claim processing.
   - Implement algorithmic audits and fraud detection mechanisms to prevent misuse of PM-JAY funds.
4. **Data Protection and Ethical Oversight**
   - Develop a digital health–specific regulatory framework.
   - Standardize consent procedures in clear, accessible language.
   - Introduce state-level digital health ombudsman offices to monitor compliance and protect patient rights.
5. **Evidence Generation and Research**
   - Conduct independent, state-wise evaluations of digital health implementation.

- Study user comprehension and uptake of digital consent mechanisms.
- Fund research on bridging rural–urban digital inequities and improving inclusive service delivery.

Conclusion

Ayushman Bharat and ABDM represent transformative policy efforts to expand financial protection and modernize healthcare delivery in India. While PM-JAY has significantly expanded coverage, and ABDM has introduced a sophisticated digital architecture, digital inequities threaten to reproduce existing social disparities. The literature reveals a tension between technological optimism and structural realities. Digital health cannot substitute for foundational infrastructure, workforce investment, and institutional trust. Without targeted digital literacy initiatives, infrastructure expansion, governance reform, and strengthened data protection, digital systems risk excluding the very populations they aim to serve. Achieving equitable Universal Health Coverage in India will require integrating technological innovation with social justice principles, ensuring that digital transformation enhances rather than undermines health equity

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