

Accessibility Toolkit for Healthcare Architecture in India: A Framework for Inclusive Hospital Design

AR. MIHIKA KHARE

Architecture

IPS Academy Indore

DR. MANITA SAXENA

Architecture

IPS Academy Indore

AR. NEELAM KUSHWAH

Architecture

IPS Academy Indore

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ABSTRACT

Healthcare accessibility is critical to achieving safe, equitable, and quality healthcare for all. People access a hospital with varied physical, sensory, and cognitive abilities, including persons with disabilities, older persons, patients, caregivers, healthcare professionals, and visitors. Therefore, accessibility should be considered a fundamental aspect of healthcare planning and not an additional design requirement. Even though India has framed various regulations for accessible design, such as the Rights of Persons with Disabilities (RPwD) Act, 2016, the National Building Code (NBC) 2016, and the Harmonised Guidelines and Standards for Universal Accessibility (2021), relevant provisions are spread across multiple documents. This often makes it difficult for architects and planners to locate the provisions and apply them uniformly during the design process.

This research, therefore, attempts to frame the Accessibility Toolkit for Healthcare Architecture in India by bringing these dispersed legislations under one single design-oriented framework. This study is based on a qualitative review of accessibility legislation, Universal Design principles, healthcare planning standards, and relevant published literature on accessible healthcare environments. Based on the qualitative review, the toolkit is structured into nine key domains: site planning, building access, circulation, vertical transportation, patient care areas, sanitary facilities, sensory accessibility, emergency preparedness, and communication systems.

The toolkit will be a practical guide for architects and healthcare planners while planning and designing a healthcare facility. It will provide a simple and organized layout of accessibility requirements, thus enabling their consideration from the very beginning of the design stage rather than as a last-minute compliance exercise. In the long run, the framework will enable the development of more inclusive, user-friendly healthcare environments that serve all users' needs and increase uniformity in healthcare design across India.

1. INTRODUCTION

Healthcare buildings are among the most demanding building types because they must respond to the needs of a wide variety of users. Every day, hospitals are accessed by patients, persons with disabilities, older adults, caregivers, visitors, and healthcare professionals, each with different physical, sensory, and cognitive abilities. Designing spaces that are

safe, comfortable, and easy to use for everyone is therefore a fundamental requirement of healthcare architecture. Today, accessibility extends beyond the provision of ramps and lifts. It also includes clear communication, intuitive wayfinding, sensory accessibility, cognitive support, and emergency preparedness, reflecting the broader principles of Universal Design and Inclusive Design.

India has made significant progress in promoting accessible design through policies such as the Rights of Persons with Disabilities (RPwD) Act, 2016, the National Building Code (NBC) 2016, the Harmonised Guidelines and Standards for Universal Accessibility (2021), and the Accessible India Campaign. Although these documents provide comprehensive accessibility provisions, they are spread across different regulations and technical guidelines. As a result, architects often need to consult multiple sources during the planning and design process, making implementation more time-consuming and sometimes inconsistent.



Because of this fragmented approach, accessibility is frequently addressed only to fulfil statutory requirements instead of being incorporated as a core design objective. This can affect how people move through healthcare facilities, access services, and interact with the built environment. As healthcare planning increasingly focuses on patient-centred design, accessibility should be integrated from the earliest stages of planning. Doing so can help create hospitals that are not only compliant with regulations but also more inclusive, functional, and supportive of the dignity, independence, and well-being of all users.

Research Aim

The outcome of this research is the development of an **Accessibility Toolkit for Healthcare Architecture in India**. The toolkit brings together accessibility regulations, Universal Design principles, and healthcare planning guidelines into a single framework that architects and planners can use during the planning, design, and evaluation of healthcare facilities. By presenting these requirements in an organised and practical format, the toolkit seeks to encourage the creation of healthcare environments that are more inclusive, resilient, and centred on the needs of all users.

2. LITERATURE REVIEW

2.1 Evolution of Accessibility in Healthcare Architecture

The concept of accessibility in architecture has evolved significantly over time. In its early stages, accessibility was largely associated with **Barrier-Free Design**, where the main objective was to remove physical obstacles that restricted movement. Design interventions such as ramps, lifts, wider corridors, and accessible toilets became common solutions for improving access, particularly for people with mobility impairments. Although these measures represented an important step towards inclusive design, accessibility was often considered only after the primary planning decisions had already been made. As a result, many healthcare facilities met basic physical accessibility standards but continued to present difficulties for users with sensory, cognitive, or communication-related needs.

The introduction of **Universal Design**, developed by Ronald Mace, marked an important shift in architectural thinking. Rather than designing for an average user and making later adjustments, Universal Design promotes environments that can be used comfortably by the widest possible range of people from the outset.

The seven principles of Universal Design:

1. equitable use
2. flexibility in use
3. simple and intuitive use
4. perceptible information
5. tolerance for error
6. low physical effort
7. appropriate size and space

They have become widely accepted as guiding principles for accessible design. Within healthcare facilities, these principles influence much more than physical movement. They also improve wayfinding, communication, patient safety, and the overall experience of patients, visitors, and healthcare staff.

Building on this approach, **Inclusive Design** places greater emphasis on diversity and the everyday experiences of users. Instead of focusing only on technical compliance, it encourages architects to recognise that people interact with the built environment in different ways depending on their age, abilities, health conditions, and personal circumstances. In hospitals, this means designing spaces that work well not only for wheelchair users but also for older adults, people with visual, hearing, or cognitive impairments, children, pregnant women, patients recovering from illness or surgery, caregivers, and healthcare professionals. This broader understanding has shifted accessibility from being viewed as a legal obligation to being recognised as an essential aspect of delivering equitable and high-quality healthcare.

2.2 Critical Review of Existing Accessibility Research

The literature reviewed indicates that accessibility is now widely understood as a multidimensional concept that includes physical, sensory, cognitive, and communication accessibility. Despite this broader understanding, much of the existing research concentrates on evaluating completed healthcare facilities through accessibility audits, compliance assessments, and post-occupancy studies. These studies play an important role in identifying barriers and highlighting areas that require improvement. However, they provide comparatively little guidance for architects during the early planning and design stages, when decisions have the greatest influence on the final accessibility of a healthcare facility.

In India, accessibility requirements are supported by several legislative and technical documents, including disability legislation, national building codes, and accessibility guidelines. Although these documents contain comprehensive provisions, the information is spread across multiple sources. Consequently, architects often need to consult several documents simultaneously, making the design process more time-consuming and increasing the possibility of inconsistent interpretation or application of accessibility requirements.

This challenge is particularly evident during the initial stages of healthcare planning, where decisions related to site layout, circulation, departmental planning, and spatial organisation shape how users experience the building throughout its life cycle. The literature therefore highlights a need for a single healthcare-specific framework that brings together these requirements in a format that is practical and easy to apply.

The present research responds to this gap through the development of an Accessibility Toolkit intended to support architects in designing healthcare facilities that are more inclusive, functional, and user-friendly.

3. COMPARATIVE ANALYSIS OF ACCESSIBILITY STANDARDS

Several national regulations and guidelines influence accessibility in healthcare planning in India. However, the requirements are distributed across different documents, making it difficult to obtain a comprehensive understanding of their individual roles and how they complement one another.

To address this, the following table presents a comparative overview of the key accessibility standards referred to in this study. The comparison highlights the purpose, scope, and contribution of each document, providing a clearer understanding of their relevance to healthcare planning and supporting the development of the proposed Accessibility Toolkit.

Table 1. Comparative Review of Accessibility Standards

Standard	Primary Focus	Healthcare Relevance
RPwD Act, 2016	Legal rights and equal access	Establishes accessibility as a statutory requirement for public buildings
NBC 2016	Technical building standards	Specifies ramps, lifts, corridors, toilets, parking, signage, and fire safety requirements
Harmonised Guidelines (2021)	Universal accessibility	Provides design recommendations for accessible built environments
Accessibility Standards for Healthcare Facilities	Healthcare-specific accessibility	Addresses accessibility requirements within hospitals and healthcare settings

Comparative Analysis

Each of the reviewed frameworks contributes to improving accessibility in the built environment, but they differ in terms of their purpose, scope, and application. The **Rights of Persons with Disabilities (RPwD) Act, 2016** provides the legal foundation for ensuring accessibility and protecting the rights of persons with disabilities. The **National Building Code (NBC) 2016** translates these legal requirements into technical design provisions that architects can apply during planning and construction

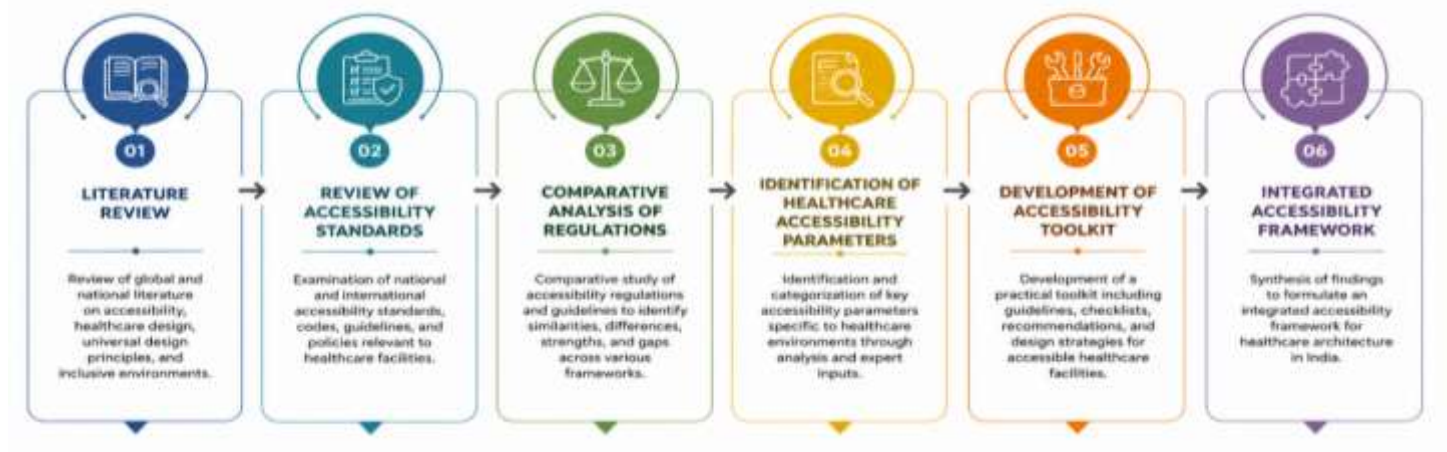
In the context of healthcare facilities, healthcare planning standards help interpret accessibility requirements within clinical environments, where patient safety, efficient movement, and ease of use are particularly important.

The **Accessible India Campaign (Sugamya Bharat Abhiyan)** complements these regulations by encouraging the implementation of accessibility measures and creating greater awareness of inclusive design practices.

The comparative analysis shows that these frameworks are intended to work together rather than function as separate documents. However, because the information is distributed across multiple regulations and guidelines, architects often face difficulties in locating and applying the relevant provisions during the design process.

This highlights the need for a single, healthcare-specific framework that brings together these requirements in a practical and easy-to-use format, which forms the basis of the Accessibility Toolkit proposed in this research.

4. RESEARCH METHODOLOGY



Each stage builds progressively upon the previous one, ensuring that the proposed toolkit reflects both regulatory requirements and healthcare planning considerations.

5. IDENTIFICATION OF HEALTHCARE ACCESSIBILITY PARAMETERS

Accessibility in hospitals extends beyond compliance with dimensional standards. Based on the synthesis presented in the uploaded draft, nine interrelated accessibility domains form the basis of the proposed toolkit.

Table 2. Primary Accessibility Domains

Accessibility Domain	Principal Planning Considerations	Intended Outcome
Site Accessibility	Accessible parking, pedestrian routes, drop-off areas, external pathways	Safe arrival and independent site movement
Building Access	Step-free entrances, reception areas, entrance usability	Independent entry into healthcare facilities
Internal Circulation	Corridors, waiting areas, maneuvering spaces	Efficient and barrier-free movement
Vertical Mobility	Ramps, lifts, staircases, handrails	Access to all building levels
Patient Care Areas	Consultation rooms, wards, diagnostic spaces	Inclusive healthcare delivery
Sanitation Facilities	Accessible toilets, maneuvering space, assistance systems	Independent sanitation access
Sensory Accessibility	Braille signage, tactile flooring, visual contrast, audible information	Inclusive navigation and communication
Emergency Accessibility	Refuge areas, evacuation routes, alarms	Safe emergency response

6. PROPOSED ACCESSIBILITY TOOLKIT FOR HEALTHCARE ARCHITECTURE

The primary outcome of this study is the development of an **Accessibility Toolkit for Healthcare Architecture in India**. The toolkit has been designed to bring together accessibility regulations, healthcare planning standards, and the principles of Universal Design into one practical reference for healthcare planning and design. Rather than functioning only as a checklist for regulatory compliance, it is intended to support decision-making throughout the lifecycle of a healthcare project. Architects, planners, healthcare administrators, and regulatory authorities can use the framework during planning, design development, project evaluation, and post-occupancy assessment.

To make the toolkit easier to apply in practice, it has been organised into nine accessibility domains that cover the major components of healthcare planning and design. Each domain outlines the planning objectives, key design parameters, assessment indicators, compliance requirements, and the expected design outcomes. This structured approach enables accessibility to be considered from the earliest stages of planning instead of being addressed only at the final approval stage. It also provides a consistent method for evaluating accessibility across different phases of a project, helping designers create healthcare environments that are more inclusive, functional, and responsive to the needs of all users.

Table 3. Accessibility Toolkit Framework

Accessibility Domain	Planning Objective	Assessment Indicators	Expected Outcome
Site Accessibility	Safe and barrier-free arrival	Accessible parking, pathways, drop-off zones	Independent site access
Building Access	Equitable building entry	Step-free entrances, automatic doors, reception accessibility	Inclusive entrance experience
Internal Circulation	Efficient movement	Corridor width, turning spaces, waiting areas	Uninterrupted circulation
Vertical Mobility	Access to all floors	Lift accessibility, ramp gradient, stair handrails	Safe vertical movement
Patient Care Areas	Inclusive healthcare services	Accessible OPD, wards, diagnostics	Equal access to treatment
Sanitation Facilities	Independent sanitation use	Accessible toilets, grab bars, emergency assistance	User dignity and safety
Sensory Accessibility	Inclusive information	Braille signage, tactile flooring, colour contrast	Improved navigation
Emergency Accessibility	Safe evacuation	Refuge areas, alarms, evacuation routes	Emergency preparedness
Digital & Communication Accessibility	Accessible communication	Wayfinding systems, multilingual information	Inclusive healthcare information

The toolkit is intended as a planning framework rather than a replacement for statutory codes. Designers should continue to comply with the relevant regulations while using the toolkit to organize and evaluate accessibility decisions.

7. PROPOSED ACCESSIBILITY ASSESSMENT FRAMEWORK

To support systematic evaluation, the uploaded paper proposes a simple compliance-based assessment matrix. The following presentation expands that concept while remaining consistent with the paper's three-level rating approach.

Table 4. Accessibility Assessment Matrix

Rating	Description	Recommended Action
Compliant (C)	Fully satisfies accessibility requirements	Maintain current design
Partially Compliant (PC)	Meets some requirements but improvements are necessary	Modify during design or renovation
Non-Compliant (NC)	Does not satisfy accessibility requirements	Immediate corrective intervention required

Suggested Assessment Categories

Accessibility Category	Assessment Focus
Site Planning	Arrival, parking, pathways
Building Entrance	Accessibility of entry points
Internal Circulation	Movement through the building
Vertical Mobility	Lifts, ramps and stairs
Patient Care Areas	Accessibility of healthcare services
Sanitation	Accessible toilet facilities
Sensory Systems	Signage, tactile guidance and information
Emergency Systems	Evacuation and refuge
Digital Communication	Accessible information delivery

8. DISCUSSION

The findings of this study highlight that accessibility should be viewed as an essential part of healthcare planning rather than something that is considered only to satisfy statutory requirements. Although India has comprehensive accessibility legislation and technical guidelines, architects often find it difficult to apply these provisions effectively because the information is distributed across several documents. Referring to multiple regulations during the design process can be time-consuming and may also lead to inconsistencies in interpretation. A consolidated accessibility toolkit can help simplify this process by bringing together the relevant requirements into a single, easy-to-use resource that supports decision-making from the earliest stages of planning.

One of the key strengths of the proposed toolkit is that it combines accessibility requirements, healthcare planning standards, and Universal Design principles within one structured framework. Instead of focusing only on regulatory compliance, it encourages accessibility to be considered throughout the entire lifecycle of a healthcare project, including planning, design development, construction, and post-occupancy evaluation. The framework also promotes a more comprehensive understanding of accessibility by addressing physical, sensory, cognitive, and communication needs together rather than treating them as separate issues.

Another important contribution of the toolkit is its emphasis on the overall user experience. Traditional accessibility checklists often concentrate on dimensional standards such as ramp gradients, corridor widths, or toilet layouts. While these requirements remain essential, they do not fully reflect how people interact with healthcare environments. The proposed framework encourages designers to think about the complete journey of hospital users, from entering the site and navigating the building to accessing treatment areas, communicating with healthcare staff, and evacuating safely during emergencies. Considering accessibility from this broader perspective can contribute to healthcare environments that are safer, more inclusive, and easier to use for all.

9 .RECOMMENDATIONS

Based on the findings of this research, the following recommendations are suggested:

1. Accessibility should be integrated into the conceptual planning stage so that inclusive design becomes a fundamental part of healthcare projects rather than being addressed only during approvals or construction.
2. Accessibility assessments should be incorporated into both the design review process and post-occupancy evaluations to identify barriers early and ensure that completed facilities continue to meet user needs.
3. Greater emphasis should be placed on Universal Design within architectural education, professional training, and continuing education programmes to strengthen awareness and improve its application in practice.
4. A healthcare-specific accessibility manual should be developed to consolidate existing national regulations into a practical reference that architects and planners can easily use throughout the design process.

10. CONCLUSION

Accessibility is a fundamental aspect of healthcare architecture because it directly influences the safety, independence, dignity, and overall experience of patients, healthcare professionals, caregivers, and visitors. The literature reviewed in this study indicates that India has a comprehensive legal and technical framework to support accessible design. However, because the relevant requirements are dispersed across different acts, codes, and guidelines, architects often face practical challenges when trying to apply them consistently during healthcare planning.

To address this gap, this research presents an **Accessibility Toolkit for Healthcare Architecture in India** that brings together healthcare planning standards, accessibility regulations, and the principles of Universal Design within a single framework. Organised into nine accessibility domains, the toolkit is intended to support architects and other stakeholders in integrating accessibility throughout the planning and design process rather than considering it only as a compliance requirement at the end of a project.

Although the proposed toolkit is conceptual, it establishes a practical foundation for improving accessibility in future healthcare projects. Further research could strengthen the framework by applying it to real hospital projects, evaluating its effectiveness through case studies, and refining it based on feedback from architects, healthcare professionals, and regulatory authorities. Such developments would help transform the toolkit into a practical decision-support resource that contributes to more inclusive, equitable, and patient-centred healthcare environments across India.

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