Epidemiology and Projections of Childhood and Adolescent Disability in India: Findings from Census 2011

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ABSTRACT

BACKGROUND

There is limited data on the magnitude of disability in children and adolescents in India. The objectives of this study were to compare the prevalence of disability among children and adolescents over a decade (2001–2011), estimate standardized prevalence across different geographical regions, examine its correlation with the State Health Index (SHI), and project decadal estimates for India up to 2051.

METHODS

Datasets from the 2001 and 2011 Censuses covering the total population and disability data were obtained, filtered for individuals under 20 years of age, and analyzed to determine age- and sex-specific prevalence rates. Disability rates for the state were standardized based on the country's population. Pearson's correlation and linear regression were used to determine the association between disability and SHI of states. Projections were calculated using an exponential growth rate model.

RESULTS

Disability rate among children and adolescents under 20 years was 1667 and 1595 per 100,000 population in 2001 and 2011, respectively. The magnitude of children and adolescent with disability increased by 1.69% over the decade. The highest increase in disability magnitude over the decade was observed among children below 5 years of age being 7.62%. The prevalence was higher among boys and urban residents. Disability prevalence varied among states and was negatively associated with SHI. The projected estimates from this study suggested a rise in children with disability from 7.86 million in 2011 to 8.13 million in 2031, furthermore rising to 8.41 million in 2051.

CONCLUSION

The significant magnitude of disability among young children highlights the need for strategies addressing disability in child health policies. The regional disparities in disability rates highlight the need for tailored regional interventions. Moreover, the projected rise in disability prevalence, particularly among children below 5 years of age, signifies the importance of prevention, screening, diagnosis, and early intervention.

Keywords: India, Children and adolescents, Disability prevalence, Regional variations, State health index

Highlights

- Data on children and adolescents with disability in India is lacking. This study involved analysis of Census 2001 and 2011 datasets to estimate the prevalence over a decade, determine the relationship with the State Health Index (SHI), and estimate future projections.
- The findings estimated an increase in the overall individuals with disability by 1.69%. However, there was the highest increase in disability prevalence among children younger than 5 years of age. Disability rates demonstrated a regional variation and were negatively associated with SHI. It is estimated that there will be approximately 8.41 million children and adolescents with disabilities in India by 2051.
- The study highlights the need for a policy targeting prevention, early screening, diagnosis, and rehabilitation while taking into account the regional disparities for children and adolescents with a disability.

Introduction

Disability is an umbrella term, covering impairments, activity limitations, and participation restrictions. Disability is thus not just a health problem but also a complex phenomenon, reflecting the interaction between an individual's physical characteristics and the social environment in which they reside.[1,2] Childhood and adolescent disability are a significant public health concern, particularly in low- and middle-income countries, where the burden of disability among the younger population can have extensive social and economic consequences.[3–5] The World Health Organization (WHO) and the United Nations Children's Funds (UNICEF) reports emphasize that disabilities during the formative years can affect physical and cognitive development and the extent of educational attainment, social participation, and long-term quality of life. Moreover, there is a considerable gap between the needs of persons with disabilities and the available services, leading to inequity and social exclusion of this marginalized population.[1,6]

The *Global Report on Health Equity for Persons with Disabilities* (2022) states that 1.3 billion people (16% of the global population) live with disabilities.[1] Disability prevalence among children in Low- and Middle-Income Countries (LMICs) has been estimated to be between 4% and 6%.[7] As per the 2011 Census, India had 26.8 million individuals with disabilities, amounting to 2.21% of the total population (i.e., 1210 million).[8,9] The National Sample Survey Organization (NSSO) estimates that 2.2% of the Indian population facing disability.[10] National Institute for Transforming India (NITI) Aayog recognizes this figure as 5%.[11] A report by the World Bank states that while estimates vary, there is growing evidence that persons with disability are around 40–80 million, which constitute between 4% and 8% of India's population.[12] Despite its significant impact, disability has not been prioritized in national health agendas, particularly in developing

countries like India. Much of the existing literature on disability has been led by industrialized nations, where comprehensive healthcare services and social support systems are more readily available.[13,14] However, in India, disability remains underreported and inadequately addressed due to stigma and cultural perceptions.[15–17]

For many developing countries, the only reliable data source for disability prevalence remains the population Censuses. Unlike sample-based surveys like National Sample Survey (NSS) and National Family Health Survey (NFHS), the Census captures near-complete data, allowing for accurate disability prevalence estimates and reliable future projections. The Census 2011 remains the latest national population dataset available during the study, as the Census 2021 has not been conducted due to the COVID-19 pandemic. Thus, using the most recent comprehensive population data (2011) alongside the earlier 2001 Census data enables the most accurate and thorough analysis of long-term trends in disability prevalence.

This study seeks to analyze the epidemiology of childhood and adolescent disability in India based on evidence from 2001 and 2011 Census data, focusing on understanding the patterns of disability across different age groups, sexes, types of disabilities, and geographical regions. Additionally, the study aims to provide projections of disability prevalence for the current decade and up to 2051, offering insights for policymakers to prioritize resources and interventions that can effectively address the growing burden of disability among India's younger population.

Materials and Methods

Data Source and Acquisition

The Decadal Census of India enumerates the total Indian population and collects data on selected characteristics from all individual residents of the country.[8] Data from Census 2001 and 2011 was used in the present study. Disability data was collected through the question that investigated the presence of a family member with physical or mental disability in both the Census. In the Census 2001, disability was categorized into five types: vision, hearing, speech, movement, and intellectual. In 2011, data on eight types of disability was collected: vision, hearing, speech, movement, intellectual, mental illness, any other, and multiple disabilities.

The data on age-wise population and disability was acquired from the Census website.[8] The data included demographic details (age, gender, rural-urban place of residence, and state or union territory) and disability type. Data for the total number of children and adolescents in the 0–19 age group and children and adolescents with disability in the same age group were extracted from these two datasets for analysis. The details about the methodology of data collection, definitions used, and categorization of disability for both sources are available in the public domain.[18]

The State Health Index (SHI) is a composite weighted score of 24 indicators for health outcomes, governance, and infrastructure; it is calculated for all states of the country. Disability is not used as an indicator for the calculation of this score. The data for the SHI for all states (except West Bengal) was obtained from the NITI Aayog Health Index Round-IV Report 2019–20.[11]

Analysis

The 2011 Census showed a notably low prevalence of mental illness. Hence, for analysis, the categories of mental retardation and mental illness were combined as intellectual disability. The magnitude of disability has been presented as absolute numbers and rate per 100,000. Age-sex-specific prevalence rates were estimated by age group, sex, rural-urban place of residence, and type of disability per 100,000 population for 2001 and 2011. The difference between the absolute number of individuals with disability was calculated as percent change. To assess whether disability was more prevalent in specific regions of India, age-standardized prevalence rates by type of disability were calculated for 28 states and 7 union territories using the 2011 Census Indian population as the standard reference population. The rates have been expressed at 95% Confidence Interval (CI). Furthermore, the correlation and linear regression analysis between disability rate and the SHI was performed. Future projections for disability from 2021 to 2051 for age groups were estimated using an exponential growth rate.[17] The data was analyzed using Microsoft Excel 2016 and Statistical Package for Social Sciences (SPSS) version 21.

Results

Disability Prevalence Among Children and Adolescents

The Census recorded 1.03 billion individuals in India in 2001 and 1.21 billion in 2011, with 225.06 million (21.88%) and 253.24 million (20.91%) of the population under 20 years of age, respectively. The Census 2001 recorded 21.91 million individuals with disabilities, while the Census 2011 registered 26.81 million. Among these, 7.73 million in 2001 and 7.86 million in 2011 were children and adolescents under 20 years of age. The disability rate was 1667 (1666–1668) per 100,000 in 2001 and 1595 (1594–1596) per 100,000 in 2011. Age-specific disability prevalence increased with increasing age during both the Census, being highest for the 10–19 years age group. The individuals with disability over two Censuses increased by 1.69%, with the most significant rise observed in children below 5 years of age (7.62%) (Table 1).

Socio-demographic Characteristics of Children and Adolescents with Disability

The age-sex-specific prevalence rate of disability was higher among boys than girls in both the 2001 and 2011 Censuses. However, the proportional change over two Census periods was greater among females (5.04%) than males (−0.82%). The age-residence-specific prevalence rate of disability was higher among urban residents than rural in both the Census, with a decadal change of 22.2% among the urban residents (Table 1).

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Table 1 | Age-specific prevalence per 100 100,000 for children and adolescents with disability in India

Characteristics	Census 2001 Age Group (years)				Census 2011 Age Group (years)				Percent Change Age Group (years)			
	0–4	5–9	10–19	0–19	0–4	5–9	10–19	0–19	0–4	5–9	10–19	0–19
All	1086 (1084–1088)	1603 (1601–1605)	1988 (1987–1990)	1667 (1666–1668)	1145 (1143–1147)	1541 (1539–1543)	1823 (1821–1824)	1595 (1594–1596)	7.62	−4.93	3.15	1.69
Sex												
Male	1131 (1128–1134)	1733 (1730–1736)	2188 (2185–2190)	1815 (1813–1817)	1177 (1175–1180)	1631 (1628–1634)	1957 (1954–1959)	1696 (1695–1698)	6.84	−6.47	−0.22	−0.82
Female	1038 (1036–1041)	1462 (1459–1465)	1763 (1760–1765)	1503 (1502–1505)	1109 (1107–1112)	1441 (1438–1444)	1674 (1672–1676)	1483 (1482–1485)	8.54	−2.96	7.88	5.04
Place of residence												
Rural	1102 (1100–1104)	1636 (1634–1639)	2046 (2044–2048)	1697 (1696–1699)	1094 (1091–1096)	1512 (1510–1515)	1806 (1804–1808)	1564 (1562–1565)	−3.22	−11.93	−1.79	−4.8
Urban	8210 (8199–8220)	12584 (12572–12596)	13697 (13689–13706)	12235 (12229–12241)	1287 (1283–1291)	1621 (1617–1626)	1864 (1861–1867)	1677 (1675–1680)	46.44	20.33	17.4	22.2
Type of disability												
Intellectual	68 (67–68)	148 (147–148)	237 (236–237)	172 (171–172)	51 (51–52)	128 (127–128)	202 (201–202)	148 (148–149)	−22.73	−14.57	−3.99	−8.26
Visual	753 (751–754)	769 (767–770)	794 (793–796)	777 (777–778)	246 (245–246)	283 (282–284)	306 (305–306)	286 (286–287)	−66.68	−63.58	−56.71	−60.89
Hearing	21 (21–22)	62 (62–63)	83 (83–83)	63 (62–63)	280 (279–281)	320 (319–321)	345 (344–345)	323 (323–324)	1229.9	407.7	367.31	448.89
Speech	32 (32–33)	200 (200–201)	214 (214–215)	167 (167–168)	29 (28–29)	168 (167–168)	173 (173–174)	139 (138–139)	−9.46	−17.26	−9.14	−11.84
Locomotor	212 (211–213)	424 (423–425)	660 (659–661)	488 (487–489)	104 (103–105)	166 (165–167)	283 (283–284)	212 (212–213)	−49.9	−61.28	−51.69	−53.81
Multiple	–	–	–	–	70 (69–70)	148 (147–148)	163 (162–163)	138 (137–138)	–	–	–	–
Any other	–	–	–	–	366 (365–367)	329 (328–330)	351 (351–352)	349 (348–349)	–	–	–	–

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Prevalence by Disability Type

In 2001, the prevalence of visual disability was highest (777, 777–778), and in 2011, the prevalence of other disabilities, followed by hearing disability, was highest (349, 348–349; and 323, 323–324, respectively). The decadal increase was highest for hearing disability at 448.89%, and that decline was for visual disability at 60.89% (Table 1).

State-wise Standardized Disability Rates for Children and Adolescents for 2011 by Type of Disability

The prevalence of disability showed an extensive range, from 2036 per 100,000 children and adolescents for Maharashtra to as low as 614 per 100,000 children and adolescents for Daman and Diu. Eleven states had rates above the national average of 1595 per 100,000 individuals below 20 years of age. These 11 states were clustered in four zones of the country. These included the three northern states of Jammu and Kashmir, Punjab, and Uttar Pradesh; four eastern states of Odisha, Bihar, Jharkhand, and West Bengal; the western state of Maharashtra; and two southern states, Andhra Pradesh, and Karnataka (Figure 1, Supplementary Data S1).

The top five states with the highest prevalence of visual disability were Manipur, Bihar, Jharkhand, Maharashtra, Orissa; for hearing disability were Bihar, Punjab, Uttar Pradesh, Arunachal Pradesh, Jammu and Kashmir; for speech disability were Maharashtra, Goa, Andhra Pradesh, Andaman and Nicobar Islands, Karnataka; for movement disability were Chhattisgarh, Odisha, Madhya Pradesh, Karnataka, Andhra Pradesh; for intellectual disability was Puducherry, Lakshadweep, Odisha, Kerala, Maharashtra; for any other disability were Punjab, Maharashtra, Andhra Pradesh, Uttar Pradesh, Jammu and Kashmir; and for multiple disabilities were Lakshadweep, Jammu and Kashmir, Odisha, Andhra Pradesh, Kerala (Supplementary Data S1).

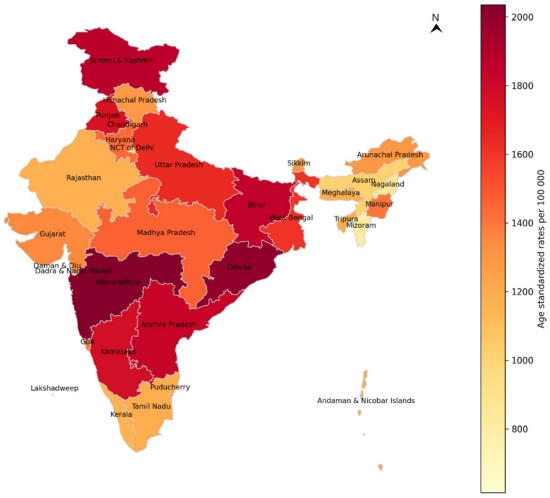

Fig 1 | Heatmap of Indian states showing age-standardized disability prevalence for children below 20 years of age in India, 2011

Age-Specific Prevalence of Disability Across India and SHI

Figure 2 shows the correlation of disability prevalence with SHI. A negative correlation was observed (−0.17, $p < 0.05$), indicating that disability was higher among states with low SHI (Figure 2). However, higher disability rates were also observed among high-SHI states like Andhra Pradesh, Maharashtra, Karnataka, and Punjab. Linear regression analysis revealed the unstandardized beta coefficient as −0.044, indicating that for every one-unit increase in SHI, the disability rate per 1000 decreases by 0.044, with an *R* square of 0.03 (Table 2).

Projected Estimates for Disability

The projected estimates suggest that there will be around 8 million children and adolescents with disability in India in 2021, increasing to 8.13 million in 2031, 8.27 million in 2041, and 8.41 million in 2051 (Table 3).

Discussion

Disability has not been widely recognized as a public health issue, partly because the notion of prevention is often seen as conflicting with disability rights.[16] Global priorities have recently shifted from child survival to thriving, promoting inclusion and equity so that 'no child is left behind.'[1,19] Inter-sectoral collaborations, sustainable funding, disability-focused strategies, and interventions have been recommended by UNICEF's Disability Inclusive Policy and Strategy (DIPAS) for the betterment of persons with disabilities.[20] However, in LMICs like India, there is a need for country-specific epidemiological data to improve decision-making of policymakers.[21] The present study provides insights into the epidemiological data on young children with disabilities and provides future estimates for decision-makers.

Magnitude of Disability

The disability prevalence estimated using Census 2011 was similar to NSS 2018 estimates among children below 14 years of age.[22] However, these rates for the 0–19 years age group were lower than the global estimates performed by Global Burden of Disease (GBD) collaborators[23] and the umbrella review.[24] These differences could be due to the statistical modeling and the data used in these studies, mainly from high-income countries.

The findings of this study highlight significant shifts in the prevalence of disability among children and adolescents (0–19 years) in India between the 2001 and 2011 Census periods. While the overall disability in absolute numbers slightly increased by 1.69% over the decade, disability rate declined from 1667 per 100,000 in 2001 to 1595 per 100,000 in 2011, these changes were not uniformly distributed across age groups, sexes, places of residence, or types of disability. The highest increase in individuals with disability was observed among children under 5 years of age (7.62%). This increase may be attributable to congenital anomalies,[6] the onset of disability at birth[25,26] or before reaching the fifth birthday,[9] and road traffic injuries.[27]

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Table 2 | Linear regression between disability rate and SHI

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Constant	16.027	2.401	–	6.675	<0.001	11.142	20.912
State health index	−0.044	0.044	−0.170	−0.990	0.329	−0.133	0.046

Table 3 | Projection of disability estimates for children and adolescents till 2051 for India

Age Group (years)	Year of Disability Estimate			
	2021	2031	2041	2051
0–4	1,389,764	1,495,698	1,609,707	1,732,407
5–9	1,859,044	1,767,310	1,680,103	1,597,199
10–19	4,761,247	4,911,011	5,065,486	5,224,819
0–19	7,995,856	8,131,039	8,268,507	8,408,299

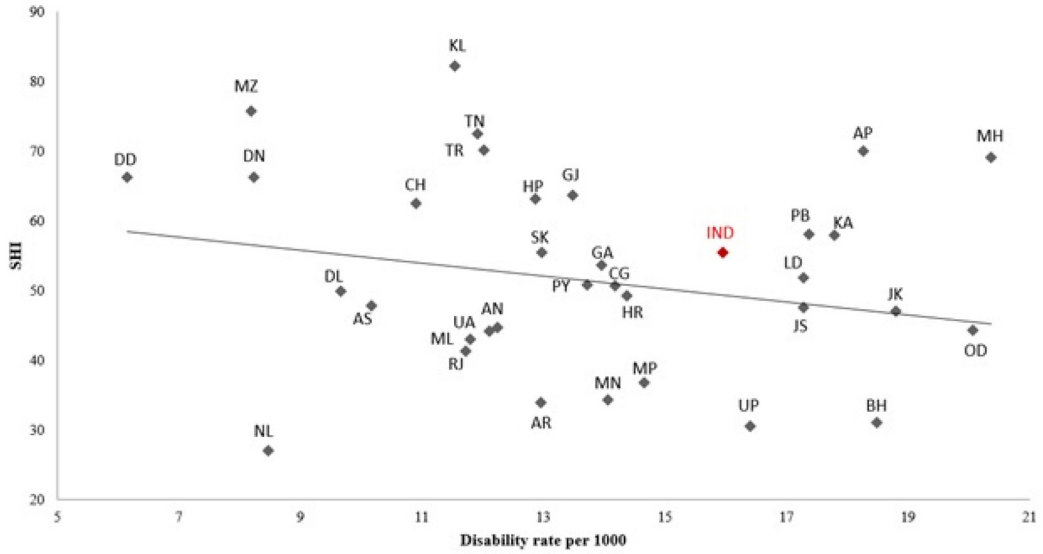

Fig 2 | Correlation between disability rate for Census 2011 and state health index. Note: The codes used to indicate states are mentioned in Supplementary Data S1

The disability prevalence was highest across both Census periods in the 10–19 age group. This may be attributed to the considerable impact of children born with disabilities surviving and contributing to the overall population of individuals with disabilities.[28]

The present study projects an absolute number of 8.13 million young children with disability in 2031, suggesting the need to integrate disability into the child health policy.[29] Targeted interventions should be implemented to address disabilities at younger ages to mitigate long-term adverse outcomes in later childhood and adolescence. These would include prevention through preconception care services, especially to reduce congenital anomalies of preventable causes. Additionally, screening and early intervention for optimal development of children should be reinforced, not only for the first 1000 days but up to 5 years of age.[30]

Sex-Specific and Urban-Rural Disparities

A noteworthy finding from this study is the disproportionate distribution of disability by sex. Boys had higher disability prevalence rates in both Census periods. However, the proportional increase in disability was greater among females, rising by 5.04% between 2001 and 2011, compared to a slight decline of 0.82% among males. The results are similar to the evidence from other countries where females have higher disability levels.[10,31–34] This trend also reflects the underlying gender disparities and social-cultural inequities in access and utilization of services.[35,36]

In terms of place of residence, we showed disability prevalence was higher among urban residents compared to their rural counterparts, with a significant decadal change of 22.2% in urban areas. A study by Mitra and Sambamoorthi analyzed disability data from India. It highlighted that urban areas tend to have higher reported rates of disability due to better access to healthcare and diagnostic services, as well as increased awareness and reporting mechanisms compared to rural areas.[36] The result of our study also can be attributed to similar factors in addition to differences in environmental and lifestyle factors between rural and urban populations. Urbanization is

also associated with risk factors like poor sanitation (urban slums), noise pollution, and a higher proportion of road traffic accidents, which could also affect the higher prevalence observed in these areas.[37–41]

Changes in Disability Types

The current analysis as per disability type revealed shifts in the prevalence of various disabilities over the decade. Visual disability, which was the most prevalent in 2001, experienced a marked decline of 60.89% by 2011. This was similar to the Global Burden of Disease study, wherein a decline in visual impairment among children and adolescents was reported.[42,43] Conversely, we showed a sharp rise in hearing disability with a decadal increase of 448.89%, becoming the second most common disability in 2011 after visual impairment. These changes can be attributed to differences in definitions, training, and questions for data collection for the two Censuses.[18] UNICEF estimates that 30% of children in the age group 7–14 years have difficulty in hearing and 22% have difficulty in communication.[6] This significant rise in hearing disabilities could be attributed to various factors, including greater awareness, neonatal screening, better diagnostic capabilities,[44] or rising exposure to risk factors such as noise pollution and untreated ear infections.[45,46] A WHO report highlights similar findings stating increased awareness, improved diagnostics, and the role of environmental factors like noise pollution contributing to rising cases of hearing impairment.[47]

The steep decline in visual disabilities might suggest improvements in eye care services, such as access to corrective measures, as well as enhanced awareness and interventions for preventable causes of blindness.[16,48] Further research would be required to fully understand these trends, but they indicate the critical role of public health interventions and early screening programs in reducing the burden of certain disabilities.

Regional Variation and Health Index (HI)

A key aspect of this study was the exploration of regional variations in disability prevalence across India's 28 states and 7 union territories. The overall disability rate for India is 1595 per 100,000 individuals under 20 years of age, with notable state-specific variations. The wide range in disability prevalence, from 2036 per 100,000 in Maharashtra to as low as 614 per 100,000 in Daman and Diu, underscores the significant disparities in disability burden across the country. Disability types also differ regionally; for example, hearing disability shows a substantial magnitude in Bihar (603 per 100,000), and speech disability is highest in Maharashtra (402 per 100,000). Despite notable advancement in the HI score, the NFHS-5 also revealed higher disability rates in western states like Maharashtra.[49] Several states, such as Uttar Pradesh, Bihar, West Bengal, Jharkhand, Odisha, Maharashtra, and Andhra Pradesh, reported similar higher disability rates among the youth.[50] These disparities may be attributable to differences in literacy, socioeconomic status, access and utilization of healthcare services, stigma, and environmental factors.[16,51,52] The reasons for geographical variations need to be further explored. The negative correlation between disability prevalence and the SHI (−0.17, $p < 0.01$) further supports this observation, indicating that states with poorer health outcomes, infrastructure, and governance, as reflected by lower SHI scores, tend to have higher disability rates. However, the SHI was not an effective indicator for explaining the regional variability. The low R square value indicates that other factors not captured in the present dataset might be attributed to the variation in disability rates observed across the states. Studies have reported various factors like poverty, socioeconomic, biological, nutritional, and maternal factors as risk factors for disability.[34,53–55] Our study also found high disability rates in some high-SHI states, such as Maharashtra, Andhra Pradesh, and Punjab. This could be attributed to evidence suggesting that reductions in neonatal and under-five mortality rates are associated with an increased risk of congenital anomalies and disabilities.[55,56] Besides these, environmental, genetic, or lifestyle factors could contribute to the disability burden in these regions. India's current child health program, 'Rashtriya Bal Swasthya Karyakram' (RBSK), identifies congenital anomalies and childhood disabilities.[57] However, the program does not consider the regional disparities, as shown in our study. This further emphasizes the need for tailored regional policies to address the diverse disability needs in different parts of India, focusing on resource allocation and healthcare infrastructure to manage the growing burden of disability among children and adolescents.

Recommendations and Policy Implications

The significant magnitude of children and adolescents with disability raises the need to take action for policymakers. Based on the study findings, the following recommendations are proposed.

1. Disability should be considered a priority in the child health policy. Disability metrics need to be integrated into health indices like SHI. The government should ensure adequate resource allocation for persons with disabilities, especially young children, as they represent the nation's future. They should provide equitable education, employment, and healthcare opportunities.
2. Cross-sectoral collaborative efforts of technology, education, healthcare, and social welfare institutions are needed to ensure holistic support for individuals with disabilities.
3. Preconception care services should be integrated into maternal services to prevent and reduce the magnitude of congenital anomalies leading to disability.
4. The current RBSK program needs to be strengthened. Regular monitoring of child growth and development, screening, and early intervention for developmental disabilities during the first

five years of life at the grassroots level should be integrated into the RBSK program.
5. Mothers should be trained to monitor child growth and development to identify delays in developmental milestones.
6. Early intervention and rehabilitation centers should be strengthened and expanded, including trained human resources, to cater to 8.13 million children with disabilities by 2031.
7. Telemedicine can bridge gaps in access to diagnostic and rehabilitation services, especially in rural and underserved areas. Virtual consultations and remote therapy programs can enable early detection and ongoing management of disabilities.
8. Establishing a national disability registry could enable accurate data collection and monitoring.
9. States with high disability prevalence and low SHI need to strengthen healthcare infrastructure, maternal and child health programs, and access to diagnostic and rehabilitation services. Opportunities to enhance their socioeconomic status, nutritional status, immunizations, housing, and sanitation are needed. On the contrary, states with high disability prevalence and high SHI need to promote preconception care services and address issues related to environmental pollution, noise pollution, and urbanization.
10. Community mobilization and awareness campaigns combating stigma for disability, knowledge about road safety measures, and utilization of healthcare services are needed to promote health equity. Besides, staff of healthcare institutions and educational institutes should be trained to provide accessible, equitable, and inclusive facilities for children with disabilities.

Limitations

This study had a few limitations. Firstly, secondary data was used. The Census data may under-report disability, as the information collected was based on self-reports. Secondly, stigma, lack of diagnosis, poor awareness, and perception of disability could also contribute to non-reporting of the disability. Thirdly, individual-level data on socio-demographic factors was unavailable in the dataset. Hence, regression analysis to identify the effect of other confounding variables on regional variation in disability rates and SHI could not be tested. Lastly, the two datasets used in the present study differ in definitions used to identify persons with disabilities that could not be adjusted.[58] However, various aspects like systematic planning, training, and quality assurance are involved in conducting the Census covering the population of about 1.2 billion to ensure accuracy and timeliness.[59] Despite these limitations, this study provides insights into the epidemiology of childhood disability in India.

Conclusion

In conclusion, disability among children and adolescents in India presents a significant and growing public health challenge, with notable variations across age groups, sexes, types of disabilities, and regions. While improvements in early detection and healthcare services may have contributed to declines in some disability types, such as visual impairments, other conditions, such as hearing disabilities, showed a sharp increase, particularly in urban areas. The disparities between states, as well as the association between disability rates and SHI, highlight the need for tailored regional interventions, especially among highly prevalent states. The projected rise in disability prevalence, particularly among younger children, underscores the importance of early detection and intervention and rehabilitation services to support this vulnerable population. Policymakers need to use a more inclusive national child health policy approach to address these disparities and strengthen health systems to meet the growing needs of children with disabilities in the coming decades.

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Supplementary Material

Supplementary Data S1 | Age-standardized state-wise disability rates per 100,00 for census 2011 by type of disability (states are arranged in alphabetical order with the codes mentioned in the parenthesis)

States and Union territories	All Disability	Seeing	Hearing	Speech	Movement	Intellectual	Any Other	Multiple Disability
India (IND)	1595 (1594–1596)	286 (286–287)	323 (323–324)	139 (138–139)	212 (212–213)	148 (148–149)	349 (348–349)	138 (137–138)
Andaman & Nicobar Islands (AN)	1225 (1224–1225)	113 (112–113)	184 (184–185)	163 (163–163)	186 (186–186)	145 (144–145)	239 (238–239)	195 (195–196)
Andhra Pradesh (AP)	1827 (1826–1828)	255 (254–255)	276 (275–276)	213 (212–213)	256 (256–257)	199 (199–200)	416 (416–417)	212 (212–213)
Arunachal Pradesh (AR)	1296 (1295–1297)	269 (269–269)	402 (401–403)	84 (83–84)	121 (121–122)	102 (101–102)	228 (227–228)	91 (91–91)
Assam (AS)	1017 (1016–1018)	151 (150–151)	217 (217–217)	114 (114–114)	126 (126–127)	81 (80–81)	231 (230–231)	98 (97–98)
Bihar (BR)	1849 (1848–1850)	442 (442–443)	473 (473–474)	144 (144–144)	242 (241–242)	98 (98–98)	358 (357–358)	92 (92–93)
Chandigarh (CH)	1090 (1089–1091)	135 (134–135)	174 (174–174)	86 (86–86)	175 (174–175)	178 (178–178)	207 (207–208)	135 (135–136)
Chhattisgarh (CG)	1418 (1417–1419)	236 (236–236)	177 (177–178)	109 (108–109)	308 (308–309)	164 (164–165)	231 (230–231)	192 (192–193)
Dadra & Nagar Haveli (DN)	824 (823–825)	84 (83–84)	152 (152–153)	64 (64–64)	112 (111–112)	92 (92–92)	126 (126–126)	194 (194–195)
Daman & Diu (DD)	614 (614–615)	98 (98–98)	91 (91–92)	61 (61–61)	106 (106–107)	97 (96–97)	78 (78–79)	82 (82–83)
Delhi (DL)	967 (966–968)	110 (110–110)	142 (142–143)	89 (89–89)	159 (159–160)	145 (145–146)	190 (190–191)	131 (131–131)
Goa (GA)	1396 (1395–1397)	160 (159–160)	229 (229–230)	249 (249–250)	106 (106–106)	190 (190–190)	332 (331–332)	130 (129–130)
Gujarat (GJ)	1348 (1347–1349)	258 (257–258)	218 (217–218)	99 (99–99)	185 (185–185)	164 (163–164)	299 (298–299)	126 (126–126)
Haryana (HR)	1438 (1437–1439)	167 (167–168)	353 (353–354)	85 (85–86)	181 (180–181)	152 (151–152)	363 (362–363)	137 (137–138)
Himachal Pradesh (HP)	1287 (1286–1288)	181 (181–182)	191 (191–192)	107 (107–107)	144 (144–144)	157 (157–158)	328 (327–328)	178 (178–178)
Jammu & Kashmir (JK)	1879 (1878–1881)	333 (333–334)	393 (393–394)	143 (143–144)	224 (224–225)	174 (174–175)	389 (388–389)	222 (222–222)
Jharkhand (JS)	1728 (1727–1729)	427 (426–427)	383 (382–383)	137 (136–137)	229 (228–229)	138 (138–138)	278 (278–279)	138 (137–138)
Karnataka (KA)	1779 (1778–1780)	316 (315–316)	314 (314–315)	163 (162–163)	257 (256–257)	190 (190–190)	356 (355–356)	184 (184–185)
Kerala (KL)	1154 (1153–1155)	129 (129–129)	178 (177–178)	103 (103–103)	139 (139–140)	205 (205–206)	199 (198–199)	201 (201–202)
Lakshadweep (LD)	1728 (1727–1730)	316 (315–316)	261 (261–262)	86 (85–86)	227 (227–227)	217 (216–217)	278 (277–278)	345 (344–345)
Madhya Pradesh (MP)	1465 (1464–1466)	243 (243–243)	267 (267–268)	91 (91–91)	262 (262–263)	126 (126–127)	341 (340–341)	134 (134–134)
Maharashtra (MH)	2036 (2035–2037)	408 (408–409)	321 (321–322)	290 (289–290)	231 (231–232)	201 (201–202)	434 (433–435)	150 (150–151)
Manipur (MN)	1406 (1405–1407)	544 (544–545)	265 (264–265)	73 (73–73)	77 (77–77)	130 (129–130)	239 (238–239)	79 (78–79)
Meghalaya (ML)	1180 (1179–1181)	163 (163–164)	327 (327–328)	86 (86–86)	133 (132–133)	113 (112–113)	254 (253–254)	104 (104–105)
Mizoram (MZ)	820 (819–820)	123 (123–123)	133 (133–133)	76 (76–77)	90 (90–90)	135 (134–135)	142 (142–142)	121 (121–121)
Nagaland (NL)	847 (846–848)	109 (109–110)	238 (238–238)	79 (79–80)	93 (93–93)	54 (54–55)	193 (192–193)	80 (80–80)
Odisha (OD)	2007 (2006–2008)	402 (402–403)	392 (391–393)	156 (155–156)	265 (264–265)	215 (214–215)	356 (355–356)	221 (221–222)
Puducherry (PY)	1372 (1371–1373)	129 (129–129)	240 (239–240)	117 (116–117)	222 (221–222)	253 (253–254)	263 (262–263)	148 (148–148)
Punjab (PB)	1737 (1736–1738)	204 (203–204)	442 (441–443)	86 (86–86)	195 (195–196)	190 (190–191)	488 (488–489)	132 (131–132)
Rajasthan (RJ)	1172 (1171–1173)	216 (215–216)	176 (176–177)	93 (93–93)	193 (192–193)	136 (136–136)	220 (220–221)	138 (138–139)
Sikkim (SK)	1297 (1296–1298)	181 (181–182)	354 (354–355)	132 (132–133)	143 (143–144)	93 (92–93)	233 (233–233)	160 (160–160)
Tamil Nadu (TN)	1191 (1190–1192)	107 (107–107)	220 (219–220)	104 (103–104)	159 (158–159)	191 (191–192)	270 (269–270)	141 (141–142)
Tripura (TR)	1201 (1200–1202)	152 (152–153)	190 (190–191)	121 (120–121)	169 (169–169)	116 (116–116)	305 (304–305)	148 (148–149)
Uttar Pradesh (UP)	1639 (1638–1641)	283 (282–283)	439 (438–439)	114 (114–114)	201 (200–201)	105 (104–105)	415 (414–415)	84 (84–84)
Uttarakhand (UA)	1210 (1209–1211)	151 (150–151)	250 (249–250)	102 (102–103)	175 (175–176)	130 (130–130)	259 (259–259)	143 (143–143)
West Bengal (WB)	1612 (1610–1613)	295 (294–295)	245 (245–246)	155 (155–156)	188 (187–188)	167 (166–167)	378 (378–379)	184 (183–184)

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