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Review Article

Unlocking India's hospital beds: why a digital portal is the cure for a stretched system

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ABSTRACT

India's health system faces chronic resource gaps and inefficiencies. With public health spending at only 1.84% of GDP and very low hospital bed densities (around 0.6 beds per 1000 population), simply adding beds is unaffordable and slow. A more efficient alternative is to improve utilisation: a real-time digital platform that tracks staffed bed availability can raise effective capacity and reduce inequity. Early experiments – from Delhi's COVID-19 bed portal to the bed management system in AIG Hospitals, Hyderabad – show substantially higher occupancy and throughput. International evidence also supports these results, confirming that real-time tracking systems can deliver major efficiency gains. This brief proposes piloting a national bed-tracking dashboard and shows it can yield large gains for much lower cost and risk than new construction, with safeguards to address data accuracy, incentives and privacy. These promising results are tempered by limited evidence from a small number of pilots and by systemic constraints such as staff shortages, uneven digital readiness, and governance challenges that will require independent evaluation and safeguards during scale-up.

Keywords: Real-time bed tracking, Health equity, Hospital bed occupancy, Bed management dashboard, Digital health infrastructure, Health system efficiency

INTRODUCTION

India's government spends only around 1.84% of GDP on health, far below the 2.5% recommended by national policy targets.[1] This underfunding is reflected in very low availability of facilities and staff. India has only about 0.6 hospital beds per 1000 population. The 2017 National Health Policy itself aimed for 2 beds per 1000, which the country is yet to achieve.[2] The official public sector has merely ~0.79 beds per 1000.[3]

A recent analysis highlights India's shortfall of roughly 2.4 million hospital beds.[4] Workforce shortages compound the problem: the doctor-to-population ratio is only 1.2 per 1000, and nurse density is 1.96 per 1000, well below WHO norms.[5,6] Large vacant posts in public facilities have been documented.[7] These constraints – a limited health budget, low bed density, and insufficient staff – mean India cannot safely meet demand through new construction alone. There is an urgent need for innovative solutions to make the system work better with existing resources.

PROBLEM: LOW OCCUPANCY AND WASTED CAPACITY

Bed occupancy rate is a better measure of hospital system performance than just the total number of beds.[8] Well-run hospitals aim for about 80% occupancy; much lower rates indicate idle capacity and inefficiency.[9] In India, average occupancy falls well short of this benchmark. Industry analysts report aggregate hospital occupancy around 63.5% in 2025.[10] A multi-site study confirms the pattern, with occupancy markedly lower in private hospitals

(50%) compared with district hospitals (80%) and tertiary facilities (70%).[11] This uneven use means some hospitals remain underused while others are overcrowded, with patients left waiting in corridors or ambulances at busy centres. The true bottleneck is not the total bed capacity, but the number of staffed beds – those with doctors and nurses available to care for patients. Without staff and supplies, extra beds are ineffective.

As a result, keeping too many beds empty is wasteful: it wastes fixed costs and staff time and reduces admission efficiency.[12] Building new beds is very expensive (often costing several million rupees per bed) and slow to pay back.[13,14] Instead, raising occupancy closer to 80% frees significant capacity efficiently, effectively giving the equivalent of hundreds of new beds without construction.[9] This also matters for equity: if capacity is idle in urban centres while rural or smaller hospitals are overwhelmed, a national dashboard can help redirect patients and reduce disparities in care.

EXISTING DIGITAL FOUNDATIONS: FEASIBLE BUILDING BLOCKS

Much of the digital foundation for a bed-tracking portal already exists in India. The Ministry of Health and Family Welfare's e-Hospital system (built by the National Informatics Centre) is a nationwide cloud-based hospital management information system now deployed in hundreds of government hospitals.[15] It handles patient registration, bed allocation, labs, billing and more, making real-time data centrally available.[16]

Similarly, Delhi's health department launched the 'Delhi Corona' application in June 2020 to let citizens and officials see real-time counts of beds and ventilators in city hospitals.[17] At launch, it showed that out of 6731 available COVID-19 beds, 4100 were vacant, demonstrating that a live, real-time dashboard for hospital capacity was technically feasible and could fill critical information gaps.[18]

More recently, in July 2024, the city launched an intensive care unit (ICU) bed dashboard. At implementation, 42.4% of the 389 ICU beds across 17 government hospitals were reported as available. The system is being expanded to cover all 25 government hospitals (around 1050 ICU beds) and linked to a new centralised healthcare control room.[19,20] Taken together, these initiatives demonstrate that India can build interoperable, real-time health dashboards linking hospitals, ambulance services, and state health systems on a unified platform.

EVIDENCE: CAUTIOUS OPTIMISM FROM PILOTS

In a recent study, AIG Hospitals in Hyderabad implemented a web-based bed management system with real-time tracking, intelligent analytics, and communication tools. In this 620-bed tertiary hospital, introducing the portal raised occupancy from 75% to 80% and increased monthly admissions by about 12% (roughly 323 extra patients per month). Bed turnover (discharges per bed) rose by 11% and average time to admission fell by 65%. Patient satisfaction improved by about 14 percentage points (as measured by Net Promoter Score). These results illustrate that even a modest occupancy gain markedly boosts throughput and capacity.[21]

International evidence also reinforces this: a 2022 study found that hospitals adopting real-time data integration achieved a 20% increase in effective bed utilisation, a 33% decrease in average time to admission, a 25% reduction in emergency wait times, shorter hospital stays, and higher staff satisfaction.[22] In Delhi, the ICU dashboard has improved transparency by providing policymakers and the public with live data on capacity. A Delhi High Court committee had specifically recommended such systems after the COVID-19 crisis.[23] Taken together, these experiences give cause for cautious optimism that a national portal could meaningfully improve the efficiency and responsiveness of India's hospitals.

PROPOSAL: A NATIONAL REAL-TIME BED DASHBOARD

A centrally managed, real-time bed-tracking portal is proposed, covering all public hospitals and eventually private facilities. The portal would aggregate hourly or daily data on staffed bed occupancy by facility, disease category (e.g., intensive care unit, general ward, or oxygen support), and bed type (ICU versus general).[24] Core functions would include:

A real-time occupancy dashboard for administrators

Available to the Ministry of Health and Family Welfare, state health officials, and hospital managers. It would show current fill-rates, trends, and surge forecasts.

A public-facing availability map or app

This tool would guide emergency services and patients to the nearest available care facility.[25]

Ambulance triage tools

These would integrate emergency response services so that ambulance crews can see available beds and bypass congested sites.[25]

Reporting analytics for policy

Such as identifying chronic under-utilisation or over-utilisation across regions. The system should integrate with existing health information framework (such as the Ayushman Bharat Digital Mission and the e-Hospital system) and leverage the National Informatics Centre's

cloud infrastructure (MeghRaj) for hosting.[15,26,27] Data capture would be automated via hospital information systems (or simple mobile apps in smaller centres) to minimise error. A single-login, searchable dashboard would unify diverse sources into one command-and-control view.

IMPLEMENTATION PLAN

A phased pilot to test this approach is recommended. For example, the pilot could select two large urban hospitals and two district hospitals (from different states) over a six-month period. The sites should vary (public and private institutions) to test adaptability. The pilot will include integration with regional ambulance services so that ambulances can access real-time bed availability.

Key performance indicators (KPIs) will be tracked, including staffed bed occupancy, bed turnover rate (admissions/discharges per bed), emergency admission wait times, and measures of equity (for example, the percentage of patients diverted to rural facilities versus the backlog in cities).[28] Local technical teams will train hospital staff and ambulance drivers to use the system. An independent evaluation team (for example, from the Indian Council of Medical Research or an academic partner) will monitor data quality and the KPIs.

A governance committee involving the Ministry of Health and Family Welfare, the Directorate General of Health Services, and state health representatives will oversee the pilot. This committee will meet monthly to review progress and solicit feedback from stakeholders (clinicians, patients, privacy experts). If the pilot achieves predefined targets (for example, improving occupancy by more than five percentage points or reducing average time to admission for patients by 33%), it will be refined and expanded nationwide.[21,22]

RISKS AND SAFEGUARDS

Staffing gaps

Staffing shortages may persist as a binding constraint. While dashboards improve allocation of existing staff, sustained investment in recruitment and retention of nurses and doctors will still be required.[29]

Data accuracy

Hospitals might misreport data (for example, overstating vacancies or under-reporting full wards). To mitigate this, the system will log timestamped updates (an audit trail) and cross-check with billing and admission records. Random audits by independent teams (using spot checks or patient surveys) will verify portal data. Aligning incentives can also encourage truthful reporting (for example, including occupancy data in performance evaluations or funding decisions).[30]

Incentives and gaming

Some hospitals, especially private ones, might resist sharing data or attempt to game the system. Clear policies or legal mandates will be needed to require participation. Private providers can be enlisted through existing schemes, such as the Ayushman Bharat Health Infrastructure Mission and the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana insurance network, which already involve thousands of hospitals and collect some bed data. Incentives for participation might include integration with the eSanjeevani telemedicine platform and the Ayushman Bharat Health Account system, or higher reimbursements for demonstrating faster throughput.[26,31-33]

Private sector integration

Initially will be focused on public and large corporate hospitals. Over time, the system can include willing private chains. Eventually, policy can require anonymised bed reporting from all hospitals during emergencies.

Operations and maintenance

Sustaining the digital dashboard will require modest central funding from the Ministry of Health and Family Welfare or National Health Mission grants.[34,35] Using existing government IT infrastructure minimises costs. Hardware and software upgrades (for example, redundant servers) should be planned, and a helpdesk established (possibly by expanding the existing e-Hospital support model).[15]

Privacy and security

The portal will only share aggregate bed numbers and will not contain personal data. Patient identities will not appear in the system. Administrative access will require authentication. All data flows will comply with India's Digital Personal Data Protection Act (DPDPA) 2023 and the National Digital Health Mission (NDHM), and a clear privacy policy will be published.[36,37] For ambulance integration, only anonymised patient case severity will be shared with emergency crews.

Change management

Clinicians may be wary of additional reporting burdens. The portal will reuse data from routine hospital workflows (for example, admission and discharge modules) to minimise extra entry. Training and communication will emphasise that the system benefits all providers by making it easier to arrange admissions when hospitals are busy.[38]

COST AND RETURN ON INVESTMENT

A national bed-tracking portal is extremely cost-effective compared to constructing new hospitals. Building even a

small 30-50 bed hospital typically costs about 250 million to 450 million rupees (5 million rupees to 9 million rupees per bed), excluding land.[14] In comparison, the Delhi COVID-19 bed portal was developed with an initial investment of just 2.5 million rupees.[39] Scaling this approach nationwide, including software, training, and pilot evaluation, would likely cost tens of millions of rupees, still a tiny fraction of the cost of new construction.[40] Maintenance and hosting costs would remain modest, particularly when using existing government IT infrastructure.

Even a modest occupancy gain would yield substantial returns. For example, a 5-10 percentage point increase in occupancy (similar to the AIG Hyderabad pilot from 75% to 80%) would add hundreds of thousands of bed-days nationwide.[21] Raising occupancy from the current 63.5% to 80% effectively frees up 16.5 additional occupied beds per 100 staffed beds, which is equivalent to adding millions of bed-days annually.[10] These extra beds translate into faster care and lives saved in emergencies. By contrast, non-strategic bed construction risks creating under-utilised facilities if staff and other inputs are insufficient, leading to under-utilised investments. From an economic standpoint, the portal's return on investment – measured in increased admissions, reduced wait times, and lives saved – would far exceed its cost.[41] Implementation of such a system has been shown to reduce overall operational expenses by 15%, highlighting its capacity to improve efficiency while remaining highly cost-effective.[22]

LIMITATIONS OF THE PROPOSAL

Limited evidence and context-specific findings

The proposal draws on a small number of pilots and studies, which may not reflect the full range of India's diverse health system.[21,22] Gains seen in a single tertiary centre or the COVID-19 dashboard in Delhi may not repeat in rural or under-resourced facilities.[42] Without broader trials across varied states and hospital types, the generalisability of these results is unclear. Over-generalising from limited evidence risks overlooking challenges unique to remote or resource-constrained settings.

Human resources as the real bottleneck

A digital portal cannot overcome fundamental staff shortages. Many public hospitals lack sufficient doctors, nurses and support staff, so empty beds often indicate too few caregivers rather than a lack of information. In such cases, improved visibility alone will not increase capacity. The proposal acknowledges the need for more health workers, but its premise assumes that coordination can substitute for recruitment. In practice, raising occupancy will require simultaneous investment in hiring, training and retention of clinical staff.[29]

Digital infrastructure and readiness gaps

The initiative assumes reliable IT systems and internet connectivity that do not exist everywhere. Many smaller or rural facilities still use paper records or fragmented software, and network outages are frequent. Even existing e-health platforms struggle with interoperability. Integrating disparate systems across states and hospitals is a formidable technical challenge. These infrastructure gaps could delay or complicate implementation, especially outside well-resourced centres.[43]

Behaviour changes and incentive issues

Simply making data available does not guarantee that administrators, clinicians or ambulance crews will change their practices. Existing routines, hierarchies and heavy workloads may resist new protocols. Healthcare staff might view the portal as an extra reporting burden unless it clearly aligns with their incentives and workflows.[38] Hospitals might also manipulate or overstate figures if oversight is weak. Ensuring that real-time information leads to action will require clear incentives, training and accountability mechanisms.

Private sector engagement and data integrity

Private hospitals provide 48.2% of India's inpatient care and constitute 63% of the country's approximately 70,000 hospitals.[44,45] Their inclusion is therefore essential for any credible national bed-tracking system, yet many private providers may resist sharing real-time data. Profit-driven providers might distrust centralised systems or see little benefit in participation. Even if included, the accuracy of privately reported data could vary. Without strong legal mandates and enforcement, some facilities might exaggerate availability or selectively report. Robust auditing and transparent governance will be needed to build trust and ensure the portal reflects reality.

Equity and access barriers

The assumption that a national dashboard will automatically improve equity is optimistic. Marginalised and rural patients may lack access to smartphones, internet or reliable transport to reach alternate facilities. Urban, tech-savvy populations could benefit first while poorer groups remain unaware.[46] Simply listing a bed as available does not overcome social and geographic hurdles. To truly advance equity, the system must be linked with outreach efforts (for example, via community health workers or toll-free helplines for rural areas) and integrated with patient transportation planning, which adds further complexity.

Governance and coordination challenges

Implementing a national system requires extensive coordination between central and state governments and buy-in from diverse stakeholders. Health policy is

primarily a state matter, so states may have different priorities or capacities.[47] Questions remain about who will govern the platform, how data rights are managed, and how accountability is maintained across jurisdictions. Political changes or bureaucratic inertia could stall progress. Effective central–state coordination and clear accountability frameworks will be crucial, but they aren't guaranteed.[48]

Scalability and sustainability issues

Pilots often succeed under controlled conditions with dedicated support, but scaling up to thousands of hospitals is far more complex.[49] Costs for deployment, training and maintenance could grow significantly at scale. It is unclear how technical support and helpdesk services would be sustained nationally. The initial cost-benefit analysis is illustrative, but real-world return on investment depends on adoption, data quality and staff compliance. If the system underperforms or loses credibility, stakeholder confidence could be eroded and long-term support lost.

Quality of care and system limitations

The portal focuses on bed availability, but it does not directly address the broader quality of care. A bed may be nominally free but lack equipment, medicines or adequate staff for safe treatment. There is also a risk that emphasising occupancy metrics could inadvertently prioritise speed over patient outcomes. The system does not measure whether redirected transfers improve recovery or survival. In short, better bed-tracking does not guarantee better treatment; parallel efforts are needed to ensure clinical quality and patient outcomes.[50]

CONCLUSION

In summary, a national real-time bed-tracking dashboard has the potential to significantly improve hospital efficiency and equity at lower costs. It is recommended that India pilot the portal in diverse settings, refine it based on lessons learned, and then scale it nationwide, integrating existing digital health infrastructure to connect all hospitals and ambulance services. This digital strategy must complement, not replace, targeted infrastructure expansion; physical capacity should be increased only in locations that remain above 80% occupancy even after improving allocation (for example, remote areas or epidemic hotspots). In most of the country, however, a well-implemented bed tracker can maximise idle capacity and make care more responsive. Policymakers and health authorities should build on India's digital health gains to translate unused beds into improved patient access, provided these initiatives are implemented with realistic expectations regarding staffing shortages, data accuracy, and digital readiness gaps. Careful planning, independent evaluation, and adaptive governance will be essential to navigate these limitations and ensure the system strengthens rather than oversimplifies India's hospital network.

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