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Disabled or handicapped- examining the factors affecting the social inclusion of people living with disability in India.

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2 Abstract

Manuscript

Introduction: People living with disabilities (PLD) are particularly at risk of social exclusion due to physical obstacles, societal attitudes and practices that exclude such groups. The study's primary aim was to examine the epidemiology of disabilities and the accessibility of PLDs to crucial services, such as education, healthcare, and employment.

Methods: We did a secondary data analysis of the 76th round of the National Sample Survey 7 8 (2018) conducted in India that focussed on disability. The cross-sectional survey included 576,796 individuals. The presence of "any disability" was primary dependent variable. The 9 10 impact of disability on the activities of daily living was assessed by the difficulties faced in 11 accessing public buildings, public transport, loss of job after disability, availability of any help or support, enrolment in any special schools, and possession of a disability certificate. 12 Prevalence was estimated using sampling weights using Stata (version 17.0). Bivariate analysis 13 was done to depict the association between dependent and independent variables. Multivariable 14 binary logistic regression analysis explored the independent variables affecting the likelihood 15 of living with 'any disability'. All p-values<0.05 were considered statistically significant. 16

17 **Results:** Disability prevalence of any kind was about 2.2%, with significant disparities. Nearly 18 45% of the PLDs who did not have disability since birth were between 15 and 59 years old. and 20.8% did not receive any aid or help from the government. About 40%, and 57.7% 19 reported inability to use public transport, and accessing public buildings. Around 60.7% of 20 PLDs reported a loss of work due to disability, and 69.6% did not have any disability certificate. 21 22 **Conclusions:** The study suggests a high burden of PLDs who feel socially excluded despite numerous efforts by the government to improve the social inclusion of such people. There is a 23 24 need for advocacy and empathy in society to improve the well-being of PLDs, help them improve their productivity, and contribute to the best of their abilities. 25

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1 Introduction

The term "disability" has been defined and understood in various ways by scholars, organisations, and legal frameworks globally. Disability is defined as limitations in performing routine activities. Impairment is any deviation in psychological, physiological, or anatomical structure/function. Handicaps represent a relative disadvantage due to ill health, considering dimensions like mobility, orientation, occupation, social integration, physical independence, and economic self-sufficiency. [1,2] The World Health Organization's (WHO) International Classification of Functioning, Disability, and Health (ICF) encompass physical impairments, activity limitations, and restrictions in physical participation to provide a holistic understanding of disability after considering individual and environmental factors.[3] According to the "bio-psycho-social model", disability has evolved from being viewed as a medical to a social construct, considering one's environment, personality traits, quality of life, and selfsufficiency.[4]

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Disability is a global issue, impacting 1.3 billion people or 16% of the population.[5] According to the world report on disability published by the WHO and the World Bank, of the total disabled population globally, 80% were in the working-age group, with a significant portion living in developing countries.[6][7] In India, the problem is equally concerning, with a wide range of disabilities afflicting the population. A recent study using the National Family Health Survey-5 (NFHS-5) data found the overall prevalence of disability in India to be 4.52%, with locomotor disabilities accounting for 44.70% of all disabilities.[8] These are followed by psychiatric disabilities, which are highest among the working-age population, and visual and hearing disability among the aged population. [9,10] The findings concur with the reports from the Census 2011 and the 76th round of the National Sample Survey Organization, which depict a disability prevalence of 2.2%, affecting 14,085,000 and 4,406,000 people in rural and urban areas. Of these, about 13% were seriously crippled and could not self-care, even with aid/

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appliances.[11,12] The number of PLDs in India had increased over the last decade (2001-11),
from 21.9 to 26.8 million.[13] with an age-dependent increase, being highest in individuals
above 60 years.[8,14] The Increasing ageing population complicated by the simultaneously
increasing prevalence of chronic diseases is a significant contributing factor to disability.[15]
It is estimated that 323 million people in India (19.1% of the total population) will be over 60
years of age by 2050, thus escalating the disability burden substantially.[16]

These emerging concerns require an urgent obligation to have inclusive policies and interventions towards PLDs.[16] To attain genuine social inclusion, it is imperative to shift from perceiving disability as a medical or welfare concern to acknowledging it as a fundamental human rights issue. From a social perspective, disability is often seen as a result of barriers imposed by society rather than an inherent limitation of an individual's body or mind. These barriers can include physical obstacles, as well as societal attitudes and practices that exclude or marginalise people with disabilities. Globally, the most concerning issue faced by PLD is inequitable access to resources like employment, education, healthcare, and social and legal support, leading to social disparities and disproportionately higher rates of poverty.[17] The international organisations have constantly highlighted the barriers to PLD's social and economic inclusion.[18] They have also emphasised the right to education, a conducive workplace, and similar interventions to create a social environment that is open, inclusive, and accessible to PLDs and prevent them from feeling handicapped. [6,19–22] Based on these unmet needs, every nation is obligated be inclusive by addressing the inequities faced by PLD under international human rights law and the Convention on the Rights of Persons with Disabilities (CRPD).[23,24] But the world is far from appreciating the rights of PLD, leading to poorer health, lower education achievements, and fewer economic opportunities, thus worsening the social disparities.[5,6]

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These emerging disparities make it imperative to study the access to essential services by the PLDs. Given the multifaceted nature of their exclusion, understanding the diverse experiences of PLDs is paramount for effective policymaking. However, the existing discrepancies in official statistics underscore the intricate nature of disability, thus requiring a nuanced approach to build our assumptions. Existing literature has been primarily limited to exploring the epidemiology of disability in India, but none has looked into policies that improve their social inclusion and minimise the emerging social disparities due to disability. With this background, this study examines the epidemiology of disabilities, and accessibility of PLDs to crucial services, such as education, healthcare, and employment, for PLDs in India to provide insights for specific interventions and support inclusive development.

11 Methodology

Data sources: We conducted a secondary analysis of the data from the 76th National Sample Survey (NSS), conducted by the Ministry of Statistics, Planning, and Implementation (MOSPI) between July and December 2018. The survey (NSS) collects socio-economic data employing scientific sampling methods and serves as a crucial tool to gauge various socio-economic aspects across all states of India. Its primary objective is to identify unmet needs within the population, thereby aiding the government in formulating effective policies to address them. The survey made its first attempt to collect information on the number of PLDs during 15th round (July 1959 - June 1960).[25] The survey on PLD (Schedule 26) was last conducted during the 58th round of NSS (July – December 2002). Information was collected from the households on the nature of the disability, viz. visual, hearing, speech, locomotor, and mental disability of the household members. In the 76th round, the main objective of the survey was to estimate indicators of incidence and prevalence of disability, cause of disability, age at onset of disability, facilities available to the PLDs, difficulties faced in accessing public building/public transport, arrangement of regular caregiver, out-of-pocket expense relating to

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disability, etc. Further, estimates were obtained on various employment and unemployment
particulars in usual status for the household members with at least one disability. For each
household member aged 12 to 59 years, information was collected on whether or not they
received vocational/technical training and details related to such training.

Sampling design and sample size: The 76th NSS employed a stratified two-stage sampling design, utilising Census 2011 as the sampling frame. In the first stage, villages/urban blocks were selected, and in the second stage, households in both rural and urban areas were chosen.[26] Encompassing all states and union territories of India, the NSS 76th round covered 8,992 village/urban blocks (5,378 rural villages and 3,614 urban blocks), including 1,18,152 households with a population of 576,796 individuals (4,02,589 in rural and 1,73,980 in urban). Within this, the present study focuses on 1,07,125 individuals consisting of 61,707 males and 45,305,96 females) who reported at least one disability during the survey.

13 Study Variables

14 Dependent variable: The presence of "any disability" was our primary dependent variable.
15 This is made by the presence of at least one condition among all seven disability types,
16 elaborated subsequently

 Locomotor disability: A person was categorised as living with locomotor disability based on a positive response to any of the following three conditions: *(i) whether having difficulty in using hands, fingers, toes, body movement (including cerebral palsy, muscular dystrophy); (ii) whether having loss of sensation in the body due to paralysis, leprosy, other reasons; or (iii) whether having deformity of the body part(s) like hunch back, dwarfism, deformity due to leprosy, caused by acid attack, etc.*

Visual disability: It was identified using a direct question: "Whether having difficulty in seeing, counting fingers of hand from a distance of 10 feet (with spectacles, if using, and both eyes taken together)."

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Hearing disability: The categorisation was based on the question: "Whether having
 difficulty in hearing day-to-day conversational speech (without hearing aid, if using, and
 both ears taken together)"

4 4. Speech and language disability: It was assessed using a question: "Whether having
5 difficulty in speech (unable to speak like a normal person/ speech is not comprehensible,
6 including laryngectomy, aphasia) which is base for speech disability.

7 5. Mental retardation/intellectual disability: This disability variable has been prepared
8 based on the following question "Whether having difficulty in understanding/

9 *comprehension or communicating in doing daily activities*"

6. Mental illness: This disability was identified when there was a positive response to any of the three conditions: (i) whether having unnecessary and excessive worry and anxiety, repetitive behaviour/ thoughts, changes of mood or mood swings, talking/laughing to self, staring in space; (ii) whether having unusual experiences of hearing voices, seeing visions, strange smell or sensation or strange taste; or (iii) whether having unusual behaviour or difficulty in social interactions and adaptability.

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16 7. Other disabilities: To identify other types of disability of the persons, the following question was used: "Whether having any of the following: Parkinson's disease, multiple sclerosis, other chronic neurological conditions, thalassemia, haemophilia, sickle cell disease".

Predictor variables: In the present study, the variables were chosen following a literature
 review and the scope of data collected in the original survey. We included age groups, place of
 residence, education level, religion, wealth status or monthly per capita income (MPCI) level,
 gender, marital status, social group, and regions. The impact of disability on the activities of
 daily living was assessed by the difficulties faced in accessing public buildings, public

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transport, loss of job after disability, availability of any help or support, enrolment in any
 special schools, and possession of a disability certificate.

Statistical methodology: The prevalence, along with the dispersion of all disability variables, were estimated as part of univariate analysis by using sampling weights. Further, the prevalence of all disability types was estimated per socio-economic characteristics, and the associations were tested using bivariate analysis through a chi-squares test. Multivariable binary logistic regression analysis was used to explore the independent variables affecting the likelihood of living with 'any disability', which was the dependent variable coded by 1 and otherwise 0. The analysis depicted the unadjusted and adjusted odds ratio (95% confidence interval). All p-values<0.05 were considered statistically significant. All the analysis was done using Stata (version 17.0). Graphical maps were created using MS Excel sheets to depict the regional disparities.

Patient and public involvement: Patients and/or the public were not involved in the design,
or conduct, or reporting, or dissemination plans of this research.

Results

Table 1 provides a comprehensive overview of the weighted prevalence of different types of disabilities across various socio-demographic characteristics in India. About 2.2% of the participants had at least one form of disability. The majority of such participants had a locomotor disability (1.36%), followed by Hearing(0.30%), visual (0.23%), speech-related (0.23), mental retardation (0.16%), mental illness (0.16%), and other types (0.05%) of disabilities. The highest prevalence of any disability, locomotor, speech and 'other' disabilities was seen in 50-65 years. However, the proportion of participants with visual and hearing disabilities was highest in the eldest age group, while mental retardation and mental illness were highest in the 6-35 years age group. Further, male gender, ever-married participants from rural areas, with minimal or no educational attainment, following Hinduism, belonging to OBC

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social castes, poorer wealth index quintile, and Southern part of India depicted the highest prevalence.

We further assessed the origin of disability as per the type (Table 2). The most common cause of locomotor and speech disability was disease (46.3%, 61.9%), while 'Other causes' were most commonly involved in visual (46.5%) and hearing (49.7%) disabilities.). Around 18.5% of PLD had it since birth, while one-third (6.1%) had developed it in the last 1 year. Road was the most common place of occurrence of disability (41.9%), followed by home (32.9%). Only 28% of PLD were consulting doctors and undergoing treatment.

Table 3 depicts the living conditions of PLDs. Nearly half of the PLDs who did not have disability since birth were between 15 and 59 years old (45.9%), while nearly one-fifth (20.8%) had received any aid or help from the government. 57% of PLDs lived with their spouses, and 62.8% reported that caregivers were available. About 40% reported an inability to use public transport, while 54.4% reported inaccessibility to public buildings. Further, 57.7% of PLDs reported facing difficulties while accessing public buildings. Around 60.7% of PLDs reported a loss of work due to disability onset, and 69.6% did not have any official document certifying their disability for administrative purposes. Figure 1 further depicts the geographic disparities in the access to basic services by the PLDs.

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Table 4 demonstrates the results from the multivariable binary logistic regression analysis to present the socio-demographic variables affecting the likelihood of living with disability. We found a significantly higher likelihood of living with disability with increasing age, urban residence, social castes other than scheduled tribes, richest wealth quintiles, and living in a Northern or Southern region of India. However, female gender, more years of education, following the Islamic religion, currently married/widowed vs never married, higher socio-economic status depicted a lower likelihood.

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Discussion

We report here an investigation of multiple perspectives on the social inclusion of PLDs using nationally representative data from India. We report certain interesting findings for the first time that have profound policy implications. First, there are significant disparities in disability prevalence per socio-demographic characteristics. Second, one-fifth of PLDs had developed it since birth. Third, the roads were the most common place for the onset of disability, followed by home. Fourth, around half reported an inability to use public transport and buildings. Lastly, the majority of PLD reported a loss of work due to disability onset and did not have any official document certifying their disability.

The disability prevalence depicted a significant inclination towards higher age, male gender, rural areas, and lower socio-economic status. A mere 2.2% prevalence is equivalent to around 30 million PLDs is expected to increase in the near future and calls for urgent attention. While there was a preponderance of males with locomotor disabilities, speech and language disabilities were significantly higher in females. As per the estimates obtained from the previous 36th, 47th, and 58th rounds of NSS, there is a constant rise in disability prevalence in rural (1.8% in the 36th round to 2.3% in 76th round) as well as urban (1.4% in 36th round to 2.0% in 76th round) areas, with the overall increase from 1.6% in 36th round in year 1981 to 2.2% in 76th round in year 2018.[27][26]Another study based on NFHS-5 depicts an overall disability prevalence of 4.52%, with a higher proportion of locomotor disabilities (44.70%), followed by mental disabilities (20.28%).[8] Similarly, an increased prevalence of locomotor (1.35%), visual (0.23%), and hearing disability (0.30%) among the elderly population belonging to rural areas, with a low level of education and low wealth quintile, respectively.[27][28]

We observed a high proportion of PLDs had developed it since birth. The high burden calls
for adopting a more rigorous screening toolkit and investigations at the primary healthcare

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level. Pregnancy is still fraught with uncertainty about the health status of the newborn child in resource-constrained settings. So, the preparation should target pregnancy more comprehensively concerning screening Down's syndrome and similar intellectual disabilities, later extending to include screening for auditory and visual disabilities.[28] Newborn screening can allow for early psychological or therapeutic interventions and improve the quality of life of affected children.[29] Such screening tests can also help parents make timely decisions for either terminating the pregnancy or preparing for raising a child with a disability. Better awareness through adequate counselling of such bereaved parents may reduce parental anxiety. Meanwhile, the Rashtriya Bal Swasthya Karyakram (RBSK) provides free healthcare for children with disabilities up to 18.[30] Additionally, the government has various healthcare schemes that cater to the specific needs of PLDs. The government provides assistive devices and aids such as wheelchairs, hearing aids, and prosthetic limbs at subsidised rates through schemes like the Assistance to Disabled Persons for Purchase/Fitting of Aids and Appliances (ADIP). [31] Under ADIP, aids and appliances are provided to PLDs at subsidised rates. Deendaval Disabled Rehabilitation Scheme (DDRS) provides financial assistance to NGOs for various rehabilitation services for persons with disabilities.[32]

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The most **common place of disability origin was road**, followed by home. Trauma is an important cause of locomotor disability, and in India, it is the second most common cause of locomotor disability.[33] Previous estimates suggest that the poorest quintiles are maximally impacted by road crashes. Most victims are pedestrians, bicyclists and motorcyclists, who are less prone to adopt safety gear while on the road and also do not have adequate access to medical and social safety nets.[34] Anecdotal evidence from Chandigarh, a Union Territory of India, suggests that stringent traffic mutually benefits the public and the administration. On one side, it reduces morbidity due to road traffic acts, while on the other side, penalties generate massive revenues to run and develop the administration and also generate awareness. An

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> increasing number of domestic accidents are equally concerning. Domestic accidents may be subjected to under-reporting as most of the domestic injuries are considered minor, often neglected, and may be easily forgotten and subjected to recall bias. This changing trend is similar to many developed nations where more accidents happen in home than anywhere else. With increasing population, and population density, we expect an increase. Domestic accidents depend on the physical and social environment and also on the functional capacity of the individual. While road traffic accidents are unforeseen and unexpected, it is generally accepted that domestic accidents can be prevented and minimised by taking adequate safety measures well in time.[35]

We observed that there is still scope for improving the accessibility of public buildings and transport by the PWDs, as they must accommodate PWDs' needs. Various schemes and initiatives demonstrate the Indian government's commitment to securing the rights and welfare of disabled populations in the country. India's commitment to the United Nations Convention on the Rights of PWD (UNCRPD) is embodied in the Rights of Persons with Disabilities Act of 2016 (RPWD Act, 2016) and emphasises dignity, autonomy, and non-discrimination for Persons with Disabilities (PWD).[36][37]. The Act further mandates inclusive education, vocational training, and self-employment opportunities without discrimination. [28]To increase the accessibility of public buildings, The Rights of Persons with Disabilities Act 2016 and the National Building Code of India 2016 [38] outline expanded guidelines for building accessibility. Compliance with these standards has been made crucial, with responsibility falling on those involved in commissioning, designing, constructing, or managing built environments. The building design must adhere to relevant legislation, including equality and safety regulations. This focus on accessibility has fostered the adoption of universal design concepts, leading to numerous best practices for creating inclusive environments. These encompass accessible buildings, parking areas, parks, and recreational facilities, reflecting a

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concerted effort to ensure equal access and inclusion for people with disabilities in the built environment.

In addition to the above, the Indian government has taken several steps to ensure that the rights of disabled populations are secured. The Right to Education Act (RTE) aims to provide free and compulsory education for children with disabilities up to 18 years. [39] The government-funded higher education institutions reserve 5% of seats for PWDs, fostering diversity and enhancing workforce opportunities. This legislation reflects India's dedication to empowering individuals with disabilities, ensuring their full participation in society.[37] Additionally, the Samagra Shiksha Abhiyan integrates children with disabilities into mainstream education.[40] Likewise, many people lost their current jobs due to the onset of disabilities. Employment can enhance social sustainability and individual well-being.[41] Loss of jobs can be linked to the social stigma associated with impairment or disabilities and the perception of such people being less productive. Many employers have depict ill-founded views about the work-related abilities of PLDs; these negative views are often a result of interrelated concerns that permeate the entire employment cycle. [42] It is to be empasised that negative attitudes toward disability disempower individuals with disabilities and lead to their social exclusion and isolation. By contrast, a healthy society encourages positive attitudes toward individuals with disabilities and promotes social inclusion.[43] However, various initiatives have been introduced to promote employment opportunities for PLDs. This includes reservation quotas in government jobs and incentives for the private sector to employ persons with disabilities. The government provides financial assistance and benefits to persons with disabilities through schemes like the National Handicapped Finance and Development Corporation (NHFDC) which offers loans and subsidies to start self-employment ventures.[44]. Some prominent schemes introduced for disabled people in India include the National Handicapped Finance and Development Corporation (NHFDC), which provides financial

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assistance to persons with disabilities for self-employment, education, and training.[44]
Scheme for Implementation of Persons with Disabilities Act (SIPDA) [45] to create barrierfree environments and improve the quality of life for persons with disabilities. Accessible India
Campaign (Sugamya Bharat Abhiyan) focuses on making public infrastructure and
transportation accessible for persons with disabilities. Inclusive Education for Disabled at
Secondary Stage (IEDSS) [46] supports the inclusive education of students with disabilities at

There are a few strengths and limitations of this study that should be acknowledged. Its major strength lies in its novelty by bringing social science and medicine to a common platform. We have used the latest nationally representative data, and adequately weighted estimates can help us guide the policy.. The present study takes a novel approach by initially delineating the proportions of various types of disabilities. Subsequently, it delves into the analysis concerning "any disability," thus unveiling unique characteristics within this broader category. By doing so, the study not only broadens the scope of understanding but also highlights the nuanced interplay between different types of disabilities and their impact on hospitalisation rates. This shift towards a more inclusive analysis holds promise for informing policy decisions and healthcare interventions tailored to address the complex needs of individuals with disabilities. The major limitation lies in the study's cross-sectional nature, which limits causality and temporal associations and is limited by recall bias, particularly when assessing disabilities since birth. Being a secondary analysis, we are limited by the number of variables that can further explain social inclusion and exclusion. There was also a non-uniformity in the sample size to assess different questions related to the impact of disability.

There are a few policy implications and recommendations emerging from the study. Given the
increasing prevalence of disability and the concurrent escalating proportion of the geriatric
population, we need to work on improving the accessibility for PLDs. A large number of

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disabilities originating since birth calls for more robust ante-natal and neonatal screening protocols supported by adequate counselling and rehabilitation services. A high proportion of PLDs agreed to have a caretaker who can help us improve their quality of life by adopting a family-centred approach to rehabilitation and empowering the family members of PLDs. Despite many schemes extended by the government to enhance the social inclusion of PLDs, high social exclusion calls for more health advocacy around this issue.

To conclude, while most of the previous research has predominantly emphasised individual heterogeneity among PLDs, our study suggests a high burden of PLDs who feel socially excluded despite numerous efforts by the government to improve the social inclusion of such people. There is a need for advocacy and empathy in society to improve the well-being of PLDs, help them improve their productivity, and contribute to the best of their abilities. This will contribute to realising our national goals and stand towards our global commitment to the 2030 Agenda for Sustainable Development, which recognises the promotion of the rights, perspectives and well-being of PLDs as a pre-requisite while envisaging a more sustainable and inclusive world

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Declarations

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- **Patient and Public Involvement**: Patients were not involved at any stage of this study.
- **Funding:** No funding was involved at any stage of this study.
- Data availability: Data is available from the first author upon reasonable request.
- Ethics approval: Not applicable

Authors' contribution: MM, BB, and MA conceptualised the study, MV and AKJ collected data, drafted the manuscript, and reviewed it. VE, MV, and AKJ did the analysis and drafted the final version; MA and RK critically reviewed the manuscript from policy and feasibility points of view. All the authors read and approved the final version of the manuscript.

1 2		
3 4	1	References
5	2	1. A. J. CAMPBELL WJBMCRCLLJAL and FCM. Disease, impairment, disability and social
6 7	3	handicap: a community based study of people aged 70 years and over. Disabil Rehabil.
8 9	4	1994;16:72–9.
10	5	2. Prince MJ, Harwood " R H, Blizard RA, Thomas A. Impairment, disability and handicap as
11 12	6	risk factors for depression in old age. The Gospel Oak Project V. Psychol Med. 1997.
13 14	7	3. International Classification of Functioning, Disability and Health (ICF) [Internet]. [cited
15 16	8	2024 Jan 3]. Available from: https://www.who.int/standards/classifications/international-
17	9	classification-of-functioning-disability-and-health
18 19	10	4. Mahmud I, Clarke L, Ploubidis GB. Socio-demographic determinants of the severity of
20 21	11	locomotor disability among adults in Bangladesh: a cross-sectional study, December
22	12	2010–February 2011. Archives of Public Health [Internet]. 2017;75:47. Available from:
23 24	13	http://archpublichealth.biomedcentral.com/articles/10.1186/s13690-017-0217-5
25 26	14	5. Global report on health equity for persons with disabilities Knowledge Action Portal on
27 28	15	NCDs [Internet]. [cited 2024 Jan 3]. Available from: https://www.knowledge-action-
29	16	portal.com/en/content/global-report-health-equity-persons-disabilities
30 31	17	6. World Health Organization., World Bank. World report on disability. World Health
32 33	18	Organization; 2011.
34	19	7. Health Organization W. WORLD REPORT ON DISABILITY WHO Library Cataloguing-
35 36	20	in-Publication Data. 2011 [cited 2022 Feb 9]; Available from:
37 38	21	www.who.int/about/licensing/copyright_form/en/index.html
39 40	22	8. Pattnaik S, Murmu J, Agrawal R, Rehman T, Kanungo S, Pati S. Prevalence, pattern and
41	23	determinants of disabilities in India: Insights from NFHS-5 (2019–21). Front Public Health
42 43	24	[Internet]. 2023 [cited 2024 Mar 16];11. Available from: /pmc/articles/PMC10009251/
44 45	25	9. Patel S. An Empirical Study of Causes of Disability in India. The Internet Journal of
46 47	26	Epidemiology. 2008;6.
48	27	10. Sivadasan L, Narayanan A. Factors of Resilience Among Physically Disabled: An
49 50	28	Interpretative Phenomenological Analysis. Indian Journal of Positive Psychology
51 52	29	[Internet]. 2016 [cited 2024 Feb 22];7:113-8. Available from: https://www.i-
53	30	scholar.in/index.php/ijpp/article/view/123703
54 55	31	11. Unit level data & Report on NSS 76th Round for Schedule 1.2, July-December, 2018
56 57	32	(Drinking Water, Sanitation, Hygiene and Housing Condition) Ministry of Statistics and
58 59 60	33	Program Implementation Government Of India [Internet]. [cited 2024 Jan 6]. Available
		18

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2 3	1	from: https://magni.gov.in/unit laval data report neg 76th round schedule 12 july
4	1	from: https://mospi.gov.in/unit-level-data-report-nss-76th-round-schedule-12-july-
5 6	2	december-2018-drinking-water-sanitation
7 8	3	12. India - Survey of Persons with Disabilities NSS 76th Round : July 2018 - December 2018
9	4	- Overview [Internet]. [cited 2024 Feb 22]. Available from:
10 11	5	https://microdata.gov.in/nada43/index.php/catalog/154/overview
12 13	6	13. Ministry of Statistics and Programme Implementation G of I. Persons with Disabilities
14	7	(Divyangjan) in India-A Statistical Profile: 2021 [Internet]. Available from:
15 16	8	www.mospi.gov.in
17 18	9	14. Nations U, of Economic D, Affairs S, Division P. World Population Prospects: The 2010
19	10	Revision, Volume I: Comprehensive Tables.
20 21	11	15. Bickenbach JE, Cieza A, Sabariego C, Tchounwou PB. Disability and Public Health. J
22 23	12	Environ Res Public Health [Internet]. 2016 [cited 2024 Jan 3];13:123. Available from:
24	13	www.mdpi.com/journal/ijerph
25 26	14	16. New York: United Nations. United Nation, Department of Economic Social Affairs
27 28	15	Population Division. World Population Ageing 2017 [Internet]. 2017. Available from:
29	16	https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_
30 31	17	Report.pdf
32 33	18	17. Groce NE, United Nations. Department of Economic and Social Affairs. Disability and the
34 35	19	Millennium Development Goals : a review of the MDG process and strategies for inclusion
36	20	of disability issues in Millennium Development Goal efforts. United Nations; 2011.
37 38	21	18. Disability Inclusion Overview [Internet]. [cited 2024 Jan 3]. Available from:
39 40	22	https://www.worldbank.org/en/topic/disability
41	23	19. Article 27 – Work and employment United Nations Enable [Internet]. [cited 2024 Jan 5].
42 43	24	Available from: https://www.un.org/development/desa/disabilities/convention-on-the-
44 45	25	rights-of-persons-with-disabilities/article-27-work-and-employment.html
46	26	20. 70/1. Transforming our world: the 2030 Agenda for Sustainable Development
47 48	27	Transforming our world: the 2030 Agenda for Sustainable Development Preamble. 2015;
49 50	28	21. Article 24 – Education United Nations Enable [Internet]. [cited 2024 Jan 5]. Available
51 52	29	from: https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-
53	30	persons-with-disabilities/article-24-education.html
54 55	31	22. Disability and Development Report Realizing the Sustainable Development Goals
56 57	32	by, for and with persons with disabilities. 2018 [cited 2024 Jan 5]; Available from:
58	33	http://shop.un.org
59 60	55	http://bitop.unorg

BMJ Open

1 2		
3 4	1	23. International Human Rights Law OHCHR [Internet]. [cited 2024 Jan 3]. Available from:
5	2	https://www.ohchr.org/en/instruments-and-mechanisms/international-human-rights-law
6 7	3	24. Convention on the Rights of Persons with Disabilities (CRPD) Division for Inclusive
8 9	4	Social Development (DISD) [Internet]. [cited 2024 Jan 3]. Available from:
10 11	5	https://social.desa.un.org/issues/disability/crpd/convention-on-the-rights-of-persons-
12	6	with-disabilities-crpd
13 14	7	25. Ministry of Statistics and Program Implementation (Government of India). Introduction:
15 16	8	Coverage, Concepts, Design and Definitions [Internet]. National Sample Surveys. 2024
17 18	9	[cited 2024 May 29]. Available from:
19	10	https://www.mospi.gov.in/sites/default/files/NSS7612dws/NSS_76_ins_Ch1.pdf
20 21	11	26. Ministry of Statistics and Program Implementation (Government of India). Note on Sample
22 23	12	Design and Estimation Procedure of NSS 76th Round [Internet]. National Sample Surveys.
24 25	13	2018 [cited 2024 May 29]. p. 1–125. Available from:
26	14	https://mospi.gov.in/sites/default/files/NSS7612dws/Estimation Procedure_NSS 76.pdf
27 28	15	27. Ministry of Statistics and Programme Implementation. NSS 76th round (July – December
29 30	16	2018) Persons with Disabilities in India. Government of India [Internet]. 2018 [cited 2023
31 32	17	Nov 3]; Available from: www.mospi.gov.
33	18	28. Acharya K. Prenatal testing for intellectual disability: Misperceptions and reality with
34 35	19	lessons from down syndrome. Dev Disabil Res Rev [Internet]. 2011;17:27–31. Available
36 37	20	from: https://onlinelibrary.wiley.com/doi/10.1002/ddrr.135
38	21	29. Bailey DB, Skinner D, Warren SF. Newborn Screening for Developmental Disabilities:
39 40	22	Reframing Presumptive Benefit. Am J Public Health [Internet]. 2005;95:1889–93.
41 42	23	Available from: https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2004.051110
43 44	24	30. RBSK-Rashtriya Bal Swasthya Karyakram :: National Health Mission [Internet]. [cited
45	25	2024Mar19].Availablefrom:
46 47	26	https://nhm.gov.in/index4.php?lang=1&level=0&linkid=499&lid=773
48 49	27	31. SCHEME OF ASSISTANCE TO DISABLED PERSONS FOR PURCHASE/FITTING
50 51	28	OF AIDS/APPLIANCES (ADIP SCHEME) Govt. of India Ministry of Social Justice and
52	29	Empowerment, Shastri Bhawan New Delhi.
53 54	30	32. DDRS Department of Empowerment of Persons with Disabilities (DEPwD) India
55 56	31	[Internet]. [cited 2024 Mar 19]. Available from: https://depwd.gov.in/ddrs/
57	32	33. Dhole SR, Gaur AK, More SN, Popalwar H, Lokhande V. Original Article Study of
58 59	33	Locomotor Disability Due To Various Types of Trauma. National Journal Of Medical
60	34	Research. 2004;5:1–5.
		20

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BMJ Open

2 3	1	34. The World Bank. Traffic Crash Injuries and Disabilities: The Burden on Indian Society
4 5	2	[Internet]. 2021 [cited 2024 May 29]. Available from:
6 7	3	https://www.worldbank.org/en/country/india/publication/traffic-crash-injuries-and-
8 9	4	disabilities-the-burden-on-indian-society
10	5	35. Rehman T, Sulgante S, Sekhar Kar S. Prevalence and pattern of domestic accidents in the
11 12	6	field practice area of Jawaharlal Institute of Urban Health Centre, Puducherry: a cross-
13 14	7	sectional analytical study. J Inj Violence Res [Internet]. 2020;12. Available from:
15	8	http://www.jivresearch.org/jivr/index.php/jivr/article/view/1182
16 17	9	36. Convention on the Rights of Persons with Disabilities and Optional Protocol UNITED
18 19	10	NATIONS.
20 21	11	37. MINISTRY OF LAW AND JUSTICE, (Legislative Department). THE RIGHTS OF
22	12	PERSONS WITH DISABILITIES ACT, 2016 (NO. 49 OF 2016). MINISTRY OF LAW
23 24	13	AND JUSTICE; Dec 27, 2016.
25 26	14	38. National Building Code - Bureau of Indian Standards [Internet]. [cited 2024 Mar 19].
27 28	15	Available from: https://www.bis.gov.in/standards/technical-department/national-
29	16	building-code/
30 31	17	39. Right To Education [Internet]. [cited 2024 Mar 19]. Available from:
32 33	18	https://righttoeducation.in/know-your-rte/about
34 35	19	40. Ministry of Education (Government of India). Samagra Shiksha [Internet]. 2022 [cited 2024
36	20	Jun 1]. Available from: https://samagra.education.gov.in/
37 38	21	41. Qiu N, Jiang Y, Sun Z, Du M. The impact of disability-related deprivation on employment
39 40	22	opportunity at the neighborhood level: does family socioeconomic status matter? Front
41 42	23	Public Health [Internet]. 2023;11. Available from:
43	24	https://www.frontiersin.org/articles/10.3389/fpubh.2023.1232829/full
44 45	25	42. Bonaccio S, Connelly CE, Gellatly IR, Jetha A, Martin Ginis KA. The Participation of
46 47	26	People with Disabilities in the Workplace Across the Employment Cycle: Employer
48 49	27	Concerns and Research Evidence. J Bus Psychol [Internet]. 2020;35:135-58. Available
50	28	from: http://link.springer.com/10.1007/s10869-018-9602-5
51 52	29	43. Babik I, Gardner ES. Factors Affecting the Perception of Disability: A Developmental
53 54	30	Perspective. Front Psychol [Internet]. 2021;12. Available from:
55	31	https://www.frontiersin.org/articles/10.3389/fpsyg.2021.702166/full
56 57	32	44. National Divyangjan Finance and Development Corporation Department of
58 59	33	Empowerment of Persons with Disabilities (DEPwD) India [Internet]. [cited 2024 Mar
60		

1	19]. Available from: https://depwd.gov.in/national-handicapped-finance-and-
2	development-corporation/
3	45. SIPDA Department of Empowerment of Persons with Disabilities (DEPwD) India
4	[Internet]. [cited 2024 Mar 19]. Available from: https://depwd.gov.in/sipda/
5	46. Inclusive Education of the Disabled at Secondary Stage Government of India, Ministry of
6	Education [Internet]. [cited 2024 Mar 19]. Available from
7 8	https://www.education.gov.in/iedss

BMJ Open Tables Tables Table 1: Prevalence of different types of disabilities across different socio-demographic characteristics, NSS, 76th round, India.

3

Background characteristics	Total sample N	Locomotor N (%)	Vision N (%)	Hearing N (%)	Speech N (%)	Mental Retardation N (%) 8564 (0.16) 8564 (0.16) 60 445 (5.3) 60	Mantal Illness	Others N (%)	Any one disability N (%)
6	576,796	61981 (1.36)	11977 (0.23)	15294 (0.30)	12661 (0.23)	8564 (0.16)	6 751 (0.16)	3121 (0.05)	107,125 (2.20)
Age Group (completed years)						latec	125. I		
up to 5	50,010	1494 (2.2)	182 (1.5)	311 (2)	907 (7.3)	445 (5.3) 5	4 1 (0.5)	182 (5.5)	2839 (2.5)
`6-17	152,084	7290 (10.8)	1210 (9.2)	1977 (12.6)	4515 (35.8)	3492 (41.2)	8 060 (15.4)	691 (21.5)	16695 (14.4)
18-35	166,862	11546 (18)	1386 (10.7)	2036 (13.3)	3273 (26.4)		6 915 (27.6)	601 (19.8)	20673 (18.8)
36-49	104,790	11434 (18.1)	1557 (12.3)	2118 (13)	1812 (13.8)	1113 (12.4)	1 1 1 1 1 1 1 1 1 1	478 (14.8)	18665 (17.2)
50-65	80,025	16627 (27.9)	3609 (31.1)	3843 (25.1)	1495 (11.4)	561 (6.5) B	4 409 (21.3)	645 (21.9)	26420 (25.7)
65+	23,025	13590 (23)	4033 (35.2)	5009 (34)	659 (5.3)	157 (1.6)	80 (10.1)	524 (16.6)	21833 (21.4)
Gender				101		Al tra	njop		
Male	298,982	36862 (58.7)	6014 (50.2)	7993 (52)	7554 (60.4)	5202 (61.7) 5 .	3 856 (56.8)	1764 (58.9)	61707 (57.3)
Female	277,716	25110 (41.3)	5958 (49.8)	7296 (48)	5106 (39.6)	3359 (38.3) a	2893 (43.2)	1355 (41.1)	45396 (42.7)
Marital Status						nd si	om/		
Never Married	257,794	16912 (24.7)	2719 (20.8)	3987 (24.2)	8708 (67.8)	7450 (86.9)	9 3 281 (46.1)	1314 (40.4)	36813 (31.4)
Ever Married	287,768	33257 (55.3)	5541 (46.9)	7094 (47.5)	3086 (25.3)	791 (9.3) f	2 381 (35.8)	1402 (47.2)	50108 (48.8)
Widowed	29,644	11293 (19)	3616 (31.5)	4024 (27.1)	690 (5.4)	190 (2.1) ho	75 (12.5)	366 (11.1)	18933 (18.5)
divorced/separated	1,590	519 (1)	101 (0.8)	189 (1.1)	177 (1.4)	133 (1.8) G	3 314 (5.5)	39 (1.2)	1271 (1.3)
Area of residence						Ň	at Ag		
Rural	401,474	42222 (71.6)	8809 (76.3)	11121 (74.9)	9164 (72.9)	5974 (69.9)	4 772 (73.1)	2055 (62.4)	75091 (72.8)
Urban	175,322	19759 (28.4)	3168 (23.7)	4173 (25.1)	3497 (27.1)	2590 (30.1)	1111111111111	1066 (37.6)	32034 (27.2)
Educational attainment							oliog		
	154,126	26376 (44.5)	7160 (62.6)	8365 (57.3)	7119 (56.9)	5846 (69.3)	3 285 (49.6)	1108 (34.1)	50848 (48.9)

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Literate but not formal	169,468	15002 (23.2)	2483 (19.4)	3700 (22.9)	3428 (26.7)	1858 (21) in	8 29 (23.3)	859 (29)	26145 (23
Upto primary	200,712	16885 (26.5)	1987 (15.5)	2782 (16.9)	1908 (14.9)	808 (9.1) Iudin	N 623 (24.1)	916 (28.7)	25210 (23.
Upto secondary	52,489	3718 (5.8)	347 (2.6)	447 (2.9)	206 (1.5)	52 (0.6) f	9 214 (3.1)	238 (8.2)	4922 (4.6
Preferred Religion							15 Ma		
Hindu	465,055	49548 (81.9)	9479 (82.9)	12090 (82.6)	9658 (78.7)	6540 (78.7)	5 063 (74.7)	2444 (80.8)	84742 (81.
Islam	82,924	8375 (12.5)	1601 (12.5)	1927 (11.7)	2021 (15.6)	1366 (15.9)	X 67 (18.4)	402 (12.6)	14658 (12.
Others	28,817	4058 (5.6)	897 (4.6)	1277 (5.7)	982 (5.7)	658 (5.4) ö	2 21 (6.9)	275 (6.5)	7725 (5.5
Social Group						text	vnloa		
Scheduled Tribe	53,251	6049 (8.3)	1491 (9.1)	1923 (9.5)	1478 (9.4)	822 (7.2) and	6 70 (7.8)	452 (12.3)	11729 (8.
Scheduled Caste	106,559	12240 (20.4)	2407 (21.3)	2805 (19.4)	2467 (20.5)	1602 (19.2)	Ι.	574 (17.8)	20925 (20
Other Backward Classes	261,808	26861 (44.7)	5205 (46)	6583 (45.5)	5482 (44.7)	3806 (45.8)	13	1167 (40.2)	46223 (44
General	155,178	16831 (26.6)	2874 (23.6)	3983 (25.6)	3234 (25.4)	2334 (27.8)		928 (29.7)	28248 (26
Wealth Index				0		Al tr			
Poorer	139,451	17681 (30.2)	3919 (35.1)	4933 (34.7)	3552 (30.1)	2025 (25.3)	1932 (31)	823 (25.8)	31259 (31
Poor	119,425	12553 (20.5)	2474 (20.8)	3005 (19.4)	2746 (21.4)	1773 (20.9) a	364 (20.5)	524 (16.2)	21959 (20
Middle	116,427	11468 (18.2)	2271 (18.5)	2730 (17.4)	2434 (18.5)	1751 (20) a	3 02 (18.1)	550 (17.3)	20058 (18
Richer	107,200	10440 (16)	1864 (14.4)	2480 (15.4)	2080 (15.8)	1611 (18.3) <mark>2</mark> .	9 161 (16.8)	593 (19.9)	17946 (15
Richest	94,293	9839 (15.1)	1449 (11.1)	2146 (13)	1849 (14.2)	1404 (15.5)	9 92 (13.6)	631 (20.7)	15903 (14
Regions of India						chno	7, 2		
Northern	80,441	8787 (14.4)	1478 (13.1)	1692 (11.7)	1347 (11.1)	1144 (13.5) 0	8 31 (14.2)	216 (7.6)	14305 (13
Southern	120,725	13448 (23)	2814 (24.7)	4013 (27.3)	2958 (24.8)	2141 (25.6)	447 (21.3)	714 (25.5)	23699 (23
Western	78,844	8387 (12.7)	1286 (10.1)	1740 (11.1)	1423 (11.3)	1293 (15.2)	9 06 (10.6)	540 (17.7)	13708 (12
Eastern	129,717	12790 (20.3)	2538 (21.9)	3238 (22.5)	3248 (27.1)	1762 (21.3)	6 72 (26.3)	954 (30.4)	23061 (21.
North-Eastern	22,101	3858 (2.1)	1335 (4.5)	1620 (3.7)	1308 (3.4)	594 (2)	b b b b c (2.7)	282 (2.4)	8839 (2.8
Central	144,968	14711 (27.4)	2526 (25.6)	2991 (23.8)	2377 (22.4)	1630 (22.6)	4 13 (24.8)	415 (16.3)	23513 (20
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	Locomotor	Visual	Hearing	Speech and language	Mental retardation/	Ngentæ Mgentæ Mgness	Other types of disability	Any Disability
Total sample size	61980	1156	1281	2013	1217	15 May 2025. Downloaded from http Senseignement Superiour (ABES) or Uses related to text and data mining 11	768	61980
Causes of disability						ay 20 nseig es re		
Disease	28673 (46.3)	454 (39.3)	484 (37.8)	1246 (61.9)	NA)25. Jnén latec	NA	NA
Other than disease due to burn	723 (1.2)	88 (0.7)	1 (0.1)	8 (0.4)	NA	to t	NA	NA
Injuries other than burn	13876 (22.4)	156 (13.5)	158 (12.4)	105 (5.2)	NA	nloac Supe extra	NA	NA
Other causes	18702 (30.2)	538 (46.5)	637 (49.7)	654 (32.5)	NA	hied f	NA	NA
Disability Since Birth		MO.				rom r (AB ata r		
Yes	11,488 (18.5)	91 (7.9)	198 (15.4)	1041 (51.7)	955 (78.5)		119 (15.5)	11,488 (18.5)
No	50,052 (80.8)	1062 (91.9)	1081 (84.4)	964 (47.9)	258 (21.2)	405 (7 2 6)	645 (84)	50,052 (80.8)
Not Known	440 (0.7)	3 (0.2)	2 (0.2)	8 (0.4)	4 (0.3)		4 (0.4)	440 (0.7)
Disability commenced in last 365 days				19		liopen.bmj.com/ (1 Heaining, anersi		
sample size	48741	1034.2	1052.4	938.7	251.6	ng 94.	628.6	48741
Yes	2987 (6.1)	72 (7)	65 (6.2)	100 (10.6)	11 (4.4)	4() 4() 2(10) 2)	48 (7.7)	2987 (6.1)
No	45754 (93.9)	961 (93)	987 (93.8)	839 (89.4)	240 (95.6)	35 8 (898)	580 (92.3)	45754 (93.9)
Place of occurrence of disability						7, 20 hnol		
Sample size	14281	161	157	105	33	7, 2025 at mologies	63	14281
Workplace	2308 (16.2)	13 (8.3)	30 (19.2)	11 (10.9)	2 (6.9)	9 (1 Age	11 (18.1)	2308 (16.2)
Road	5977 (41.9)	46 (28.5)	43 (27.5)	41 (38.7)	9 (25.9)	35 (40 G)	15 (23.8)	5977 (41.9)
Home	4693 (32.9)	93 (57.9)	73 (46.3)	45 (42.4)	19 (58.5)	33 (38 9	31 (49.5)	4693 (32.9)
Other places	1302 (9.1)	9 (5.3)	11 (7)	8 (8)	3 (8.7)	8 (9.5	5 (8.6)	1302 (9.1)
	F		25	omj.com/site/ab		8 (9.3phique de l	1 1	

BMJ Open Table 2: Percentage distribution of different disability types and their associated information, NSS 76th round, India.

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Treatment taken/undergoing treatment						jopen-2024-090220 . copyright, including		
Sample siz	ze 61980	1156	1281	2013	1217	g on 15	768	61980
yes: consulting doct	or 35,923 (58)	566.6 (49)	617 (48.2)	1,080 (53.7)	710 (58.4)		330 (43)	35923 (58)
Otherwis	se 1565 (2.5)	22 (1.9)	34 (2.7)	42 (2.1)	36 (2.9)	seigner relate	6 (0.7)	1564.5 (2.5
Yes: consulting doctor, plu undergoing treatme		375 (32.4)	418 (32.7)	719 (35.7)	355 (29.2)	5. Downloaded emEnt Superieu 190 textsand c	397 (51.7)	17329 (28)
Otherwis	se 860 (1.4)	34 (2.9)	21 (1.7)	20 (1)	4 (0.3)		8 (1)	860 (1.4)
Attending special school/speci therap		2.9 (0.3)	0 (0)	4 (0.2)	6 (0.5)	ed from http: rieu£(ABES) nd data minir	0 (0)	116 (0.2)
Cannot afford treatme	nt 2040 (3.3)	75 (6.4)	73 (5.7)	72 (3.6)	55 (4.6)		8 (1)	2040 (3.3)
No treatment available for the disability of the	6997111	13 (1.1)	8 (0.6)	17 (0.8)	16 (1.3)	ig, 4 4[(0.83)jo	5 (0.7)	699 (1.1)
Not require	ed 2717 (4.4)	60 (5.2)	97 (7.6)	47 (2.3)	26 (2.1)		14 (1.8)	2717 (4.4)
Not know	rn 732 (1.2)	8 (0.7)	12 (0.9)	13 (0.7)	9 (0.7)	ມ ເມື່ອ ເອັ	1 (0.1)	732 (1.2)

Note: Causes of disability were recorded for individuals with disabilities like locomotor, visual, hearing, and speece

 Disability Commenced in the last 365 days was recorded for those individuals who did not have a disability a birth' but disability commenced during the last 365 days before the survey.

during the last 365 days before the survey. Place of occurrence was recorded for individuals with disabilities who are experiencing disability post their bird of whom the cause of disability was burn, injury or other than burn. 26 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1 Table 3: Living conditions of the people living with disabilities, NSS76th round

Living conditions of the people (<i>n</i> = <i>sample included in the analysis</i>)	Weighted percentag
Percentage distribution of persons who were not having disability since birth	
by different age at the onset of disability (n= 48,727)	
0 to 4 years	17.2
5 to 14 years	9.0
15 to 59 years 60 years and above	45.9 28.0
Receipt of aid/help (n=61,712)	20.0
Received aid/help from Government	20.8
Received aid/help from organisations other than government	4.1
Did not receive aid/help	75.1
Living arrangement(n=61,962)	10.1
Living alone or with a spouse	57.0
Living with others	43.0
Arrangement of regular caregiver(n=61,980)	
Care-giver required but not available	0.1
Care-giver is not required	37.1
Care-giver is available	62.8
Access to public Transport (n=61,980)	
Yes	59.6
No	40.4
Accesses to public building (n=61,980)	
Yes	45.6
No	54.4
Difficulty faced accessing public building(n=27,756)	57.7
difficulty faced: due to stairs and non-availability of ramp, grooved tiles or lift	57.7 4.4
in opening doors no seating arrangement: in the waiting area	1.6
at the point of receiving service	0.8
no special toilet seats	0.7
no sign for direction/ instruction/no public announcement system	0.7
no difficulty faced	27.6
others	7.0
Working before onset (For persons of age 15 years and above; n=55,819)	
Yes	40.3
No	59.7
Disability causing loss or change in job(n= 21,559)	
loss of work	60.7
change of work	18.3
no loss or change of work	21.3
Having Disability Certificate(n=61,980)	
Yes	30.4
No	69.6
Percentage of Disability as per Certificate (n=20,213)	
40% or more but less than 60%	49.3
60% or more but less than 80%	36.3
80% or more	12.8
none of these	1.6

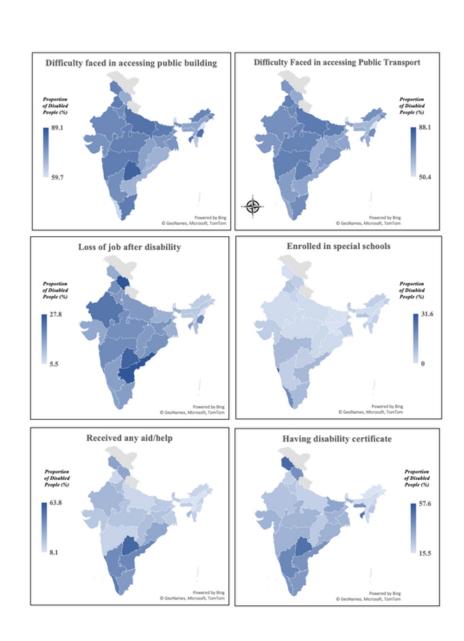
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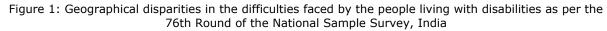
Table 4: Multivariable binary logistic regression analysis exploring the likelihood of living
 with any disability per the 76th round of the NSS, India.

	Unadjusted Odds	p-value	Adjusted Odds	
	ratio (95% C.I)		ratio (95% C.I)	p-value
Age Group (Completed years)				
Up to 5 years	Reference value		Reference value	
6 - 18 years	2.1(2-2.1)	< 0.001	3.5(3.4-3.7)	< 0.001
19-35 years	2.3(2.2-2.4)	< 0.001	8.4(8-8.8)	< 0.001
36-49 years	3.5(3.4-3.7)	< 0.001	17.6(16.8-18.5)	< 0.001
50-65 years	6.4(6.1-6.7)	< 0.001	25.8(24.5-27.1)	< 0.001
65+ years	17.5(16.7-18.2)	< 0.001	58.4(55.4-61.5)	< 0.001
Gender				
Male	Reference value		Reference value	
Female	0.7(0.7-0.7)	< 0.001	0.6(0.6-0.6)	< 0.001
Place of Residence				
Rural	Reference value		Reference value	
Urban	1.02(1.01-1.03)	0.03	1.3(1.2-1.3)	< 0.001
Social Group				
Scheduled Tribe	Reference value		Reference value	
Scheduled Caste	1.1(1.1-1.1)	< 0.001	1.1(1.1-1.2)	< 0.001
Other Backward Classes	1.1(1-1.1)	<0.001	1.1(1.1-1.2)	<0.001
General	1.1(1.1-1.1)	<0.001	1.3(1.3-1.3)	<0.001
Educational attainment	1.1(1.1-1.1)	<0.001	1.5(1.5-1.5)	<0.001
No education	Reference value		Reference value	
Upto Primary class	0.5(0.5-0.5)	< 0.001	0.5(0.5-0.5)	<0.001
Upto Secondary Class	0.4(0.4-0.4)	<0.001	0.4(0.4-0.4)	<0.001
Graduate & Above		<0.001	· · · · · · · · · · · · · · · · · · ·	<0.001
	0.3(0.3-0.4)	<0.001	0.3(0.3-0.3)	<0.001
Preferred Religion	D		D.C.	
Hindu	Reference value	<0.001	Reference value	<0.001
Islam	0.8(0.8-0.9)	< 0.001	0.9(0.9-0.9)	<0.001
Others	0.9(0.9-1)	< 0.001	1(1-1.1)	0.019
Marital Status				-
Never married	Reference value	.0.001	Reference value	.0.001
Currently married	1.3(1.3-1.3)	< 0.001	0.3(0.3-0.3)	< 0.001
widowed	5.9(5.8-6.1)	< 0.001	0.6(0.5-0.6)	< 0.001
Divorced/separated	4.4(4.1-4.8)	< 0.001	1.1(1-1.2)	0.011
Wealth Index				
Poorest	Reference value	0.001	Reference value	
Poor	0.6(0.6-0.6)	< 0.001	0.7(0.7-0.7)	< 0.001
Middle	0.6(0.5-0.6)	< 0.001	0.6(0.6-0.6)	< 0.001
Richer	0.5(0.5-0.5)	< 0.001	0.5(0.5-0.6)	< 0.001
Richest	0.4(0.4-0.4)	< 0.001	0.5(0.5-0.5)	< 0.001
Regions of India				
Northern	Reference value		Reference value	
Southern	1.42(1.39-1.46)	< 0.001	1.1(1.1-1.2)	< 0.001
Western	1.13(1.1-1.16)	< 0.001	1(1-1.1)	0.065
Eastern	1.15(1.13-1.18)	< 0.001	1(0.9-1)	0.001
North-eastern	1(0.97-1.03)	0.961	1(1-1)	0.361
Central	1.01(0.98-1.03)	0.653	0.9(0.8-0.9)	< 0.001

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1	Figure Legends
23	Figure 1: Geographical disparities in the difficulties faced by the people living with disabilities as per the 76 th Round of the National Sample Survey, India
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40x58mm (300 x 300 DPI)

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Epidemiology of disability and access to disability support and rehabilitation services in India: A secondary data analysis a National Sample Survey (2018).

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4	1	Title Page
5	2	Epidemiology of disability and access to disability support and
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Manuscript

Abstract **Objective:** The primary aim of this study was to examine the epidemiology of disabilities in India and assess access to disability support and rehabilitation services by people with Disabilities (PWDs). Design: This study is a secondary analysis of the data from the 76th round of the National Sample Survey (2018), that focussed on disability in India. Setting: The survey employed a stratified two-stage sampling design based on Census 2011, covering all states and union territories of India. Villages and urban blocks were selected in the first stage, while households were chosen in the second stage across rural and urban areas. **Participants**: The survey included data from a population of 576,796 individuals residing in 1,18,152 households from 8,992 village/urban blocks (5,378 rural villages and 3,614 urban blocks). The analysis focussed on 1,07,125 individuals (61,707 males and 45,305 females) who reported at least one disability. **Outcome Measures**: The primary outcome was "any disability". Secondary outcomes included access to disability support and rehabilitation services that assessed difficulties faced in accessing public buildings, transport, loss of employment after disability, availability of government support, enrolment in special schools, and possession of a disability certificate. Results: The overall weighted disability prevalence was 2.2%, with significant disparities

across socio-demographic characteristics. Among PWDs, 45.9% of those who acquired
disabilities after birth were aged between 15 and 59, and 20.8% received no government aid.
About 40% of PWDs struggled to use public transport, and 57.7% had difficulties accessing
public buildings. Additionally, 60.7% reported job loss due to disability, and 69.6% lacked a
disability certificate.

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Conclusion: This study highlights disparities faced by PWDs in accessing disability support
 and rehabilitation services. There is an urgent need for concerted efforts to minimise such
 experiences. This will help us enhance the well-being and participation of PWDs and empower
 them to contribute to society with their true potential.

Keywords: Disability, inequity, disparities, accessibility, health access.

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1 2 3 4	1	Strengths and limitations of this study
5 6 7	2	• One of the very first comprehensive assessments of accessibility issues of the people
8 9	3	living with disability data from the 76 th round of the National Sample Survey (2018).
10 11 12	4	• We estimated the proportion of people with disability who could access basic services
12 13 14	5	through a weighted analysis that makes the results generalisable and highlights
15 16	6	actionable points.
17 18 19	7	• The lack of a standardised definition of disability was the critical limitation of the study,
20 21	8	which restricts sub-national and national comparisons over time and regions.
22 23	9	• The possibility of estimates being affected by recall bias and social desirability bias
24 25 26	10	may not be ruled out.
27 28	11	• We were limited by the number of variables available in the primary data, which
29 30	12	restricted us from making further conclusions about the social inclusion of people with
31 32 33	13	disability.
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3 Introduction

4 As per the United Nations Convention on the Rights of Persons with Disabilities (CRPD), persons with disabilities (PWD) include those who have long-term physical, mental, 5 6 intellectual or sensory impairments which, in interaction with various barriers, may hinder their 7 full and effective participation in society on an equal basis with others.[1] Disability is a global concern, impacting 1.3 billion people or 16% of the population.[2] The World Health 8 9 Organization (WHO) and the World Bank's World Report on Disability highlight that 80% of the global disabled population is of working age, with a substantial proportion residing in 10 11 developing countries.[3] India is one of the most populous countries, and the burden of disabilities afflicting the population is concerning.[4] With the increasing proportion of the 12 13 geriatric population, the burden of disability has also proportionately increased (from 21.9 to 14 26.8 million) over the last two rounds of the national census (2001-2011).[5,6] The reports from the 2011 Census and the 76th round of the National Sample Survey (NSS) estimate 15 disability prevalence to be around 2.2%.[7] But the fifth round of the National Family Health 16 Survey-5 (2019-21) estimates an overall disability prevalence of 4.52%.[8] The discrepancy in 17 available estimates is due to differences in the methodologies, poor quality and inconsistent 18 19 data, and lack of standardisation of the definition, which underscores the intricate nature of the disability.[9,10] 20

The CRPD defines disability as an evolving concept as it results from the interaction between persons with impairments and attitudinal and environmental barriers that hinder full and effective participation in society on an equal basis with others.[1] This evolution of the definition highlights the constantly changing needs of PWDs, which are largely unmet.[11,12] Articles 6, 7, 9, 24, and 27 of CRPD talk about the gender, age, accessibility, education, work and employment rights for empowering the PWD by addressing such needs so that they live

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independently and participate fully in all aspects of life, who are otherwise less prioritised over the general population.[13–17] Low priority increases the existing disparities, leading to poorer health outcomes, lower educational attainment, and reduced economic opportunities, thereby exacerbating social inequities.[18] Addressing these disparities is a global priority as mandated by the second principle of the Sustainable Development Goals (SDGs), "Leave no one behind", which is the central, transformative promise of the Agenda 2030.[19] The International Human Rights Law and the CRPD also obligate each country to tackle the inequalities faced by PWDs.[1,20] Despite ratification by most countries, the world remains far from fully recognising and upholding the rights and needs of PWDs.[18] The needs of PWD can span from personal functional assistance (daily activities and extent of disability), social integration (living conditions, caregivers, and public accessibility), economic rehabilitation (impact on employment and finances) to service access (certification and receipt of government/NGO support) necessitating a comprehensive approach.[21] But access to such services is less studied, and it is crucial to highlight disparities that affect the disability care continuum and also limit the efforts to minimise social exclusion of PWD and foster a social environment that is inclusive and accessible to all.[22]

Previous literature from India has primarily focused on the epidemiology of disability.[10] The lack of disability-friendly infrastructure, affordable assistive technologies, support services, including personal assistance, therapy, aids and vocational rehabilitation, and comprehensive care perpetuates inequalities.[23] Still, it is less explored by the scientific community. Within this context, the 76th NSS collects data regarding disability and PWD's access to different disability support and rehabilitation services and provides an opportunity to study them. Thus, the primary aim of the study was to explore the epidemiology of disabilities and the accessibility of PWDs to various disability support and rehabilitation services to provide insights for specific interventions.

1 Methodology

Data sources: We conducted a secondary analysis of the cross-sectional data from the 76th National Sample Survey (NSS) conducted by the Ministry of Statistics, Planning, and Implementation (MOSPI) between July and December 2018. MoSPI has formulated a code of ethics that follows the principles of ethics and sets out certain standards of conduct for the members of the Committees in order to protect the confidentiality of the data/information acquired by them by virtue of their membership in such Committees. The NSS collects socio-economic data using scientific sampling methods and serves as a crucial tool to gauge various socio-economic aspects across all states of India. Its primary objective is to identify unmet needs within the population, thereby aiding the government in formulating effective policies to address them.

The survey made its first attempt to collect information on the number of PWDs during the 15th round (July 1959 - June 1960).[24] In the 76th round, the main objective of the survey was to estimate indicators of incidence and prevalence of disability, cause of disability, age at onset of disability, facilities available to the PWDs, difficulties faced in accessing public building/public transport, arrangement of regular caregiver, out-of-pocket expense relating to disability, etc. using a structured questionnaire.[25] Further, estimates were obtained on various employment and unemployment particulars in usual status for the household members with at least one disability. For each household member aged 12 to 59 years, information was collected on whether or not they received vocational/technical training and details related to such training.

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Sampling design and sample size: The 76th NSS employed a stratified two-stage sampling
design, utilising Census 2011 as the sampling frame.[7] The survey commenced on 1st July
2018 for six months'. In the first stage, villages/urban blocks were selected, followed by the
selection of households in rural and urban areas at the second stage. This round of NSS

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encompassed all states and union territories of India except the villages in Andaman and
Nicobar Islands, which are difficult to access, covering a total of 8,992 village/urban blocks
(5,378 rural villages and 3,614 urban blocks) and including 118,152 households representing a
population of 576,796 individuals (402,589 in rural areas and 173,980 in urban areas). Within
this, the present study focuses on 1,07,125 individuals consisting of 61,707 males and 45,418
females) who reported at least one disability during the survey.

7 Study Variables

Bependent variable: The presence of "any disability" was our primary dependent variable. MOSPI defines a "Person with disability" as a person with a long-term physical, mental,
intellectual or sensory impairment which, in interaction with barriers, hinders his full and
effective participation in society equally with others.[7] The variable is created by the presence
of at least one condition among all seven disability types, elaborated subsequently

 Locomotor disability: A person was categorised as living with locomotor disability based on a positive response to any of the following three conditions: (i) whether having difficulty in using hands, fingers, toes, body movement (including cerebral palsy, muscular dystrophy); (ii)whether having loss of sensation in the body due to paralysis, leprosy, other reasons; or (iii)whether having deformity of the body part(s) like hunch back, dwarfism, deformity due to leprosy, caused by acid attack, etc.

Visual disability: It was identified using a direct question: "Whether having difficulty in seeing, counting fingers of hand from a distance of 10 feet (with spectacles, if using, and both eyes taken together)."

3. Hearing disability: The categorisation was based on the question: "Whether having
difficulty in hearing day-to-day conversational speech (without hearing aid, if using, and
both ears taken together)"

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4. Speech and language disability: It was assessed using a question: "Whether having difficulty in speech (unable to speak like a normal person/ speech is not comprehensible, including laryngectomy, aphasia) which is base for speech disability. 5. Mental retardation/intellectual disability: This disability variable has been prepared based on the following question "Whether having difficulty in understanding/ comprehension or communicating in doing daily activities" 6. Mental illness: This disability was identified when there was a positive response to any of the three conditions: (i) whether having unnecessary and excessive worry and anxiety, repetitive behaviour/ thoughts, changes of mood or mood swings, talking/laughing to self, staring in space; (ii) whether having unusual experiences of hearing voices, seeing visions, strange smell or sensation or strange taste; or (iii) whether having unusual behaviour or difficulty in social interactions and adaptability. 7. Other disabilities: To identify other types of disability of the persons, the following question was used: "Whether having any of the following: Parkinson's disease, multiple sclerosis, other chronic neurological conditions, thalassemia, haemophilia, sickle cell disease". The access to different disability support and rehabilitation services by the PWD were secondary dependent variables that were assessed by studying the receipt of aid/help (received

aid/help from government, received aid/help from organisations other than government, did
not receive aid/help), living arrangement(living alone or with a spouse, living with others),
arrangement of regular caregiver(care-giver required but not available, care-giver is not
required, care-giver is available), access to public transport (yes, no), accesses to public
building (yes, no), difficulty faced in accessing public building (difficulty faced due to stairs
and non-availability of ramp, grooved tiles or lift, in opening doors, no seating arrangement: in

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the waiting area, at the point of receiving service, no special toilet seats, no sign for direction/ instruction/no public announcement system, no difficulty faced, and others). employed/working before onset of disability (yes, no), disability causing loss or change in job (loss of work, change of work, no loss or change of work), having disability certificate(yes, no), and percentage of disability as per certificate (40-60%, 60-80%, >80%, and none of these). Predictor variables: In the present study, the variables were chosen following a literature review and the scope of data collected in the original survey.[26–29] Research has extensively explored how various socio-demographic factors influence the prevalence and types of disabilities. This review presented key insights from the literature review on how disability is impacted by age group (completed years) categorised as: up to 5, 6-17, 18-35, 36-49, 50-65 and 65+ completed years, sex(male, female), marital status (never married, ever married, widowed, divorced/separated), area of residence (rural, urban), educational attainment (non-literate, literate but not formal, upto primary, upto secondary), preferred religion (Hindu, Islam, others), social group (scheduled tribe, scheduled caste, other backward classes, general), wealth index (poorer, poor, middle, richer, richest), regions of India (northern, southern, western, eastern, north-eastern and central). Specifically, PWDs were characterised using variables like causes of disability (disease, other than disease due to burn, injuries other than burn, other causes), age at the onset of disability (0 to 4, 5 to 14, 15 to 59, and 60 years and above), the origin of disability from birth (yes, no, not known), disability commenced in last 365 days (yes, no), place of occurrence of disability (workplace, road, home, other places), treatment taken/undergoing treatment (yes: consulting doctor, otherwise, yes: consulting doctor, plus undergoing treatment, otherwise, attending special school/special therapy, cannot afford treatment, no treatment available for the disability, not required and not known).

24 Statistical methodology: The prevalence, along with the dispersion of all disability variables,
25 were estimated as part of a univariate analysis by using already calculated sampling weights

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with clustering as provided with the datasets.[30] The details of sampling weight have been described in the NSS 76th round report. We used the SVY command while using sampling weights.[31] Further, the prevalence of all disability types was estimated per socio-economic characteristics, and the associations were tested using bivariate analysis through a chi-squares test. The access to different services was depicted using weighted proportions. The missing data were handled using the Available case analysis (ACA) technique, and the estimates were generated using the available data, leading to the different sample sizes as they vary from variable to variable. It helped us retain more data compared to listwise deletion. Multivariable binary logistic regression analysis was used to explore the independent variables affecting the likelihood of living with 'any disability', which was the dependent variable coded by 1 and otherwise 0. Additionally, binary logistic regressions are also employed on all seven types of disabilities. The analysis depicted the unadjusted and adjusted odds ratio (95% confidence interval). All p-values<0.05 were considered statistically significant. All the analysis was done using Stata (version 17.0). Graphical maps were created using MS Excel sheets to depict the regional disparities.

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Patient and public involvement: None

Results

Table 1 provides a comprehensive overview of the weighted prevalence of different types of disabilities across various socio-demographic characteristics in India. Of the total participants, 107,125 (2.2%) of the participants had at least one form of disability. The majority of such participants had a locomotor disability 61,981 (1.36%), followed by Hearing 15,294 (0.30%), visual 11,977 (0.23%), speech-related 12,661 (0.23), mental retardation 8,564 (0.16%), mental illness 6,751 (0.16%), and other types 3,121 (0.05%) of disabilities. The highest prevalence of any disability, locomotor, speech and 'other' disabilities was seen in 50-65 years. However, the proportion of participants with visual and hearing disabilities was highest in the eldest age

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group, while mental retardation and mental illness were highest in the 6-35 years age group. Further, male sex, ever-married participants from rural areas, with minimal or no educational attainment, following Hinduism, belonging to other backward social castes, poorer wealth index quintile, and Southern part of India depicted the highest prevalence. We further assessed the origin of disability as per the type (Table 2). The most common cause of locomotor and speech disability was disease 28,673 (46.3%), 1246 (61.9%), while 'Other causes' were most commonly involved in visual 538 (46.5%) and hearing 637 (49.7%) disabilities. Around 11,488 (18.5%) of PWD had it from birth. Of the total participants, 2987 (6.1%) participants who acquired it in the last year preceding the survey. The most common place of disability origin was road 5977 (41.9%), followed by home, 4693 (32.9%). Only 17,329 (28%) of PWD were consulting doctors and undergoing treatment. Table 3 depicts the living conditions of people with any disability and access to crucial services, and Supplementary Table 1 provides results in more detail for each type of disability. Overall, nearly half of the PWDs who did not have disability since birth were between 15 and 59 years old (45.9%), while nearly one-fifth (20.8%) had received any aid or help from the government. 57% of PWDs lived with their spouses, and 62.8% reported that caregivers were available. About 40% reported an inability to use public transport, while 54.4% reported inaccessibility to public buildings. Further, 57.7% of PWDs reported facing difficulties while accessing public buildings. Around 60.7% of PWDs reported a loss of work due to disability onset, and 69.6% did not have any official document certifying their disability for administrative purposes. Figure 1 further depicts the geographic disparities in the PWDs' access to basic services.

Table 4 demonstrates the multivariable binary logistic regression analysis results to present the socio-demographic variables affecting the likelihood of living with any type of disability. We found a significantly higher likelihood of living with disability with increasing age (Adjusted

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Odds ratio: 58.4; 95% Confidence Interval: 55.4-61.5 in >65 years vs up to 5 years), urban residence (1.3; 1.2-1.3) vs rural, social castes (1.3; 1.3-1.3 in general caste) vs scheduled tribes, and living in a Southern region of India (1.1; 1.1-1.2) compared to those from North India. However, female sex (0.6; 0.6-0.6), more years of education (0.3; 0.3-0.3), Islam followers (0.9; 0.9-0.9), currently married/widowed vs never married (0.3; 0.3-0.3), and higher socioeconomic status (0.5; 0.5-0.5) depicted significantly lower likelihood. Supplementary Table 2 provides results from the more detailed regression analysis for each type of disability.

8 Discussion

We report an investigation that assesses the epidemiology of PWD and their access to disability support and rehabilitation services in India using nationally representative data from India. Our findings reveal critical insights that have profound policy implications. First, we identify concerning disparities in disability prevalence across socio-demographic groups. Second, one-fifth of PWDs reported acquiring their disability at birth. Third, the most common place of disability origin was roads, followed by home. Fourth, approximately half of PWDs reported challenges in using public transport and buildings. Lastly, the majority of PWD reported a loss of work due to disability onset and did not have any official document certifying their disability.

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Disability prevalence was notably higher among older individuals, males, rural populations, and those from lower socio-economic backgrounds. Despite a modest 2.2% prevalence rate, this figure represents around 30 million people in India, and it is expected to rise, indicating an urgent need for attention. While there was a preponderance of males with locomotor disabilities, speech and language disabilities were significantly higher in females. As per the estimates obtained from the previous 36th, 47th, and 58th rounds of NSS, there is a constant rise in disability prevalence in rural (1.8% in the 36th round to 2.3% in 76th round) as well as urban (1.4% in 36th round to 2.0% in 76th round) areas, with the overall increase from 1.6%

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in 36th round in year 1981 to 2.2% in 76th round in year 2018.[7] Another study based on NFHS-5 depicts an overall disability prevalence of 4.52%, with a higher proportion of locomotor disabilities (44.70%), followed by mental disabilities (20.28%).[4] Similarly, an increased prevalence of locomotor (1.35%), visual (0.23%), and hearing disability (0.30%) among the elderly population belonging to rural areas, with a low level of education and low wealth quintile, respectively.

We observed that a high proportion of survey participants had their disabilities from birth. However, the available data limits our further understanding of such disabilities, whether they were congenital or acquired during the birthing process. Still, this high burden calls for mitigation strategies that target pregnancy more comprehensively and screening for intra-uterine pathologies causing disabilities like Down's syndrome and intellectual disabilities, later extending to include screening for auditory and visual disabilities, should be made more accessible.[32] Such screening tests can also help parents make timely decisions for either terminating the pregnancy or preparing for raising a child with a disability. Better awareness through adequate counselling of such bereaved parents may reduce parental anxiety. Further, adopting more rigorous screening toolkits and investigations for newborn screening at the primary healthcare level through the expansion of the Rashtriya Bal Swasthya Karyakram (Indian National program that involves screening of children from birth to 18 years of age for 4 Ds- Defects at birth, Diseases, Deficiencies and Development delays, spanning 32 common health conditions for early detection and free treatment and management, including surgeries at tertiary level) would help in increasing scope for early psychological or therapeutic interventions that would impact the quality of life of affected children.[33] In addition, the Pradhan Mantri Jan Arogya Yojana (PM-JAY) also offers free healthcare for children with disabilities not covered by the RBSK due to various reasons.[34,35] Additionally, the government has various healthcare schemes that cater to the specific needs of PWDs. The

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government provides assistive devices and aids such as wheelchairs, hearing aids, and prosthetic limbs at subsidised rates through schemes like the Assistance to Disabled Persons for Purchase/Fitting of Aids and Appliances (ADIP).[36] Under ADIP, aids and appliances are provided to PWDs at subsidised rates. Deendayal Disabled Rehabilitation Scheme (DDRS) provides financial assistance to NGOs for various rehabilitation services for persons with disabilities.[37] Apart from this, there is still scope for improvement to address specific issues related to health and ethics, the need to shift societal attitudes toward people with mental disabilities, and the set-up of accessible support systems for affected persons and their families (e.g. schools, vocational training) to improve the social inclusion of people with disabilities since birth.[38]

The most common place of disability origin was road, followed by home. Trauma is an important cause of locomotor disability, and in India, it is the second most common cause of locomotor disability.[39] Previous estimates suggest that road crashes maximally impact the poorest quintiles. Most people who experience road trauma are pedestrians, bicyclists and motorcyclists, are less prone to adopt safety gear while on the road, and also do not have adequate access to medical and social safety nets. [40,41] Anecdotal evidence from Chandigarh, a Union Territory of India, suggests that stringent traffic mutually benefits the public and the administration. On one side, it reduces morbidity due to road traffic acts, while on the other side, penalties generate massive revenues to run and develop the administration and also generate awareness. An increasing number of domestic accidents are equally concerning.[42] Domestic accidents may be subjected to under-reporting as most of the domestic injuries are considered minor, often neglected, and may be easily forgotten and subjected to recall bias. This changing trend is similar to many developed nations where more accidents happen in home than anywhere else. With increasing population and population density, we expect an increase. Domestic accidents depend on the physical and social environment and also on the

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functional capacity of the individual. While road traffic accidents are unforeseen and
 unexpected, it is generally accepted that domestic accidents can be prevented and minimised
 by taking adequate safety measures well in time.[43]

We observed that there is still scope for improving the accessibility of public buildings and transport by the PWDs, as they must accommodate PWDs' needs. Various schemes and initiatives demonstrate the Indian government's commitment to securing the rights and welfare of disabled populations in the country. India's commitment to the United Nations Convention on the Rights of PWD (UNCRPD) is embodied in the Rights of Persons with Disabilities Act of 2016 (RPWD Act, 2016). It emphasises dignity, autonomy, and non-discrimination for Persons with Disabilities (PWD).[44] The Act further mandates inclusive education, vocational training, and self-employment opportunities without discrimination. To increase the accessibility of public buildings, the Rights of Persons with Disabilities Act 2016 and the National Building Code of India 2016 outline expanded guidelines for building accessibility.[45] Compliance with these standards has been made compulsory, with responsibility falling on those involved in commissioning, designing, constructing, or managing built environments. The building design must adhere to relevant legislation, including equality and safety regulations. This focus on accessibility has fostered the adoption of universal design concepts, leading to numerous best practices for creating inclusive environments. These encompass accessible buildings, parking areas, parks, and recreational facilities, reflecting a concerted effort to ensure equal access and inclusion for people with disabilities in the built environment.

In addition to the above, the Indian government has taken several steps to ensure that the rights of disabled populations are secured. The Right to Education Act (RTE) aims to provide free and compulsory education for children with disabilities up to 18 years.[46] The governmentfunded higher education institutions reserve 5% of seats for PWDs, fostering diversity and Page 19 of 45

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enhancing workforce opportunities. This legislation reflects India's dedication to empowering individuals with disabilities, ensuring their full participation in society.[44] Additionally, the Samagra Shiksha Abhiyan integrates children with disabilities into mainstream education.[47] The National Education Policy 2020 also prioritises "inclusion" by aiming to fully integrate children with disabilities into the mainstream education system, providing necessary accommodations and support to ensure their active participation in the learning process without segregation or discrimination; this includes accessible infrastructure, specialised teaching methods, and assistive technologies tailored to individual needs.[48]

Likewise, many people lost their current jobs due to the onset of disabilities. Employment can enhance social sustainability and individual well-being.[49] Loss of jobs can be linked to the social stigma associated with impairment or disabilities and the perception of such people being less productive. Many employers have ill-founded views about the work-related abilities of PWDs; these negative views are often a result of interrelated concerns that permeate the entire employment cycle.[50] It is to be emphasised that negative attitudes toward disability disempower individuals with disabilities and lead to their social exclusion and isolation. By contrast, a healthy society encourages positive attitudes toward individuals with disabilities and promotes social inclusion.[51] However, various initiatives have been introduced to promote employment opportunities for PWDs. This includes reservation quotas in government jobs and incentives for the private sector to employ persons with disabilities. The government provides financial assistance and benefits to persons with disabilities through schemes like the National Handicapped Finance and Development Corporation (NHFDC), which offers loans and subsidies for education and training or self-employment ventures.[52] Some prominent schemes introduced for disabled people in India include the National Handicapped Finance and Development Corporation (NHFDC), which provides financial assistance to persons with disabilities for self-employment, education, and training.[52] Scheme for Implementation of Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

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Persons with Disabilities Act (SIPDA) to create barrier-free environments and improve the
quality of life for persons with disabilities.[53] Accessible India Campaign (Sugamya Bharat
Abhiyan) focuses on making public infrastructure and transportation accessible for persons
with disabilities. Inclusive Education for Disabled at Secondary Stage (IEDSS) supports the
inclusive education of students with disabilities at the secondary level.[54]

This study has a few strengths and limitations that should be acknowledged. Its major strength lies in its novelty by bringing social science and medicine to a common platform. The estimates generated using the weighted analysis are nationally representative and can serve as robust evidence to help guide the policies that improve accessibility. The present study takes a novel approach by initially delineating the proportions of various types of disabilities. Subsequently, it delves into the analysis concerning "any disability," thus unveiling unique characteristics within this broader category. By doing so, the study not only broadens the scope of understanding but also highlights the nuanced interplay between different types of disabilities and the socio-demographic backgrounds of PWD. This shift towards a more inclusive analysis holds promise for informing policy decisions and healthcare interventions tailored to address the complex needs of individuals with disabilities. The major limitation lies in the study's cross-sectional nature, which limits causality and temporal associations and is limited by recall bias, particularly when assessing disabilities from birth. We need more qualitative studies to better assess the impact of inaccessibility to basic support and rehabilitative services.[12] As a secondary analysis, we are limited by the number of variables that can further explain issues affecting accessibility to services. Due to a limited number of explanatory variables, the possibility of residual confounding cannot be negated. There was also a non-uniformity in the sample size when assessing different questions related to the impact of disability, but it was handled using available case analysis techniques to generate estimates and retain more data compared to listwise deletion. Lastly, some terms used in the manuscript may not be inclusive

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or even perceived as offensive by some readers but are coherent with the original survey report
 to prevent confusion in case some readers want to refer to the original report.

A few policy implications and recommendations emerged from the study. Given the increasing prevalence of disability and the concurrent escalating proportion of the geriatric population, we need to work on improving the accessibility for PWDs. A large number of disabilities originating from birth calls for more robust ante-natal and neonatal screening protocols supported by adequate counselling and rehabilitation services. Our results depict that a high proportion of PWDs have a caretaker who is available. Previous studies have suggested that empowering the caretakers can help improve the quality of life of PWDs. At the same time, there is an added burden on caregivers that should considered. empathetically Despite many schemes touched upon in the manuscript extended by the government to enhance the social inclusion of PWDs, there is a high unmet need that calls for more health advocacy around this issue.

To conclude, while most of the previous research has predominantly emphasised individual heterogeneity among PWDs, our study suggests that a large proportion of PWDs experience disparities in accessing disability support and rehabilitation services. There is an urgent need for concerted efforts to minimise such experiences, enhance the well-being and participation of PWDs, and empower them to contribute to society with their true potential. This will contribute to realising our national goals and stand towards our global commitment to the 2030 Agenda for Sustainable Development, which recognises the promotion of the rights, perspectives and well-being of PWDs as a pre-requisite while envisaging a more sustainable and inclusive world.

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Declarations

• Acknowledgements: Nil

Competing interests: None

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> 1 Ethics statement: The ethical approvals were not deemed necessary since it was • 2 secondary data analysis. No patient-level data were used in this paper. However, the 3 original survey was conducted by the Ministry of Statistics and Programme Implementation (MoSPI), which is mandated to act as the nodal agency for the integrated 4 5 development of the statistical systems in India. The Ministry, as part of its comprehensive 6 decision-making process on various matters, has formulated a Code of Ethics for Members 7 of the various Committees constituted by MoSPI or by the Organizations, Institutions, bodies, etc., funded by it that follow the principles of ethics and set out certain standards 8 9 of conduct for the members of the Committees in order to protect the confidentiality of the data/information acquired by them by virtue of their membership in such Committees. 10

- 11 Patient and Public Involvement: None
- **Funding:** No funding was involved at any stage of this study.
- Data availability: Data (Reference ID: DDI-IND-MOSPI-NSSO-76Rnd-Sch26.0-July2018 December 2018) is freely available on the website of the Ministry of Statistics and Programme Implementation (GOI) MOSPI's
 https://microdata.gov.in/nada43/index.php/catalog/154/overview, and can be accessed as
 per standard protocols.
 - 18 Ethics approval: Not applicable

Authors' contribution: MM, BB, and MA conceptualised the study, MV and AKJ
 collected data, drafted the manuscript, and reviewed it. VE, MV, and AKJ did the analysis
 and drafted the final version; MA and RK critically reviewed the manuscript from policy
 and feasibility points of view. All the authors read and approved the final version of the
 manuscript. MM is responsible for the overall content as guarantor.

³ 25 **References**

24

26 1. United Nations. Convention on the Rights of Persons with Disabilities [Internet].

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		-

1 2			
3	1		Human Rights Instruments. 2008 [cited 2024 Dec 16]. Available from:
4 5	2		https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-
6 7	3		persons-disabilities
8 9	4	2.	World Health Organization. Global report on health equity for persons with disabilities
10	5		[Internet]. 2023 [cited 2024 Dec 10]. Available from: https://www.knowledge-action-
11 12	6		portal.com/en/content/global-report-health-equity-persons-disabilities
13 14	7	3.	World Health Organization. World Report on Disability [Internet]. 2011 [cited 2022
15 16	8		Feb 9]. p. 1–27. Available from:
17	9		www.who.int/about/licensing/copyright_form/en/index.html
18 19	10	4.	Pattnaik S, Murmu J, Agrawal R, Rehman T, Kanungo S, Pati S. Prevalence, pattern
20 21	11		and determinants of disabilities in India: Insights from NFHS-5 (2019–21). Front
22 23	12		Public Heal. 2023;11:1036499.
24	13	5.	Ministry of Statistics and Programme Implementation(GOI) - MOSPI. Elderly in India
25 26	14		2021 [Internet]. 2021 [cited 2024 Dec 16]. Available from:
27 28	15		https://mospi.gov.in/sites/default/files/publication_reports/Elderly in India 2021.pdf
29 30	16	6.	Paul K, Saha S. Burden of Disability in India (1881–2011). J Multidiscip Res Healthc.
31	17		2015 Oct 5;2(1):31–54.
32 33	18	7.	Ministry of Statistics and Program Implementation Government of India. Persons with
34 35	19		Disabilities in India-NSS 76th report [Internet]. NSS Report No 583 (76/26/1). 2018
36 37	20		[cited 2024 Dec 12]. p. 209. Available from:
38	21		https://www.mospi.gov.in/sites/default/files/publication_reports/Report_583_Final_0.p
39 40	22		df
41 42	23	8.	International Institute for Population Sciences. National Family Health Survey (NFHS-
43 44	24		5) 2019-21 [Internet]. India Report. 2022 [cited 2024 Dec 16]. Available from:
45	25		https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf
46 47	26	9.	Rashmi R, Mohanty SK. Socioeconomic and geographic variations of disabilities in
48 49	27		India: evidence from the National Family Health Survey, 2019–21. Int J Health Geogr.
50	28		2024 Dec 1;23(1):1–16.
51 52	29	10.	Chanda S, Sekher T V. Identification of Disability for Inclusive Development: Lessons
53 54	30		from Disability Census of Kerala, India. SAGE Open. 2023;13(3).
55 56	31	11.	Department of Economic and Social Affairs. Disability and Development Report 2018
57	32		[Internet]. United Nations. 2019 [cited 2024 Dec 16]. Available from:
58 59	33		https://www.un.org/development/desa/disabilities/wp-
60	34		content/uploads/sites/15/2019/07/disability-report-chapter2.pdf
			22

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BMJ Open

2			
3 4	1	12.	Chavan BS. Relevance of qualitative research in disability. J Disabil Manag Rehabil.
5 6	2		2015;1(1):1–2.
7	3	13.	United Nations- Division for Inclusive Social Development (DISD). Article 24 -
8 9	4		Education [Internet]. Social Development Issues-Disability. [cited 2024 Dec 15].
10 11	5		Available from: https://social.desa.un.org/issues/disability/crpd/article-24-education
12	6	14.	United Nations- Division for Inclusive Social Development (DISD). Article 27 - Work
13 14	7		and employment [Internet]. Social Development Issues-Disability. [cited 2024 Dec
15 16	8		12]. Available from: https://www.un.org/development/desa/disabilities/convention-on-
17	9		the-rights-of-persons-with-disabilities/article-27-work-and-employment.html
18 19	10	15.	United Nations- Division for Inclusive Social Development (DISD). Article 6 -
20 21	11		Women with disabilities [Internet]. Social Development Issues-Disability. [cited 2024
22	12		Dec 12]. Available from: https://social.desa.un.org/issues/disability/crpd/article-6-
23 24	13		women-with-disabilities
25 26	14	16.	United Nations- Division for Inclusive Social Development (DISD). Article 7 -
27 28	15		Children with disabilities [Internet]. Social Development Issues-Disability. [cited 2024
29	16		Dec 12]. Available from: https://social.desa.un.org/issues/disability/crpd/article-7-
30 31	17		children-with-disabilities
32 33	18	17.	United Nations- Division for Inclusive Social Development (DISD). Article 9 -
34 35	19		Accessibility [Internet]. Disability. [cited 2024 Dec 10]. Available from:
36	20		https://social.desa.un.org/issues/disability/crpd/article-9-accessibility
37 38	21	18.	Sophie Mitra AP and BV. Disability and Poverty in Developing Countries: A Snapshot
39 40	22		from the World Health Survey [Internet]. The World Bank - Social Protection and Lab.
41	23		2011 [cited 2024 Dec 17]. Available from:
42 43	24		https://documents1.worldbank.org/curated/en/501871468326189306/pdf/625640NWP
44 45	25		0110900PUBLIC00BOX361487B.pdf
46 47	26	19.	United Nations. Transforming our world: the 2030 Agenda for Sustainable
48	27		Development [Internet]. Department of Economic and Social Affairs Sustainable
49 50	28		Development. 2015 [cited 2024 Dec 12]. Available from:
51 52	29		https://sdgs.un.org/2030agenda
53 54	30	20.	United Nations. International Human Rights Law [Internet]. Instruments &
55	31		mechanisms. [cited 2024 Dec 10]. Available from:
56 57	32		https://www.ohchr.org/en/instruments-and-mechanisms/international-human-rights-
58 59	33		law
60	34	21.	World Bank Group. Disability Inclusion [Internet]. Understanding Poverty. 2023 [cited
			22

BMJ Open

1 2			
2 3 4	1		2024 Dec 12]. Available from: https://www.worldbank.org/en/topic/disability
5	2	22.	Saran A, Hunt X, White H, Kuper H. Protocol: Effectiveness of interventions for
6 7	3		improving social inclusion outcomes for people with disabilities in low- and
8 9	4		middle-income countries: A systematic review. Campbell Syst Rev. 2021 Sep
10 11	5		29;17(3):e1191.
12	6	23.	Centers for Disease Control and Prevention. Disability and Health Disability Barriers
13 14	7		[Internet]. Disability Inclusion. [cited 2024 Dec 17]. Available from:
15 16	8		https://www.cdc.gov/ncbddd/disabilityandhealth/disability-barriers.html
17 18	9	24.	Ministry of Statistics and Programme Implementation G of I. Note on sample design
19	10		and estimation procedure of NSS 76th round. Ministry of Statistics and Programme
20 21	11		Implementation, Government of India.
22 23	12	25.	National Sample Survey Office, Ministry of Statistics and Program Implementation
24 25	13		Government of India. Schedule 26: Survey of persons with disabilities [Internet].
26	14		Seventy-Sixth round: July, 2018 - December, 2018, 2018. 2018 [cited 2024 Dec 12].
27 28	15		Available from:
29 30	16		https://www.mospi.gov.in/sites/default/files/NSS7612dws/NSS_76_sch_26.0.pdf
31	17	26.	Okoro CA, Hollis ND, Cyrus AC, Griffin-Blake S. Prevalence of Disabilities and
32 33	18		Health Care Access by Disability Status and Type Among Adults - United States,
34 35	19		2016. MMWR Morb Mortal Wkly Rep. 2018 Aug 17;67(32):882–7.
36 37	20	27.	Ozawa MN, Hun Yeo Y. Race/ethnicity and socioeconomic class as correlates of
38	21		disability in old age. J Gerontol Soc Work. 2008;51(3-4):337-65.
39 40	22	28.	Kavanagh AM, Krnjacki L, Aitken Z, Lamontagne AD, Beer A, Baker E, et al.
41 42	23		Intersections between disability, type of impairment, gender and socio-economic
43 44	24		disadvantage in a nationally representative sample of 33,101 working-aged
45	25		Australians. Disabil Health J. 2015 Apr 1;8(2):191–9.
46 47	26	29.	Courtney-Long EA, Carroll DD, Zhang QC, Stevens AC, Griffin-Blake S, Armour BS,
48 49	27		et al. Prevalence of Disability and Disability Type Among AdultsUnited States,
50	28		2013. MMWR Morb Mortal Wkly Rep. 2015 Jul 31;64(29):777-82.
51 52	29[d	lataset] 30. Ministry of Statistics and Programme Implementation(GOI) - MOSPI. India -
53 54	30	Sı	urvey of Persons with Disabilities NSS 76th Round : July 2018 - December 2018 -
55 56	31	0	verview [Internet]. Central Data Catalog. 2018 [cited 2024 Dec 10]. Available from:
57	32	ht	tps://microdata.gov.in/nada43/index.php/catalog/154/overview
58 59	33	31.	Stata. SVY estimation — Estimation commands for survey data [Internet]. [SEM] sem
60	34		- Structural equation model estimation command. [cited 2024 Dec 17]. Available
			24

Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

BMJ Open

1 2

2			
3 4	1		from: https://www.stata.com/manuals13/svysvyestimation.pdf
5	2	32.	Acharya K. Prenatal testing for intellectual disability: Misperceptions and reality with
6 7	3		lessons from down syndrome. Dev Disabil Res Rev. 2011 Jan 1;17(1):27-31.
8 9	4	33.	Bailey DB, Skinner D, Warren SF. Newborn Screening for Developmental
10	5		Disabilities: Reframing Presumptive Benefit. Am J Public Health. 2005
11 12	6		Nov;95(11):1889.
13 14	7	34.	National Health Authority, Government of India. Pradhan Mantri Jan Arogya Yojana
15 16	8		(PM-JAY) [Internet]. About PM-JAY. 2019 [cited 2024 Dec 10]. Available from:
17	9		https://nha.gov.in/PM-JAY
18 19	10	35.	Ministry of Health and Family Welfare. Government of India. RBSK-Rashtriya Bal
20 21	11		Swasthya Karyakram [Internet]. Schemes. 2024 [cited 2024 Dec 10]. Available from:
22 23	12		https://rbsk.mohfw.gov.in/RBSK/
24	13	36.	Department of Empowerment of Persons with Disabilities (DEPwD). Assistance to
25 26	14		Persons with Disabilities for Purchase/Fitting of Aids /Appliances (ADIP) [Internet].
27 28	15		Scheme. [cited 2024 Dec 17]. Available from: https://depwd.gov.in/adip/
29	16	37.	Department of Empowerment of Persons with Disabilities (DEPwD), Government of
30 31	17		India. Deendayal Divyangjan Rehabilitation Scheme (DDRS) [Internet]. Schemes.
32 33	18		2023 [cited 2024 Dec 10]. Available from: https://depwd.gov.in/ddrs/
34 35	19	38.	Hayes AM, Bulat J. Disabilities Inclusive Education Systems and Policies Guide for
36	20		Low- and Middle-Income Countries. RTI Press Publication. Research Triangle Park,
37 38	21		NC: RTI Press; 2017 Jul.
39 40	22	39.	Dhole RS, Gaur KA, More NS, Popalwar H, Lokhande V. Study of locomotor
41 42	23		disability due to various types of Trauma. Natl J Med Res. 2015;5(3):194-8.
43	24	40.	Musselwhite CBA, Avineri E, Susilo YO, Bhattachary D. Public attitudes towards
44 45	25		motorcyclists' safety: A qualitative study from the United Kingdom. Accid Anal Prev.
46 47	26		2012 Nov;49:105–13.
48	27	41.	World Bank Group. Traffic crash injuries and disabilities: The burden on Indian
49 50	28		society [Internet]. Policy Document. 2021 [cited 2024 Dec 17]. Available from:
51 52	29		https://www.worldbank.org/en/country/india/publication/traffic-crash-injuries-and-
53 54	30		disabilities-the-burden-on-indian-society
55	31	42.	Cole EOB, Christie SA, Oke R, Motwani G, Dickson D, Chendjou W, et al. Too
56 57	32		serious to ignore: The epidemiologic and economic burden of home injuries in the
58 59	33		Southwest Region of Cameroon-A community-based study. Bourgeois D, editor.
60	34		PLoS One. 2022 Sep 22;17(9):e0274686.

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1 2

BMJ Open

valence and pattern of domestic accidents in the	
ute of Urban Health Centre, Puducherry: a cross-	
nce Res. 2020;12(1).	-
ons with Disabilities. The Rights of persons with	
Document. 2016 [cited 2024 Dec 11]. Available	-
efault/files/A2016-49_1.pdf	
building code of India 2016 (NBC 2016)	υ
24 Dec 21]. Available from:	rotec
nical-department/national-building-code/	ted b
ucation [Internet]. [cited 2024 Dec 10]. Available	у со
y-your-rte/about	pyrig
f India. Samagra Shiksha [Internet]. 2021 [cited	ht, in
/samagra.education.gov.in/about.html	nclud
velopment; Government of India. National	ing fo
20 [cited 2024 Dec 17]. Available from:	or us
load_files/mhrd/files/NEP_Final_English_0.pdf	nseig es rei
pact of disability-related deprivation on	ated
oorhood level: does family socioeconomic status	ent S to te
9;11:1232829.	uperi xt an
, Jetha A, Martin Ginis KA. The Participation of	Enseignement Superieur (A Protected by copyright, including for uses related to text and data
lace Across the Employment Cycle: Employer	Ξ Φ
us Psychol. 2020 Apr 1;35(2):135–58.	s). ning,
g the Perception of Disability: A Developmental	Al tra
21;12:702166.	ainin
ons with Disabilities (DEPwD). National	g, an
corporation-India [Internet]. Organizations Under	ES) nining, Al training, and similar technologies
vailable from: https://depwd.gov.in/national-	nilar t
nt-corporation/	echn
ons with Disabilities (DEPwD), Government of	ologi
the Rights of Persons with Disabilities Act, 2016	es.
ited 2024 Dec 12]. Available from:	
fundia Inclusiva Education of the D' 11-1 (
f India. Inclusive Education of the Disabled at	u L
DE. 2016 [cited 2024 Dec 17]. Available from:	-
26	
en.bmj.com/site/about/guidelines.xhtml	1

3	1	43.	Rehman T, Sulgante S, Sekhar S. Prevalence and pattern of domestic accidents in the
4 5	2		field practice area of Jawaharlal Institute of Urban Health Centre, Puducherry: a cross-
6 7	3		sectional analytical study. J Inj Violence Res. 2020;12(1).
8 9	4	44.	Department of Empowerment of Persons with Disabilities. The Rights of persons with
10	5		disabilities act 2016 [Internet]. Policy Document. 2016 [cited 2024 Dec 11]. Available
11 12	6		from: https://legislative.gov.in/sites/default/files/A2016-49_1.pdf
13 14	7	45.	Bureau of Indian Standards. National building code of India 2016 (NBC 2016)
15 16	8		[Internet]. SP 7: 2016. 2016 [cited 2024 Dec 21]. Available from:
17	9		https://www.bis.gov.in/standards/technical-department/national-building-code/
18 19	10	46.	Centre for Civil Society. Right To Education [Internet]. [cited 2024 Dec 10]. Available
20 21	11		from: https://righttoeducation.in/know-your-rte/about
22 23	12	47.	Ministry of Education, Government of India. Samagra Shiksha [Internet]. 2021 [cited
24	13		2024 Dec 17]. Available from: https://samagra.education.gov.in/about.html
25 26	14	48.	The Ministry of Human Resource Development; Government of India. National
27 28	15		Education Policy, 2020 [Internet]. 2020 [cited 2024 Dec 17]. Available from:
29 30	16		https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
31	17	49.	Qiu N, Jiang Y, Sun Z, Du M. The impact of disability-related deprivation on
32 33	18		employment opportunity at the neighborhood level: does family socioeconomic status
34 35	19		matter? Front Public Heal. 2023 Aug 9;11:1232829.
36	20	50.	Bonaccio S, Connelly CE, Gellatly IR, Jetha A, Martin Ginis KA. The Participation of
37 38	21		People with Disabilities in the Workplace Across the Employment Cycle: Employer
39 40	22		Concerns and Research Evidence. J Bus Psychol. 2020 Apr 1;35(2):135–58.
41 42	23	51.	Babik I, Gardner ES. Factors Affecting the Perception of Disability: A Developmental
43	24		Perspective. Front Psychol. 2021 Jun 21;12:702166.
44 45	25	52.	Department of Empowerment of Persons with Disabilities (DEPwD). National
46 47	26		divyangjan finance and development corporation-India [Internet]. Organizations Under
48 49	27		DEPwD. 2024 [cited 2024 Dec 10]. Available from: https://depwd.gov.in/national-
50	28		handicapped-finance-and-development-corporation/
51 52	29	53.	Department of Empowerment of Persons with Disabilities (DEPwD), Government of
53 54	30		India. Scheme for Implementation of the Rights of Persons with Disabilities Act, 2016
55	31		(SIPDA) [Internet]. Schemes. 2016 [cited 2024 Dec 12]. Available from:
56 57	32		https://depwd.gov.in/sipda/
58 59	33	54.	Ministry of Education, Government of India. Inclusive Education of the Disabled at
60	34		Secondary Stage [Internet]. About MoE. 2016 [cited 2024 Dec 17]. Available from:

https://www.education.gov.in/iedss

to occurrences

BMJ Open BMJ Open Tables Tables Table 1: Prevalence of different types of disabilities across different socio-demographic characteristics, NSS, 76th round, India (n=576,796)

Background characteristics	Locomotor N (%)	Vision N (%)	Hearing N (%)	Speech N (%)	Mental Retardation N (%)	Mental Illness N (%)	Ditters Ditters 2010	Any one disability N (%)
C .	61981 (1.36)	11977 (0.23)	15294 (0.30)	12661 (0.23)	8564 (0.16)	6751 (0.16)	<u>e</u> 321 (0.05)	107,125 (2.20)
Age Group (completed years)							nem	
up to 5	1494 (2.2)	182 (1.5)	311 (2)	907 (7.3)	445 (5.3)	41 (0.5)	1 8 82 (5.5)	2839 (2.5)
`6-17	7290 (10.8)	1210 (9.2)	1977 (12.6)	4515 (35.8)	3492 (41.2)	1060 (15.4)	up 🖓 1 (21.5)	16695 (14.4)
18-35	11546 (18)	1386 (10.7)	2036 (13.3)	3273 (26.4)	2796 (33)		e 6 1 (19.8)	20673 (18.8)
36-49	11434 (18.1)	1557 (12.3)	2118 (13)	1812 (13.8)	1113 (12.4)	1646 (25)		18665 (17.2)
50-65	16627 (27.9)	3609 (31.1)	3843 (25.1)	1495 (11.4)	561 (6.5)		5 (21.9)	26420 (25.7)
65+	13590 (23)	4033 (35.2)	5009 (34)	659 (5.3)	157 (1.6)	680 (10.1) 4	• 524 (16.6)	21833 (21.4)
Sex				101			njop	
Male	36862 (58.7)	6014 (50.2)	7993 (52)	7554 (60.4)	5202 (61.7)	3856 (56.8)	1764 (58.9)	61707 (57.3)
Female	25110 (41.3)	5958 (49.8)	7296 (48)	5106 (39.6)	3359 (38.3)	2893 (43.2)	1355 (41.1)	45396 (42.7)
Marital Status								
Never Married	16912 (24.7)	2719 (20.8)	3987 (24.2)	8708 (67.8)	7450 (86.9)	3281 (46.1)	1 9 14 (40.4)	36813 (31.4)
Ever Married	33257 (55.3)	5541 (46.9)	7094 (47.5)	3086 (25.3)	791 (9.3)	2381 (35.8)	1902 (47.2)	50108 (48.8)
Widowed	11293 (19)	3616 (31.5)	4024 (27.1)	690 (5.4)	190 (2.1)	775 (12.5)		18933 (18.5)
divorced/separated	519 (1)	101 (0.8)	189 (1.1)	177 (1.4)	133 (1.8)	314 (5.5)	8 9 (1.2)	1271 (1.3)
Area of residence							at A	
Rural	42222 (71.6)	8809 (76.3)	11121 (74.9)	9164 (72.9)	5974 (69.9)	4772 (73.1)	2 9 55 (62.4)	75091 (72.8)
Urban	19759 (28.4)	3168 (23.7)	4173 (25.1)	3497 (27.1)	2590 (30.1)	1979 (26.9)	1966 (37.6)	32034 (27.2)
Educational attainment							blic	
Non-literate	26376 (44.5)	7160 (62.6)	8365 (57.3)	7119 (56.9)	5846 (69.3)	3285 (49.6)	dfaphique de l	50848 (48.9)

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Literate but not formal	15002 (23.2)	2483 (19.4)	3700 (22.9)	3428 (26.7)	1858 (21)	ب ر 1629 (23.3)	8 59 (29)	26145 (23
Upto primary	16885 (26.5)	1987 (15.5)	2782 (16.9)	1908 (14.9)	808 (9.1)	1623 (24.1)	% 6 (28.7)	25210 (23
Upto secondary	3718 (5.8)	347 (2.6)	447 (2.9)	206 (1.5)	52 (0.6)	214 (3.1) 5	2 38 (8.2)	4922 (4.6
Preferred Religion						, u	ີ ທີ່ 1<	
Hindu	49548 (81.9)	9479 (82.9)	12090 (82.6)	9658 (78.7)	6540 (78.7)	5063 (74.7)	2 4 44 (80.8)	84742 (81
Islam	8375 (12.5)	1601 (12.5)	1927 (11.7)	2021 (15.6)	1366 (15.9)	1167 (18.4)	492 (12.6)	14658 (12
Others	4058 (5.6)	897 (4.6)	1277 (5.7)	982 (5.7)	658 (5.4)	521 (6.9) 6	8 75 (6.5)	7725 (5.5
Social Group						text	Nnlo	
Scheduled Tribe	6049 (8.3)	1491 (9.1)	1923 (9.5)	1478 (9.4)	822 (7.2)	670 (7.8)	452 (12.3)	11729 (8.
Scheduled Caste	12240 (20.4)	2407 (21.3)	2805 (19.4)	2467 (20.5)	1602 (19.2)	1269 (19.9)	574 (17.8)	20925 (20
Other Backward Classes	26861 (44.7)	5205 (46)	6583 (45.5)	5482 (44.7)	3806 (45.8)	2915 (45.7)	67 (40.2)	46223 (44
General	16831 (26.6)	2874 (23.6)	3983 (25.6)	3234 (25.4)	2334 (27.8)	1897 (26.6)	9 28 (29.7)	28248 (2
Wealth Index						J, A	nj.	
Poorer	17681 (30.2)	3919 (35.1)	4933 (34.7)	3552 (30.1)	2025 (25.3)	1932 (31)	2 3 (25.8)	31259 (3
Poor	12553 (20.5)	2474 (20.8)	3005 (19.4)	2746 (21.4)	1773 (20.9)	1364 (20.5)	\$ 4 (16.2)	21959 (20
Middle	11468 (18.2)	2271 (18.5)	2730 (17.4)	2434 (18.5)	1751 (20)	1302 (18.1)	5 0 (17.3)	20058 (18
Richer	10440 (16)	1864 (14.4)	2480 (15.4)	2080 (15.8)	1611 (18.3)	1161 (16.8)	3 (19.9)	17946 (15
Richest	9839 (15.1)	1449 (11.1)	2146 (13)	1849 (14.2)	1404 (15.5)	992 (13.6) a	2 2 1 (20.7)	15903 (14
Regions of India							ine 7	
Northern	8787 (14.4)	1478 (13.1)	1692 (11.7)	1347 (11.1)	1144 (13.5)	931 (14.2)	8 16 (7.6)	14305 (13
Southern	13448 (23)	2814 (24.7)	4013 (27.3)	2958 (24.8)	2141 (25.6)	1447 (21.3)	Tag 4 (25.5)	23699 (23
Western	8387 (12.7)	1286 (10.1)	1740 (11.1)	1423 (11.3)	1293 (15.2)	706 (10.6)	G (17.7)	13708 (12
Eastern	12790 (20.3)	2538 (21.9)	3238 (22.5)	3248 (27.1)	1762 (21.3)	1672 (26.3)	% 4 (30.4)	23061 (21
North-Eastern	3858 (2.1)	1335 (4.5)	1620 (3.7)	1308 (3.4)	594 (2)	582 (2.7)	8 82 (2.4)	8839 (2.8
Central	14711 (27.4)	2526 (25.6)	2991 (23.8)	2377 (22.4)	1630 (22.6)	1413 (24.8)	4 5 (16.3)	23513 (2

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Table 2: Percentage distribution	oution of diff	ferent disa	bility type:	s and their a	associated i	<u> </u>	on, NSS 76 ^t	ⁿ round, I
	Locomotor	Visual	Hearing	Speech and language	Mental retardation/	Ngenta Mgness	Other types of disability	Any Disabil
Total sample size	61980	1156	1281	2013	1217		768	61980
Causes of disability						ay 20 nseig es re		
Disease	28673 (46.3)	454 (39.3)	484 (37.8)	1246 (61.9)	NA	Jném lated	NA	NA
Other than disease due to burn	723 (1.2)	88 (0.7)	1 (0.1)	8 (0.4)	NA		NA	NA
Injuries other than burn	13876 (22.4)	156 (13.5)	158 (12.4)	105 (5.2)	NA	5 May 2025. Downloaded from http: ?Enseignement Superigur (ABES) r Uses related to text and data minii 11	NA	NA
Other causes	18702 (30.2)	538 (46.5)	637 (49.7)	654 (32.5)	NA	ried f	NA	NA
Disability from Birth		NO.				rom (AB ata n		
Yes	11,488 (18.5)	91 (7.9)	198 (15.4)	1041 (51.7)	955 (78.5)	113.00.4)	119 (15.5)	11,488 (18.:
No	50,052 (80.8)	1062 (91.9)	1081 (84.4)	964 (47.9)	258 (21.2)		645 (84)	50,052 (80.3
Not Known	440 (0.7)	3 (0.2)	2 (0.2)	8 (0.4)	4 (0.3)	括 (1 <mark>융</mark>	4 (0.4)	440 (0.7)
Disability commenced in last 365 days				19		n.bmj.c ining, ar		
sample size	48741	1034.2	1052.4	938.7	251.6	8 94.	628.6	48741
Yes	2987 (6.1)	72 (7)	65 (6.2)	100 (10.6)	11 (4.4)	40 (10 2)	48 (7.7)	2987 (6.1)
No	45754 (93.9)	961 (93)	987 (93.8)	839 (89.4)	240 (95.6)	35 8 (898)	580 (92.3)	45754 (93.9
Place of occurrence of disability						7, 20 hnol		
Sample size	14281	161	157	105	33	2025 at hologies	63	14281
Workplace	2308 (16.2)	13 (8.3)	30 (19.2)	11 (10.9)	2 (6.9)	9 (1)	11 (18.1)	2308 (16.2
Road	5977 (41.9)	46 (28.5)	43 (27.5)	41 (38.7)	9 (25.9)	35 (40 G)	15 (23.8)	5977 (41.9
Home	4693 (32.9)	93 (57.9)	73 (46.3)	45 (42.4)	19 (58.5)	33 (38 98)	31 (49.5)	4693 (32.9
Other places	1302 (9.1)	9 (5.3)	11 (7)	8 (8)	3 (8.7)	8 (9.53phique de	5 (8.6)	1302 (9.1)

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						·2024 ight,		
Freatment taken/undergoing reatment						·2024-090220 o ight, including		
Sample size	61980	1156	1281	2013	1217	on 15 for 15	768	61980
yes: consulting doctor	35,923 (58)	566.6 (49)	617 (48.2)	1,080 (53.7)	710 (58.4)	26 ges (May	330 (43)	35923 (58)
Otherwise	1565 (2.5)	22 (1.9)	34 (2.7)	42 (2.1)	36 (2.9)	reign relat	6 (0.7)	1564.5 (2.5
Yes: consulting doctor, plus undergoing treatment	17329 (28)	375 (32.4)	418 (32.7)	719 (35.7)	355 (29.2)	5. Down 19to te	397 (51.7)	17329 (28)
Otherwise	860 (1.4)	34 (2.9)	21 (1.7)	20 (1)	4 (0.3)	1/ar	8 (1)	860 (1.4)
Attending special school/special therapy	116 (0.2)	2.9 (0.3)	0 (0)	4 (0.2)	6 (0.5)	2025. Downloaded from Intp eignement Superieu® (ABES) related to text and data mini	0 (0)	116 (0.2)
Cannot afford treatment	2040 (3.3)	75 (6.4)	73 (5.7)	72 (3.6)	55 (4.6)		8 (1)	2040 (3.3)
No treatment available for the disability	699 (1.1)	13 (1.1)	8 (0.6)	17 (0.8)	16 (1.3)	://b⊛jop 19,4[l tr	5 (0.7)	699 (1.1)
Not required	2717 (4.4)	60 (5.2)	97 (7.6)	47 (2.3)	26 (2.1)	trakin	14 (1.8)	2717 (4.4)
Not known	732 (1.2)	8 (0.7)	12 (0.9)	13 (0.7)	9 (0.7)	ອີງລູ(0.6) ກຸ່ມ ກຸ່ມ	1 (0.1)	732 (1.2)

Note: Causes of disability were recorded for individuals with disabilities like locomotor, visual, hearing, and speece

 Disability Commenced in the last 365 days was recorded for those individuals who did not have a disability from birth' but disability commenced during the last 365 days before the survey.

during the last 365 days before the survey. Place of occurrence was recorded for individuals with disabilities who are experiencing disability post their birds and for whom the cause of disability was burn, injury or other than burn. 31 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

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Line	Weishted
Living conditions of the people (<i>n=sample included in the analysis</i>)	Weighted percentage
Age at the onset of disability* (n= 48,727) 0 to 4 years	17.2
5 to 14 years	9.0
15 to 59 years	45.9
60 years and above	28.0
Receipt of aid/help (n=61,712)	
Received aid/help from Government	20.8
Received aid/help from organisations other than government	4.1
Did not receive aid/help	75.1
Living arrangement(n=61,962)	
Living alone or with a spouse	57.0
Living with others	43.0
Arrangement of regular caregiver(n=61,980)	
Care-giver required but not available	0.1
Care-giver is not required	37.1
Care-giver is available	62.8
Access to public Transport (n=61,980)	
Yes	59.6
No	40.4
Accesses to public building (n=61,980)	1.5. (
Yes	45.6
No No	54.4
Difficulty faced accessing public building(n= 27,756) difficulty faced: due to stairs and non-availability of ramp, grooved tiles or lift	577
	57.7
in opening doors no seating arrangement: in the waiting area	4.4
at the point of receiving service	0.8
no special toilet seats	0.8
no sign for direction/ instruction/no public announcement system	0.7
no difficulty faced	27.6
others	7.0
Employed/working before onset of disability (For persons of age 15 years and	1.5
above; n=55,819)	
Yes	40.3
No	59.7
Disability causing loss or change in job(n= 21,559)	
loss of work	60.7
change of work	18.3
no loss or change of work	21.3
Having Disability Certificate(n=61,980)	
Yes	30.4
No	69.6
Percentage of Disability as per Certificate (n=20,213)	
40-<60%	49.3
<u>>60-<80%</u>	36.3
<u>≥80%</u>	12.8
none of these	1.6

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	Unadjusted Odds ratio (95% C.I)	p-value	Adjusted Odds ratio (95% C.I)	p-value
Age Group (Completed years)				
Up to 5 years	Reference value		Reference value	
6 - 18 years	2.1(2-2.1)	< 0.001	3.5(3.4-3.7)	< 0.001
19-35 years	2.3(2.2-2.4)	< 0.001	8.4(8-8.8)	< 0.001
36-49 years	3.5(3.4-3.7)	< 0.001	17.6(16.8-18.5)	< 0.001
50-65 years	6.4(6.1-6.7)	< 0.001	25.8(24.5-27.1)	< 0.001
65+ years	17.5(16.7-18.2)	< 0.001	58.4(55.4-61.5)	< 0.001

Reference value

Male

Reference value

Iviale	Iterer ence value		Itereference value	
Female	0.7(0.7-0.7)	< 0.001	0.6(0.6-0.6)	< 0.001
Place of Residence				
Rural	Reference value		Reference value	
Urban	1.02(1.01-1.03)	0.03	1.3(1.2-1.3)	< 0.001
Social Group				
Scheduled Tribe	Reference value		Reference value	
Scheduled Caste	1.1(1.1-1.1)	< 0.001	1.1(1.1-1.2)	< 0.001
Other Backward Classes	1.1(1-1.1)	< 0.001	1.1(1.1-1.2)	< 0.001
General	1.1(1.1-1.1)	< 0.001	1.3(1.3-1.3)	< 0.001
Educational attainment				
No education	Reference value		Reference value	
Upto Primary class	0.5(0.5-0.5)	< 0.001	0.5(0.5-0.5)	< 0.001
Upto Secondary Class	0.4(0.4-0.4)	< 0.001	0.4(0.4-0.4)	< 0.001
Graduate & Above	0.3(0.3-0.4)	< 0.001	0.3(0.3-0.3)	< 0.001
Preferred Religion				
Hindu	Reference value		Reference value	
Islam	0.8(0.8-0.9)	< 0.001	0.9(0.9-0.9)	< 0.001
Others	0.9(0.9-1)	< 0.001	1(1-1.1)	0.019
Marital Status		4		
Never married	Reference value		Reference value	
Currently married	1.3(1.3-1.3)	< 0.001	0.3(0.3-0.3)	< 0.001
widowed	5.9(5.8-6.1)	< 0.001	0.6(0.5-0.6)	< 0.001
Divorced/separated	4.4(4.1-4.8)	< 0.001	1.1(1-1.2)	0.011
Wealth Index				
Poorest	Reference value		Reference value	
Poor	0.6(0.6-0.6)	< 0.001	0.7(0.7-0.7)	< 0.001
Middle	0.6(0.5-0.6)	< 0.001	0.6(0.6-0.6)	< 0.001
Richer	0.5(0.5-0.5)	< 0.001	0.5(0.5-0.6)	< 0.001
Richest	0.4(0.4-0.4)	< 0.001	0.5(0.5-0.5)	< 0.001
Regions of India				
Northern	Reference value		Reference value	
Southern	1.42(1.39-1.46)	< 0.001	1.1(1.1-1.2)	< 0.001
		< 0.001	1(1-1.1)	0.065
Western	1.13(1.1-1.16)	<0.001		
Eastern	$\frac{1.13(1.1-1.16)}{1.15(1.13-1.18)}$	<0.001	1(0.9-1)	0.001
				0.001 0.361

1	Figure Legends
2	Figure 1: Geographical disparities in the difficulties faced by the people living
3	with disabilities as per the 76 th Round of the National Sample Survey, India
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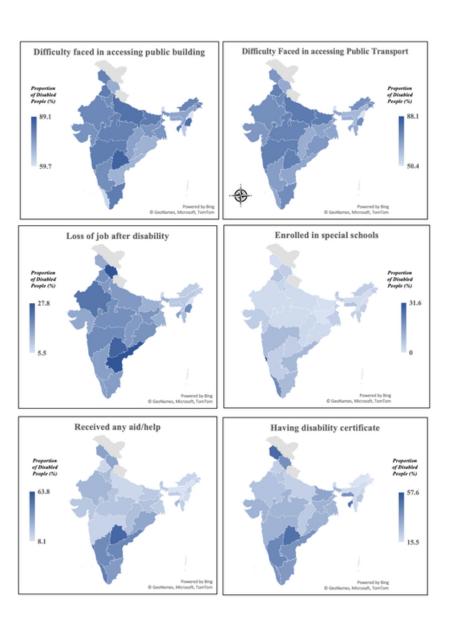


Figure 1: Geographical disparities in the difficulties faced by the people living with disabilities as per the 76th Round of the National Sample Survey, India

40x58mm (300 x 300 DPI)

BMJ Open Supplementary Table 1: Living conditions of the people living with different types of of the second for the National Sample Survey Organization India (2017-18)

Living conditions of the people (<i>n</i> = <i>sample included in the analysis</i>)	Locomotor	Visual	es region Hearingen Hearingen	Speech	Mental retardness	Mental illness	Others
	Weighted %	Weighted %	Weighted &	Weighted %	Weighted %	Weighted %	Weighted %
Age at the onset of disability			4.2 ar	~~~~			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
0 to 4 years	17.2	3.0	4.2 ft a	21.0	51.0	10.1	9.9
5 to 14 years	9.0	2.3	3.0 de 3.0 de 17.4 a 3.0 de 4 a 3.0 de 4 a 3.0 de 4 a 5.4 m 5.4 m 5.	9.6	17.3	12.3	7.0
15 to 59 years	45.9	22.1	17.44ta	40.9	24.0	40.5	49.2
60 years and above	28.0	72.6	75.43 B	28.4	7.7	37.1	33.8
Total number of participants	48,737	1,035	1,05€.95	946	259	395	632
Receipt of aid/help			g, .				
Received aid/help from Government	20.8	22.2	20.7 t	29.2	37.2	25.5	20.0
Received aid/help from organisations other than			8.6				
government	4.1	10.2	8.6 m	4.0	3.3	6.0	2.7
Did not receive aid/help	75.1	67.7	70.88	66.8	59.5	68.5	77.3
Total number of participants	61,712	1,145	1,272	2,010	1,215	521	766
Living arrangement			on mil				
Living alone or with a spouse	57.0	43.5	41.6 r u	26.8	4.1	35.4	55.8
Living with others	43.0	56.5	58.4 ^{ec}	73.2	95.9	64.6	44.2
Total number of participants	61,962	1,156	1,28 6	2,013	1,217	523	768
Arrangement of regular caregiver			1,28 <u>6</u> 20 9 25				
Care-giver required but not available	0.1	0.0	0.0 s.	0.1	0.9	0.0	0.3
Care-giver is not required	37.1	11.5	15.7 Ge	8.8	5.6	10.8	13.4
Care-giver is available	62.8	88.6	84.2 nce	91.1	93.6	89.2	86.3
Total number of participants	61,980	1,156	1,281	2,013	1,217	523	768
Accesses to public building			1,281 Bi io 29.4 Ta				
Yes	45.6	25.4	29.4 gra	27.2	26.0	26.0	29.9

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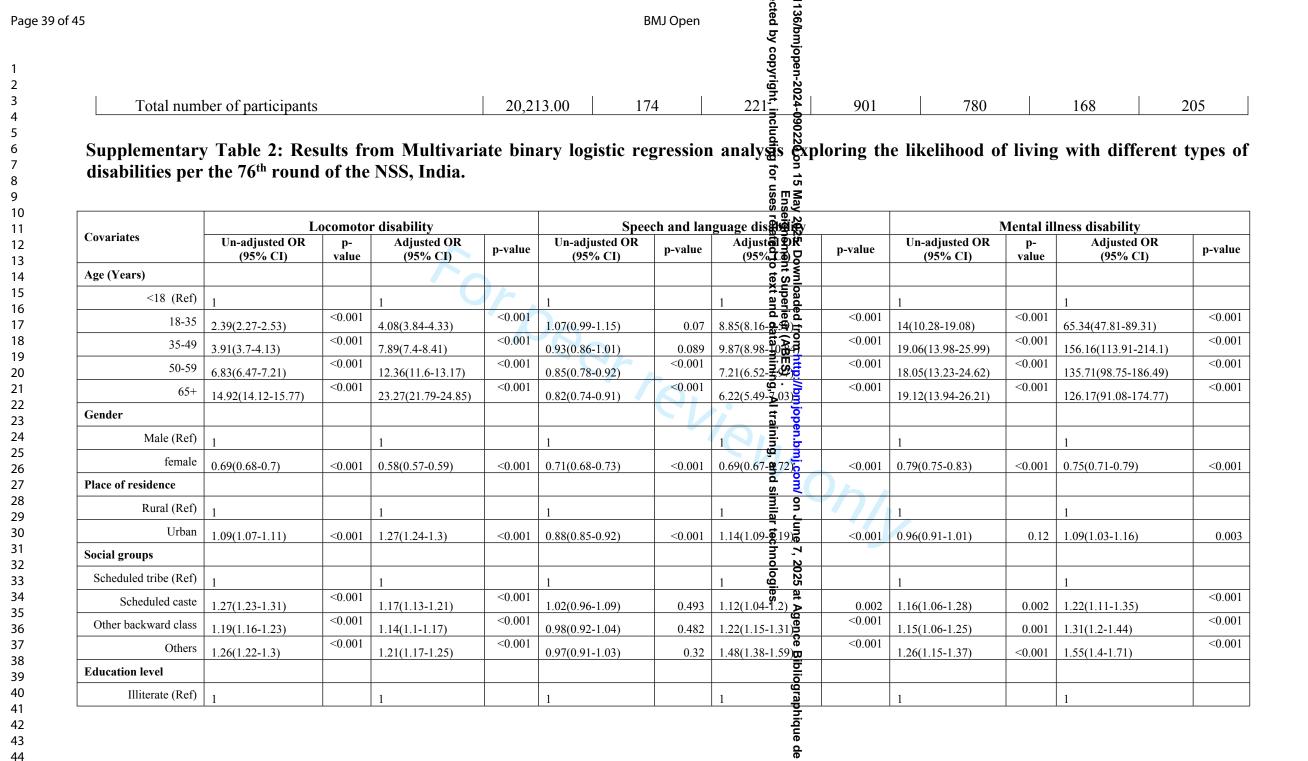
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No	54.4	74.6	right_i 70.6	72.8	74.0	74.0	70.1
Total number of participants	61,980	1156	1281 8	2013	523	523	768
Difficulty faced accessing public building			yright, in <u>-2024-090220</u> on 15 N 128 <u>U</u> ding for us 60.7 us				
difficulty faced: due to stairs and non-availability of			on Ig f				
ramp, grooved tiles or lift	57.7	63.2	60.7 c 5	55.4	49.7	46.7	52.2
in opening doors	4.4	1.6	60.7. 5 1.3 cs Ensy 2.9 reignements 2.2 2.1 attement Superieur 0.0 to text and compared 17.6d data million 13.3 attemperieur 433 million 433 million	2.8	1.0	7.6	2.8
no seating arrangement: in the waiting area	1.6	3.0	2.9 reig	0.7	1.4	1.7	2.1
at the point of receiving service	0.8	5.7	2.1 at e 125	0.9	0.8	1.3	0.3
no special toilet seats	0.7	0.4		0.7	0.0	0.8	0.9
no sign for direction/ instruction/no public			e tex				
announcement system	0.3	2.2	2.0 to be	2.2	2.1	1.3	0.0
no difficulty faced	27.6	8.4	17.6 ⁿ e	15.2	17.7	24.2	25.8
others	7.0	15.4	13.3 data	22.1	27.4	16.3	15.8
Total number of participants	27,756	330		537	330	134	226
Working before onset (For >15 years and above)			<u> </u>				
Yes	40.3	44.4	35.9	32.7	5.6	38.5	53.6
No	59.7	55.6	64.1 [±] / _± [±] / ₅	67.3	94.4	61.5	46.4
Total number of participants	55,819	1093	1173 si si	1353	690	448	667
Disability causing loss or change in job			ing				
loss of work	60.7	75.3	72.8	86.5	80.9	84.2	82.8
change of work	18.3	11.0	72.88	5.2	2.7	8.7	5.9
no loss or change of work	21.3	13.7	21.5 ^m on June 404 ^{tr} tech	8.3	16.4	7.1	11.4
Total number of participants	21,559	465	404 art ur	425	37	165	343
Having Disability Certificate			ech				
Yes	30.4	14.0	16.1 <mark>0</mark>	41.7	59.8	29.9	24.9
No	69.6	86.0	16.10 20 83.99 25	58.3	40.2	70.1	75.1
Total number of participants	61,980	1156	1281 ⁶ A	2013	1217	523	768
Percentage of Disability as per Certificate			128 128				
40% or more but less than 60%	49.3	23.2	22.5 ce	16.9	14.6	27.7	29.7
60% or more but less than 80%	36.3	37.6		32.3	35.5	43.0	37.3
80% or more	12.8	38.7	34.2 Bi 42.2 io 1.1 graphic ue	50.3	49.1	29.0	31.7
none of these	1.6	0.5	1.1 g	0.5	0.8	0.4	1.3

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(0.56-0.59) <0.001 (0.56-0.58) <0.001 (0.55-0.6) <0.001	0.84(0.82-0.86) 0.76(0.74-0.78) 0.66(0.63-0.68)	<0.001 <0.001	0.51(0.49-0.53) 0.25(0.24-0.26) 0.12(0.11-0.14)	<0.001 <0.001	0.24(0.23-525) 0.11(0.11-525) 0.05(0.04-606) 0.05(0.04-606)	<0.001 <0.001	0.53(0.5-0.56) 0.47(0.44-0.49) 0.28(0.24-0.32)	<0.001	0.52(0.49-0.56) 0.34(0.32-0.36) 0.15(0.13-0.17)	<0.00
<0.001		< 0.001		< 0.001		< 0.001		< 0.001		< 0.00
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<0.001	1		1		1 uses		1		1	
(0.82-0.86)	0.96(0.94-0.99)	0.004	1.05(1-1.11)	0.031	0.83(0.79-55	0	1.16(1.09-1.24)	< 0.001	1.08(1.01-1.16)	0.0
(0.82-0.87) <0.001	0.99(0.95-1.03)	0.607	1.07(1-1.14)	0.057		0.001	S2	0.101	1.17(1.06-1.29)	0.00
					to te					
		h	1		1 Supe		1		1	
(1.86-1.93) <0.001	0.52(0.51-0.54)	< 0.001	0.31(0.3-0.33)	< 0.001	0.15(0.14-6, 12)	0	0.66(0.62-0.69)	< 0.001	0.13(0.12-0.14)	< 0.0
<0.001				< 0.001	0 16(0 15-0 28)		× /	< 0.001	, , , , , , , , , , , , , , , , , , ,	<0.0
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(0.66-0.69) <0.001	0.78(0.76-0.8)	< 0.001	0.77(0.73-0.81)	< 0.001	0.81(0.77-	0	0.7(0.65-0.75)	< 0.001	0.83(0.77-0.89)	< 0.0
0.59-0.62)		< 0.001	, , , , , , , , , , , , , , , , , , ,	< 0.001	0.74(0.7-0 a 78)			< 0.001		< 0.0
(0.54-0.56) <0.001		< 0.001	, , , , , , , , , , , , , , , , , , ,	< 0.001			× /	< 0.001	, , , , , , , , , , , , , , , , , , ,	< 0.0
(0.51-0.54) <0.001		< 0.001		< 0.001		0		< 0.001		< 0.0
					ar te					
	1		1		•7,		1		1	
(1.22-1.3) <0.001	0.97(0.94-1)	0.073	1.78(1.67-1.9)	< 0.001	1.84(1.72 -6 97)	< 0.001	1.25(1.15-1.36)	<0.001	1.05(0.96-1.15)	0.2
(1.08-1.15) <0.001			, , , , , , , , , , , , , , , , , , ,	< 0.001		< 0.001				0.0
		< 0.001	, , , , , , , , , , , , , , , , , , ,	< 0.001		< 0.001	× /	< 0.001		0.0
(0.66-0.71) <0.001	0.66(0.63-0.69)	< 0.001		< 0.001	0	< 0.001	× × ×	0.833	Ì Ì	0.3
		< 0.001	, , , , , , , , , , , , , , , , , , ,	0.026	0.85(0.79-0.92)	< 0.001	0.93(0.85-1.01)	0.073	, , , , , , , , , , , , , , , , , , ,	<0.0
	1.86-1.93) <0.001	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $

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		Hearing	disability			Visual	disability 9			Mental	retardness.	
	Un-adjusted OR (95% CI)	p- value	Adjusted OR (95% CI)	p- value	Un-adjusted OR (95% CI)	p- value	Adjusted (95% GI	p-value	Un-adjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age (Years)							2025. relate					
<18 (Ref)	1		1		1		1 in the second		1		1	
18-35	1.95(1.73-2.2)	< 0.001	5.16(4.55-5.85)	0	10.37(1.94-2.65)	< 0.001	6.57(5.59 a 32	< 0.001	1.88(1.7-2.08)	< 0.001	33.33(30-37.04)	< 0.00
35-49	3.23(2.87-3.64)	< 0.001	9.31(8.14-10.65)	0		< 0.001	13.95(11.29)	< 0.001	1.17(1.05-1.31)	0.005	34.13(30.24-38.51)	< 0.00
50-59	6.63(5.91-7.45)	< 0.001	15.34(13.43-17.52)	0	31.04(9.17-12.36)	< 0.001	29.2(24.7 a 44.48)	< 0.001	0.65(0.57-0.74)	< 0.001	18.86(16.39-21.71)	< 0.00
65+	20.67(18.42-23.2)	< 0.001	38.97(34.06-44.58)	0	43.68(23.92-32.23)	1	61.23(51.74-76.47)	< 0.001	0.4(0.33-0.48)	< 0.001	11.39(9.26-14.01)	< 0.00
Gender	X						ninii http					
Male (Ref)	1		1		1	0.			1		1	
female	0.96(0.93-0.99)	0.012	0.73(0.7-0.75)	< 0.001	1.04(1.01-1.08)	0.022	0.76(0.73	< 0.001	0.68(0.65-0.71)	< 0.001	0.76(0.73-0.8)	< 0.00
Place of residence							en.k					
Rural (Ref)	1		1		1				1		1	
Urban	0.86(0.83-0.9)	< 0.001	1.07(1.03-1.12)	0.001	0.83(0.8-0.86)	< 0.001	1.08(1.04 .13	0.001	1(0.96-1.05)	0.894	1.18(1.11-1.24)	< 0.00
Social groups							mili					
Scheduled tribe (Ref)	1		1		1		June ar te		1		1	
~	0.89(0.84-0.94)	< 0.001	0.95(0.89-1.01)	0.084	0.99(0.93-1.06)	0.734		0.228	1.2(1.1-1.3)	< 0.001	1.24(1.13-1.36)	< 0.00
Other backward		< 0.001					1.04(0.97 ð .12) G 1.03(0.97 ð .1)			< 0.001		< 0.00
	0.9(0.86-0.95)	0.000	1.02(0.96-1.08)		0.92(0.87-0.98)				1.23(1.14-1.32)	< 0.001	1.49(1.37-1.63)	< 0.00
Education level	0.92(0.87-0.97)	0.002	1.14(1.07-1.21)	< 0.001	0.85(0.8-0.91)	< 0.001	1.02(0.95-1.08	0.576	1.26(1.17-1.37)		1.91(1.74-2.09)	
Illiterate (Ref)												-
	1	< 0.001		< 0.001		< 0.001		<0.001		< 0.001		< 0.00
<u> </u>	0.47(0.45-0.48)	< 0.001	0.65(0.62-0.68)	< 0.001	0.36(0.35-0.38)	< 0.001	0.57(0.55-0.6	< 0.001	0.34(0.32-0.35) 0.13(0.12-0.14)	< 0.001	0.1(0.1-0.11) 0.03(0.03-0.04)	< 0.00

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and Higher Education	0.22(0.2-0.25)	< 0.001	0.29(0.27-0.33)	< 0.001	0.2(0.18-0.23)	< 0.001	136/bmjopen-2024-pp cted by copyright, iii	< 0.001	0.04(0.03-0.05)	< 0.001	0.01(0.01-0.01)	<0.
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Muslim	0.8(0.76-0.84)	< 0.001	0.88(0.84-0.93)	< 0.001	0.85(0.8-0.89)	< 0.001	1 for 15 Ma 1(0.94-1.00) for 15 Ma 0.94(0.875 related to 5 ma 0.94(0.33 for 10 ma 1 to 5 ma 0.36(0.33 for 10 ma 0.36(0.33 for 10 ma 0.73(0.67 ma 1 to 5 ma 0.67(0.54 for 10 ma 1 to 5 ma 1 to 6 ma 1	0.995	1.05(0.99-1.12)	0.089	0.71(0.67-0.76)	<0
Others	1.11(1.05-1.18)	< 0.001	1.08(1.01-1.16)	0.024	0.99(0.92-1.06)	0.802	0.94(0.87 ⁹ 1929)	0.112	1.05(0.97-1.14)	0.195	1.27(1.15-1.39)	<0
Marital status							relat					
Un-married (Ref)	1		1		1				1		1	
Currently married	1.63(1.57-1.7)	< 0.001	0.42(0.39-0.45)	< 0.001	1.87(1.78-1.96)	< 0.001	0.36(0.33 ē) g æ	< 0.001	0.09(0.09-0.1)	< 0.001	0.03(0.03-0.03)	<0
Widowed	7.49(7.16-7.84)	< 0.001	0.77(0.72-0.84)	< 0.001	9.8(9.31-10.31)	< 0.001	0.73(0.67 ²) 3)	< 0.001	0.17(0.15-0.19)	< 0.001	0.04(0.03-0.05)	<0
Divorced/separated	4.27(3.68-4.97)	< 0.001	1.15(0.98-1.35)	0.096	3.26(2.67-3.99)	< 0.001	0.67(0.54 8).53	< 0.001	1.56(1.31-1.85)	< 0.001	0.36(0.3-0.44)	<0
Wealth					100		ta n					
Poorest (Ref)	1		1				1 ES)		1		1	
Poor	0.6(0.57-0.63)	< 0.001	0.74(0.71-0.78)	< 0.001	0.62(0.59-0.65)	<0.001	0.8(0.76-0	< 0.001	0.87(0.82-0.93)	< 0.001	0.93(0.87-1)	0.
Middle	0.54(0.51-0.56)	< 0.001	0.67(0.64-0.7)	< 0.001	0.56(0.54-0.59)	< 0.001	0.73(0.69 3.77	< 0.001	0.85(0.8-0.91)	< 0.001	0.92(0.86-0.99)	0.
Richer	0.49(0.47-0.52)	< 0.001	0.62(0.59-0.65)	< 0.001	0.47(0.44-0.49)	< 0.001	0.61(0.57	< 0.001	0.79(0.74-0.85)	< 0.001	0.92(0.85-0.99)	0.
Richest	0.43(0.41-0.45)	< 0.001	0.57(0.54-0.6)	< 0.001	0.37(0.35-0.39)	< 0.001	0.5(0.47-@54)	< 0.001	0.7(0.65-0.75)	< 0.001	0.91(0.84-0.99)	0
Region							d si					
Northern (Ref)	1		1		1		nila 1		1		1	
Southern	1.94(1.83-2.05)	< 0.001	1.52(1.43-1.61)	< 0.001	1.54(1.45-1.64)	< 0.001	1.1(1.03- g 18)	0.006	1.51(1.4-1.62)	< 0.001	1.7(1.57-1.84)	<0
Western	1.19(1.12-1.28)	< 0.001	1.07(1-1.15)	0.053	1.01(0.93-1.08)	0.883	0.88(0.82	0.002	1.31(1.21-1.42)	< 0.001	1.49(1.37-1.63)	<0
Eastern	1.34(1.26-1.42)	< 0.001	1.18(1.11-1.26)	< 0.001	1.2(1.13-1.28)	< 0.001	1(0.93-1.927) 5	0.981	1.07(1-1.16)	0.062	0.92(0.84-0.99)	0.
North-eastern	1.57(1.46-1.68)	< 0.001	1.58(1.47-1.7)	< 0.001	1.47(1.37-1.59)	< 0.001	1.52(1.41-1.65)	< 0.001	0.84(0.76-0.93)	0.001	0.82(0.74-0.92)	0.
Central	1.08(1.02-1.15)	0.01	1(0.94-1.06)	0.96	1.05(0.98-1.12)	0.182	0.91(0.85-0.97	0.006	0.87(0.81-0.94)	< 0.001	0.63(0.58-0.69)	<0

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Supplementary T disabilities per th	Table 2: Result Te 76 th round of	ts from f the Na	n Multivariate SS, India (Con	binary ht)	logistic regression analysing	rijopen-zoz-gosozzo	1138/bmjopen-2020 Decision255. Downloaded from http://bmjopen.bmj.com/ on June 7, 2025 at Agence	s of
	Othe	er types	of disabilities			a for	9 1	
	Un-adjusted OR (95% CI)	p- value	Adjusted OR	p- value		Ens		
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<18 (Ref)	1		1			ted f	5. 	
18-35	0.98(0.83-1.16)	0.8	1.46(1.21-1.77)	< 0.001	00 Te	o te		
35-49	1 23(1 04-1 46)	0.018	2 37(1 91-2 93)	< 0.001		upei xtar		
50-59	1.84(1.56-2.17)	< 0.001	3.51(2.84-4.34)	< 0.001		rieur nd d:		
65+	3.3(2.78-3.9)	< 0.001	6.01(4.81-7.5)	< 0.001		ata r		
Gender						ninir		
Male (Ref)	1		1		, in the second se			
female	0.81(0.75-0.87)	< 0.001	0.8(0.74-0.86)	< 0.001	tra	ltra		
Place of residence						inin d		
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Urban	1.2(1.12-1.29)	< 0.001	1.21(1.11-1.31)	< 0.001	a s	d si		
Social groups						nilar		
Scheduled tribe (Ref)	1		1			. tec		
Scheduled caste	0.78(0.69-0.88)	< 0.001	0.82(0.72-0.94)	0.004		۲, ۲, hnol	7, 20	
Other backward class	0.68(0.61-0.76)	< 0.001	0.71(0.63-0.81)	< 0.001		oaie	125 2	
Others	0.91(0.81-1.02)	0.098	0.89(0.78-1.01)	0.066	ŭ	is is	at Agence	
Education level						Jene	leud	
Illiterate (Ref)	1		1					
Primary	0.84(0.76-0.91)	< 0.001	0.88(0.8-0.98)	0.018			Bibliograph	
Secondary	0.79(0.72-0.86)	< 0.001	0.89(0.81-0.99)	0.034		gi ap	угар	

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and Higher Education	0.93(0.81-1.07)	0.334	0.97(0.83-1.14)	0.713	
Religion					
Hindu (Ref)	1		1		
Muslim	0.83(0.74-0.92)	< 0.001	0.88(0.79-0.98)	0.021	
Others	1.18(1.04-1.34)	0.01	1.09(0.94-1.26)	0.239	
Marital status					
Un-married (Ref)	1		1		
Currently married	0.97(0.9-1.04)	0.409	0.48(0.42-0.54)	< 0.001	
Widowed	1.89(1.68-2.12)	< 0.001	0.55(0.46-0.66)	< 0.001	
Divorced/separated	2.57(1.86-3.54)	< 0.001	1.29(0.92-1.81)	0.142	
Wealth					
Poorest (Ref)	1		1		er revie
Poor	0.63(0.57-0.71)	< 0.001	0.72(0.64-0.8)	< 0.001	
Middle	0.66(0.59-0.73)	< 0.001	0.76(0.68-0.85)	< 0.001	
Richer	0.72(0.65-0.8)	< 0.001	0.84(0.75-0.94)	0.002	
Richest	0.78(0.7-0.86)	< 0.001	0.88(0.78-0.99)	0.038	
Region					
Northern (Ref)	1		1		
Southern	2.66(2.28-3.1)	< 0.001	2.62(2.25-3.07)	< 0.001	
Western	2.9(2.48-3.4)	< 0.001	2.82(2.4-3.31)	< 0.001	
Eastern	3.09(2.67-3.59)	< 0.001	3.23(2.77-3.77)	< 0.001	
North-eastern	2.12(1.77-2.53)	< 0.001	1.98(1.64-2.38)	< 0.001	
Central	1.17(1-1.38)	0.056	1.26(1.07-1.49)	0.007	

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Epidemiology of disability and access to disability support and rehabilitation services in India: A secondary data analysis a National Sample Survey (2018).

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Primary Subject Heading :	Public health
Secondary Subject Heading:	Epidemiology, General practice / Family practice, Global health, Health services research, Occupational and environmental medicine
Keywords:	Disabled Persons, PUBLIC HEALTH, Health Equity





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6	3	rehabilitation services in India: A secondary data analysis a
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Abstract **Objective:** The primary aim of this study was to examine the epidemiology of disability in India and assess access to disability support and rehabilitation services by person with disability (PWD). Design: This study is a secondary analysis of the data from the 76th round of the National Sample Survey (2018), that focussed on disability in India. Setting: The survey employed a stratified two-stage sampling design based on Census 2011, covering all states and union territories of India. Villages and urban blocks were selected in the first stage, while households were chosen in the second stage across rural and urban areas. **Participants**: The survey included data from a population of 576,796 individuals residing in 1,18,152 households from 8,992 village/urban blocks (5,378 rural villages and 3,614 urban blocks). The analysis focussed on 1,07,125 individuals (61,707 males and 45,305 females) who reported at least one disability. **Outcome Measures**: The primary outcome was "any disability". Secondary outcomes included access to disability support and rehabilitation services that assessed difficulties faced in accessing public buildings, transport, loss of employment after disability, availability of government support, enrolment in special schools, and possession of a disability certificate. Results: The overall weighted disability prevalence was 2.2%, with significant disparities across socio-demographic characteristics. Among PWD, 45.9% of those who acquired disability after birth were aged between 15 and 59, and 20.8% received no government aid. About 40% of PWD struggled to use public transport, and 57.7% had difficulties accessing public buildings. Additionally, 60.7% reported job loss due to disability, and 69.6% lacked a disability certificate.

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Conclusion: This study highlights disparities faced by PWD in accessing disability support
 and rehabilitation services. There is an urgent need for concerted efforts to minimise such
 experiences. This will help us enhance the well-being and participation of PWD and empower
 them to contribute to society with their true potential.

Keywords: Disability, inequity, disparities, accessibility, health access.

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1 2 3 4	1	Strengths and limitations of this study
5 6	2	• One of the very first comprehensive assessments of accessibility issues of the people
7 8 9	3	living with disability data from the 76 th round of the National Sample Survey (2018).
10 11	4	• We estimated the proportion of person with disability who could access basic services
12 13 14	5	through a weighted analysis that makes the results generalisable and highlights
15 16	6	actionable points.
17 18 19	7	• The lack of a standardised definition of disability was the critical limitation of the study,
20 21	8	which restricts sub-national and national comparisons over time and regions.
22 23	9	• The possibility of estimates being affected by recall bias and social desirability bias
24 25 26	10	may not be ruled out.
27 28	11	• We were limited by the number of variables available in the primary data, which
29 30 31	12	restricted us from making further conclusions about the social inclusion of person with
32 33	13	disability.
34 35	14	disability.
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5 6	2 3	Introduction
7 8 9	4	As per the United Nations Convention on the Rights of Persons with Disabilities (CRPD), a
9 10 11	5	persons with disability (PWD) includes those who have long-term physical, mental,
12 13	6	intellectual, or sensory impairments which, in interaction with various barriers, may hinder
14 15	7	their full and effective participation in society on an equal basis with others.[1] Disability is a
16 17	8	global concern, impacting 1.3 billion people, or 16% of the population.[2] The World Health
18 19 20	9	Organization (WHO) and the World Bank's World Report on Disability highlight that 80% of
21 22	10	the global disabled population is of working age, with a substantial proportion residing in
23 24	11	developing countries.[3] India is one of the most populous countries, and the proportion of
25 26	12	Indian PWD is concerning.[4] With the increasing proportion of the geriatric population, the
27 28 29	13	burden of disability has also proportionately increased (from 21.9 to 26.8 million) over the last
30 31	14	two rounds of the national census (2001-2011).[5,6] The reports from the 2011 Census and
32 33 34 35 36 37 38 39 40 41 42	15	the 76th round of the National Sample Survey (NSS) estimate disability prevalence to be
	16	around 2.2%.[7] But the fifth round of the National Family Health Survey-5 (2019-21)
	17	estimates an overall disability prevalence of 4.52%.[8] The discrepancy in available estimates
	18	
		is due to methodological differences, poor quality and inconsistent data, and lack of
43 44	19	standardisation of the definition, which underscores the intricate nature of disability.[9,10]
45 46	20	The CRPD identifies disability as an evolving concept and highlights the constantly changing
47 48	21	needs of PWD, which are largely unmet. [11–13] The different articles of CRPD (6, 7, 9, 24,
49 50 51	22	and 27) focus on key aspects such as gender, age, accessibility, education, and employment to
51 52 53 54 55 56 57 58 59 60	23	empower PWD by addressing specific needs. For instance, article 6 caters to gender-related
	24	needs, which may include protections against gender-based discrimination and access to
	25	reproductive healthcare, while article 7 focuses on the needs of children with disability and that
	26	they receive inclusive education (article 24) and older adults with disability access to necessary
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social and healthcare services (article 9). These measures aim to enable independent living and full participation in all aspects of life, ensuring that PWD are not deprioritised compared to the general population.[14–18] The limited priority given to the needs of PWD in society increases the existing disparities, leading to poorer health outcomes, lower educational attainment, and reduced economic opportunities, thereby exacerbating social inequities.[19] Addressing these disparities is a global priority as mandated by the second principle of the Sustainable Development Goals (SDGs), "Leave no one behind", which is the central, transformative promise of the Agenda 2030.[20] International human rights law, including the CRPD, Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), Convention on the Rights of the Child (CRC), International Covenant on Civil and Political Rights (ICCPR), International Covenant on Economic, Social and Cultural Rights (ICESCR), collectively uphold the principles of equality and non-discrimination, obligates each country to address the inequalities faced by PWD, ensuring that they have equitable access to services, full participation in society, and protection from exclusionary practices.[1,21] Since March 2007, 192 parties, including India, have ratified CRPD till January 2025. Despite progress, the world still falls short of fully recognising and upholding the rights and needs of PWD.[19] The needs of PWD can span from *personal functional assistance* (daily activities and extent of disability), social integration (living conditions, caregivers, and public accessibility), economic rehabilitation (impact on employment and finances) to service access (certification and receipt of government/NGO support) necessitating a comprehensive approach.[22] However, access to such services is less studied, and it is crucial to highlight disparities that affect the disability care continuum and also limit the efforts to minimise social exclusion of PWD and foster a social environment that is inclusive and accessible to all. [22][23] Previous literature from India has primarily focused on the epidemiology of disability.[10] The

24 Inevious interature from financial has primarily focused on the epidemiology of disability.[10] The
25 lack of disability-friendly infrastructure, affordable assistive technologies, support services,

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including personal assistance, therapy, aids and vocational rehabilitation, and comprehensive care perpetuates inequalities.[24] Still, it is less explored by the scientific community. Within this context, the 76th NSS collects data regarding disability and PWD's access to different disability support and rehabilitation services and provides an opportunity to study them. [7] Thus, the primary aim of the study was to explore the epidemiology of disability and the accessibility of PWD to various disability support and rehabilitation services to provide insights for specific interventions.

Methodology

Data sources: We conducted a secondary analysis of the cross-sectional data from the 76th National Sample Survey (NSS) conducted by the Ministry of Statistics, Planning, and Implementation (MoSPI) between July and December 2018. MoSPI has formulated a code of ethics and sets out certain standards of conduct for the members of the Survey Committees (group of people appointed to conduct and supervise the survey). The data for NSSO is collected in accordance with the Collection of Statistics Act, 2008, which ensures transparency in data collection by issuing public notifications outlining the subject, purpose, and methodology of the survey. Participation in these surveys is generally voluntary, with respondents providing implied consent by answering survey questions after being informed about the study's objectives. Additionally, the Act mandates confidentiality safeguards, ensuring that collected data is used solely for statistical purposes. While respondents are legally obligated to provide accurate information, the data remains anonymous and protected. Thus, the NSSO follows ethical guidelines to uphold privacy while maintaining the integrity of national statistics.[25] The NSS collects socio-economic data using interviews through scientific sampling methods and serves as a crucial tool to gauge various socio-economic aspects across all states of India. Its primary objective is to identify unmet needs within the population, thereby aiding the government in formulating effective policies to address them.

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The survey made its first attempt to collect information on the number of PWD during the 15th round (July 1959 - June 1960).[26] In the 76th round, the main objective of the survey was to estimate indicators of incidence and prevalence of disability, cause of disability, age at onset of disability, facilities available to the PWD, difficulties faced in accessing public building/public transport, arrangement of regular caregiver, out-of-pocket expense relating to disability, etc. using a structured questionnaire.[27] Further, estimates were obtained on various employment and unemployment particulars in usual status for the household members with at least one disability. For PWD aged 12 to 59 years, information was collected on whether or not they received vocational/technical training and details related to such training.

Sampling design and sample size: The 76th NSS employed a stratified two-stage sampling design, utilising Census 2011 as the sampling frame.[7] The survey commenced on 1st July 2018 for six months. In the first stage, villages/urban blocks were selected, followed by the selection of households in rural and urban areas in the second stage. This round of NSS encompassed all states and union territories of India except the villages in Andaman and Nicobar Islands, which are difficult to access, covering a total of 8,992 village/urban blocks (5,378 rural villages and 3,614 urban blocks) and including 118,152 households representing a population of 576,796 individuals (402,589 in rural areas and 173,980 in urban areas). Within this, the present study focuses on 1,07,125 individuals consisting of 61,707 males and 45,418 females) who reported at least one disability during the survey.

20 Study Variables

Dependent variable: The presence of "any disability" was our primary dependent variable.
MoSPI defines a "Person with disability" as a person with a long-term physical, mental,
intellectual or sensory impairment which, in interaction with barriers, hinders full and effective
participation in society equally with others.[7] The variable is created by the presence of at
least one condition among all seven disability types, elaborated subsequently

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3 4	1	1.	Locomotor disability: A person was categorised as living with locomotor disability based
5 6 7	2		on a positive response to any of the following three conditions: (i) whether having difficulty
8 9	3		in using hands, fingers, toes, body movement (including cerebral palsy, muscular
10 11	4		dystrophy); (ii)whether having loss of sensation in the body due to paralysis, leprosy, other
12 13 14	5		reasons; or (iii)whether having deformity of the body part(s) like hunch back, dwarfism,
15 16	6		deformity due to leprosy, caused by acid attack, etc."
17 18 10	7	2.	Visual disability: It was identified using a direct question: "Whether having difficulty in
19 20 21	8		seeing, counting fingers of hand from a distance of 10 feet (with spectacles, if using, and
22 23	9		both eyes taken together)."
24 25 26	10	3.	Hearing disability: The categorisation was based on the question: "Whether having
27 28	11		difficulty in hearing day-to-day conversational speech (without hearing aid, if using, and
29 30 31	12		both ears taken together)"
32 33	13	4.	Speech and language disability: It was assessed using a question: "Whether having
34 35 36	14		difficulty in speech (unable to speak like a normal person/ speech is not comprehensible,
37 38	15		including laryngectomy, aphasia) which is base for speech disability."
39 40 41	16	5.	Mental retardation/intellectual disability: This disability variable has been prepared
42 43	17		based on the following question "Whether having difficulty in understanding/
44 45	18		comprehension or communicating in doing daily activities"
46 47 48	19	6.	Mental illness: This disability was identified when there was a positive response to any
49 50	20		of the three conditions: "(i) whether having unnecessary and excessive worry and anxiety,
51 52 53	21		repetitive behaviour/ thoughts, changes of mood or mood swings, talking/laughing to self,
54 55	22		staring in space; (ii) whether having unusual experiences of hearing voices, seeing visions,
56 57	23		strange smell or sensation or strange taste; or (iii) whether having unusual behaviour or
58 59 60	24		difficulty in social interactions and adaptability."

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7. Other disability: To identify other types of disability of the persons, the following question was used: "Whether having any of the following: Parkinson's disease, multiple sclerosis, other chronic neurological conditions, thalassemia, haemophilia, sickle cell disease".

The access to disability support and rehabilitation services by the PWD were secondary dependent variables. For this study, we adopted the United Nations CRPD definition of 'disability support,' which is stated as 'the means to ensure that PWD can fully enjoy their rights and participate equally in society." The original survey assessed disability support by estimating the proportion of PWD ever receiving any aid/help (received aid/help from government, or received aid/help from organisations other than government, did not receive aid/help), living arrangement (living alone or with a spouse, living with others), arrangement of regular caregiver (care-giver required but not available, care-giver is not required, care-giver is available), access to public transport (yes, no), accesses to public building (yes, no), difficulty faced in accessing public building (difficulty faced due to stairs and non-availability of ramp, grooved tiles or lift, in opening doors, no seating arrangement: in the waiting area, at the point of receiving service, no special toilet seats, no sign for direction/ instruction/no public announcement system, no difficulty faced, and others), employed/working before onset of disability (yes, no), disability causing loss or change in job (loss of work, change of work, no loss or change of work), having disability certificate (yes, no), and percentage of disability as per certificate (40-60%, 60-80%, >80%, and none of these). Disability certificate is issued to PWD by the competent medical authorities notified by the State/UT Government and aims to encourage transparency, efficiency and ease of delivering the government benefits to the person with disabilities and to ensure uniformity.[28,29]

24 Predictor variables: In the present study, the predictor variables were chosen following a
25 literature review and the scope of data collected in the original survey.[30–33] We included

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age group (completed years) categorised as; upto 5, 6-17, 18-35, 36-49, 50-65 and 65+ completed years, sex (male, female), marital status (never married, ever married, widowed, divorced/separated), area of residence (rural, urban), educational attainment (non-literate, literate but not formal, upto primary, upto secondary), preferred religion (Hindu, Islam, others), social group (scheduled tribe, scheduled caste, other backward classes, general), wealth index (poorer, poor, middle, richer, richest), regions of India (northern, southern, western, eastern, north-eastern and central). For readers outside India, the term 'backward class, schedule caste and schedule tribe' refers to socially and educationally disadvantaged groups legally recognised by the constitution of India, that have historically faced discrimination and marginalisation, and aim to promote social justice by reducing disparities, enhancing representation in education and employment, and fostering socio-economic inclusion. [34]

Specifically, PWD were characterised using variables like causes of disability (disease, other than disease due to burn, injuries other than burn, other causes), age at the onset of disability (0 to 4, 5 to 14, 15 to 59, and 60 years and above), the origin of disability from birth (yes, no, not known), disability commenced in last 365 days (yes, no), place of occurrence of disability (workplace, road, home, other places), treatment taken/undergoing treatment (yes: consulting doctor, otherwise, yes: consulting doctor, plus undergoing treatment, otherwise, attending special school/special therapy, cannot afford treatment, no treatment available for the disability, not required and not known).

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Statistical methodology: The prevalence, along with the dispersion of all disability variables,
were estimated as part of a univariate analysis by using already calculated sampling weights
with clustering as provided with the datasets.[35] The details of sampling weight have been
described in the NSS 76th round report. We used the SVY command while using sampling
weights.[36] Further, the prevalence of all disability types was estimated per socio-economic
characteristics, and the associations were tested using bivariate analysis through a chi-squared

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test. The access to different services was depicted using weighted proportions. The missing data were handled using the Available case analysis (ACA) technique, and the estimates were generated using the available data, leading to the different sample sizes as they vary from variable to variable. It helped us retain more data compared to listwise deletion. However, the relationships between the pattern of missing data and observed variables was studied to assess the nature of the missing data using the Little's MCAR (Missing cases at random) test. The results suggested that the data were not completely at random but likely missing at random (MAR), and therefore, the ACA technique was considered appropriate for retaining more data compared to listwise deletion. Further, a sensitivity analysis was conducted to assess the robustness of the findings to different missing data handling techniques. Results obtained using ACA were compared with those from Complete Case Analysis (CCA), and the findings were consistent across the two methods. Lastly, multivariable binary logistic regression analysis was used to explore the independent variables affecting the likelihood of living with 'any disability', which was the dependent variable coded by 1 and otherwise 0. Additionally, binary logistic regressions are also employed on all seven types of disability. The analysis depicted the unadjusted and adjusted odds ratio (95% confidence interval). All p-values<0.05 were considered statistically significant. All the analysis was done using Stata (version 17.0). Graphical maps were created using MS Excel sheets to depict the regional disparities.

19 Patient and public involvement: None

Results

Table 1 provides a comprehensive overview of the weighted prevalence of different types of
disability across various socio-demographic characteristics in India. Of the total participants,
107,125 (2.2%) of the participants had at least one form of disability. The majority of such
participants had a locomotor disability 61,981 (1.36%), followed by hearing 15,294 (0.30%),
visual 11,977 (0.23%), speech-related 12,661 (0.23), mental retardation 8,564 (0.16%), mental

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illness 6,751 (0.16%), and other types 3,121 (0.05%) of disability. The highest prevalence of any disability, locomotor, speech and 'other' disability was seen in 50-65 years. However, the proportion of participants with visual and hearing disability was highest in the eldest age group, while mental retardation and mental illness were highest in the 6-35 years age group. Disability prevalence was notably higher among older individuals, males, rural populations, and those from lower socioeconomic backgrounds with minimal or no educational attainment, and living in the southern part of India.

We further assessed the origin of disability as per the type (Table 2). The most common cause of locomotor and speech disability was disease 28,673 (46.3%), 1246 (61.9%), while 'other causes' were most commonly involved in visual 538 (46.5%) and hearing 637 (49.7%) disability. Around 11,488 (18.5%) of PWD had their disability from birth. Of the total participants, 2987 (6.1%) participants acquired their disability in the last year preceding the survey. The most common place of disability origin was road 5977 (41.9%), followed by home, 4693 (32.9%). Only 17,329 (28%) of PWD were consulting doctors and undergoing treatment.

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Table 3 depicts the living conditions of PWD and access to crucial services, and Supplementary Table 1 provides results in more detail for each type of disability. Overall, nearly half of the PWD who did not have disability since birth were between 15 and 59 years old (45.9%), while nearly one-fifth (20.8%) had received aid or help from the government. 57% of PWD lived with their spouses, and 62.8% reported that caregivers were available. About 40% reported an inability to use public transport, while 54.4% reported inaccessibility to public buildings. Further, 57.7% of PWD reported facing difficulties while accessing public buildings. Around 60.7% of PWD reported a loss of work due to disability onset, and 69.6% did not have any official document certifying their disability for administrative purposes. Figure 1 further depicts the geographic disparities in the PWD' access to basic services.

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Table 4 demonstrates the multivariable binary logistic regression analysis results to present the socio-demographic variables affecting the likelihood of living with any type of disability. We found a significantly higher likelihood of living with disability with increasing age (Adjusted Odds ratio: 58.4; 95% Confidence Interval: 55.4-61.5 in >65 years vs up to 5 years), urban residence (1.3; 1.2-1.3) vs rural, social castes (1.3; 1.3-1.3 in general caste) vs scheduled tribes, and living in a Southern region of India (1.1; 1.1-1.2) compared to those from North India. However, female sex (0.6; 0.6-0.6), more years of education (0.3; 0.3-0.3), Islam followers (0.9; 0.9-0.9), currently married/widowed vs never married (0.3; 0.3-0.3), and higher socio-economic status (0.5; 0.5-0.5) depicted significantly lower likelihood of living with disability. Supplementary Table 2 provides results from the more detailed regression analysis for each type of disability.

12 Discussion

We report an investigation that assesses the epidemiology of PWD and their access to disability support and rehabilitation services in India using nationally representative data. Our key findings have profound policy implications. First, we identify concerning disparities in disability prevalence across socio-demographic groups. Second, one-fifth of PWD reported acquiring their disability at birth. Third, the most common place of disability origin was roads, followed by home. Fourth, approximately half of PWD reported challenges in using public transport and buildings. Lastly, the majority of PWD reported a loss of work due to disability onset and did not have any official document certifying their disability.

Disability prevalence was notably higher among older individuals, males, rural populations,
and those from lower socio-economic backgrounds. Despite a modest 2.2% prevalence rate,
this figure represents around 30 million people in India, and it is expected to rise, indicating an
urgent need for attention. While there was a preponderance of males with locomotor disability,
speech and language disability were significantly higher in females. As per the estimates

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obtained from the previous 36th, 47th, and 58th rounds of NSS, there is a constant rise in
disability prevalence in rural (1.8% in the 36th round to 2.3% in the 76th round) as well as
urban (1.4% in 36th round to 2.0% in 76th round) areas, with the overall increase from 1.6%
in 36th round in year 1981 to 2.2% in 76th round in year 2018.[7] Secondary analysis of another
national survey (NFHS-5) depicts an overall disability prevalence of 0.95%, with a higher
proportion of locomotor disability (0.4%), followed by mental disability (0.2%).[37]

We observed that a high proportion of survey participants had their disability from birth. However, the available data limits our further understanding of such disability, whether the onset was intrauterine or acquired during the birthing process. Such limited information still necessitates mitigation strategies targeting pregnant females by ensuring accessibility to screening for intra-uterine pathologies causing disability like Down's syndrome and intellectual disability and later extending the access to screening for auditory and visual disability.[38] Further, adopting more rigorous screening toolkits and investigations for newborns at the primary healthcare level through the expansion of the Rashtriya Bal Swasthya Karvakram (Indian National program that involves screening of children from birth to 18 years of age for 4 Ds- Defects at birth, Diseases, Deficiencies and Development delays, spanning 32 common health conditions for early detection and free treatment and management, including surgeries at tertiary level) would help in increasing scope for early psychological or therapeutic interventions that would impact the quality of life of children with disability.[39] In addition, the Pradhan Mantri Jan Arogya Yojana (PM-JAY) offers free healthcare for children with disability, who are not covered under the RBSK scheme.[40,41]

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The most common place of disability origin was road, followed by home. Trauma is an important cause of locomotor disability, and in India, it is the second most common cause of locomotor disability.[42] Previous estimates suggest that road crashes maximally impact the poorest quintiles. A lack of appropriate safety gear while on the road is often a factor in road

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trauma. People who experience road trauma often have inadequate access to medical and social safety nets after injury.[43,44] Anecdotal evidence from Chandigarh, a Union Territory of India, suggests that strict compliance with the traffic rules can mutually benefit the public and the administration. On one side, it reduces morbidity due to road traffic accidents, while on the other side, penalties due to non-compliance generate revenues and also generate awareness. An increasing number of domestic accidents are equally concerning.[45] Domestic accidents may be subjected to under-reporting as most of the domestic injuries are considered minor, often neglected, and may be easily forgotten and subjected to recall bias. This changing trend is similar to many developed nations where more accidents happen at home than anywhere else. With increasing population and population density, we expect an increase. Domestic accidents depend on the physical and social environment and also on the functional capacity of the individual. While road traffic accidents are unforeseen and unexpected, it is generally accepted that domestic accidents can be prevented and minimised by taking adequate safety measures well in time.[46]

We observed that there is a scope for improving the accessibility of public buildings and transport for the PWD; they must accommodate PWD's needs. Various schemes and initiatives demonstrate the Indian government's commitment to securing the rights and welfare of disabled populations in the country. India's commitment to the United Nations Convention on the Rights of PWD (UNCRPD) is embodied in the Rights of Persons with Disabilities Act of 2016 (RPWD Act, 2016). It emphasises dignity, autonomy, and non-discrimination for PWD.[47] The Act further mandates inclusive education, vocational training, and self-employment opportunities without discrimination. To increase the accessibility of public buildings, the RPWD Act 2016 and the National Building Code of India 2016 outline expanded guidelines for building accessibility.[48] Compliance with these standards has been made compulsory, with responsibility falling on those involved in commissioning, designing, constructing, or

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managing built environments. The building design must adhere to relevant legislation,
including equality and safety regulations. This focus on accessibility has fostered the adoption
of universal design concepts, leading to numerous best practices for creating inclusive
environments. These encompass accessible buildings, parking areas, parks, and recreational
facilities, reflecting a concerted effort to ensure equal access and inclusion for PWD in the built
environment.

Government schemes to improve inclusion and access

The government has a variety of healthcare schemes like the Assistance to Disabled Persons for Purchase/Fitting of Aids and Appliances (ADIP) that cater to the specific needs of PWD and provides assistive devices, aids such as wheelchairs, hearing aids, and prosthetic limbs at subsidised rates.[49] The Deendaval Disabled Rehabilitation Scheme (DDRS) provides financial assistance to NGOs for various rehabilitation services for PWD.[50] However, the scheme faces inconsistencies in service availability across different states. The lack of standardisation in rehabilitation programs results in variable quality of care, while administrative delays in fund disbursement further hinder its effectiveness.[51] Moreover, rural and economically weaker sections often struggle to access these services, limiting the scheme's reach and equity. While DDRS aligns with the principle of equal opportunities under the RPWD Act of 2016, its impact is weakened by poor implementation and monitoring mechanisms. Apart from catering to the healthcare needs of PWD, we must address specific issues related to health and ethics and the need to shift societal attitudes toward PWD to improve social inclusion.[52]

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In addition to the health-related needs, the Government of India has taken several steps to
secure the social rights of PWD. Right to Education Act (RTE) aims to provide free and
compulsory education for children with a disability up to 18 years.[53] The 'Samagra Shiksha
Abhiyan' integrates children with disability into mainstream education.[54] The National

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Education Policy 2020 also prioritises "inclusion" by aiming to fully integrate children with disability into the mainstream education system, providing necessary accommodations and support to ensure their active participation in the learning process without segregation or discrimination; this includes accessible infrastructure, specialised teaching methods, and assistive technologies tailored to individual needs.[55] Training gaps for teachers for PWD, lack of assistive technology, and poor enforcement of inclusive education policies hinder meaningful inclusion.[56] The government-funded higher education institutions in India reserve 5% of seats for PWD to foster diversity and enhance employment opportunities, but the effectiveness of such policies is hindered by challenges [57] such as infrastructural barriers, lack of accessible learning materials, and inadequate support services. Many PWDs also lack access to skill development programs, which limits their employability. The government also provides financial assistance and benefits to PWD through schemes like the National Handicapped Finance and Development Corporation (NHFDC); which offers loans and subsidies for education and training or self-employment ventures.[58]

Employment can enhance social sustainability and individual well-being.[59] But, we observed that a very high proportion of PWDs had a change or loss of their jobs due to the onset of disability. Loss of jobs can be linked to the social stigma associated with impairment or disability and the perception of such people being less productive. Many employers have ill-founded views about the work-related abilities of PWD; these negative views are often a result of interrelated concerns that permeate the entire employment cycle.[60] It is to be emphasised that negative attitudes toward disability disempower PWD and lead to social exclusion. By contrast, a healthy society encourages positive attitudes toward PWD and promotes social inclusion.[61] Various initiatives have been introduced to promote employment opportunities for PWD. But, a lack of awareness and red tape discourages many PWDs from receiving

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employment benefits. While the RPWD Act mandates non-discrimination in employment, the
absence of accountability measures continues to hinder its success. Many PWDs also lack
formal certification as seen in our study, restricting their access to essential services and
benefits.[62][63]

Other prominent schemes introduced for PWD in India include the National Handicapped Finance and Development Corporation (NHFDC) which provides financial assistance to persons with disability for self-employment, education, and training; Scheme for Implementation of Persons with Disabilities Act (SIPDA) to create barrier-free environments and improve the quality of life for PWD; Accessible India Campaign (Sugamya Bharat Abhiyan) focuses on making public infrastructure and transportation accessible for person with disability and Inclusive Education for Disabled at Secondary Stage (IEDSS) supports the inclusive education of students with disability at the secondary level.[58][64][65] Despite multiple policy frameworks supporting disability inclusion, several gaps remain in implementation and enforcement. [66] The mere existence of legislation and policies does not guarantee their effectiveness. There is a pressing need for stronger monitoring mechanisms, improved financial transparency, and enhanced awareness campaigns to bridge the gap between policy intent and real-world impact. The government must prioritise accountability measures to ensure scheme implementation and greater investment in infrastructure and assistive technologies to create an inclusive environment for PWD. [67]

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Strengths and limitations of the study

The studies major strength lies in its novelty by bringing social science and medicine to a common platform. The estimates generated using the weighted analysis are nationally representative, and depict strong external validity due to its national coverage, stratified sampling approach, and standardised definitions. The emerging results can serve as robust evidence to help guide the policies that improve accessibility. The present study takes a novel

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approach by initially delineating the proportions of various types of disability. Subsequently, it delves into the analysis concerning "any disability," thus unveiling unique characteristics within this broader category. By doing so, the study not only broadens the scope of understanding but also highlights the nuanced interplay between different types of disability and the socio-demographic backgrounds of PWD. This shift towards a more inclusive analysis holds promise for informing policy decisions and healthcare interventions tailored to address the complex needs of individuals with disability. The major limitation lies in the study's cross-sectional nature, which limits causality and temporal associations and is limited by recall bias, particularly when assessing disability from birth. We need more qualitative studies to better assess the impact of inaccessibility to basic support and rehabilitative services.[12] As a secondary analysis, we are limited by the number of variables that can further explain issues affecting accessibility to services. Due to a limited number of explanatory variables, the possibility of residual confounding cannot be negated. There was also a non-uniformity in the sample size when assessing different questions related to the impact of disability, but it was handled using available case analysis techniques to generate estimates and retain more data compared to listwise deletion. Lastly, some terms used in the manuscript, like the categorisation of disability (e.g., using "mental retardation" instead of "intellectual disability"), the terminology used to describe social classes ("backward classes" instead of "disadvantaged classes") is non-inclusive, outdated, perceived offensive by the PWD, and lacks alignment with the global vision targeting inclusion and discrimination. However, it is still being used so that the manuscript is coherent with the original survey report and would help prevent confusion in case some readers want to refer to the original report.

Policy implications and recommendations

A few policy implications and recommendations emerged from the study. Given the increasing prevalence of disability and the concurrent escalating proportion of the geriatric population, Page 23 of 49

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we need to work on improving the accessibility for PWD. A large number of disability originating from birth calls for more robust ante-natal and neonatal screening protocols supported by adequate counselling and rehabilitation services. Our results depict that a high proportion of PWD have a caretaker who is available. Previous studies have suggested that empowering the caretakers can help improve the quality of life of PWD.[68] We must simultaneously think of ways (like investing in developing more assistive devices and making them affordable) to help us share the added burden on caregivers.[68] Despite many schemes extended by the government to enhance the social inclusion of PWD that have been briefly described in the manuscript, there is a need for health advocacy drives to sensitise the population about the needs of PWD, improve social inclusion and minimise discrimination. The use of non-inclusive language in the original dataset used in the study necessitates using more appropriate language to promote inclusivity. It is recommended that future national surveys focus on more inclusive language, which is compliant with the CRPD and the globally ongoing disability rights movements.

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15 Conclusions

While previous research has primarily emphasised individual heterogeneity among PWDs, our study indicated that a large proportion of PWD experience systemic disparities in accessing disability support and rehabilitation services. The high prevalence varies significantly as per the studied socio-demographic characteristics, reinforcing the urgent need for targeted interventions. We acknowledge that while individual differences exist, these do not negate the common challenges faced by PWDs in securing equitable access to essential services. Despite government initiatives, there remain gaps in accessibility, public awareness, and enforcement of disability rights. There is an urgent need for concerted efforts to minimise these disparities, enhance the well-being and participation of PWD, and empower them to contribute meaningfully to society. Furthermore, our findings underscore that many disabilities originate from birth or early childhood, yet the availability of early screening, diagnostic services, and

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> timely interventions remains inadequate. Strengthening antenatal and neonatal screening, particularly for intrauterine conditions and birth-related complications, could significantly improve early detection and management of disabilities. As a society, we must work toward reshaping societal and institutional perceptions of disability, shifting the focus from viewing disability as a personal deficit or burden to recognising it as a societal construct that can be addressed through inclusion, accessibility, and policy-driven structural changes. A more inclusive and disability-friendly society is essential not only for ensuring the dignity and rights of PWD but also for achieving socioeconomic development and social justice. These efforts align with India's commitment to the CRPD and contribute to the global vision set by the 2030 Agenda for Sustainable Development, which recognises the promotion of the rights, perspectives, and well-being of PWD as a fundamental prerequisite for a more sustainable and inclusive world.

13 Declarations

Acknowledgements: This study used the National Sample Survey (NSS), 76th round
Person with Disability in India Survey 2018. The authors gratefully acknowledge members
of the study field team, including those who were involved in mapping/listing/segmentation
and the main survey during data collection. The authors also acknowledge all the
respondents for their active participation in this study.

• Competing interests: None

Ethics statement: The ethical approvals were not deemed necessary since it was secondary
 data analysis. No patient-level data were used in this paper. However, the original survey
 was conducted by the Ministry of Statistics and Programme Implementation (MOSPI),
 which is mandated to act as the nodal agency for the integrated development of the statistical
 systems in India. The Ministry, as part of its comprehensive decision-making process on
 various matters, has formulated a Code of Ethics for Members of the various Committees

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constituted by MOSPI or by the Organizations, Institutions, bodies, etc., funded by it that
follow the principles of ethics and set out certain standards of conduct for the members of
the Committees in order to protect the confidentiality of the data/information acquired by
them by virtue of their membership in such Committees.
Patient and Public Involvement: None
Funding: No funding was involved at any stage of this study.
Data availability: Data (Reference ID: DDI-IND-MOSPI-NSSO-76Rnd-Sch26.0-July2018
December 2018) is freely available on the website of the Ministry of Statistics and
Programme Implementation (GOI) MOSPI's
https://microdata.gov.in/nada43/index.php/catalog/154/overview, and can be accessed as
per standard protocols.
Ethics approval: Not applicable
Authors' contribution: MM, BB, and MA conceptualised the study, MV and AKJ collected
data, drafted the manuscript, and reviewed it. VE, MV, and AKJ did the analysis and drafted
the final version; MA and RK critically reviewed the manuscript from policy and feasibility
points of view. All the authors read and approved the final version of the manuscript. MM
is responsible for the overall content as guarantor.
eferences
United Nations. Convention on the Rights of Persons with Disabilities [Internet]. Human Rights Instruments. 2008 [cited 2024 Dec 16]. Available from:
https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-
persons-disabilities
World Health Organization. Global report on health equity for persons with disabilities
[Internet]. 2023 [cited 2024 Dec 10]. Available from: https://www.knowledge-action-
portal.com/en/content/global-report-health-equity-persons-disabilities
24
24 For peer review only - http://bmiopen.hmi.com/site/about/guidelines.yhtml

7 8 9	3	the Committees in order to protect the confidentiality of the data/information acquired by					
9 10 11	4	them by virtue of their membership in such Committees.					
12 13	5	5 • Patient and Public Involvement: None					
14 15	6	• Funding: No funding was involved at any stage of this study.					
16 17 18	7	• Data availability: Data (Reference ID: DDI-IND-MOSPI-NSSO-76Rnd-Sch26.0-July2018					
19 20	8	December 2018) is freely available on the website of the Ministry of Statistics and					
21 22	9	Programme Implementation (GOI) MOSPI's					
23 24 25	10	https://microdata.gov.in/nada43/index.php/catalog/154/overview, and can be accessed as					
26 27	11	per standard protocols.					
28 29 30 31 32 33 34 35 36 37 38 39	12	• Ethics approval: Not applicable					
	13	• Authors' contribution: MM, BB, and MA conceptualised the study, MV and AKJ collected					
	14	data, drafted the manuscript, and reviewed it. VE, MV, and AKJ did the analysis and drafted					
	15	the final version; MA and RK critically reviewed the manuscript from policy and feasibility					
	16	points of view. All the authors read and approved the final version of the manuscript. MM					
40 41	17	is responsible for the overall content as guarantor.					
42 43	18						
44 45	19 20	 References 1. United Nations. Convention on the Rights of Persons with Disabilities [Internet]. Human 					
46 47	20	Rights Instruments. 2008 [cited 2024 Dec 16]. Available from:					
48 49 50 51 52 53 54 55 56	22	https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-					
	23	persons-disabilities					
	23	 World Health Organization. Global report on health equity for persons with disabilities 					
	25	[Internet]. 2023 [cited 2024 Dec 10]. Available from: https://www.knowledge-action-					
	26	portal.com/en/content/global-report-health-equity-persons-disabilities					
57 58	20	portai.com/en/content/grobal-report-nearm-equity-persons-uisabilities					
59							
60							
		24					

Page 26 of 49

BMJ Open

2 3 4	1	3.	World Health Organization. World Report on Disability [Internet]. 2011 [cited 2022 Feb
4 5 6 7 8 9 10 11	2		9]. p. 1–27. Available from:
	3		www.who.int/about/licensing/copyright_form/en/index.html
	4	4.	Pattnaik S, Murmu J, Agrawal R, Rehman T, Kanungo S, Pati S. Prevalence, pattern and
	5		determinants of disabilities in India: Insights from NFHS-5 (2019-21). Front Public
12	6		Health. 2023;11:1036499.
13 14 15 16 17 18	7	5.	Ministry of Statistics and Programme Implementation(GOI) - MOSPI. Elderly in India
	8		2021 [Internet]. 2021 [cited 2024 Dec 16]. Available from:
	9		https://mospi.gov.in/sites/default/files/publication_reports/Elderly in India 2021.pdf
19	10	6.	Paul K, Saha S. Burden of Disability in India (1881–2011). Journal of Multidisciplinary
20 21	11		Research in Healthcare. 2015 Oct 5;2(1):31–54.
22 23 24	12	7.	Ministry of Statistics and Program Implementation Government of India. Persons with
	13		Disabilities in India-NSS 76th report [Internet]. NSS Report No 583 (76/26/1). 2018
25 26	14		[cited 2024 Dec 12]. p. 209. Available from:
27 28 29 30 31 32 33 34 35	15		https://www.mospi.gov.in/sites/default/files/publication_reports/Report_583_Final_0.p
	16		df
	17	8.	International Institute for Population Sciences. National Family Health Survey (NFHS-
	18		5) 2019-21 [Internet]. India Report. 2022 [cited 2024 Dec 16]. Available from:
	19		https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf
36 37	20	9.	Rashmi R, Mohanty SK. Socioeconomic and geographic variations of disabilities in
38	21		India: evidence from the National Family Health Survey, 2019–21. Int J Health Geogr.
39 40	22		2024 Dec 1;23(1):1–16.
41 42	23	10.	Chanda S, Sekher T V. Identification of Disability for Inclusive Development: Lessons
43 44	24		from Disability Census of Kerala, India. Sage Open. 2023;13(3).
45	25	11.	Department of Economic and Social Affairs. Disability and Development Report 2018
46 47	26		[Internet]. United Nations. 2019 [cited 2024 Dec 16]. Available from:
48 49	27		https://www.un.org/development/desa/disabilities/wp-
50 51 52 53 54 55 56 57 58 59	28		content/uploads/sites/15/2019/07/disability-report-chapter2.pdf
	29	12.	Chavan BS. Relevance of qualitative research in disability. Journal of Disability
	30		Management and Rehabilitation. 2015;1(1):1–2.
	31	13.	United Nations. Convention on the Rights of Persons with Disabilities [Internet]. Human
	32		Rights Instruments. 2008 [cited 2024 Dec 16]. Available from:
	33		https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-
60	34		persons-disabilities

Page 27 of 49

1

BMJ Open

1 2			
3 4 5 6 7	1	14.	United Nations- Division for Inclusive Social Development (DISD). Article 24 -
	2		Education [Internet]. Social Development Issues-Disability. [cited 2024 Dec 15].
	3		Available from: https://social.desa.un.org/issues/disability/crpd/article-24-education
8 9	4	15.	United Nations- Division for Inclusive Social Development (DISD). Article 27 - Work
10 11	5		and employment [Internet]. Social Development Issues-Disability. [cited 2024 Dec 12].
12	6		Available from: https://www.un.org/development/desa/disabilities/convention-on-the-
13 14	7		rights-of-persons-with-disabilities/article-27-work-and-employment.html
15 16	8	16.	United Nations- Division for Inclusive Social Development (DISD). Article 6 - Women
17 18	9		with disabilities [Internet]. Social Development Issues-Disability. [cited 2024 Dec 12].
19	10		Available from: https://social.desa.un.org/issues/disability/crpd/article-6-women-with-
20 21	11		disabilities
22 23	12	17.	United Nations- Division for Inclusive Social Development (DISD). Article 7 - Children
24	13		with disabilities [Internet]. Social Development Issues-Disability. [cited 2024 Dec 12].
25 26	14		Available from: https://social.desa.un.org/issues/disability/crpd/article-7-children-with-
27 28	15		disabilities
29 30	16	18.	United Nations- Division for Inclusive Social Development (DISD). Article 9 -
31	17		Accessibility [Internet]. Disability. [cited 2024 Dec 10]. Available from:
32 33	18		https://social.desa.un.org/issues/disability/crpd/article-9-accessibility
34 35	19	19.	Sophie Mitra AP and BV. Disability and Poverty in Developing Countries: A Snapshot
36 37	20		from the World Health Survey [Internet]. The World Bank - Social Protection and Lab.
38	21		2011 [cited 2024 Dec 17]. Available from:
39 40	22		https://documents1.worldbank.org/curated/en/501871468326189306/pdf/625640NWP
41 42	23		0110900PUBLIC00BOX361487B.pdf
43	24	20.	United Nations. Transforming our world: the 2030 Agenda for Sustainable Development
44 45	25		[Internet]. Department of Economic and Social Affairs Sustainable Development. 2015
46 47	26		[cited 2024 Dec 12]. Available from: https://sdgs.un.org/2030agenda
48 49	27	21.	United Nations. International Human Rights Law [Internet]. Instruments & mechanisms.
49 50 51 52	28		[cited 2024 Dec 10]. Available from: https://www.ohchr.org/en/instruments-and-
	29		mechanisms/international-human-rights-law
53 54	30	22.	World Bank Group. Disability Inclusion [Internet]. Understanding Poverty. 2023 [cited
55 56 57	31		2024 Dec 12]. Available from: https://www.worldbank.org/en/topic/disability
	32	23.	Saran A, Hunt X, White H, Kuper H. Protocol: Effectiveness of interventions for
58 59 60	33		improving social inclusion outcomes for people with disabilities in low- and

Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

BMJ Open

1 2			
3 4	1		middle-income countries: A systematic review. Campbell Systematic Reviews. 2021
5	2		Sep 29;17(3):e1191.
6 7	3	24.	Centers for Disease Control and Prevention. Disability and Health Disability Barriers
8 9	4		[Internet]. Disability Inclusion. [cited 2024 Dec 17]. Available from:
10 11	5		https://www.cdc.gov/ncbddd/disabilityandhealth/disability-barriers.html
12	6	25.	Ministry of state for statistics and Program implementation. Handbook on Collection of
13 14	7		statistics act, 2008 [Internet]. Ministry of Law and Justice. 2008 [cited 2025 Mar 4].
15 16	8		Available from:
17	9		https://www.mospi.gov.in/sites/default/files/main_menu/handbook_%20collection_of_
18 19	10		statistic_act/hand_col_stat_act_2008.pdf
20 21	11	26.	Ministry of Statistics and Programme Implementation G of I. Note on sample design
22 23	12		and estimation procedure of NSS 76th round. Ministry of Statistics and Programme
24	13		Implementation, Government of India.
25 26	14	27.	National Sample Survey Office, Ministry of Statistics and Program Implementation
27 28	15		Government of India. Schedule 26: Survey of persons with disabilities [Internet].
29 30	16		Seventy-Sixth round: July, 2018 - December, 2018, 2018. 2018 [cited 2024 Dec 12].
31	17		Available from:
32 33	18		https://www.mospi.gov.in/sites/default/files/NSS7612dws/NSS_76_sch_26.0.pdf
34 35	19	28.	Government of Assam H and FW. Disability Certificate Health & Family Welfare
36 37	20		Government Of Assam, India [Internet]. Disability Certificate. [cited 2025 Feb 17].
38	21		Available from: https://hfw.assam.gov.in/information-services/disability-certificate
39 40	22	29.	Disabilities. D of E of P with. Unique Disability ID [Internet]. Ministry of Social Justice
41 42	23		and Empowerment, Governmenet of India of India. [cited 2025 Mar 3]. Available from:
43	24		https://swavlambancard.gov.in/faqs
44 45	25	30.	Okoro CA, Hollis ND, Cyrus AC, Griffin-Blake S. Prevalence of Disabilities and Health
46 47	26		Care Access by Disability Status and Type Among Adults - United States, 2016.
48 49	27		MMWR Morb Mortal Wkly Rep. 2018 Aug 17;67(32):882–7.
50	28	31.	Ozawa MN, Hun Yeo Y. Race/ethnicity and socioeconomic class as correlates of
51 52	29		disability in old age. J Gerontol Soc Work. 2008;51(3-4):337-65.
53 54	30	32.	Kavanagh AM, Krnjacki L, Aitken Z, Lamontagne AD, Beer A, Baker E, et al.
55	31		Intersections between disability, type of impairment, gender and socio-economic
56 57	32		disadvantage in a nationally representative sample of 33,101 working-aged Australians.
58 59	33		Disabil Health J. 2015 Apr 1;8(2):191–9.
60			

Page 29 of 49

33.

BMJ Open

Courtney-Long EA, Carroll DD, Zhang QC, Stevens AC, Griffin-Blake S, Armour BS,
et al. Prevalence of Disability and Disability Type Among AdultsUnited States, 2013.
MMWR Morb Mortal Wkly Rep. 2015 Jul 31;64(29):777-82.
Department of Social Justice and Empowerment M of SJ and EG of I. About the
Division Department of Social Justice and Empowerment - Government of India
[Internet]. [cited 2025 Mar 3]. Available from:
https://socialjustice.gov.in/common/31548
et] 35. Ministry of Statistics and Programme Implementation(GOI) - MOSPI. India -
Survey of Persons with Disabilities NSS 76th Round : July 2018 - December 2018 -
Overview [Internet]. Central Data Catalog. 2018 [cited 2024 Dec 10]. Available from:
https://microdata.gov.in/nada43/index.php/catalog/154/overview
Stata. SVY estimation — Estimation commands for survey data [Internet]. [SEM] sem
— Structural equation model estimation command. [cited 2024 Dec 17]. Available from:
https://www.stata.com/manuals13/svysvyestimation.pdf
Rashmi R, Mohanty SK. Socioeconomic and geographic variations of disabilities in
India: evidence from the National Family Health Survey, 2019–21. Int J Health Geogr
[Internet]. 2024 Dec 1 [cited 2025 Mar 3];23(1):1-16. Available from: https://ij-
healthgeographics.biomedcentral.com/articles/10.1186/s12942-024-00363-w
Acharya K. Prenatal testing for intellectual disability: Misperceptions and reality with
lessons from down syndrome. Dev Disabil Res Rev. 2011 Jan 1;17(1):27–31.
Bailey DB, Skinner D, Warren SF. Newborn Screening for Developmental Disabilities:
Reframing Presumptive Benefit. Am J Public Health. 2005 Nov;95(11):1889.
National Health Authority, Government of India. Pradhan Mantri Jan Arogya Yojana
(PM-JAY) [Internet]. About PM-JAY. 2019 [cited 2024 Dec 10]. Available from:
https://nha.gov.in/PM-JAY
Ministry of Health and Family Welfare. Government of India. RBSK-Rashtriya Bal
Swasthya Karyakram [Internet]. Schemes. 2024 [cited 2024 Dec 10]. Available from:
https://rbsk.mohfw.gov.in/RBSK/
Dhole RS, Gaur KA, More NS, Popalwar H, Lokhande V. Study of locomotor disability
due to various types of Trauma. National journal of medical research. 2015;5(3):194-8.
Musselwhite CBA, Avineri E, Susilo YO, Bhattachary D. Public attitudes towards
motorcyclists' safety: A qualitative study from the United Kingdom. Accid Anal Prev.
2012 Nov;49:105–13.

MMWR Morb Mortal Wkly Rep. 2015 Jul 31;64(29):777-82. Department of Social Justice and Empowerment M of SJ and EG of I 34. Division | Department of Social Justice and Empowerment - Governme [Internet]. [cited] Mar 3]. Available https://socialjustice.gov.in/common/31548 [dataset] 35. Ministry of Statistics and Programme Implementation(GOI) - MC Survey of Persons with Disabilities NSS 76th Round : July 2018 - Decer Overview [Internet]. Central Data Catalog. 2018 [cited 2024 Dec 10]. Ava https://microdata.gov.in/nada43/index.php/catalog/154/overview 36. Stata. SVY estimation — Estimation commands for survey data [Internet]. - Structural equation model estimation command. [cited 2024 Dec 17]. Ava https://www.stata.com/manuals13/svysvyestimation.pdf 37. Rashmi R, Mohanty SK. Socioeconomic and geographic variations of di India: evidence from the National Family Health Survey, 2019–21. Int J H [Internet]. 2024 Dec 1 [cited 2025 Mar 3];23(1):1-16. Available from healthgeographics.biomedcentral.com/articles/10.1186/s12942-024-00363-Acharya K. Prenatal testing for intellectual disability: Misperceptions and 38. lessons from down syndrome. Dev Disabil Res Rev. 2011 Jan 1;17(1):27-3 39. Bailey DB, Skinner D, Warren SF. Newborn Screening for Developmental Reframing Presumptive Benefit. Am J Public Health. 2005 Nov;95(11):188 40. National Health Authority, Government of India. Pradhan Mantri Jan Aro (PM-JAY) [Internet]. About PM-JAY. 2019 [cited 2024 Dec 10]. Available https://nha.gov.in/PM-JAY 41. Ministry of Health and Family Welfare. Government of India. RBSK-Ra Swasthya Karyakram [Internet]. Schemes. 2024 [cited 2024 Dec 10]. Ava https://rbsk.mohfw.gov.in/RBSK/ 42. Dhole RS, Gaur KA, More NS, Popalwar H, Lokhande V. Study of locomot due to various types of Trauma. National journal of medical research. 2015; 43. Musselwhite CBA, Avineri E, Susilo YO, Bhattachary D. Public attitud motorcyclists' safety: A qualitative study from the United Kingdom. Accid 2012 Nov;49:105-13.

Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

BMJ Open

- 3 4	1	44.	World Bank Group. Traffic crash injuries and disabilities: The burden on Indian society
5	2		[Internet]. Policy Document. 2021 [cited 2024 Dec 17]. Available from:
6 7	3		https://www.worldbank.org/en/country/india/publication/traffic-crash-injuries-and-
8 9	4		disabilities-the-burden-on-indian-society
10 11	5	45.	Cole EOB, Christie SA, Oke R, Motwani G, Dickson D, Chendjou W, et al. Too serious
12	6		to ignore: The epidemiologic and economic burden of home injuries in the Southwest
13 14	7		Region of Cameroon—A community-based study. Bourgeois D, editor. PLoS One. 2022
15 16	8		Sep 22;17(9):e0274686.
17	9	46.	Rehman T, Sulgante S, Sekhar S. Prevalence and pattern of domestic accidents in the
18 19	10		field practice area of Jawaharlal Institute of Urban Health Centre, Puducherry: a cross-
20 21	11		sectional analytical study. J Inj Violence Res. 2020;12(1).
22 23	12	47.	Department of Empowerment of Persons with Disabilities. The Rights of persons with
24	13		disabilities act 2016 [Internet]. Policy Document. 2016 [cited 2024 Dec 11]. Available
25 26	14		from: https://legislative.gov.in/sites/default/files/A2016-49_1.pdf
27 28	15	48.	Bureau of Indian Standards. National building code of India 2016 (NBC 2016)
29 30	16		[Internet]. SP 7: 2016. 2016 [cited 2024 Dec 21]. Available from:
31	17		https://www.bis.gov.in/standards/technical-department/national-building-code/
32 33	18	49.	Department of Empowerment of Persons with Disabilities (DEPwD). Assistance to
34 35	19		Persons with Disabilities for Purchase/Fitting of Aids /Appliances (ADIP) [Internet].
36	20		Scheme. [cited 2024 Dec 17]. Available from: https://depwd.gov.in/adip/
37 38	21	50.	Department of Empowerment of Persons with Disabilities (DEPwD), Government of
39 40	22		India. Deendayal Divyangjan Rehabilitation Scheme (DDRS) [Internet]. Schemes. 2023
41 42	23		[cited 2024 Dec 10]. Available from: https://depwd.gov.in/ddrs/
43	24	51.	Kumar SG, Roy G, Kar SS. Disability and Rehabilitation Services in India: Issues and
44 45	25		Challenges. J Family Med Prim Care [Internet]. 2012 [cited 2025 Mar 3];1(1):69.
46 47	26		Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC3893941/
48 49	27	52.	Hayes AM, Bulat J. Disabilities Inclusive Education Systems and Policies Guide for
50	28		Low- and Middle-Income Countries. RTI Press Publication. Research Triangle Park,
51 52	29		NC: RTI Press; 2017 Jul.
53 54	30	53.	Centre for Civil Society. Right To Education [Internet]. [cited 2024 Dec 10]. Available
55	31		from: https://righttoeducation.in/know-your-rte/about
56 57	32	54.	Ministry of Education, Government of India. Samagra Shiksha [Internet]. 2021 [cited
58 59	33		2024 Dec 17]. Available from: https://samagra.education.gov.in/about.html
60			

Page 31 of 49

BMJ Open

1 2			
3	1	55.	The Ministry of Human Resource Development; Government of India. National
4 5	2		Education Policy, 2020 [Internet]. 2020 [cited 2024 Dec 17]. Available from:
6 7	3		https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
8 9	4	56.	Ahmed SK, Jeffries D, Chakraborty A, Carslake T, Lietz P, Rahayu B, et al. Teacher
10	5		professional development for disability inclusion in low- and middle-income Asia-
11 12	6		Pacific countries: An evidence and gap map. Campbell Systematic Reviews [Internet].
13 14	7		2022 Dec 1 [cited 2025 Mar 3];18(4):e1287. Available from:
15 16	8		https://onlinelibrary.wiley.com/doi/full/10.1002/cl2.1287
17	9	57.	Bera M, Kartick Chandra Pramanik P. Access Challenges For Students With Disabilities
18 19	10		In Higher Education. 2023 [cited 2025 Mar 3];11:2320-882. Available from:
20 21	11		www.ijcrt.org
22 23	12	58.	Department of Empowerment of Persons with Disabilities (DEPwD). National
24	13		divyangjan finance and development corporation-India [Internet]. Organizations Under
25 26	14		DEPwD. 2024 [cited 2024 Dec 10]. Available from: https://depwd.gov.in/national-
27 28	15		handicapped-finance-and-development-corporation/
29 30	16	59.	Qiu N, Jiang Y, Sun Z, Du M. The impact of disability-related deprivation on
31	17		employment opportunity at the neighborhood level: does family socioeconomic status
32 33	18		matter? Front Public Health. 2023 Aug 9;11:1232829.
34 35	19	60.	Bonaccio S, Connelly CE, Gellatly IR, Jetha A, Martin Ginis KA. The Participation of
36 37	20		People with Disabilities in the Workplace Across the Employment Cycle: Employer
38	21		Concerns and Research Evidence. J Bus Psychol. 2020 Apr 1;35(2):135–58.
39 40	22	61.	Babik I, Gardner ES. Factors Affecting the Perception of Disability: A Developmental
41 42	23		Perspective. Front Psychol. 2021 Jun 21;12:702166.
43 44	24	62.	Jameel S. Disability in the Context of Higher Education: Issues and Concerns in India.
45	25		Electronic Journal for Inclusive Education. 2011 Jan 1;2(7).
46 47	26	63.	Moumita Barman. Barriers to higher education for persons with disabilities block their
48 49	27		meaningful growth. News article - The Siasat Daily. 2024 Jan 26;
50 51	28	64.	Department of Empowerment of Persons with Disabilities (DEPwD), Government of
52	29		India. Scheme for Implementation of the Rights of Persons with Disabilities Act, 2016
53 54	30		(SIPDA) [Internet]. Schemes. 2016 [cited 2024 Dec 12]. Available from:
55 56	31		https://depwd.gov.in/sipda/
57	32	65.	Ministry of Education, Government of India. Inclusive Education of the Disabled at
58 59	33		Secondary Stage [Internet]. About MoE. 2016 [cited 2024 Dec 17]. Available from:
60	34		https://www.education.gov.in/iedss

2	
3	
4	
5	
6	
7	
/	
8	
9	
10	
11	
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47	
47	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	

12

13 14

1 2

> 1 66. Disempowering the Empowered: The Systemic Failures of India's Disability Welfare 2 Schemes [Internet]. [cited 2025 Mar 3]. Available from: 3 https://www.salzburgglobal.org/news/fellows/article/disempowering-the-empowered-4 the-systemic-failures-of-indias-disability-welfare-schemes

- 5 67. Lawson A, Pineda VS, Walker J, Jain S, Jain M. Revisiting the Conceptual Terrains of 6 the Right to Accessibility in India: The Role of Judicial Enforcement. Laws 2024, Vol 7 13, Page 54 [Internet]. 2024 Aug 16 [cited 2025 Mar 3];13(4):54. Available from: 8 https://www.mdpi.com/2075-471X/13/4/54/htm
- 9 68. Arasu S, Shanbhag D. Quality of Life and Burden of Caregiving Among the Primary Caregivers of Children with Disability in Rural Karnataka. J Family Med Prim Care. 10 2021 Aug 27;10(8):2804-9. 11

58 59 Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies

BMJ Open Tables Tables Table 1: Prevalence of different types of disabilities across different socio-demographic characteristics, NSS, 76th round, India (n=576,796)

Background characteristics	Locomotor N (%)	Vision N (%)	Hearing N (%)	Speech N (%)	Mental Retardation N (%)	N (%)	R 1R (B)	Any one disability N (%)	
0	61981 (1.36)	11977 (0.23)	15294 (0.30)	12661 (0.23)	8564 (0.16)	6751 (0.16)	2021 (0.05)	107,125 (2.20	
Age Group (completed years)							5. Do		
up to 5	1494 (2.2)	182 (1.5)	311 (2)	907 (7.3)	445 (5.3)	41 (0.5)		2839 (2.5)	
`6-17	7290 (10.8)	1210 (9.2)	1977 (12.6)	4515 (35.8)	3492 (41.2)	1060 (15.4)	e e e e e e e e e e	16695 (14.4)	
18-35	11546 (18)	1386 (10.7)	2036 (13.3)	3273 (26.4)	2796 (33)	1915 (27.6)		20673 (18.8)	
36-49	11434 (18.1)	1557 (12.3)	2118 (13)	1812 (13.8)	1113 (12.4)	1646 (25)		18665 (17.2)	
50-65	16627 (27.9)	3609 (31.1)	3843 (25.1)	1495 (11.4)	561 (6.5)	1409 (21.3)	96 45 (21.9)	26420 (25.7)	
65+	13590 (23)	4033 (35.2)	5009 (34)	659 (5.3)	157 (1.6)	680 (10.1)	4 (16.6)	21833 (21.4)	
Sex						2	oper		
Male	36862 (58.7)	6014 (50.2)	7993 (52)	7554 (60.4)	5202 (61.7)	3856 (56.8)	1964 (58.9)	61707 (57.3)	
Female	25110 (41.3)	5958 (49.8)	7296 (48)	5106 (39.6)	3359 (38.3)	2893 (43.2)	1855 (41.1)	45396 (42.7)	
Marital Status						C C	sim		
Never Married	16912 (24.7)	2719 (20.8)	3987 (24.2)	8708 (67.8)	7450 (86.9)	3281 (46.1)		36813 (31.4)	
Ever Married	33257 (55.3)	5541 (46.9)	7094 (47.5)	3086 (25.3)	791 (9.3)	2381 (35.8)		50108 (48.8)	
Widowed	11293 (19)	3616 (31.5)	4024 (27.1)	690 (5.4)	190 (2.1)	775 (12.5)	র ৪	18933 (18.5)	
divorced/separated	519(1)	101 (0.8)	189 (1.1)	177 (1.4)	133 (1.8)	314 (5.5)	2 3 9 9 (1.2)	1271 (1.3)	
Area of residence						2	Ag		
Rural	42222 (71.6)	8809 (76.3)	11121 (74.9)	9164 (72.9)	5974 (69.9)	4772 (73.1)	2655 (62.4)	75091 (72.8)	
Urban	19759 (28.4)	3168 (23.7)	4173 (25.1)	3497 (27.1)	2590 (30.1)	1979 (26.9)	1966 (37.6)	32034 (27.2)	
Educational attainment							liogr		
Non-literate	26376 (44.5)	7160 (62.6)	8365 (57.3)	7119 (56.9)	5846 (69.3)	3285 (49.6)		50848 (48.9)	
				1			12008 (34.1)		

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Literate but not formal	15002 (23.2)	2483 (19.4)	3700 (22.9)	3428 (26.7)	1858 (21)	f, inclusion (1629 (23.3)	14-099 59 (29)	26145 (23.3)
Upto primary	16885 (26.5)	1987 (15.5)	2782 (16.9)	1908 (14.9)	808 (9.1)	1623 (24.1)	9 6 (28.7)	25210 (23.1)
Upto secondary	3718 (5.8)	347 (2.6)	447 (2.9)	206 (1.5)	52 (0.6)	214 (3.1) 9	238 (8.2)	4922 (4.6)
Preferred Religion								
Hindu	49548 (81.9)	9479 (82.9)	12090 (82.6)	9658 (78.7)	6540 (78.7)	5063 (74.7)	2844 (80.8)	84742 (81.5)
Islam	8375 (12.5)	1601 (12.5)	1927 (11.7)	2021 (15.6)	1366 (15.9)	1167 (18.4)	5 N	14658 (12.9)
Others	4058 (5.6)	897 (4.6)	1277 (5.7)	982 (5.7)	658 (5.4)	521 (6.9)	2 75 (6.5)	7725 (5.5)
Social Group		0h				521 (6.9) o	nloa	
Scheduled Tribe	6049 (8.3)	1491 (9.1)	1923 (9.5)	1478 (9.4)	822 (7.2)	670 (7.8) d	4 2 (12.3)	11729 (8.7)
Scheduled Caste	12240 (20.4)	2407 (21.3)	2805 (19.4)	2467 (20.5)	1602 (19.2)	1269 (19.9)		20925 (20.4)
Other Backward Classes	26861 (44.7)	5205 (46)	6583 (45.5)	5482 (44.7)	3806 (45.8)	2915 (45.7)	6 7 (40.2)	46223 (44.9)
General	16831 (26.6)	2874 (23.6)	3983 (25.6)	3234 (25.4)	2334 (27.8)	1897 (26.6)	8 8 (29.7)	28248 (26)
Wealth Index				101			njop	
Poorer	17681 (30.2)	3919 (35.1)	4933 (34.7)	3552 (30.1)	2025 (25.3)	1932 (31)	82 3 (25.8)	31259 (31)
Poor	12553 (20.5)	2474 (20.8)	3005 (19.4)	2746 (21.4)	1773 (20.9)	1364 (20.5)	\$24 (16.2)	21959 (20.7)
Middle	11468 (18.2)	2271 (18.5)	2730 (17.4)	2434 (18.5)	1751 (20)	1302 (18.1)	50 (17.3)	20058 (18.3)
Richer	10440 (16)	1864 (14.4)	2480 (15.4)	2080 (15.8)	1611 (18.3)	1161 (16.8)	9 3 (19.9)	17946 (15.9)
Richest	9839 (15.1)	1449 (11.1)	2146 (13)	1849 (14.2)	1404 (15.5)	992 (13.6)	6 1 (20.7)	15903 (14.1)
Regions of India						chnc	, r	
Northern	8787 (14.4)	1478 (13.1)	1692 (11.7)	1347 (11.1)	1144 (13.5)	931 (14.2) g	N N 1 6 (7.6)	14305 (13.8)
Southern	13448 (23)	2814 (24.7)	4013 (27.3)	2958 (24.8)	2141 (25.6)	1447 (21.3)	1 4 (25.5)	23699 (23.3)
Western	8387 (12.7)	1286 (10.1)	1740 (11.1)	1423 (11.3)	1293 (15.2)	706 (10.6)	9 10 (17.7)	13708 (12.3)
Eastern	12790 (20.3)	2538 (21.9)	3238 (22.5)	3248 (27.1)	1762 (21.3)	1672 (26.3)	6 6 6 6 6 6 6 6 6 6	23061 (21.8)
North-Eastern	3858 (2.1)	1335 (4.5)	1620 (3.7)	1308 (3.4)	594 (2)	582 (2.7)	9 82 (2.4)	8839 (2.8)
Central	14711 (27.4)	2526 (25.6)	2991 (23.8)	2377 (22.4)	1630 (22.6)	1413 (24.8)	4415 (16.3)	23513 (26)
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of 49				BMJ O	pen		/bmjoper d by copy		
1 2	Table 2: Percentage distribution	oution of diff	ferent disa	bility type	s and their a	associated	n-2024-0902203in /right, including f	on, NSS 76	^h round, In
		Locomotor	Visual	Hearing	Speech and language	Mental retardation/	ontai Mientai Bay Bay	Other types of disability	Any Disability
	Total sample size	61980	1156	1281	2013	1217		768	61980
	Causes of disability						ited t		
	Disease	28673 (46.3)	454 (39.3)	484 (37.8)	1246 (61.9)	NA		NA	NA
	Other than disease due to burn	723 (1.2)	88 (0.7)	1 (0.1)	8 (0.4)	NA	2025. Downloaded from http://t eignementSuperieur (ABES) . rélated to text and data mining.	NA	NA
	Injuries other than burn	13876 (22.4)	156 (13.5)	158 (12.4)	105 (5.2)	NA	d dat dat dat	NA	NA
	Other causes	18702 (30.2)	538 (46.5)	637 (49.7)	654 (32.5)	NA		NA	NA
	Disability from Birth						s) . ning,		
	Yes	11,488 (18.5)	91 (7.9)	198 (15.4)	1041 (51.7)	955 (78.5)	11 ≥ (2 2 4)	119 (15.5)	11,488 (18.5)
	No	50,052 (80.8)	1062 (91.9)	1081 (84.4)	964 (47.9)	258 (21.2)	40 3 (7 8 6)	645 (84)	50,052 (80.8)
	Not Known	440 (0.7)	3 (0.2)	2 (0.2)	8 (0.4)	4 (0.3)	ng (1)	4 (0.4)	440 (0.7)
	Disability commenced in last 365 days						and similar te		
	sample size	48741	1034.2	1052.4	938.7	251.6		628.6	48741
	Yes	2987 (6.1)	72 (7)	65 (6.2)	100 (10.6)	11 (4.4)	400010,7	48 (7.7)	2987 (6.1)
	No	45754 (93.9)	961 (93)	987 (93.8)	839 (89.4)	240 (95.6)	35 <mark>9</mark> (888)	580 (92.3)	45754 (93.9)
	Place of occurrence of disability						5 at A jies.		
	Sample size	14281	161	157	105	33	86 en	63	14281
	Workplace	2308 (16.2)	13 (8.3)	30 (19.2)	11 (10.9)	2 (6.9)	9 (1 1 9)	11 (18.1)	2308 (16.2)
	Road	5977 (41.9)	46 (28.5)	43 (27.5)	41 (38.7)	9 (25.9)	35 (40 5)	15 (23.8)	5977 (41.9)
	Home	4693 (32.9)	93 (57.9)	73 (46.3)	45 (42.4)	19 (58.5)	33 (38)	31 (49.5)	4693 (32.9)
			1	3		1	ique		
		For peer r	eview only - ht	tp://bmjopen.k	omj.com/site/abo	out/guidelines.>	chtml de		

nd, India.

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	Other places	1302 (9.1)	9 (5.3)	11 (7)	8 (8)	3 (8.7)	inc.(9.922	5 (8.6)	1302 (9.1)
Treatment treatment	t taken/undergoing						on 15 ig for u		
	Sample size	61980	1156	1281	2013	1217		768	61980
	yes: consulting doctor	35,923 (58)	566.6 (49)	617 (48.2)	1,080 (53.7)	710 (58.4)		330 (43)	35923 (58)
	Otherwise	1565 (2.5)	22 (1.9)	34 (2.7)	42 (2.1)	36 (2.9)	d Go to	6 (0.7)	1564.5 (2.5
Yes:	consulting doctor, plus undergoing treatment	17329 (28)	375 (32.4)	418 (32.7)	719 (35.7)	355 (29.2)	2625. Downloaded friom http://binjo reignement Superieut/(ABES) . (3) 19and data mining, AI to	397 (51.7)	17329 (28)
	Otherwise	860 (1.4)	34 (2.9)	21 (1.7)	20 (1)	4 (0.3)		8 (1)	860 (1.4)
Attending	g special school/special therapy	116 (0.2)	2.9 (0.3)	0 (0)	4 (0.2)	6 (0.5)	m http:// ABES), a m∓hing	0 (0)	116 (0.2)
C	Cannot afford treatment	2040 (3.3)	75 (6.4)	73 (5.7)	72 (3.6)	55 (4.6)	1 <u>7</u> (3.3)	8 (1)	2040 (3.3)
No trea	tment available for the disability	699 (1.1)	13 (1.1)	8 (0.6)	17 (0.8)	16 (1.3)	opegi.bm tratition	5 (0.7)	699 (1.1)
	Not required	2717 (4.4)	60 (5.2)	97 (7.6)	47 (2.3)	26 (2.1)	, क्षाd	14 (1.8)	2717 (4.4)
	Not known	732 (1.2)	8 (0.7)	12 (0.9)	13 (0.7)	9 (0.7)	<u>ب</u> بی ا	1 (0.1)	732 (1.2)
Disab during Place	es of disability were reco ility Commenced in the g the last 365 days befor of occurrence was reco urn, injury or other than	last 365 days wa the survey. rded for individu	s recorded for	r those individ	luals who did no	t have a disab	ility of rom bir		
		_	eview only - ht				de		

Table 3: Access to disability support and rehabilitation services by the person with disability as per the 76th round of the National Sample Survey (2018), India.

Living conditions of the person with disability	Weighted percentag
(<i>n=sample included in the analysis</i>)	
Age at the onset of disability* (n= 48,727)	17.2
0 to 4 years	
5 to 14 years	9.0
15 to 59 years	45.9
60 years and above	28.0
Receipt of aid/help (n=61,712)	
Received aid/help from Government	20.8
Received aid/help from organisations other than government	4.1
Did not receive aid/help	75.1
Living arrangement(n=61,962)	
Living alone or with a spouse	57.0
Living with others	43.0
Arrangement of regular caregiver(n=61,980)	
Care-giver required but not available	0.1
Care-giver is not required	37.1
Care-giver is available	62.8
Access to public Transport (n=61,980)	
Yes	59.6
No	40.4
Accesses to public building (n=61,980)	
Yes	45.6
No	54.4
Difficulty faced accessing public building (n= 27,756)	
difficulty faced: due to stairs and non-availability of ramp, grooved tiles or lift	57.7
in opening doors	4.4
no seating arrangement: in the waiting area	1.6
at the point of receiving service	0.8
no special toilet seats	0.7
no sign for direction/ instruction/no public announcement system	0.3
no difficulty faced	27.6
others	7.0
Employed/working before onset of disability (For person of age 15 years and	1.0
above; n=55,819)	
Yes	40.3
No	59.7
Disability causing loss or change in job(n= 21,559)	57.1
loss of work	60.7
change of work	18.3
no loss or change of work	21.3
Having Disability Certificate(n=61,980)	20.4
Yes	30.4
No	69.6
Percentage of Disability as per Certificate (n=20,213)	40.0
40-<60%	49.3
<u>>60-<80%</u>	36.3
> 80%	12.8
none of these	1.6

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Table 4: Multivariable binary logistic regression analysis exploring the likelihood of living with any disability per the 76th round of the NSS, India.

	Unadjusted Odds	p-value	Adjusted Odds	
	ratio (95% C.I)		ratio (95% C.I)	p-value
Age Group (Completed years)				
Up to 5 years	Reference value	.0.001	Reference value	
6 - 18 years	2.1(2-2.1)	< 0.001	3.5(3.4-3.7)	< 0.001
19-35 years	2.3(2.2-2.4)	< 0.001	8.4(8-8.8)	< 0.001
36-49 years	3.5(3.4-3.7)	< 0.001	17.6(16.8-18.5)	< 0.001
50-65 years	6.4(6.1-6.7)	< 0.001	25.8(24.5-27.1)	< 0.001
65+ years	17.5(16.7-18.2)	< 0.001	58.4(55.4-61.5)	< 0.001
Sex				
Male	Reference value		Reference value	
Female	0.7(0.7-0.7)	< 0.001	0.6(0.6-0.6)	< 0.001
Place of Residence				
Rural	Reference value		Reference value	
Urban	1.02(1.01-1.03)	0.03	1.3(1.2-1.3)	< 0.001
Social Group				
Scheduled Tribe	Reference value		Reference value	
Scheduled Caste	1.1(1.1-1.1)	< 0.001	1.1(1.1-1.2)	< 0.001
Other Backward Classes	1.1(1-1.1)	< 0.001	1.1(1.1-1.2)	< 0.001
General	1.1(1.1-1.1)	< 0.001	1.3(1.3-1.3)	< 0.001
Educational attainment				
No education	Reference value		Reference value	
Upto Primary class	0.5(0.5-0.5)	< 0.001	0.5(0.5-0.5)	< 0.001
Upto Secondary Class	0.4(0.4-0.4)	< 0.001	0.4(0.4-0.4)	< 0.001
Graduate & Above	0.3(0.3-0.4)	< 0.001	0.3(0.3-0.3)	< 0.001
Preferred Religion				
Hindu	Reference value		Reference value	
Islam	0.8(0.8-0.9)	< 0.001	0.9(0.9-0.9)	< 0.001
Others	0.9(0.9-1)	< 0.001	1(1-1.1)	0.019
Marital Status		0.001		0.015
Never married	Reference value		Reference value	
Currently married	1.3(1.3-1.3)	< 0.001	0.3(0.3-0.3)	< 0.001
widowed	5.9(5.8-6.1)	< 0.001	0.6(0.5-0.6)	<0.001
Divorced/separated	4.4(4.1-4.8)	<0.001	1.1(1-1.2)	0.011
Wealth Index	<u></u>	~0.001	1.1(1-1.2)	0.011
Poorest	Reference value		Reference value	
Poor	0.6(0.6-0.6)	< 0.001	0.7(0.7-0.7)	< 0.001
Middle	0.6(0.5-0.6)	<0.001	0.6(0.6-0.6)	<0.001
Richer	0.5(0.5-0.5)	<0.001	0.5(0.5-0.6)	<0.001
Richest	0.4(0.4-0.4)	<0.001	0.5(0.5-0.5)	<0.001
Regions of India	0.4(0.4-0.4)	~0.001	0.5(0.5-0.5)	~0.001
8	Deference value		Deference value	
Northern	Reference value	<0.001	Reference value	<0.001
Southern	1.42(1.39-1.46)	<0.001	1.1(1.1-1.2)	<0.001
Western	1.13(1.1-1.16)	< 0.001	1(1-1.1)	0.065
Eastern	1.15(1.13-1.18)	< 0.001	1(0.9-1)	0.001
North-eastern	1(0.97-1.03)	0.961	1(1-1)	0.361
Central	1.01(0.98-1.03)	0.653	0.9(0.8-0.9)	< 0.001

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1	Figure Legends
2 3	Figure 1: Geographical disparities in the difficulties faced by the people livin with disability as per the 76 th Round of the National Sample Survey, India
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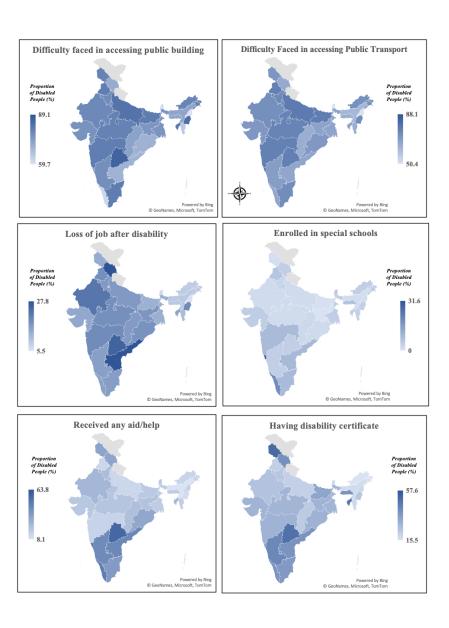


Figure 1: Geographical disparities in the difficulties faced by the people living with disabilities as per the 76th Round of the National Sample Survey, India

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BMJ Open Supplementary Table 1: Living conditions of the people living with different types of of the second for the National Sample Survey Organization India (2017-18)

Living conditions of the people (<i>n</i> = <i>sample included in the analysis</i>)	Locomotor	Visual	es region Hearingen Hearingen	Speech	Mental retardness	Mental illness	Others
	Weighted %	Weighted %	Weighted &	Weighted %	Weighted %	Weighted %	Weighted %
Age at the onset of disability			4.2 ar	~~~~			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
0 to 4 years	17.2	3.0	4.2 ft a	21.0	51.0	10.1	9.9
5 to 14 years	9.0	2.3	3.0 de 3.0 de 17.4 a 3.0 de 4 a 3.0 de 4 a 3.0 de 4 a 5.4 m 5.4 m 5.	9.6	17.3	12.3	7.0
15 to 59 years	45.9	22.1	17.44 tro	40.9	24.0	40.5	49.2
60 years and above	28.0	72.6	75.43 B	28.4	7.7	37.1	33.8
Total number of participants	48,737	1,035	1,05€.95	946	259	395	632
Receipt of aid/help			9, '				
Received aid/help from Government	20.8	22.2	20.7 t	29.2	37.2	25.5	20.0
Received aid/help from organisations other than			8.6g				
government	4.1	10.2	8.6 m	4.0	3.3	6.0	2.7
Did not receive aid/help	75.1	67.7	70.88	66.8	59.5	68.5	77.3
Total number of participants	61,712	1,145	1,272	2,010	1,215	521	766
Living arrangement			on mil				
Living alone or with a spouse	57.0	43.5	41.6 r u	26.8	4.1	35.4	55.8
Living with others	43.0	56.5	58.4 ^{ec}	73.2	95.9	64.6	44.2
Total number of participants	61,962	1,156	1,28 6	2,013	1,217	523	768
Arrangement of regular caregiver			1,28 <u>6</u> 20 9 25				
Care-giver required but not available	0.1	0.0	0.0 s.	0.1	0.9	0.0	0.3
Care-giver is not required	37.1	11.5	15.7 Ge	8.8	5.6	10.8	13.4
Care-giver is available	62.8	88.6	84.2 nce	91.1	93.6	89.2	86.3
Total number of participants	61,980	1,156	1,281	2,013	1,217	523	768
Accesses to public building			1,281 Bi io 29.4 Ta				
Yes	45.6	25.4	29.4 gra	27.2	26.0	26.0	29.9

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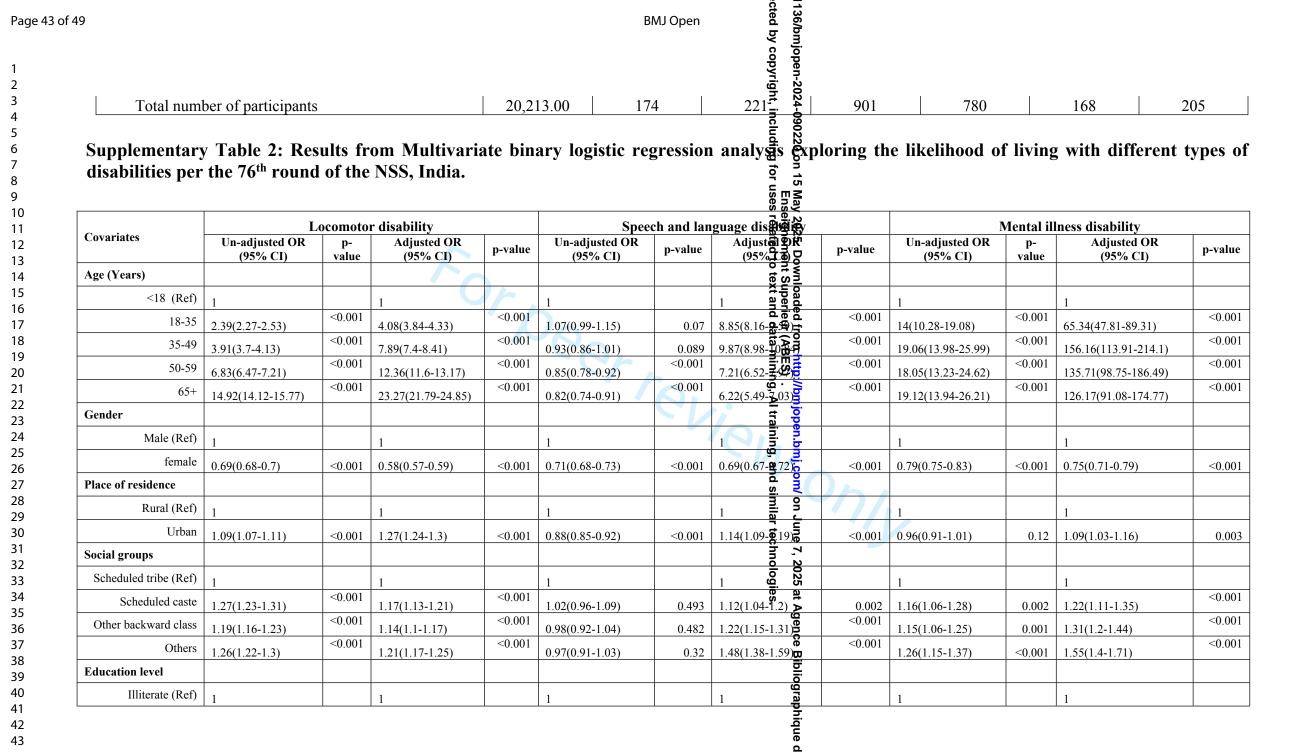
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No	54.4	74.6	yright, in-2024-090220 70.6 including fo	72.8	74.0	74.0	70.1
Total number of participants	61,980	1156	1281 200	2013	523	523	768
Difficulty faced accessing public building	,		220 oj Jding				
difficulty faced: due to stairs and non-availability of			ng f				
ramp, grooved tiles or lift	57.7	63.2	60.7 2 5	55.4	49.7	46.7	52.2
in opening doors	4.4	1.6		2.8	1.0	7.6	2.8
no seating arrangement: in the waiting area	1.6	3.0	2.9 e c 20	0.7	1.4	1.7	2.1
at the point of receiving service	0.8	5.7	2.9 reignement Superieur 2.0 to text superieur 2.0 data mining 2.0 data mining 13.3 ta mining 433 mining 2.0 data superieur	0.9	0.8	1.3	0.3
no special toilet seats	0.7	0.4		0.7	0.0	0.8	0.9
no sign for direction/ instruction/no public			o teg				
announcement system	0.3	2.2	2.0 to be a	2.2	2.1	1.3	0.0
no difficulty faced	27.6	8.4	17.6 den inde	15.2	17.7	24.2	25.8
others	7.0	15.4	13.34 To	22.1	27.4	16.3	15.8
Total number of participants	27,756	330	433 8 8	537	330	134	226
Working before onset (For >15 years and above)			inin				
Yes	40.3	44.4	JJ.T 2	32.7	5.6	38.5	53.6
No	59.7	55.6	64.1 ²	67.3	94.4	61.5	46.4
Total number of participants	55,819	1093		1353	690	448	667
Disability causing loss or change in job			ing				
loss of work	60.7	75.3	72.8 a	86.5	80.9	84.2	82.8
change of work	18.3	11.0	72.88 5.7 d	5.2	2.7	8.7	5.9
no loss or change of work	21.3	13.7	21.5 2 . S	8.3	16.4	7.1	11.4
Total number of participants	21,559	465		425	37	165	343
Having Disability Certificate							
Yes	30.4	14.0	16.100 2025	41.7	59.8	29.9	24.9
No	69.6	86.0	83.9 6 25	58.3	40.2	70.1	75.1
Total number of participants	61,980	1156	128 128 Age	2013	1217	523	768
Percentage of Disability as per Certificate			\gei				
40% or more but less than 60%	49.3	23.2	22.5 c	16.9	14.6	27.7	29.7
60% or more but less than 80%	36.3	37.6		32.3	35.5	43.0	37.3
80% or more	12.8	38.7	34.2 Bi 42.2 jo 1.1 gra bh que	50.3	49.1	29.0	31.7
none of these	1.6	0.5	1.1 g	0.5	0.8	0.4	1.3

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Primary	0.58(0.56-0.59)	< 0.001	0.84(0.82-0.86)	< 0.001	0.51(0.49-0.53)	< 0.001	copyright, 0.24(0.22	< 0.001	0.53(0.5-0.56)	< 0.001	0.52(0.49-0.56)	<0.0
Secondary	0.57(0.56-0.58)	< 0.001	0.76(0.74-0.78)	< 0.001	0.25(0.24-0.26)	< 0.001	right, 0.24(0.23-525)- 0.11(0.11-512)22	< 0.001	0.47(0.44-0.49)	< 0.001	0.34(0.32-0.36)	<0.0
and Higher Education	0.57(0.55-0.6)	< 0.001	0.66(0.63-0.68)	< 0.001	0.12(0.11-0.14)	< 0.001	0.05(0.04 <u>9</u> .06) 2	< 0.001	0.28(0.24-0.32)	< 0.001	0.15(0.13-0.17)	< 0.0
Religion							15 15 15		0.20(0.21 0.02)			
Hindu (Ref)	1		1		1		1 Ses		1		1	
Muslim	0.84(0.82-0.86)	< 0.001	0.96(0.94-0.99)	0.004	1.05(1-1.11)	0.031	0.83(0.79-55)20	0	1.16(1.09-1.24)	< 0.001	1.08(1.01-1.16)	0.
Others	0.84(0.82-0.87)	< 0.001	0.99(0.95-1.03)	0.607	1.07(1-1.14)	0.057	1.13(1.05- 1.22)	0.001	1.08(0.99-1.18)	0.101	1.17(1.06-1.29)	0.0
Marital status							to text and 1					
Un-married (Ref)	1		1		1		1 Ioad		1		1	
Currently married	1.89(1.86-1.93)	< 0.001	0.52(0.51-0.54)	< 0.001	0.31(0.3-0.33)	< 0.001	0.15(0.14-6 10)	0	0.66(0.62-0.69)	< 0.001	0.13(0.12-0.14)	<0.0
Widowed	5.99(5.83-6.15)	< 0.001	0.93(0.89-0.97)	0.001	0.53(0.49-0.57)	< 0.001	0.16(0.15-	0		< 0.001	0.22(0.19-0.24)	<0.0
Divorced/separated	2.98(2.7-3.28)	< 0.001	0.92(0.83-1.01)	0.091	1.79(1.54-2.09)	< 0.001	0.16(0.15-0, 00)	0	9.06(8.02-10.23)	< 0.001	1.76(1.54-2.02)	<0.0
Wealth							//br					
Poorest (Ref)	1		1		1		njop Al tra		1		1	
Poor	0.67(0.66-0.69)	< 0.001	0.78(0.76-0.8)	< 0.001	0.77(0.73-0.81)	<0.001	0.81(0.77-th:85)	0	0.7(0.65-0.75)	< 0.001	0.83(0.77-0.89)	< 0.0
Middle	0.6(0.59-0.62)	< 0.001	0.67(0.66-0.69)	< 0.001	0.67(0.64-0.71)	< 0.001	0.74(0.7-0 a 8)	0	0.66(0.62-0.71)	< 0.001	0.8(0.74-0.86)	<0.0
Richer	0.55(0.54-0.56)	< 0.001	0.58(0.57-0.6)	< 0.001	0.58(0.55-0.61)	< 0.001	0.69(0.65-673)	0	0.6(0.55-0.64)	< 0.001	0.75(0.69-0.81)	<0.0
Richest	0.52(0.51-0.54)	< 0.001	0.52(0.5-0.53)	< 0.001	0.52(0.49-0.55)	< 0.001	0.71(0.66- 1 75)	0	0.52(0.48-0.56)	< 0.001	0.7(0.64-0.77)	< 0.0
Region							r te					
Northern (Ref)	1		1		1		≥ 7, 2 chno		1		1	
Southern	1.26(1.22-1.3)	< 0.001	0.97(0.94-1)	0.073	1.78(1.67-1.9)	< 0.001	1.84(1.72 .6 97)	< 0.001	1.25(1.15-1.36)	< 0.001	1.05(0.96-1.15)	0.2
Western	1.12(1.08-1.15)	< 0.001	0.99(0.95-1.02)	0.429	1.23(1.14-1.32)	< 0.001	1.29(1.19-1.39)	< 0.001	0.88(0.79-0.97)	0.008	0.84(0.76-0.93)	0.0
Eastern	1.02(0.99-1.05)	0.288	0.86(0.84-0.89)	< 0.001	1.7(1.59-1.81)	< 0.001	1.42(1.33-1.52)	< 0.001	1.25(1.16-1.36)	< 0.001	1.12(1.03-1.22)	0.0
North-eastern	0.69(0.66-0.71)	< 0.001	0.66(0.63-0.69)	< 0.001	1.59(1.47-1.71)	< 0.001	1.64(1.51-1.78)	< 0.001	1.01(0.91-1.12)	0.833	0.95(0.85-1.06)	0.3
Central	1.03(1-1.05)	0.075	0.94(0.91-0.97)	< 0.001	1.08(1.01-1.15)	0.026	0.85(0.79-0.92)	< 0.001	0.93(0.85-1.01)	0.073	0.85(0.78-0.93)	<0.0

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			from Multivaria le NSS, India (C		ary logistic reg	gression	136/bmjopen-2024090220 o cted by copyright; Spoluding n analy n analy	loring th	e likelihood o	f living	with different	types c
		Hearing	disability			Visual	disability 9			Mental	retardness.	
	Un-adjusted OR (95% CI)	p- value	Adjusted OR (95% CI)	p- value	Un-adjusted OR (95% CI)	p- value	Adjusted (95% GI	p-value	Un-adjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age (Years)							2025. relate					
<18 (Ref)	1		1		1		1 in the second		1		1	
18-35	1.95(1.73-2.2)	< 0.001	5.16(4.55-5.85)	0	10.37(1.94-2.65)	< 0.001	6.57(5.59 a 32	< 0.001	1.88(1.7-2.08)	< 0.001	33.33(30-37.04)	< 0.00
35-49	3.23(2.87-3.64)	< 0.001	9.31(8.14-10.65)	0		< 0.001	13.95(11.29)	< 0.001	1.17(1.05-1.31)	0.005	34.13(30.24-38.51)	< 0.00
50-59	6.63(5.91-7.45)	< 0.001	15.34(13.43-17.52)	0	31.04(9.17-12.36)	< 0.001	29.2(24.7 a 44.48)	< 0.001	0.65(0.57-0.74)	< 0.001	18.86(16.39-21.71)	< 0.00
65+	20.67(18.42-23.2)	< 0.001	38.97(34.06-44.58)	0	43.68(23.92-32.23)	1	61.23(51.74-76.47)	< 0.001	0.4(0.33-0.48)	< 0.001	11.39(9.26-14.01)	< 0.00
Gender	X						ninii http					
Male (Ref)	1		1		1	0.			1		1	
female	0.96(0.93-0.99)	0.012	0.73(0.7-0.75)	< 0.001	1.04(1.01-1.08)	0.022	0.76(0.73	< 0.001	0.68(0.65-0.71)	< 0.001	0.76(0.73-0.8)	< 0.00
Place of residence							en.k					
Rural (Ref)	1		1		1				1		1	
Urban	0.86(0.83-0.9)	< 0.001	1.07(1.03-1.12)	0.001	0.83(0.8-0.86)	< 0.001	1.08(1.04 .13	0.001	1(0.96-1.05)	0.894	1.18(1.11-1.24)	< 0.00
Social groups	· · · · · ·						mili					
Scheduled tribe (Ref)	1		1		1		June ar te		1		1	
~	0.89(0.84-0.94)	< 0.001	0.95(0.89-1.01)	0.084	0.99(0.93-1.06)	0.734		0.228	1.2(1.1-1.3)	< 0.001	1.24(1.13-1.36)	< 0.00
Other backward		< 0.001					1.04(0.97 ð .12) G 1.03(0.97 ð .1)			< 0.001		< 0.00
	0.9(0.86-0.95)	0.000	1.02(0.96-1.08)		0.92(0.87-0.98)				1.23(1.14-1.32)	< 0.001	1.49(1.37-1.63)	< 0.00
Education level	0.92(0.87-0.97)	0.002	1.14(1.07-1.21)	< 0.001	0.85(0.8-0.91)	< 0.001	1.02(0.95-1.08	0.576	1.26(1.17-1.37)		1.91(1.74-2.09)	
Illiterate (Ref)												
	1	< 0.001		< 0.001	1	< 0.001		<0.001		< 0.001		< 0.00
<u> </u>	0.47(0.45-0.48)	< 0.001	0.65(0.62-0.68)	< 0.001	0.36(0.35-0.38)	< 0.001	0.57(0.55-0.6	< 0.001	0.34(0.32-0.35) 0.13(0.12-0.14)	< 0.001	0.1(0.1-0.11) 0.03(0.03-0.04)	< 0.00

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							136/bmjopen-2024 cted by copyright,					
and Higher Education	0.22(0.2-0.25)	< 0.001	0.29(0.27-0.33)	< 0.001	0.2(0.18-0.23)	< 0.001	0.33(0.29 a).37 a	< 0.001	0.04(0.03-0.05)	< 0.001	0.01(0.01-0.01)	<0
Religion							0.33(0.297).378					
Hindu (Ref)	1		1		1		ng f		1		1	
Muslim	0.8(0.76-0.84)	< 0.001	0.88(0.84-0.93)	< 0.001	0.85(0.8-0.89)	< 0.001		0.995	1.05(0.99-1.12)	0.089	0.71(0.67-0.76)	<0.
Others	1.11(1.05-1.18)	< 0.001	1.08(1.01-1.16)	0.024	0.99(0.92-1.06)	0.802	1(0.94-1.00 0.94(0.875) 10.94(0.875) 10.36(0.336) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36)	0.112	1.05(0.97-1.14)	0.195	1.27(1.15-1.39)	<0.
Marital status							relat					
Un-married (Ref)	1		1		1		1 teense 1 dett		1		1	
Currently married	1.63(1.57-1.7)	< 0.001	0.42(0.39-0.45)	< 0.001	1.87(1.78-1.96)	< 0.001	0.36(0.33	< 0.001	0.09(0.09-0.1)	< 0.001	0.03(0.03-0.03)	<0.
Widowed	7.49(7.16-7.84)	< 0.001	0.77(0.72-0.84)	< 0.001	9.8(9.31-10.31)	< 0.001	0.73(0.673)33)2	< 0.001	0.17(0.15-0.19)	< 0.001	0.04(0.03-0.05)	<0.
Divorced/separated	4.27(3.68-4.97)	< 0.001	1.15(0.98-1.35)	0.096	3.26(2.67-3.99)	< 0.001	0.73(0.67 0.73(0.67 0.67(0.54 0.67(0.54 0.67 0.67 0.67 0.67 0.67 0.54 0.67 0.67 0.54 0.67 0.54 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.67 0.67 0.73 0.67 0.73 0.67 0.67 0.73	< 0.001	1.56(1.31-1.85)	< 0.001	0.36(0.3-0.44)	<0.
Wealth					100		tta n					
Poorest (Ref)	1		1		1				1		1	
Poor	0.6(0.57-0.63)	< 0.001	0.74(0.71-0.78)	< 0.001	0.62(0.59-0.65)	< 0.001	0.8(0.76- 6 84)	< 0.001	0.87(0.82-0.93)	< 0.001	0.93(0.87-1)	0.0
Middle	0.54(0.51-0.56)	< 0.001	0.67(0.64-0.7)	< 0.001	0.56(0.54-0.59)	< 0.001	0.73(0.69 1.7 2	< 0.001	0.85(0.8-0.91)	< 0.001	0.92(0.86-0.99)	0.0
Richer	0.49(0.47-0.52)	< 0.001	0.62(0.59-0.65)	< 0.001	0.47(0.44-0.49)	< 0.001	0.61(0.57	< 0.001	0.79(0.74-0.85)	< 0.001	0.92(0.85-0.99)	0.0
Richest	0.43(0.41-0.45)	< 0.001	0.57(0.54-0.6)	< 0.001	0.37(0.35-0.39)	< 0.001		< 0.001	0.7(0.65-0.75)	< 0.001	0.91(0.84-0.99)	0.
Region							0.5(0.47-@354); a. <u>s.</u>					
Northern (Ref)	1		1		1		1 mila		1		1	
Southern	1.94(1.83-2.05)	< 0.001	1.52(1.43-1.61)	< 0.001	1.54(1.45-1.64)	< 0.001	1.1(1.03- ig 18)	0.006	1.51(1.4-1.62)	< 0.001	1.7(1.57-1.84)	<0.
Western	1.19(1.12-1.28)	< 0.001	1.07(1-1.15)	0.053	1.01(0.93-1.08)	0.883	0.88(0.828).96	0.002	1.31(1.21-1.42)	< 0.001	1.49(1.37-1.63)	<0.
Eastern	1.34(1.26-1.42)	< 0.001	1.18(1.11-1.26)	< 0.001	1.2(1.13-1.28)	< 0.001	1(0.93-1.927) 1 025	0.981	1.07(1-1.16)	0.062	0.92(0.84-0.99)	0.0
North-eastern	1.57(1.46-1.68)	< 0.001	1.58(1.47-1.7)	< 0.001	1.47(1.37-1.59)	< 0.001	1.52(1.41-1.65)	< 0.001	0.84(0.76-0.93)	0.001	0.82(0.74-0.92)	0.0
Central	1.08(1.02-1.15)	0.01	1(0.94-1.06)	0.96	1.05(0.98-1.12)	0.182	0.91(0.85-0.97	0.006	0.87(0.81-0.94)	< 0.001	0.63(0.58-0.69)	<0.

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Supplementary T disabilities per th	Table 2: Result 1e 76 th round of	ts from f the Na	n Multivariate SS, India (Con	binary l it)	ogistic regression analys	/ copyright;;;)ncludin	1386/miopen-202ct Block of living with different Insertion Network (Market Control of Living Vibright	types of
	Othe	er types	of disabilities			g for	9 1	
	Un-adjusted OR (95% CI)	p-	Adjusted OR	p- value		uses uses		
Age (Years)		Value		Value		rela		
<18 (Ref)	1		1			ted 1	j ci z z	
18-35	0 98(0 83-1 16)	0.8	1 46(1 21-1 77)	< 0.001		int S		
35-49	1 23(1 04-1 46)	0.018	2 37(1 91-2 93)	< 0.001		upe xt a		
50-59	1.84(1.56-2.17)	<0.001	3.51(2.84-4.34)	< 0.001		nieur nd da		
65+	3 3(2 78-3 9)	< 0.001	6.01(4.81-7.5)	< 0.001		ata r		
Gender					Cr.	ninir		
Male (Ref)	1		1			g, A	.// Ът	
female	0.81(0.75-0.87)	< 0.001	0.8(0.74-0.86)	< 0.001		l tra		
Place of residence						inin	а. .ь	
Rural (Ref)	1		1			g, an		
Urban	1.2(1.12-1.29)	< 0.001	1.21(1.11-1.31)	< 0.001		ld si	20 Co	
Social groups						mila	en contraction de la contracti	
Scheduled tribe (Ref)	1		1			r tec	ne	
Scheduled caste	0.78(0.69-0.88)	< 0.001	0.82(0.72-0.94)	0.004		hnol	7, 20	
Other backward class	0.68(0.61-0.76)	< 0.001	0.71(0.63-0.81)	< 0.001		logie)25 a	
Others	0.91(0.81-1.02)	0.098	0.89(0.78-1.01)	0.066		.s.	at Agence	
Education level						90.0	Jenc	
Illiterate (Ref)	1		1			•	U	
Primary	0.84(0.76-0.91)	< 0.001	0.88(0.8-0.98)	0.018			Bibliograph	
Secondary	0.79(0.72-0.86)	< 0.001	0.89(0.81-0.99)	0.034		9.44	угар	

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and Higher Education	0.93(0.81-1.07)	0.334	0.97(0.83-1.14)	0.713
Religion				
Hindu (Ref)	1		1	
Muslim	0.83(0.74-0.92)	< 0.001	0.88(0.79-0.98)	0.021
Others	1.18(1.04-1.34)	0.01	1.09(0.94-1.26)	0.239
Marital status				
Un-married (Ref)	1		1	
Currently married	0.97(0.9-1.04)	0.409	0.48(0.42-0.54)	< 0.00
Widowed	1.89(1.68-2.12)	< 0.001	0.55(0.46-0.66)	< 0.00
Divorced/separated	2.57(1.86-3.54)	< 0.001	1.29(0.92-1.81)	0.142
Wealth				
Poorest (Ref)	1		1	
Poor	0.63(0.57-0.71)	< 0.001	0.72(0.64-0.8)	< 0.00
Middle	0.66(0.59-0.73)	< 0.001	0.76(0.68-0.85)	< 0.00
Richer	0.72(0.65-0.8)	< 0.001	0.84(0.75-0.94)	0.002
Richest	0.78(0.7-0.86)	< 0.001	0.88(0.78-0.99)	0.038
Region				
Northern (Ref)	1		1	
Southern	2.66(2.28-3.1)	< 0.001	2.62(2.25-3.07)	< 0.00
Western	2.9(2.48-3.4)	< 0.001	2.82(2.4-3.31)	< 0.00
Eastern	3.09(2.67-3.59)	< 0.001	3.23(2.77-3.77)	< 0.00
North-eastern	2.12(1.77-2.53)	< 0.001	1.98(1.64-2.38)	< 0.00
Central	1.17(1-1.38)	0.056	1.26(1.07-1.49)	0.00

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Epidemiology of disability and access to disability support and rehabilitation services in India: A secondary data analysis a National Sample Survey (2018).

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Keywords:	Disabled Persons, PUBLIC HEALTH, Health Equity





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4	1	Title Page
5	2	Epidemiology of disability and access to disability support and
6	3	rehabilitation services in India: A secondary data analysis a
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8	4	National Sample Survey (2018).
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13	7	Moonis Mirza*, Vandana Esht ¹ *, Madhur Verma ^{*#} , Bajarang Bahadur*,
14	8	Ajit Kumar Jaiswal ³ , Manoj Alagarajan, Rakesh Kakkar
15	9	
16	10	*Authors contributed equally
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Manuscript Abstract **Objective:** The primary aim of this study was to examine the epidemiology of disability in India and assess access to disability support and rehabilitation services by people with disability (PWD). **Design**: This study is a secondary analysis of the data from the 76th round of the National Sample Survey (2018), focussing on disability in India. Setting: The survey employed a stratified two-stage sampling design based on Census 2011, covering all states and union territories of India. Villages and urban blocks were selected in the first stage, while households were chosen in the second stage across rural and urban areas. **Participants**: The survey included data from a population of 576,796 individuals residing in 1,18,152 households from 8,992 village/urban blocks (5,378 rural villages and 3,614 urban blocks). The analysis focussed on 1,07,125 individuals (61,707 males and 45,305 females) who reported at least one disability. **Outcome Measures**: The primary outcome was "any disability". Secondary outcomes included access to disability support and rehabilitation services that assessed difficulties faced in accessing public buildings, transport, loss of employment after disability, availability of government support, enrolment in special schools, and possession of a disability certificate. Results: The overall weighted disability prevalence was 2.2%, with significant disparities across socio-demographic characteristics. Among PWD, 45.9% of those who acquired disability after birth were aged between 15 and 59, and 20.8% received no government aid.

About 40% of PWD struggled to use public transport, and 57.7% had difficulties accessing
public buildings. Additionally, 60.7% reported job loss due to disability, and 69.6% lacked a
disability certificate.

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Conclusion: This study highlights disparities faced by PWD in accessing disability support and rehabilitation services. There is an urgent need for concerted efforts to minimise such experiences. This will help us enhance the well-being and participation of PWD and empower them to contribute to society with their true potential. **Keywords:** *Disability, inequity, disparities, accessibility, health access.* to per trien only

1 2 3 4	89	Strengths and limitations of this study
3 4 5 6	90	• One of the very first comprehensive assessments of accessibility issues of the people
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	91	living with disability data from the 76 th round of the National Sample Survey (2018).
	92	• We estimated the proportion of people with disability who could access basic services
	93	through a weighted analysis that makes the results generalisable and highlights
	94	actionable points.
	95	• The lack of a standardised definition of disability was the critical limitation of the study,
	96	which restricts sub-national and national comparisons over time and regions.
21 22 23	97	• The possibility of estimates being affected by recall bias and social desirability bias
24 25	98	may not be ruled out.
26 27 28	99	• We were limited by the number of variables available in the primary data, which
28 29 30	100	restricted us from making further conclusions about the social inclusion of people with
31 32	101	disability.
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2 3		
3 4	103	Manuscript
5 6	104	Introduction
7	105	Introduction
8 9	106	As per the United Nations Convention on the Rights of Persons with Disabilities (CRPD),
10 11	107	people with disability (PWD) include those who have long-term physical, mental, intellectual,
12 13 14	108	or sensory impairments which, in interaction with various barriers, may hinder their full and
14 15 16	109	effective participation in society on an equal basis with others.[1] Disability is a global concern,
17 18	110	impacting 1.3 billion people, or 16% of the population.[2] The World Health Organization
19 20	111	(WHO) and the World Bank's World Report on Disability highlight that 80% of the global
21 22 23	112	disabled population is of working age, with a substantial proportion residing in developing
24 25	113	countries.[3] India is one of the most populous countries, with a concerning proportion of
26 27	114	PWD.[4] With the increasing proportion of the geriatric population, the burden of disability
28 29	115	has also proportionately increased (from 21.9 to 26.8 million) over the last two rounds of the
30 31 32	116	national census (2001-2011).[5,6] The reports from the 2011 Census and the 76th round of the
33 34	117	National Sample Survey (NSS) estimate disability prevalence to be around 2.2%.[7] However,
35 36	118	the fifth round (2019-21) of the Indian National Family Health Survey (large-scale nationally
37 38 39	119	representative survey with repeated cross-sectional design) estimates an overall disability
40 41	120	prevalence of 4.52%.[8] The discrepancy in available estimates is due to methodological
42 43	121	differences, poor quality and inconsistent data, and lack of standardised definition, which
44 45	122	underscores the intricate nature of disability.[9,10]
46 47 48	123	The CRPD identifies disability as an evolving concept and highlights the constantly changing
49 50 51	124	needs of PWD, which are largely unmet. [11–13] The different articles of CRPD (6, 7, 9, 24,
52 53	125	and 27) focus on key aspects such as gender, age, accessibility, education, and employment to
54 55	126	empower PWD by addressing specific needs. For instance, article 6 caters to gender-related

needs, which may include protections against gender-based discrimination and access to reproductive healthcare, while Articles 7 and 24 focus on the needs of children with disability

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 and ensure inclusive education, and Article 9 ascertains that older adults with disability have access to necessary social and healthcare services. These measures aim to enable independent living and full participation in all aspects of life, ensuring that PWD are not deprioritised compared to the general population.[14–18] The limited priority given to the needs of PWD in society increases the existing disparities, leading to poorer health outcomes, lower educational attainment, and reduced economic opportunities, thereby exacerbating social inequities.[19] Addressing these disparities is a global priority as mandated by the second principle of the Sustainable Development Goals (SDGs), "Leave no one behind", which is the central, transformative promise of the Agenda 2030.[20] International human rights law, including the CRPD, Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), Convention on the Rights of the Child (CRC), International Covenant on Civil and Political Rights (ICCPR), International Covenant on Economic, Social and Cultural Rights (ICESCR), collectively uphold the principles of equality and non-discrimination, obligate each country to address the inequalities faced by PWD, ensuring that they have equitable access to services, full participation in society, and protection from exclusionary practices.[1,21] Between March 2007 and January 2025, 192 parties, including India, formally agreed to the CRPD. Despite progress, there remains a gap in fully recognising and upholding the rights and needs of PWD.[19] The needs of PWD can span from *personal functional assistance* (daily activities and extent of disability), social integration (living conditions, caregivers, and public accessibility), economic rehabilitation (impact on employment and finances) to service access (certification and receipt of government/Non-Government Organization (NGO) support) necessitating a comprehensive approach.[22] However, access to such services is less studied, so it is crucial to highlight disparities that affect the disability care continuum and limit the efforts to minimise social exclusion of PWD and foster a social environment that is inclusive and accessible to all. [22][23]

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Previous literature from India has primarily focused on the epidemiology of disability.[10] The lack of disability-friendly infrastructure, affordable assistive technologies, support services, including personal assistance, therapy, aids and vocational rehabilitation, and comprehensive care perpetuates inequalities.[24] However, it remains underexplored by the scientific community. Within this context, the 76th NSS collects data regarding disability and access of people with disability to various disability support and rehabilitation services, thus providing an opportunity to study them. [7] Thus, the primary aim of the study was to explore the epidemiology of disability and the accessibility of PWD to various disability support and rehabilitation services to provide insights for specific interventions.

163 Methodology

Data sources: We conducted a secondary analysis of the cross-sectional data from the 76th National Sample Survey (NSS) conducted by the Ministry of Statistics, Planning, and Implementation (MoSPI) between July and December 2018. MoSPI has formulated a code of ethics and sets out certain standards of conduct for the members of the Survey Committees (group of people appointed to conduct and supervise the survey). The data for NSSO is collected in accordance with the Collection of Statistics Act, 2008, which ensures transparency in data collection by issuing public notifications outlining the subject, purpose, and methodology of the survey. Participation in these surveys is generally voluntary, with respondents providing implied consent by answering survey questions after being informed about the study's objectives. Additionally, the Act mandates confidentiality safeguards, ensuring that collected data is used solely for statistical purposes. While respondents are legally obligated to provide accurate information, the data remains anonymous and protected. Thus, the NSSO follows ethical guidelines to uphold privacy while maintaining the integrity of national statistics.[25] The NSS collects socio-economic data using interviews through scientific sampling methods and serves as a crucial tool to gauge various socio-economic

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aspects across all states of India. Its primary objective is to identify unmet needs within thepopulation, thereby aiding the government in formulating effective policies to address them.

The survey made its first attempt to collect information on the number of PWD during the 15th round (July 1959 - June 1960).[26] In the 76th round, the main objective of the survey was to estimate indicators of incidence and prevalence of disability, cause of disability, age at onset of disability, facilities available to the PWD, difficulties faced in accessing public building/public transport, arrangement of regular caregiver, out-of-pocket expense relating to disability, etc. using a structured questionnaire.[27] Further, estimates were obtained on various employment and unemployment particulars in usual status for the household members with at least one disability. For PWD aged 12 to 59 years, information was collected on whether or not they received vocational/technical training and details related to such training.

Sampling design and sample size: The 76th NSS employed a stratified two-stage sampling design, utilising Census 2011 as the sampling frame.[7] The survey commenced on 1st July 2018 for six months. In the first stage, villages/urban blocks were selected, followed by the selection of households in rural and urban areas in the second stage. This round of NSS encompassed all states and union territories of India except the villages in Andaman and Nicobar Islands, which are difficult to access, covering a total of 8,992 village/urban blocks (5,378 rural villages and 3,614 urban blocks) and including 118,152 households representing a population of 576,796 individuals (402,589 in rural areas and 173,980 in urban areas). Within this, the present study focuses on 1,07,125 individuals consisting of 61,707 males and 45,418 females) who reported at least one disability during the survey.

³ 200 Study Variables

Dependent variable: The presence of "any disability" was our primary dependent variable.
 MoSPI defines a "Person with disability" as a person with a long-term physical, mental,
 intellectual or sensory impairment which, in interaction with barriers, hinders full and effective

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2 3 4	204	par	ticipation in society equally with others.[7] The variable is created by the presence of at			
5 6	205	least one condition among all seven disability types, elaborated subsequently				
$\begin{array}{c} 7\\ 8\\ 9\\ 10\\ 11\\ 12\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ 19\\ 20\\ 21\\ 22\\ 23\\ 24\\ 25\\ 26\\ 27\\ 28\\ 29\\ 30\\ 31\\ 32\\ 33\\ 45\\ 36\\ 37\\ 38\\ 940\\ 41\\ 42\\ 43\\ 445\\ 46\\ 47\\ 48\\ 49\\ 50\\ 51\\ 52\\ 53\\ 56\\ 57\\ 58\end{array}$	206	1.	Locomotor disability: A person was categorised as living with locomotor disability based			
	207		on a positive response to any of the following three conditions: (i) whether having difficulty			
	208		in using hands, fingers, toes, body movement (including cerebral palsy, muscular			
	209		dystrophy); (ii)whether having loss of sensation in the body due to paralysis, leprosy, other			
	210		reasons; or (iii)whether having deformity of the body part(s) like hunch back, dwarfism,			
	211		deformity due to leprosy, caused by acid attack, etc."			
	212	2.	Visual disability: It was identified using a direct question: "Whether having difficulty in			
	213		seeing, counting fingers of hand from a distance of 10 feet (with spectacles, if using, and			
	214		both eyes taken together)."			
	215	3.	Hearing disability: The categorisation was based on the question: "Whether having			
	216		difficulty in hearing day-to-day conversational speech (without hearing aid, if using, and			
	217		both ears taken together)"			
	218	4.	Speech and language disability: It was assessed using a question: "Whether having			
	219		difficulty in speech (unable to speak like a normal person/speech is not comprehensible,			
	220		including laryngectomy, aphasia) which is base for speech disability."			
	221	5.	Mental retardation/intellectual disability: This disability variable has been prepared			
	222		based on the following question "Whether having difficulty in understanding/			
	223		comprehension or communicating in doing daily activities"			
	224	6.	Mental illness: This disability was identified when there was a positive response to any			
	225		of the three conditions: "(i) whether having unnecessary and excessive worry and anxiety,			
	226		repetitive behaviour/ thoughts, changes of mood or mood swings, talking/laughing to self,			
59 60	227		staring in space; (ii) whether having unusual experiences of hearing voices, seeing visions,			

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strange smell or sensation or strange taste; or (iii) whether having unusual behaviour or difficulty in social interactions and adaptability."

7. Other disability: To identify other types of disability of the persons, the following question was used: "Whether having any of the following: Parkinson's disease, multiple sclerosis, other chronic neurological conditions, thalassemia, haemophilia, sickle cell disease".

The access to disability support and rehabilitation services by the PWD were secondary dependent variables. For this study, we adopted the United Nations CRPD definition of 'disability support,' which is stated as 'the means to ensure that PWD can fully enjoy their rights and participate equally in society." The original survey assessed disability support by estimating the proportion of PWD ever receiving any aid/help (received aid/help from government, or received aid/help from organisations other than government, did not receive aid/help), living arrangement (living alone or with a spouse, living with others), arrangement of regular caregiver (care-giver required but not available, care-giver is not required, care-giver is available), access to public transport (yes, no), accesses to public building (yes, no), difficulty faced in accessing public building (difficulty faced due to stairs and non-availability of ramp, grooved tiles or lift, in opening doors, no seating arrangement: in the waiting area, at the point of receiving service, no special toilet seats, no sign for direction/ instruction/no public announcement system, no difficulty faced, and others), employed/working before onset of disability (yes, no), disability causing loss or change in job (loss of work, change of work, no loss or change of work), having disability certificate (yes, no), and percentage of disability as per certificate (40-60%, 60-80%, >80%, and none of these). Disability certificate is issued to PWD by the competent medical authorities notified by the State/UT Government and aims to encourage transparency, efficiency and ease of delivering the government benefits to the person with disabilities and to ensure uniformity.[28,29]

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Predictor variables: In the present study, the predictor variables were chosen following a literature review and the scope of data collected in the original survey.[30–33] We included age group (completed years) categorised as; upto 5, 6-17, 18-35, 36-49, 50-65 and 65+ completed years, sex (male, female), marital status (never married, ever married, widowed, divorced/separated), area of residence (rural, urban), educational attainment (non-literate, literate but not formal, upto primary, upto secondary), preferred religion (Hindu, Islam, others), social group (scheduled tribe, scheduled caste, other backward classes, general), wealth index (poorer, poor, middle, richer, richest), regions of India (northern, southern, western, eastern, north-eastern and central). For readers outside India, the term 'backward class, schedule caste and schedule tribe' refers to socially and educationally disadvantaged groups legally recognised by the constitution of India, that have historically faced discrimination and marginalisation, and aim to promote social justice by reducing disparities, enhancing representation in education and employment, and fostering socio-economic inclusion. [34]

Specifically, PWD were characterised using variables like causes of disability (disease, other than disease due to burn, injuries other than burn, other causes), age at the onset of disability (0 to 4, 5 to 14, 15 to 59, and 60 years and above), the origin of disability from birth (yes, no, not known), disability commenced in last 365 days (yes, no), place of occurrence of disability (workplace, road, home, other places), treatment taken/undergoing treatment (yes: consulting doctor, otherwise, yes: consulting doctor, plus undergoing treatment, otherwise, attending special school/special therapy, cannot afford treatment, no treatment available for the disability, not required and not known).

Statistical methodology: The prevalence, along with the dispersion of all disability variables, were estimated as part of a univariate analysis by using already calculated sampling weights with clustering as provided with the datasets.[35] The details of sampling weight have been described in the NSS 76th round report. We used the SVY command while using sampling

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weights.[36] Further, the prevalence of all disability types was estimated per socio-economic characteristics, and the associations were tested using bivariate analysis through a chi-squared test. The access to different services was depicted using weighted proportions. Missing data were handled using the Available Case Analysis (ACA) technique, where estimates were generated based on the available data. This resulted in varying sample sizes across variables but allowed for greater data retention compared to listwise deletion. Little's MCAR (Missing Completely at Random) test was performed to assess whether the missingness was related to observed variables. The test results indicated that the data were not missing completely at random but were likely dependent on observed variables, suggesting that the data were missing at random (MAR). Therefore, the use of ACA was considered appropriate for preserving more data while minimizing potential bias compared to listwise deletion Further, a sensitivity analysis was conducted to assess the robustness of the findings to different missing data handling techniques. Results obtained using ACA were compared with those from Complete Case Analysis (CCA), and the findings were consistent across the two methods. Lastly, multivariable binary logistic regression analysis was used to explore the independent variables affecting the likelihood of living with 'any disability', which was the dependent variable coded by 1 and otherwise 0. Additionally, binary logistic regressions are also employed on all seven types of disability. The analysis depicted the unadjusted and adjusted odds ratio (95% confidence interval). All p-values<0.05 were considered statistically significant. All the analysis was done using Stata (version 17.0). Graphical maps were created using MS Excel sheets to depict the regional disparities.

- **Patient and public involvement:** None
- **Results**

Table 1 provides a comprehensive overview of the weighted prevalence of different types of
 disability across various socio-demographic characteristics in India. Of the total participants,

107,125 (2.2%) of the participants had at least one form of disability. The majority of such participants had a locomotor disability 61,981 (1.36%), followed by hearing 15,294 (0.30%), visual 11,977 (0.23%), speech-related 12,661 (0.23), mental retardation 8,564 (0.16%), mental illness 6,751 (0.16%), and other types 3,121 (0.05%) of disability. The highest prevalence of any disability, locomotor, speech and 'other' disability was seen in 50-65 years. However, the proportion of participants with visual and hearing disability was highest in the eldest age group, while mental retardation and mental illness were highest in the 6-35 years age group. Disability prevalence was notably higher among older individuals, males, rural populations, and those from lower socioeconomic backgrounds with minimal or no educational attainment, and living in the southern part of India.

We further assessed the origin of disability as per the type (Table 2). The most common cause of locomotor and speech disability was disease 28,673 (46.3%), 1246 (61.9%), while 'other causes' were most commonly involved in visual 538 (46.5%) and hearing 637 (49.7%) disability. Around 11,488 (18.5%) of PWD had their disability from birth. Of the total participants, 2987 (6.1%) participants acquired their disability in the last year preceding the survey. The most common place of disability origin was road 5977 (41.9%), followed by home, 4693 (32.9%). Only 17,329 (28%) of PWD were consulting doctors and undergoing treatment. Table 3 depicts the living conditions of PWD and access to crucial services, and Supplementary Table 1 provides results in more detail for each type of disability. Overall, nearly half of the PWD who did not have disability since birth were between 15 and 59 years old (45.9%), while nearly one-fifth (20.8%) had received aid or help from the government. 57% of PWD lived with their spouses, and 62.8% reported that caregivers were available. About 40% reported an inability to use public transport, while 54.4% reported inaccessibility to public buildings. Further, 57.7% of PWD reported facing difficulties while accessing public buildings. Around 60.7% of PWD reported a loss of work due to disability onset, and 69.6% did not have any

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official document certifying their disability for administrative purposes. Figure 1 furtherdepicts the geographic disparities in the PWD' access to basic services.

Table 4 demonstrates the multivariable binary logistic regression analysis results to present the socio-demographic variables affecting the likelihood of living with any type of disability. We found a significantly higher likelihood of living with disability with increasing age (Adjusted Odds ratio: 58.4; 95% Confidence Interval: 55.4-61.5 in >65 years vs up to 5 years), urban residence (1.3; 1.2-1.3) vs rural, social castes (1.3; 1.3-1.3 in general caste) vs scheduled tribes, and living in a Southern region of India (1.1; 1.1-1.2) compared to those from North India. However, female sex (0.6; 0.6-0.6), more years of education (0.3; 0.3-0.3), Islam followers (0.9; 0.9-0.9), currently married/widowed vs never married (0.3; 0.3-0.3), and higher socio-economic status (0.5; 0.5-0.5) depicted significantly lower likelihood of living with disability. Supplementary Table 2 provides results from the more detailed regression analysis for each type of disability.

Discussion

We report an investigation that assesses the epidemiology of PWD and their access to disability support and rehabilitation services in India using nationally representative data. Our key findings have profound policy implications. First, we identify concerning disparities in disability prevalence across socio-demographic groups. Second, one-fifth of PWD reported acquiring their disability at birth. Third, the most common place of disability origin was the road, followed by home. Fourth, approximately half of PWD reported challenges in using public transport and buildings. Lastly, the majority of PWD reported a loss of work due to disability onset and lacked official certification of their disability.

⁵⁵ 350 Disability prevalence was notably higher among older individuals, males, rural populations,
 ⁵⁷ 351 and those from lower socio-economic backgrounds. Despite a modest 2.2% prevalence rate,
 ⁵⁹ 352 this figure represents around 30 million people in India, and it is expected to rise, indicating an

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urgent need for attention. While there was a preponderance of males with locomotor disability, speech and language disabilities were significantly higher in females. As per the estimates obtained from the previous 36th, 47th, and 58th rounds of NSS, there is a constant rise in disability prevalence in rural (1.8% in the 36th round to 2.3% in the 76th round) as well as urban (1.4% in the 36th round to 2.0% in the 76th round) areas, with the overall increase from 1.6% in the 36th round in year 1981 to 2.2% in the 76th round in the year 2018.[7] Secondary analysis of another national survey (NFHS-5) depicts an overall disability prevalence of 0.95%, with a higher proportion of locomotor disability (0.4%), followed by mental illness (0.2%).[37] We observed that a high proportion of survey participants had their disability from birth. However, the available data limits our further understanding of such disability, whether the onset was intrauterine or acquired during the birthing process. Such limited information still necessitates mitigation strategies targeting pregnant females by ensuring accessibility to screening for intra-uterine pathologies causing disability such as Down's syndrome and intellectual disability and later extending the access to screening for auditory and visual disability.[38] Further, adopting more rigorous screening toolkits and investigations for newborns at the primary healthcare level through the expansion of the Rashtriya Bal Swasthya Karyakram (Indian National program that involves screening of children from birth to 18 years of age for 4 Ds- Defects at birth, Diseases, Deficiencies and Development delays, spanning 32 common health conditions for early detection and free treatment and management, including surgeries at the tertiary level) would help in increasing the scope for early psychological or therapeutic interventions that would impact the quality of life of children with disability.[39] In addition, the Pradhan Mantri Jan Arogya Yojana (PM-JAY) offers free healthcare for children with disability who are not covered under the RBSK scheme.[40,41] The most common place of disability origin was the road, followed by home. Trauma is an

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377 important cause of locomotor disability, and in India, it is the second most common cause of

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locomotor disability.[42] Previous estimates suggest that road crashes maximally impact the poorest quintiles. A lack of appropriate safety gear while on the road is often a factor in road trauma. People who experience road trauma often have inadequate access to medical and social safety nets after injury.[43,44] Anecdotal evidence from Chandigarh, a Union Territory of India, suggests that strict compliance with traffic rules can mutually benefit the public and the administration. On one side, it reduces morbidity due to road traffic accidents, while on the other side, penalties due to non-compliance generate revenues and raise awareness. An increasing number of domestic accidents are equally concerning.[45] Domestic accidents may be underreported as most of the domestic injuries are considered minor, often neglected, and may be easily forgotten and subject to recall bias. This changing trend is similar to many developed nations where more accidents happen at home than anywhere else. We expect an increase in such incidents with increasing population and population density. Domestic accidents depend on the physical and social environment and also on the functional capacity of the individual. While road traffic accidents are unforeseen and unexpected, it is generally accepted that domestic accidents can be prevented and minimised by taking adequate safety measures well in time.[46]

We observed that there is scope for improving the accessibility of public buildings and transport for the PWD; these facilities must accommodate PWD's needs. Various schemes and initiatives demonstrate the Indian government's commitment to securing the rights and welfare of disabled populations in the country. India's commitment to the United Nations Convention on the Rights of PWD (UNCRPD) is embodied in the Rights of Persons with Disabilities Act of 2016 (RPWD Act, 2016). It emphasises dignity, autonomy, and non-discrimination for PWD.[47] The Act further mandates inclusive education, vocational training, and selfemployment opportunities without discrimination. To increase the accessibility of public buildings, the RPWD Act 2016 and the National Building Code of India 2016 outline expanded

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guidelines for building accessibility.[48] Compliance with these standards has been made compulsory, with responsibility falling on those involved in commissioning, designing, constructing, or managing built environments. The building design must adhere to relevant legislation, including equality and safety regulations. This focus on accessibility has fostered the adoption of universal design concepts, leading to numerous best practices for creating inclusive environments. These encompass accessible buildings, parking areas, parks, and recreational facilities, reflecting a concerted effort to ensure equal access and inclusion for PWD in the built environment.

Government schemes to improve inclusion and access

The government has a variety of healthcare schemes such as the Assistance to Disabled Persons for Purchase/Fitting of Aids and Appliances (ADIP), which cater to the specific needs of PWD and provide assistive devices, aids such as wheelchairs, hearing aids, and prosthetic limbs at subsidised rates.[49] The Deendaval Disabled Rehabilitation Scheme (DDRS) provides financial assistance to NGOs for various rehabilitation services for PWD.[50] However, the scheme faces inconsistencies in service availability across different states. The lack of standardisation in rehabilitation programs results in variable quality of care, while administrative delays in fund disbursement further hinder its effectiveness.[51] Moreover, rural and economically weaker sections often struggle to access these services, limiting the scheme's reach and equity. While DDRS aligns with the principle of equal opportunities under the RPWD Act of 2016, its impact is weakened by poor implementation and inadequate monitoring mechanisms. Apart from catering to the healthcare needs of PWD, we must address specific issues related to health and ethics as well as the need to shift societal attitudes toward PWD to improve social inclusion.[52]

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In addition to health-related needs, the Government of India has taken several steps to secure the social rights of PWD. The Right to Education Act (RTE) aims to provide free and

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compulsory education for children with disability up to 18 years.[53] The 'Samagra Shiksha Abhiyan' integrates children with disability into mainstream education.[54] The National Education Policy 2020 also prioritises "inclusion" by aiming to fully integrate children with disability into the mainstream education system, providing necessary accommodations and support to ensure their active participation in the learning process without segregation or discrimination; this includes accessible infrastructure, specialised teaching methods, and assistive technologies tailored to individual needs.[55] Training gaps among teachers working with PWD, lack of assistive technology, and poor enforcement of inclusive education policies hinder meaningful inclusion.[56] The government-funded higher education institutions in India reserve 5% of seats for PWD to foster diversity and enhance employment opportunities, but the effectiveness of such policies is hindered by challenges [57], such as infrastructural barriers, lack of accessible learning materials, and inadequate support services. Many PWD lack access to skill development programs, limiting their employability. The government also provides financial assistance and benefits to PWD through schemes like the National Handicapped Finance and Development Corporation (NHFDC), which offers loans and subsidies for education and training or self-employment ventures.[58]

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Employment can enhance social sustainability and individual well-being.[59] However, we observed that a very high proportion of PWD had a change or loss of their jobs due to the onset of disability. Loss of jobs can be linked to the social stigma associated with impairment or disability and the perception of such people being less productive. Many employers have illfounded views about the work-related abilities of PWD; these negative views are often a result of interrelated concerns that permeate the entire employment cycle.[60] It is to be emphasised that negative attitudes toward disability disempower PWD and lead to social exclusion. By contrast, a healthy society encourages positive attitudes toward PWD and promotes social

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453 inclusion.[61] Various initiatives have been introduced to promote employment opportunities
454 for PWD. However, a lack of awareness and red tape discourage many PWD from receiving
455 employment benefits. While the RPWD Act mandates non-discrimination in employment, the
456 absence of accountability measures continues to hinder its success. Many PWD also lack
457 formal certification as seen in our study, restricting their access to essential services and
458 benefits.[62][63]

Other prominent schemes introduced for PWD in India include the National Handicapped Finance and Development Corporation (NHFDC), which provides financial assistance to persons with disability for self-employment, education, and training; Scheme for Implementation of Persons with Disabilities Act (SIPDA) to create barrier-free environments and improve the quality of life for PWD; Accessible India Campaign (Sugamya Bharat Abhiyan) focuses on making public infrastructure and transportation accessible for people with disability and Inclusive Education for Disabled at Secondary Stage (IEDSS) supports the inclusive education of students with disability at the secondary level. [58][64][65] Despite multiple policy frameworks supporting disability inclusion, several gaps remain in implementation and enforcement. [66] The mere existence of legislation and policies does not guarantee their effectiveness. There is a pressing need for stronger monitoring mechanisms, improved financial transparency, and enhanced awareness campaigns to bridge the gap between policy intent and real-world impact. The government must prioritise accountability measures to ensure scheme implementation and greater investment in infrastructure and assistive technologies to create an inclusive environment for PWD. [67]

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Strengths and limitations of the study

The study's major strength lies in its novelty by bringing social science and medicine to a
 common platform. The estimates generated using weighted analysis are nationally
 representative and depict strong external validity due to their national coverage, stratified

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sampling approach, and standardised definitions. The emerging results can serve as robust evidence to help guide policy that improve accessibility. The present study takes a novel approach by initially delineating the proportions of various types of disability. Subsequently, it delves into the analysis concerning "any disability," thus unveiling unique characteristics within this broader category. By doing so, the study not only broadens the scope of understanding but also highlights the nuanced interplay between different types of disability and the socio-demographic backgrounds of PWD. This shift towards a more inclusive analysis holds promise for informing policy decisions and healthcare interventions tailored to address the complex needs of people with disabilities.

The major limitation lies in the study's cross-sectional nature, which limits the assessment of causality and temporal associations and is susceptible to recall bias, particularly when assessing disability from birth. We need more qualitative studies to better assess the impact of inaccessibility to basic support and rehabilitative services.[12] As a secondary analysis, we are limited by the number of variables that can further explain issues affecting accessibility to services. Due to the limited number of explanatory variables, the possibility of residual confounding cannot be negated. There was also non-uniformity in the sample size when assessing different questions related to the impact of disability, but it was handled using available case analysis techniques to generate estimates and retain more data compared to listwise deletion. Lastly, some terms used in the manuscript, like the categorisation of disability (e.g., using "mental retardation" instead of "intellectual disability"), the terminology used to describe social classes ("backward classes" instead of "disadvantaged classes") are non-inclusive, outdated, perceived as offensive by PWD, and lack alignment with the global vision targeting inclusion and discrimination. However, these terms are retained so that the manuscript is coherent with the original survey report and would help prevent confusion in case some readers want to refer to the original report.

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503 Policy implications and recommendations

A few policy implications and recommendations emerged from the study. Given the increasing prevalence of disability and the concurrent escalating proportion of the geriatric population, we need to work on improving accessibility for PWD. A large number of disability originating from birth calls for more robust antenatal and neonatal screening protocols supported by adequate counselling and rehabilitation services. Our results depict that a high proportion of PWD have a caretaker who is available. Previous studies have suggested that empowering the caretakers can help improve the quality of life of PWD.[68] We must simultaneously think of ways (like investing in developing more assistive devices and making them affordable) to help us share the added burden on caregivers.[68] Despite many schemes extended by the government to enhance the social inclusion of PWD that have been briefly described in the manuscript, there is a need for health advocacy drives to sensitise the population about the needs of PWD, improve social inclusion and minimise discrimination. The use of noninclusive language in the original dataset used in the study necessitates using more appropriate language to promote inclusivity. It is recommended that future national surveys focus on more inclusive language, which is compliant with the CRPD and the globally ongoing disability rights movements.

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520 Conclusions

While previous research has primarily emphasised individual heterogeneity among PWDs, our study indicated that a large proportion of PWD experience systemic disparities in accessing disability support and rehabilitation services. The high prevalence varies significantly as per the studied socio-demographic characteristics, reinforcing the urgent need for targeted interventions. We acknowledge that while individual differences exist, these do not negate the common challenges faced by PWDs in securing equitable access to essential services. Despite government initiatives, there remain gaps in accessibility, public awareness, and enforcement of disability rights. There is an urgent need for concerted efforts to minimise these disparities,

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enhance the well-being and participation of PWD, and empower them to contribute meaningfully to society. Furthermore, our findings underscore that many disabilities originate from birth or early childhood, yet the availability of early screening, diagnostic services, and timely interventions remains inadequate. Strengthening antenatal and neonatal screening, particularly for intrauterine conditions and birth-related complications, could significantly improve early detection and management of disabilities. As a society, we must work toward reshaping societal and institutional perceptions of disability, shifting the focus from viewing disability as a personal deficit or burden to recognising it as a societal construct that can be addressed through inclusion, accessibility, and policy-driven structural changes. A more inclusive and disability-friendly society is essential not only for ensuring the dignity and rights of PWD but also for achieving socioeconomic development and social justice. These efforts align with India's commitment to the CRPD and contribute to the global vision set by the 2030 Agenda for Sustainable Development, which recognises the promotion of the rights, perspectives, and well-being of PWD as a fundamental prerequisite for a more sustainable and inclusive world.

Declarations

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Person with Disability in India Survey 2018. The authors gratefully acknowledge members
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and the main survey during data collection. The authors also acknowledge all the
respondents for their active participation in this study.

550 • **Competing interests:** None

Ethics statement: The ethical approvals were not deemed necessary since it was secondary
 data analysis. No patient-level data were used in this paper. However, the original survey
 was conducted by the Ministry of Statistics and Programme Implementation (MOSPI),

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3 4 5	554	which is mandated to act as the nodal agency for the integrated development
5 6 7	555	systems in India. The Ministry, as part of its comprehensive decision-mak
7 8 9	556	various matters, has formulated a Code of Ethics for Members of the various
10 11	557	constituted by MOSPI or by the Organizations, Institutions, bodies, etc., fu
12 13	558	follow the principles of ethics and set out certain standards of conduct for
14 15	559	the Committees in order to protect the confidentiality of the data/information
16 17	560	them by virtue of their membership in such Committees.
18 19 20	561	• Patient and Public Involvement: None
21 22	562	• Funding: No funding was involved at any stage of this study.
23 24	563	• Data availability: Data (Reference ID: DDI-IND-MOSPI-NSSO-76Rnd-Scl
25 26	564	December 2018) is freely available on the website of the Ministry of
27 28		
29 30	565	Programme Implementation (GOI)
31 32	566	https://microdata.gov.in/nada43/index.php/catalog/154/overview, and can
33 34	567	per standard protocols.
35 36	568	• Ethics approval: Not applicable
37 38 39	569	• Authors' contribution: MM, BB, and MA conceptualised the study, MV and
40 41	570	data, drafted the manuscript, and reviewed it. VE, MV, and AKJ did the analy
42 43	571	the final version; MA and RK critically reviewed the manuscript from policy
44 45	572	points of view. All the authors read and approved the final version of the m
46 47 48	573	is responsible for the overall content as guarantor.
49 50	574	
51 52	575	References
53	576	1. United Nations. Convention on the Rights of Persons with Disabilities [In
54 55	577	Rights Instruments. 2008 [cited 2024 Dec 16]. Ava
56 57	578	https://www.ohchr.org/en/instruments-mechanisms/instruments/convent
58 59	579	persons-disabilities
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Page 26 of 49

Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

BMJ Open

1 2			
3 4	580	2.	World Health Organization. Global report on health equity for persons with disabilities
5 6	581		[Internet]. 2023 [cited 2024 Dec 10]. Available from: https://www.knowledge-action-
7	582		portal.com/en/content/global-report-health-equity-persons-disabilities
8 9	583	3.	World Health Organization. World Report on Disability [Internet]. 2011 [cited 2022 Feb
10 11	584		9]. p. 1–27. Available from:
12 13	585		www.who.int/about/licensing/copyright_form/en/index.html
14	586	4.	Pattnaik S, Murmu J, Agrawal R, Rehman T, Kanungo S, Pati S. Prevalence, pattern and
15 16	587		determinants of disabilities in India: Insights from NFHS-5 (2019-21). Front Public
17 18	588		Health. 2023;11:1036499.
19	589	5.	Ministry of Statistics and Programme Implementation(GOI) - MOSPI. Elderly in India
20 21	590		2021 [Internet]. 2021 [cited 2024 Dec 16]. Available from:
22 23	591		https://mospi.gov.in/sites/default/files/publication_reports/Elderly in India 2021.pdf
24 25	592	6.	Paul K, Saha S. Burden of Disability in India (1881–2011). Journal of Multidisciplinary
26	593		Research in Healthcare. 2015 Oct 5;2(1):31–54.
27 28	594	7.	Ministry of Statistics and Program Implementation Government of India. Persons with
29 30	595		Disabilities in India-NSS 76th report [Internet]. NSS Report No 583 (76/26/1). 2018
31	596		[cited 2024 Dec 12]. p. 209. Available from:
32 33	597		https://www.mospi.gov.in/sites/default/files/publication_reports/Report_583_Final_0.p
34 35	598		df
36 37	599	8.	International Institute for Population Sciences. National Family Health Survey (NFHS-
38	600		5) 2019-21 [Internet]. India Report. 2022 [cited 2024 Dec 16]. Available from:
39 40	601		https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf
41 42	602	9.	Rashmi R, Mohanty SK. Socioeconomic and geographic variations of disabilities in
43	603		India: evidence from the National Family Health Survey, 2019–21. Int J Health Geogr.
44 45	604		2024 Dec 1;23(1):1–16.
46 47	605	10.	Chanda S, Sekher T V. Identification of Disability for Inclusive Development: Lessons
48 49	606		from Disability Census of Kerala, India. Sage Open. 2023;13(3).
50	607	11.	Department of Economic and Social Affairs. Disability and Development Report 2018
51 52	608		[Internet]. United Nations. 2019 [cited 2024 Dec 16]. Available from:
53 54	609		https://www.un.org/development/desa/disabilities/wp-
55	610		content/uploads/sites/15/2019/07/disability-report-chapter2.pdf
56 57	611	12.	Chavan BS. Relevance of qualitative research in disability. Journal of Disability
58 59	612		Management and Rehabilitation. 2015;1(1):1–2.
60			

BMJ Open

2 3	642	10	
4	613	13.	United Nations. Convention on the Rights of Persons with Disabilities [Internet]. Human
5 6	614		Rights Instruments. 2008 [cited 2024 Dec 16]. Available from:
7 8	615		https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-
9	616		persons-disabilities
10 11	617	14.	United Nations- Division for Inclusive Social Development (DISD). Article 24 -
12 13	618		Education [Internet]. Social Development Issues-Disability. [cited 2024 Dec 15].
14	619		Available from: https://social.desa.un.org/issues/disability/crpd/article-24-education
15 16	620	15.	United Nations- Division for Inclusive Social Development (DISD). Article 27 – Work
17 18	621		and employment [Internet]. Social Development Issues-Disability. [cited 2024 Dec 12].
19	622		Available from: https://www.un.org/development/desa/disabilities/convention-on-the-
20 21	623		rights-of-persons-with-disabilities/article-27-work-and-employment.html
22 23	624	16.	United Nations- Division for Inclusive Social Development (DISD). Article 6 - Women
24	625		with disabilities [Internet]. Social Development Issues-Disability. [cited 2024 Dec 12].
25 26	626		Available from: https://social.desa.un.org/issues/disability/crpd/article-6-women-with-
27 28	627		disabilities
29	628	17.	United Nations- Division for Inclusive Social Development (DISD). Article 7 - Children
30 31	629		with disabilities [Internet]. Social Development Issues-Disability. [cited 2024 Dec 12].
32 33	630		Available from: https://social.desa.un.org/issues/disability/crpd/article-7-children-with-
34	631		disabilities
35 36	632	18.	United Nations- Division for Inclusive Social Development (DISD). Article 9 -
37 38	633		Accessibility [Internet]. Disability. [cited 2024 Dec 10]. Available from:
39	634		https://social.desa.un.org/issues/disability/crpd/article-9-accessibility
40 41	635	19.	Sophie Mitra AP and BV. Disability and Poverty in Developing Countries: A Snapshot
42 43	636		from the World Health Survey [Internet]. The World Bank - Social Protection and Lab.
44 45	637		2011 [cited 2024 Dec 17]. Available from:
46	638		https://documents1.worldbank.org/curated/en/501871468326189306/pdf/625640NWP
47 48	639		0110900PUBLIC00BOX361487B.pdf
49 50	640	20.	United Nations. Transforming our world: the 2030 Agenda for Sustainable Development
51	641	20.	[Internet]. Department of Economic and Social Affairs Sustainable Development. 2015
52 53	642		
54		21	[cited 2024 Dec 12]. Available from: https://sdgs.un.org/2030agenda
55 56	643	21.	United Nations. International Human Rights Law [Internet]. Instruments & mechanisms.
57 58	644		[cited 2024 Dec 10]. Available from: https://www.ohchr.org/en/instruments-and-
59 60	645		mechanisms/international-human-rights-law

Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

BMJ Open

22. World Bank Group. Disability Inclusion [Internet]. Understanding Poverty. 2023 [cited 2024 Dec 12]. Available from: https://www.worldbank.org/en/topic/disability 23. Saran A, Hunt X, White H, Kuper H. Protocol: Effectiveness of interventions for improving social inclusion outcomes for people with disabilities in low- and middle-income countries: A systematic review. Campbell Systematic Reviews. 2021 Sep 29;17(3):e1191. 24. Centers for Disease Control and Prevention. Disability and Health Disability Barriers [Internet]. Disability Inclusion. [cited Dec 17]. Available from: https://www.cdc.gov/ncbddd/disabilityandhealth/disability-barriers.html 25. Ministry of state for statistics and Program implementation. Handbook on Collection of statistics act, 2008 [Internet]. Ministry of Law and Justice. 2008 [cited 2025 Mar 4]. Available from: https://www.mospi.gov.in/sites/default/files/main menu/handbook %20collection of statistic act/hand col stat act 2008.pdf 26. Ministry of Statistics and Programme Implementation G of I. Note on sample design and estimation procedure of NSS 76th round. Ministry of Statistics and Programme Implementation, Government of India. National Sample Survey Office, Ministry of Statistics and Program Implementation 27. Government of India. Schedule 26: Survey of persons with disabilities [Internet]. Seventy-Sixth round: July, 2018 - December, 2018, 2018. 2018 [cited 2024 Dec 12]. Available from: https://www.mospi.gov.in/sites/default/files/NSS7612dws/NSS 76 sch 26.0.pdf Government of Assam H and FW. Disability Certificate | Health & Family Welfare | 28. Government Of Assam, India [Internet]. Disability Certificate. [cited 2025 Feb 17]. Available from: https://hfw.assam.gov.in/information-services/disability-certificate 29. Disabilities. D of E of P with. Unique Disability ID [Internet]. Ministry of Social Justice and Empowerment, Governmenet of India of India. [cited 2025 Mar 3]. Available from: https://swavlambancard.gov.in/faqs 30. Okoro CA, Hollis ND, Cyrus AC, Griffin-Blake S. Prevalence of Disabilities and Health Care Access by Disability Status and Type Among Adults - United States, 2016. MMWR Morb Mortal Wkly Rep. 2018 Aug 17;67(32):882-7. 31. Ozawa MN, Hun Yeo Y. Race/ethnicity and socioeconomic class as correlates of disability in old age. J Gerontol Soc Work. 2008;51(3-4):337-65.

BMJ Open

2			
3 4	679	32.	Kavanagh AM, Krnjacki L, Aitken Z, Lamontagne AD, Beer A, Baker E, et al.
5 6	680		Intersections between disability, type of impairment, gender and socio-economic
7	681		disadvantage in a nationally representative sample of 33,101 working-aged Australians.
8 9	682		Disabil Health J. 2015 Apr 1;8(2):191–9.
10 11	683	33.	Courtney-Long EA, Carroll DD, Zhang QC, Stevens AC, Griffin-Blake S, Armour BS,
12	684		et al. Prevalence of Disability and Disability Type Among AdultsUnited States, 2013.
13 14	685		MMWR Morb Mortal Wkly Rep. 2015 Jul 31;64(29):777-82.
15 16	686	34.	Department of Social Justice and Empowerment M of SJ and EG of I. About the
17	687		Division Department of Social Justice and Empowerment - Government of India
18 19	688		[Internet]. [cited 2025 Mar 3]. Available from:
20 21	689		https://socialjustice.gov.in/common/31548
22 23	690	[data	set] 35. Ministry of Statistics and Programme Implementation(GOI) - MOSPI. India -
24	691		Survey of Persons with Disabilities NSS 76th Round : July 2018 - December 2018 -
25 26	692		Overview [Internet]. Central Data Catalog. 2018 [cited 2024 Dec 10]. Available from:
27 28	693		https://microdata.gov.in/nada43/index.php/catalog/154/overview
29	694	36.	Stata. SVY estimation — Estimation commands for survey data [Internet]. [SEM] sem
30 31	695		— Structural equation model estimation command. [cited 2024 Dec 17]. Available from:
32 33	696		https://www.stata.com/manuals13/svysvyestimation.pdf
34 35	697	37.	Rashmi R, Mohanty SK. Socioeconomic and geographic variations of disabilities in
36	698		India: evidence from the National Family Health Survey, 2019–21. Int J Health Geogr
37 38	699		[Internet]. 2024 Dec 1 [cited 2025 Mar 3];23(1):1-16. Available from: https://ij-
39 40	700		healthgeographics.biomedcentral.com/articles/10.1186/s12942-024-00363-w
41	701	38.	Acharya K. Prenatal testing for intellectual disability: Misperceptions and reality with
42 43	702		lessons from down syndrome. Dev Disabil Res Rev. 2011 Jan 1;17(1):27–31.
44 45	703	39.	Bailey DB, Skinner D, Warren SF. Newborn Screening for Developmental Disabilities:
46 47	704		Reframing Presumptive Benefit. Am J Public Health. 2005 Nov;95(11):1889.
48	705	40.	National Health Authority, Government of India. Pradhan Mantri Jan Arogya Yojana
49 50	706		(PM-JAY) [Internet]. About PM-JAY. 2019 [cited 2024 Dec 10]. Available from:
51 52	707		https://nha.gov.in/PM-JAY
53	708	41.	Ministry of Health and Family Welfare. Government of India. RBSK-Rashtriya Bal
54 55	709		Swasthya Karyakram [Internet]. Schemes. 2024 [cited 2024 Dec 10]. Available from:
56 57	710		https://rbsk.mohfw.gov.in/RBSK/
58 59	711	42.	Dhole RS, Gaur KA, More NS, Popalwar H, Lokhande V. Study of locomotor disability
60	712		due to various types of Trauma. National journal of medical research. 2015;5(3):194–8.

713 43. Musselwhite CBA, Avineri E, Susilo YO, Bhattachary D. Public attitudes towards
 714 motorcyclists' safety: A qualitative study from the United Kingdom. Accid Anal Prev.
 715 2012 Nov;49:105–13.

- 8 World Bank Group. Traffic crash injuries and disabilities: The burden on Indian society 716 44. 9 10 717 [Internet]. Policy Document. 2021 [cited 2024 Dec 17]. Available from: 11 https://www.worldbank.org/en/country/india/publication/traffic-crash-injuries-and-718 12 13 719 disabilities-the-burden-on-indian-society 14
- 15 45. Cole EOB, Christie SA, Oke R, Motwani G, Dickson D, Chendjou W, et al. Too serious 720 16 17 721 to ignore: The epidemiologic and economic burden of home injuries in the Southwest 18 722 Region of Cameroon—A community-based study. Bourgeois D, editor. PLoS One. 2022 19 20 723 Sep 22;17(9):e0274686. 21
- 724 46. Rehman T, Sulgante S, Sekhar S. Prevalence and pattern of domestic accidents in the
 725 field practice area of Jawaharlal Institute of Urban Health Centre, Puducherry: a cross 726 sectional analytical study. J Inj Violence Res. 2020;12(1).
- 727 28 727 47. Department of Empowerment of Persons with Disabilities. The Rights of persons with disabilities act 2016 [Internet]. Policy Document. 2016 [cited 2024 Dec 11]. Available from: https://legislative.gov.in/sites/default/files/A2016-49_1.pdf
- 32 730 48. Bureau of Indian Standards. National building code of India 2016 (NBC 2016) 33 34 SP 2016. 2016 [cited 2024 Dec 21]. 731 [Internet]. 7: Available from: 35 36 732 https://www.bis.gov.in/standards/technical-department/national-building-code/
- 733
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 730
 730
 730
 730
 730
 730
 730
 730
 730
 730
- 4373650.Department of Empowerment of Persons with Disabilities (DEPwD), Government of4445737India. Deendayal Divyangjan Rehabilitation Scheme (DDRS) [Internet]. Schemes. 20234647738[cited 2024 Dec 10]. Available from: https://depwd.gov.in/ddrs/
- ⁴⁸ 739 51. Kumar SG, Roy G, Kar SS. Disability and Rehabilitation Services in India: Issues and Challenges. J Family Med Prim Care [Internet]. 2012 [cited 2025 Mar 3];1(1):69.
 ⁵¹ 741 Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC3893941/
- ⁵³ 742 52. Hayes AM, Bulat J. Disabilities Inclusive Education Systems and Policies Guide for
 ⁵⁵ 743 Low- and Middle-Income Countries. RTI Press Publication. Research Triangle Park,
 ⁵⁶ 744 NC: RTI Press; 2017 Jul.
- ⁵⁸ 745 53. Centre for Civil Society. Right To Education [Internet]. [cited 2024 Dec 10]. Available
 ⁶⁰ 746 from: https://righttoeducation.in/know-your-rte/about

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C

54. Ministry of Education, Government of India. Samagra Shiksha [Internet]. 2021 [cited 2024 Dec 17]. Available from: https://samagra.education.gov.in/about.html 55. The Ministry of Human Resource Development; Government of India. National Education Policy, 2020 [Internet]. 2020 [cited 2024 Dec 17]. Available from: https://www.education.gov.in/sites/upload files/mhrd/files/NEP Final English 0.pdf Ahmed SK, Jeffries D, Chakraborty A, Carslake T, Lietz P, Rahayu B, et al. Teacher 56. professional development for disability inclusion in low- and middle-income Asia-Pacific countries: An evidence and gap map. Campbell Systematic Reviews [Internet]. Dec 1 [cited Mar 3];18(4):e1287. Available from: https://onlinelibrary.wiley.com/doi/full/10.1002/cl2.1287 57. Bera M, Kartick Chandra Pramanik P. Access Challenges For Students With Disabilities In Higher Education. 2023 [cited 2025 Mar 3];11:2320-882. Available from: www.ijcrt.org Department of Empowerment of Persons with Disabilities (DEPwD). National 58. divyangjan finance and development corporation-India [Internet]. Organizations Under DEPwD. 2024 [cited 2024 Dec 10]. Available from: https://depwd.gov.in/national-handicapped-finance-and-development-corporation/ 59. Qiu N, Jiang Y, Sun Z, Du M. The impact of disability-related deprivation on employment opportunity at the neighborhood level: does family socioeconomic status matter? Front Public Health. 2023 Aug 9;11:1232829. Bonaccio S, Connelly CE, Gellatly IR, Jetha A, Martin Ginis KA. The Participation of 60. People with Disabilities in the Workplace Across the Employment Cycle: Employer Concerns and Research Evidence. J Bus Psychol. 2020 Apr 1;35(2):135–58. 61. Babik I, Gardner ES. Factors Affecting the Perception of Disability: A Developmental Perspective. Front Psychol. 2021 Jun 21;12:702166. 62. Jameel S. Disability in the Context of Higher Education: Issues and Concerns in India. Electronic Journal for Inclusive Education. 2011 Jan 1;2(7). Moumita Barman. Barriers to higher education for persons with disabilities block their 63. meaningful growth. News article - The Siasat Daily. 2024 Jan 26; 64. Department of Empowerment of Persons with Disabilities (DEPwD), Government of India. Scheme for Implementation of the Rights of Persons with Disabilities Act, 2016 (SIPDA) [Internet]. Schemes. 2016 [cited 2024 Dec 12]. Available from: https://depwd.gov.in/sipda/

Ministry of Education, Government of India. Inclusive Education of the Disabled at

Secondary Stage [Internet]. About MoE. 2016 [cited 2024 Dec 17]. Available from:

Mar

3].

Available

from:

- https://www.education.gov.in/iedss Disempowering the Empowered: The Systemic Failures of India's Disability Welfare 66. Schemes [Internet]. 67. 68. 2021 Aug 27;10(8):2804-9.

[cited] https://www.salzburgglobal.org/news/fellows/article/disempowering-the-empoweredthe-systemic-failures-of-indias-disability-welfare-schemes

65.

- Lawson A, Pineda VS, Walker J, Jain S, Jain M. Revisiting the Conceptual Terrains of the Right to Accessibility in India: The Role of Judicial Enforcement. Laws 2024, Vol 13, Page 54 [Internet]. 2024 Aug 16 [cited 2025 Mar 3];13(4):54. Available from:
 - https://www.mdpi.com/2075-471X/13/4/54/htm
- Arasu S, Shanbhag D. Quality of Life and Burden of Caregiving Among the Primary Caregivers of Children with Disability in Rural Karnataka. J Family Med Prim Care.

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BMJ Open Tables Tables Table 1: Prevalence of different types of disabilities across different socio-demographic characteristics, NSS, 76th round, India (n=576,796)

Background characteristics	Locomotor N (%)	Vision N (%)	Hearing N (%)	Speech N (%)	Mental Retardation N (%)	N (%)	R 1R (B)	Any one disability N (%)
0	61981 (1.36)	11977 (0.23)	15294 (0.30)	12661 (0.23)	8564 (0.16)	6751 (0.16)	2021 (0.05)	107,125 (2.20
Age Group (completed years)							5. Do	
up to 5	1494 (2.2)	182 (1.5)	311 (2)	907 (7.3)	445 (5.3)	41 (0.5)		2839 (2.5)
`6-17	7290 (10.8)	1210 (9.2)	1977 (12.6)	4515 (35.8)	3492 (41.2)	1060 (15.4)	e e e e e e e e e e	16695 (14.4)
18-35	11546 (18)	1386 (10.7)	2036 (13.3)	3273 (26.4)	2796 (33)	1915 (27.6)		20673 (18.8)
36-49	11434 (18.1)	1557 (12.3)	2118 (13)	1812 (13.8)	1113 (12.4)	1646 (25)		18665 (17.2)
50-65	16627 (27.9)	3609 (31.1)	3843 (25.1)	1495 (11.4)	561 (6.5)	1409 (21.3)	96 45 (21.9)	26420 (25.7)
65+	13590 (23)	4033 (35.2)	5009 (34)	659 (5.3)	157 (1.6)	680 (10.1)	4 (16.6)	21833 (21.4)
Sex						2	oper	
Male	36862 (58.7)	6014 (50.2)	7993 (52)	7554 (60.4)	5202 (61.7)	3856 (56.8)	1964 (58.9)	61707 (57.3)
Female	25110 (41.3)	5958 (49.8)	7296 (48)	5106 (39.6)	3359 (38.3)	2893 (43.2)	1855 (41.1)	45396 (42.7)
Marital Status						C C	sim	
Never Married	16912 (24.7)	2719 (20.8)	3987 (24.2)	8708 (67.8)	7450 (86.9)	3281 (46.1)		36813 (31.4)
Ever Married	33257 (55.3)	5541 (46.9)	7094 (47.5)	3086 (25.3)	791 (9.3)	2381 (35.8)		50108 (48.8)
Widowed	11293 (19)	3616 (31.5)	4024 (27.1)	690 (5.4)	190 (2.1)	775 (12.5)	র ৪ া	18933 (18.5)
divorced/separated	519(1)	101 (0.8)	189 (1.1)	177 (1.4)	133 (1.8)	314 (5.5)	2 3 9 9 (1.2)	1271 (1.3)
Area of residence						2	Ag	
Rural	42222 (71.6)	8809 (76.3)	11121 (74.9)	9164 (72.9)	5974 (69.9)	4772 (73.1)	2655 (62.4)	75091 (72.8)
Urban	19759 (28.4)	3168 (23.7)	4173 (25.1)	3497 (27.1)	2590 (30.1)	1979 (26.9)	1966 (37.6)	32034 (27.2)
Educational attainment							liogr	
Non-literate	26376 (44.5)	7160 (62.6)	8365 (57.3)	7119 (56.9)	5846 (69.3)	3285 (49.6)		50848 (48.9)
				1			12008 (34.1)	

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Literate but not formal	15002 (23.2)	2483 (19.4)	3700 (22.9)	3428 (26.7)	1858 (21)	f, inclusion (1629 (23.3)	14-099 59 (29)	26145 (23.3)
Upto primary	16885 (26.5)	1987 (15.5)	2782 (16.9)	1908 (14.9)	808 (9.1)	1623 (24.1)	9 6 (28.7)	25210 (23.1)
Upto secondary	3718 (5.8)	347 (2.6)	447 (2.9)	206 (1.5)	52 (0.6)	214 (3.1) 9	238 (8.2)	4922 (4.6)
Preferred Religion								
Hindu	49548 (81.9)	9479 (82.9)	12090 (82.6)	9658 (78.7)	6540 (78.7)	5063 (74.7)	2844 (80.8)	84742 (81.5)
Islam	8375 (12.5)	1601 (12.5)	1927 (11.7)	2021 (15.6)	1366 (15.9)	1167 (18.4)	5 N	14658 (12.9)
Others	4058 (5.6)	897 (4.6)	1277 (5.7)	982 (5.7)	658 (5.4)	521 (6.9)	2 75 (6.5)	7725 (5.5)
Social Group		0h				521 (6.9) o	nloa	
Scheduled Tribe	6049 (8.3)	1491 (9.1)	1923 (9.5)	1478 (9.4)	822 (7.2)	670 (7.8) d	4 2 (12.3)	11729 (8.7)
Scheduled Caste	12240 (20.4)	2407 (21.3)	2805 (19.4)	2467 (20.5)	1602 (19.2)	1269 (19.9)		20925 (20.4)
Other Backward Classes	26861 (44.7)	5205 (46)	6583 (45.5)	5482 (44.7)	3806 (45.8)	2915 (45.7)	6 7 (40.2)	46223 (44.9)
General	16831 (26.6)	2874 (23.6)	3983 (25.6)	3234 (25.4)	2334 (27.8)	1897 (26.6)	8 8 (29.7)	28248 (26)
Wealth Index				101			njop	
Poorer	17681 (30.2)	3919 (35.1)	4933 (34.7)	3552 (30.1)	2025 (25.3)	1932 (31)	82 3 (25.8)	31259 (31)
Poor	12553 (20.5)	2474 (20.8)	3005 (19.4)	2746 (21.4)	1773 (20.9)	1364 (20.5)	\$24 (16.2)	21959 (20.7)
Middle	11468 (18.2)	2271 (18.5)	2730 (17.4)	2434 (18.5)	1751 (20)	1302 (18.1)	50 (17.3)	20058 (18.3)
Richer	10440 (16)	1864 (14.4)	2480 (15.4)	2080 (15.8)	1611 (18.3)	1161 (16.8)	9 3 (19.9)	17946 (15.9)
Richest	9839 (15.1)	1449 (11.1)	2146 (13)	1849 (14.2)	1404 (15.5)	992 (13.6)	6 1 (20.7)	15903 (14.1)
Regions of India						chnc	, r	
Northern	8787 (14.4)	1478 (13.1)	1692 (11.7)	1347 (11.1)	1144 (13.5)	931 (14.2) g	N N 1 6 (7.6)	14305 (13.8)
Southern	13448 (23)	2814 (24.7)	4013 (27.3)	2958 (24.8)	2141 (25.6)	1447 (21.3)	1 4 (25.5)	23699 (23.3)
Western	8387 (12.7)	1286 (10.1)	1740 (11.1)	1423 (11.3)	1293 (15.2)	706 (10.6)	9 10 (17.7)	13708 (12.3)
Eastern	12790 (20.3)	2538 (21.9)	3238 (22.5)	3248 (27.1)	1762 (21.3)	1672 (26.3)	6 6 6 6 6 6 6 6 6 6	23061 (21.8)
North-Eastern	3858 (2.1)	1335 (4.5)	1620 (3.7)	1308 (3.4)	594 (2)	582 (2.7)	9 82 (2.4)	8839 (2.8)
Central	14711 (27.4)	2526 (25.6)	2991 (23.8)	2377 (22.4)	1630 (22.6)	1413 (24.8)	4415 (16.3)	23513 (26)
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1 2	Table 2: Percentage distribution	oution of diff	ferent disa	bility type	s and their a	associated	n-2024-0902203in /right, including f	on, NSS 76	^h round, In
		Locomotor	Visual	Hearing	Speech and language	Mental retardation/	ontai Mientai Bay Bay	Other types of disability	Any Disability
	Total sample size	61980	1156	1281	2013	1217		768	61980
	Causes of disability						ited t		
	Disease	28673 (46.3)	454 (39.3)	484 (37.8)	1246 (61.9)	NA		NA	NA
	Other than disease due to burn	723 (1.2)	88 (0.7)	1 (0.1)	8 (0.4)	NA	2025. Downloaded from http://t eignementSuperieur (ABES) . rélated to text and data mining.	NA	NA
	Injuries other than burn	13876 (22.4)	156 (13.5)	158 (12.4)	105 (5.2)	NA	d dat dat dat	NA	NA
	Other causes	18702 (30.2)	538 (46.5)	637 (49.7)	654 (32.5)	NA		NA	NA
	Disability from Birth						s) . ning,		
	Yes	11,488 (18.5)	91 (7.9)	198 (15.4)	1041 (51.7)	955 (78.5)	11 ≥ (2 2 4)	119 (15.5)	11,488 (18.5)
	No	50,052 (80.8)	1062 (91.9)	1081 (84.4)	964 (47.9)	258 (21.2)	40 3 (7 8 6)	645 (84)	50,052 (80.8)
	Not Known	440 (0.7)	3 (0.2)	2 (0.2)	8 (0.4)	4 (0.3)	ng (1)	4 (0.4)	440 (0.7)
	Disability commenced in last 365 days						and similar te		
	sample size	48741	1034.2	1052.4	938.7	251.6		628.6	48741
	Yes	2987 (6.1)	72 (7)	65 (6.2)	100 (10.6)	11 (4.4)	400010,7	48 (7.7)	2987 (6.1)
	No	45754 (93.9)	961 (93)	987 (93.8)	839 (89.4)	240 (95.6)	35 <mark>9</mark> (888)	580 (92.3)	45754 (93.9)
	Place of occurrence of disability						5 at A jies.		
	Sample size	14281	161	157	105	33	86 en	63	14281
	Workplace	2308 (16.2)	13 (8.3)	30 (19.2)	11 (10.9)	2 (6.9)	9 (1 1 9)	11 (18.1)	2308 (16.2)
	Road	5977 (41.9)	46 (28.5)	43 (27.5)	41 (38.7)	9 (25.9)	35 (40 5)	15 (23.8)	5977 (41.9)
	Home	4693 (32.9)	93 (57.9)	73 (46.3)	45 (42.4)	19 (58.5)	33 (38)	31 (49.5)	4693 (32.9)
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	Other places	1302 (9.1)	9 (5.3)	11 (7)	8 (8)	3 (8.7)	1-0962 22	5 (8.6)	1302 (9.1)
	atment taken/undergoing tment						on 15 ig for u		
	Sample size	61980	1156	1281	2013	1217		768	61980
	yes: consulting doctor	35,923 (58)	566.6 (49)	617 (48.2)	1,080 (53.7)	710 (58.4)	26at (2003)	330 (43)	35923 (58)
	Otherwise	1565 (2.5)	22 (1.9)	34 (2.7)	42 (2.1)	36 (2.9)	d Go to	6 (0.7)	1564.5 (2.5
	Yes: consulting doctor, plus undergoing treatment	17329 (28)	375 (32.4)	418 (32.7)	719 (35.7)	355 (29.2)	2625. Downloaded friom http://binjo reignement Superieut/(ABES) . (3) 19and data mining, AI to	397 (51.7)	17329 (28)
	Otherwise	860 (1.4)	34 (2.9)	21 (1.7)	20 (1)	4 (0.3)	lanta (8 (1)	860 (1.4)
At	tending special school/special therapy	116 (0.2)	2.9 (0.3)	0 (0)	4 (0.2)	6 (0.5)	m http:/ AB€S) a m∰ning	0 (0)	116 (0.2)
	Cannot afford treatment	2040 (3.3)	75 (6.4)	73 (5.7)	72 (3.6)	55 (4.6)	1 <u>7</u> (3.3)	8 (1)	2040 (3.3)
-	No treatment available for the disability	699 (1.1)	13 (1.1)	8 (0.6)	17 (0.8)	16 (1.3)	opegi.bm tratition	5 (0.7)	699 (1.1)
	Not required	2717 (4.4)	60 (5.2)	97 (7.6)	47 (2.3)	26 (2.1)	, क्षाd	14 (1.8)	2717 (4.4)
	Not known	732 (1.2)	8 (0.7)	12 (0.9)	13 (0.7)	9 (0.7)	<u>ب</u> بی ا	1 (0.1)	732 (1.2)
	: Causes of disability were reco Disability Commenced in the during the last 365 days befor Place of occurrence was reco was burn, injury or other than	last 365 days wa the survey. rded for individu	s recorded for	r those individ	luals who did no	t have a disab	ility of rom bir		
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Table 3: Access to disability support and rehabilitation services by the person with disability as per the 76th round of the National Sample Survey (2018), India.

Living conditions of the person with disability	Weighted percentag
(<i>n=sample included in the analysis</i>)	
Age at the onset of disability* (n= 48,727)	17.2
0 to 4 years	
5 to 14 years	9.0
15 to 59 years	45.9
60 years and above	28.0
Receipt of aid/help (n=61,712)	
Received aid/help from Government	20.8
Received aid/help from organisations other than government	4.1
Did not receive aid/help	75.1
Living arrangement(n=61,962)	
Living alone or with a spouse	57.0
Living with others	43.0
Arrangement of regular caregiver(n=61,980)	
Care-giver required but not available	0.1
Care-giver is not required	37.1
Care-giver is available	62.8
Access to public Transport (n=61,980)	
Yes	59.6
No	40.4
Accesses to public building (n=61,980)	
Yes	45.6
No	54.4
Difficulty faced accessing public building (n= 27,756)	
difficulty faced: due to stairs and non-availability of ramp, grooved tiles or lift	57.7
in opening doors	4.4
no seating arrangement: in the waiting area	1.6
at the point of receiving service	0.8
no special toilet seats	0.7
no sign for direction/ instruction/no public announcement system	0.3
no difficulty faced	27.6
others	7.0
Employed/working before onset of disability (For person of age 15 years and	1.0
above; n=55,819)	
Yes	40.3
No	59.7
Disability causing loss or change in job(n= 21,559)	57.1
loss of work	60.7
change of work	18.3
no loss or change of work	21.3
Having Disability Certificate(n=61,980)	20.4
Yes	30.4
No	69.6
Percentage of Disability as per Certificate (n=20,213)	40.0
40-<60%	49.3
<u>>60-<80%</u>	36.3
> 80%	12.8
none of these	1.6

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Table 4: Multivariable binary logistic regression analysis exploring the likelihood of living with any disability per the 76th round of the NSS, India.

	Unadjusted Odds	p-value	Adjusted Odds	
	ratio (95% C.I)		ratio (95% C.I)	p-value
Age Group (Completed years)				
Up to 5 years	Reference value	.0.001	Reference value	
6 - 18 years	2.1(2-2.1)	< 0.001	3.5(3.4-3.7)	< 0.001
19-35 years	2.3(2.2-2.4)	< 0.001	8.4(8-8.8)	< 0.001
36-49 years	3.5(3.4-3.7)	< 0.001	17.6(16.8-18.5)	< 0.001
50-65 years	6.4(6.1-6.7)	< 0.001	25.8(24.5-27.1)	< 0.001
65+ years	17.5(16.7-18.2)	< 0.001	58.4(55.4-61.5)	< 0.001
Sex				
Male	Reference value		Reference value	
Female	0.7(0.7-0.7)	< 0.001	0.6(0.6-0.6)	< 0.001
Place of Residence				
Rural	Reference value		Reference value	
Urban	1.02(1.01-1.03)	0.03	1.3(1.2-1.3)	< 0.001
Social Group				
Scheduled Tribe	Reference value		Reference value	
Scheduled Caste	1.1(1.1-1.1)	< 0.001	1.1(1.1-1.2)	< 0.001
Other Backward Classes	1.1(1-1.1)	< 0.001	1.1(1.1-1.2)	< 0.001
General	1.1(1.1-1.1)	< 0.001	1.3(1.3-1.3)	< 0.001
Educational attainment				
No education	Reference value		Reference value	
Upto Primary class	0.5(0.5-0.5)	< 0.001	0.5(0.5-0.5)	< 0.001
Upto Secondary Class	0.4(0.4-0.4)	< 0.001	0.4(0.4-0.4)	< 0.001
Graduate & Above	0.3(0.3-0.4)	< 0.001	0.3(0.3-0.3)	< 0.001
Preferred Religion				
Hindu	Reference value		Reference value	
Islam	0.8(0.8-0.9)	< 0.001	0.9(0.9-0.9)	< 0.001
Others	0.9(0.9-1)	< 0.001	1(1-1.1)	0.019
Marital Status		0.001		0.015
Never married	Reference value		Reference value	
Currently married	1.3(1.3-1.3)	< 0.001	0.3(0.3-0.3)	< 0.001
widowed	5.9(5.8-6.1)	< 0.001	0.6(0.5-0.6)	<0.001
Divorced/separated	4.4(4.1-4.8)	<0.001	1.1(1-1.2)	0.011
Wealth Index	<u></u>	~0.001	1.1(1-1.2)	0.011
Poorest	Reference value		Reference value	
Poor	0.6(0.6-0.6)	< 0.001	0.7(0.7-0.7)	< 0.001
Middle	0.6(0.5-0.6)	<0.001	0.6(0.6-0.6)	<0.001
Richer	0.5(0.5-0.5)	<0.001	0.5(0.5-0.6)	<0.001
Richest	0.4(0.4-0.4)	<0.001	0.5(0.5-0.5)	<0.001
Regions of India	0.4(0.4-0.4)	~0.001	0.5(0.5-0.5)	~0.001
8	Deference value		Deference value	
Northern	Reference value	<0.001	Reference value	<0.001
Southern	1.42(1.39-1.46)	<0.001	1.1(1.1-1.2)	<0.001
Western	1.13(1.1-1.16)	< 0.001	1(1-1.1)	0.065
Eastern	1.15(1.13-1.18)	< 0.001	1(0.9-1)	0.001
North-eastern	1(0.97-1.03)	0.961	1(1-1)	0.361
Central	1.01(0.98-1.03)	0.653	0.9(0.8-0.9)	< 0.001

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1	Figure Legends
2 3	Figure 1: Geographical disparities in the difficulties faced by the people livin with disability as per the 76 th Round of the National Sample Survey, India
	7

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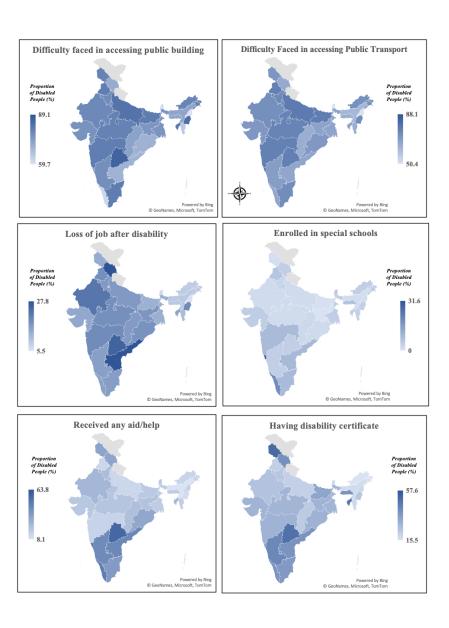


Figure 1: Geographical disparities in the difficulties faced by the people living with disabilities as per the 76th Round of the National Sample Survey, India

40x58mm (600 x 600 DPI)

BMJ Open Supplementary Table 1: Living conditions of the people living with different types of of the second for the National Sample Survey Organization India (2017-18)

Living conditions of the people (<i>n</i> = <i>sample included in the analysis</i>)	Locomotor	Visual	Hearing te	Speech	Mental retardness	Mental illness	Others
	Weighted %	Weighted %	Weighted &	Weighted %	Weighted %	Weighted %	Weighted %
Age at the onset of disability			4.2 ar				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
0 to 4 years	17.2	3.0	4.2 ft a	21.0	51.0	10.1	9.9
5 to 14 years	9.0	2.3	3.0 ded 17.4 a fro 75.4 m BE	9.6	17.3	12.3	7.0
15 to 59 years	45.9	22.1	17.44 tro	40.9	24.0	40.5	49.2
60 years and above	28.0	72.6	75.43 B	28.4	7.7	37.1	33.8
Total number of participants	48,737	1,035	1,05€.95	946	259	395	632
Receipt of aid/help			9, '				
Received aid/help from Government	20.8	22.2	20.7 t	29.2	37.2	25.5	20.0
Received aid/help from organisations other than			8.6g				
government	4.1	10.2	8.6 m	4.0	3.3	6.0	2.7
Did not receive aid/help	75.1	67.7	70.89	66.8	59.5	68.5	77.3
Total number of participants	61,712	1,145	1,272	2,010	1,215	521	766
Living arrangement			on mil				
Living alone or with a spouse	57.0	43.5	41.6 r u	26.8	4.1	35.4	55.8
Living with others	43.0	56.5	58.4 ^{ec}	73.2	95.9	64.6	44.2
Total number of participants	61,962	1,156	1,28 6	2,013	1,217	523	768
Arrangement of regular caregiver			1,28 <u>6</u> 20 9 25				
Care-giver required but not available	0.1	0.0	0.0 s.	0.1	0.9	0.0	0.3
Care-giver is not required	37.1	11.5	15.7 Ge	8.8	5.6	10.8	13.4
Care-giver is available	62.8	88.6	84.2 nce	91.1	93.6	89.2	86.3
Total number of participants	61,980	1,156	1,281	2,013	1,217	523	768
Accesses to public building			1,281 Bi io 29.4 Ta				
Yes	45.6	25.4	29.4 gra	27.2	26.0	26.0	29.9

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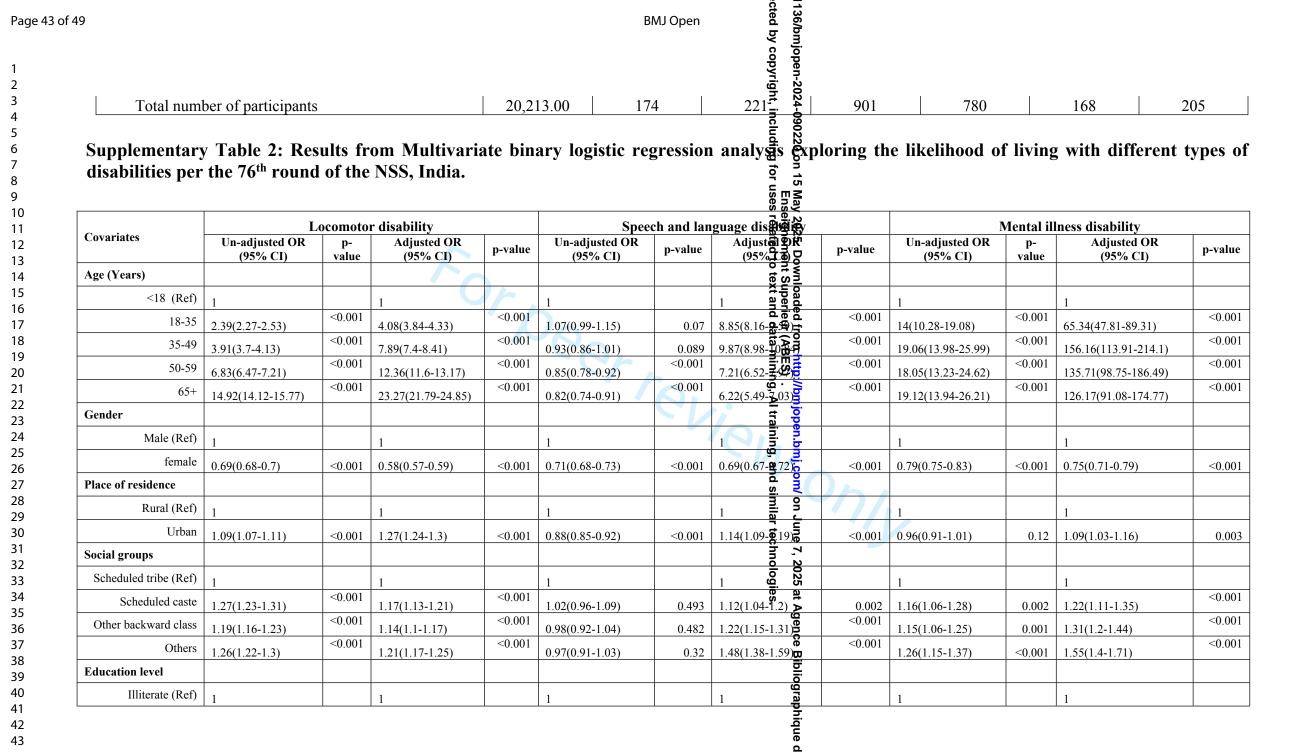
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No	54.4	74.6	yright, in-2024-090220 70.6 including fo	72.8	74.0	74.0	70.1
Total number of participants	61,980	1156	1281 200	2013	523	523	768
Difficulty faced accessing public building	,		220 oj Jding				
difficulty faced: due to stairs and non-availability of			ng f				
ramp, grooved tiles or lift	57.7	63.2	60.7 2 5	55.4	49.7	46.7	52.2
in opening doors	4.4	1.6		2.8	1.0	7.6	2.8
no seating arrangement: in the waiting area	1.6	3.0	2.9 e c 20	0.7	1.4	1.7	2.1
at the point of receiving service	0.8	5.7	2.9 reignement Superieur 2.0 to text superieur 2.0 data mining 2.0 data mining 13.3 ta mining 433 mining 2.0 data superieur	0.9	0.8	1.3	0.3
no special toilet seats	0.7	0.4		0.7	0.0	0.8	0.9
no sign for direction/ instruction/no public			o teg				
announcement system	0.3	2.2	2.0 to be a	2.2	2.1	1.3	0.0
no difficulty faced	27.6	8.4	17.6 den inde	15.2	17.7	24.2	25.8
others	7.0	15.4	13.34 To	22.1	27.4	16.3	15.8
Total number of participants	27,756	330	433 3 8	537	330	134	226
Working before onset (For >15 years and above)			inin				
Yes	40.3	44.4	JJ.T 2	32.7	5.6	38.5	53.6
No	59.7	55.6	64.1 ²	67.3	94.4	61.5	46.4
Total number of participants	55,819	1093		1353	690	448	667
Disability causing loss or change in job			ing				
loss of work	60.7	75.3	72.8 a	86.5	80.9	84.2	82.8
change of work	18.3	11.0	72.88 5.7 d	5.2	2.7	8.7	5.9
no loss or change of work	21.3	13.7	21.5 2 . S	8.3	16.4	7.1	11.4
Total number of participants	21,559	465		425	37	165	343
Having Disability Certificate							
Yes	30.4	14.0	16.100 2025	41.7	59.8	29.9	24.9
No	69.6	86.0	83.9 6 25	58.3	40.2	70.1	75.1
Total number of participants	61,980	1156	128 128 Age	2013	1217	523	768
Percentage of Disability as per Certificate			\gei				
40% or more but less than 60%	49.3	23.2	22.5 c	16.9	14.6	27.7	29.7
60% or more but less than 80%	36.3	37.6		32.3	35.5	43.0	37.3
80% or more	12.8	38.7	34.2 Bi 42.2 jo 1.1 gra bh que	50.3	49.1	29.0	31.7
none of these	1.6	0.5	1.1 g	0.5	0.8	0.4	1.3

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Primary	0.58(0.56-0.59)	< 0.001	0.84(0.82-0.86)	< 0.001	0.51(0.49-0.53)	< 0.001	copyright, 0.24(0.22	< 0.001	0.53(0.5-0.56)	< 0.001	0.52(0.49-0.56)	<0.0
Secondary	0.57(0.56-0.58)	< 0.001	0.76(0.74-0.78)	< 0.001	0.25(0.24-0.26)	< 0.001	right, 0.24(0.23-525)- 0.11(0.11-512)22	< 0.001	0.47(0.44-0.49)	< 0.001	0.34(0.32-0.36)	<0.0
and Higher Education	0.57(0.55-0.6)	< 0.001	0.66(0.63-0.68)	< 0.001	0.12(0.11-0.14)	< 0.001	0.05(0.04 <u>9</u> .06) 2	< 0.001	0.28(0.24-0.32)	< 0.001	0.15(0.13-0.17)	< 0.0
Religion							15 15 15		0.20(0.21 0.02)			
Hindu (Ref)	1		1		1		1 Ses		1		1	
Muslim	0.84(0.82-0.86)	< 0.001	0.96(0.94-0.99)	0.004	1.05(1-1.11)	0.031	0.83(0.79-55)20	0	1.16(1.09-1.24)	< 0.001	1.08(1.01-1.16)	0.
Others	0.84(0.82-0.87)	< 0.001	0.99(0.95-1.03)	0.607	1.07(1-1.14)	0.057	1.13(1.05- 1.22)	0.001	1.08(0.99-1.18)	0.101	1.17(1.06-1.29)	0.0
Marital status							to text and 1					
Un-married (Ref)	1		1		1		1 Ioad		1		1	
Currently married	1.89(1.86-1.93)	< 0.001	0.52(0.51-0.54)	< 0.001	0.31(0.3-0.33)	< 0.001	0.15(0.14-6 10)	0	0.66(0.62-0.69)	< 0.001	0.13(0.12-0.14)	<0.0
Widowed	5.99(5.83-6.15)	< 0.001	0.93(0.89-0.97)	0.001	0.53(0.49-0.57)	< 0.001	0.16(0.15-2. A)	0		< 0.001	0.22(0.19-0.24)	<0.0
Divorced/separated	2.98(2.7-3.28)	< 0.001	0.92(0.83-1.01)	0.091	1.79(1.54-2.09)	< 0.001	0.16(0.15-0, 00)	0	9.06(8.02-10.23)	< 0.001	1.76(1.54-2.02)	<0.0
Wealth							//br					
Poorest (Ref)	1		1		1		njop Al tra		1		1	
Poor	0.67(0.66-0.69)	< 0.001	0.78(0.76-0.8)	< 0.001	0.77(0.73-0.81)	<0.001	0.81(0.77-th:85)	0	0.7(0.65-0.75)	< 0.001	0.83(0.77-0.89)	< 0.0
Middle	0.6(0.59-0.62)	< 0.001	0.67(0.66-0.69)	< 0.001	0.67(0.64-0.71)	< 0.001	0.74(0.7-0 a 8)	0	0.66(0.62-0.71)	< 0.001	0.8(0.74-0.86)	<0.0
Richer	0.55(0.54-0.56)	< 0.001	0.58(0.57-0.6)	< 0.001	0.58(0.55-0.61)	< 0.001	0.69(0.65-673)	0	0.6(0.55-0.64)	< 0.001	0.75(0.69-0.81)	<0.0
Richest	0.52(0.51-0.54)	< 0.001	0.52(0.5-0.53)	< 0.001	0.52(0.49-0.55)	< 0.001	0.71(0.66- 1 75)	0	0.52(0.48-0.56)	< 0.001	0.7(0.64-0.77)	< 0.0
Region							r te					
Northern (Ref)	1		1		1		≥ 7, 2 chno		1		1	
Southern	1.26(1.22-1.3)	< 0.001	0.97(0.94-1)	0.073	1.78(1.67-1.9)	< 0.001	1.84(1.72 .6 97)	< 0.001	1.25(1.15-1.36)	< 0.001	1.05(0.96-1.15)	0.2
Western	1.12(1.08-1.15)	< 0.001	0.99(0.95-1.02)	0.429	1.23(1.14-1.32)	< 0.001	1.29(1.19-1.39)	< 0.001	0.88(0.79-0.97)	0.008	0.84(0.76-0.93)	0.0
Eastern	1.02(0.99-1.05)	0.288	0.86(0.84-0.89)	< 0.001	1.7(1.59-1.81)	< 0.001	1.42(1.33-1.52)	< 0.001	1.25(1.16-1.36)	< 0.001	1.12(1.03-1.22)	0.0
North-eastern	0.69(0.66-0.71)	< 0.001	0.66(0.63-0.69)	< 0.001	1.59(1.47-1.71)	< 0.001	1.64(1.51-1.78)	< 0.001	1.01(0.91-1.12)	0.833	0.95(0.85-1.06)	0.3
Central	1.03(1-1.05)	0.075	0.94(0.91-0.97)	< 0.001	1.08(1.01-1.15)	0.026	0.85(0.79-0.92)	< 0.001	0.93(0.85-1.01)	0.073	0.85(0.78-0.93)	<0.0

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			from Multivaria le NSS, India (C		ary logistic reg	gression	136/bmjopen-2024090220 o cted by copyright; Spoluding n analy n analy	loring th	e likelihood o	f living	with different	types c
		Hearing	disability			Visual	disability 9			Mental	retardness.	
	Un-adjusted OR (95% CI)	p- value	Adjusted OR (95% CI)	p- value	Un-adjusted OR (95% CI)	p- value	Adjusted (95% GI	p-value	Un-adjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age (Years)							2025. relate					
<18 (Ref)	1		1		1		1 in the second		1		1	
18-35	1.95(1.73-2.2)	< 0.001	5.16(4.55-5.85)	0	10.37(1.94-2.65)	< 0.001	6.57(5.59 a 32	< 0.001	1.88(1.7-2.08)	< 0.001	33.33(30-37.04)	< 0.00
35-49	3.23(2.87-3.64)	< 0.001	9.31(8.14-10.65)	0		< 0.001	13.95(11.29)	< 0.001	1.17(1.05-1.31)	0.005	34.13(30.24-38.51)	< 0.00
50-59	6.63(5.91-7.45)	< 0.001	15.34(13.43-17.52)	0	31.04(9.17-12.36)	< 0.001	29.2(24.7 a 44.48)	< 0.001	0.65(0.57-0.74)	< 0.001	18.86(16.39-21.71)	< 0.00
65+	20.67(18.42-23.2)	< 0.001	38.97(34.06-44.58)	0	43.68(23.92-32.23)	1	61.23(51.74-76.47)	< 0.001	0.4(0.33-0.48)	< 0.001	11.39(9.26-14.01)	< 0.00
Gender	X						ninii http					
Male (Ref)	1		1		1	0.			1		1	
female	0.96(0.93-0.99)	0.012	0.73(0.7-0.75)	< 0.001	1.04(1.01-1.08)	0.022	0.76(0.73	< 0.001	0.68(0.65-0.71)	< 0.001	0.76(0.73-0.8)	< 0.00
Place of residence							en.k					
Rural (Ref)	1		1		1				1		1	
Urban	0.86(0.83-0.9)	< 0.001	1.07(1.03-1.12)	0.001	0.83(0.8-0.86)	< 0.001	1.08(1.04 .13	0.001	1(0.96-1.05)	0.894	1.18(1.11-1.24)	< 0.00
Social groups	· · · · · ·						mili					
Scheduled tribe (Ref)	1		1		1		June ar te		1		1	
~	0.89(0.84-0.94)	< 0.001	0.95(0.89-1.01)	0.084	0.99(0.93-1.06)	0.734		0.228	1.2(1.1-1.3)	< 0.001	1.24(1.13-1.36)	< 0.00
Other backward		< 0.001					1.04(0.97 ð .12) G 1.03(0.97 ð .1)			< 0.001		< 0.00
	0.9(0.86-0.95)	0.000	1.02(0.96-1.08)		0.92(0.87-0.98)				1.23(1.14-1.32)	< 0.001	1.49(1.37-1.63)	< 0.00
Education level	0.92(0.87-0.97)	0.002	1.14(1.07-1.21)	< 0.001	0.85(0.8-0.91)	< 0.001	1.02(0.95-1.08	0.576	1.26(1.17-1.37)		1.91(1.74-2.09)	
Illiterate (Ref)												-
	1	< 0.001		< 0.001	1	< 0.001		<0.001		< 0.001		< 0.00
<u> </u>	0.47(0.45-0.48)	< 0.001	0.65(0.62-0.68)	< 0.001	0.36(0.35-0.38)	< 0.001	0.57(0.55-0.6	< 0.001	0.34(0.32-0.35) 0.13(0.12-0.14)	< 0.001	0.1(0.1-0.11) 0.03(0.03-0.04)	< 0.00

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and Higher Education	0.22(0.2-0.25)	< 0.001	0.29(0.27-0.33)	< 0.001	0.2(0.18-0.23)	< 0.001	0.33(0.29 a).37 a	< 0.001	0.04(0.03-0.05)	< 0.001	0.01(0.01-0.01)	<0
Religion							0.33(0.297).378					
Hindu (Ref)	1		1		1		ng f		1		1	
Muslim	0.8(0.76-0.84)	< 0.001	0.88(0.84-0.93)	< 0.001	0.85(0.8-0.89)	< 0.001		0.995	1.05(0.99-1.12)	0.089	0.71(0.67-0.76)	<0.
Others	1.11(1.05-1.18)	< 0.001	1.08(1.01-1.16)	0.024	0.99(0.92-1.06)	0.802	1(0.94-1.00 0.94(0.875) 10.94(0.875) 10.36(0.336) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36) 10.36(0.36)	0.112	1.05(0.97-1.14)	0.195	1.27(1.15-1.39)	<0.
Marital status							relat					
Un-married (Ref)	1		1		1		1 teense 1 dett		1		1	
Currently married	1.63(1.57-1.7)	< 0.001	0.42(0.39-0.45)	< 0.001	1.87(1.78-1.96)	< 0.001	0.36(0.33	< 0.001	0.09(0.09-0.1)	< 0.001	0.03(0.03-0.03)	<0.
Widowed	7.49(7.16-7.84)	< 0.001	0.77(0.72-0.84)	< 0.001	9.8(9.31-10.31)	< 0.001	0.73(0.673)33)2	< 0.001	0.17(0.15-0.19)	< 0.001	0.04(0.03-0.05)	<0.
Divorced/separated	4.27(3.68-4.97)	< 0.001	1.15(0.98-1.35)	0.096	3.26(2.67-3.99)	< 0.001	0.73(0.67 0.73(0.67 0.67(0.54 0.67(0.54 0.67 0.67 0.67 0.67 0.67 0.54 0.67 0.67 0.54 0.67 0.54 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.73 0.67 0.67 0.67 0.67 0.67 0.73 0.67 0.67 0.67 0.73 0.67 0.73 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.67 0.57 0.67 0.57	< 0.001	1.56(1.31-1.85)	< 0.001	0.36(0.3-0.44)	<0.
Wealth					100		tta n					
Poorest (Ref)	1		1		1				1		1	
Poor	0.6(0.57-0.63)	< 0.001	0.74(0.71-0.78)	< 0.001	0.62(0.59-0.65)	< 0.001	0.8(0.76- 6 84)	< 0.001	0.87(0.82-0.93)	< 0.001	0.93(0.87-1)	0.0
Middle	0.54(0.51-0.56)	< 0.001	0.67(0.64-0.7)	< 0.001	0.56(0.54-0.59)	< 0.001	0.73(0.69 1.7 2	< 0.001	0.85(0.8-0.91)	< 0.001	0.92(0.86-0.99)	0.0
Richer	0.49(0.47-0.52)	< 0.001	0.62(0.59-0.65)	< 0.001	0.47(0.44-0.49)	< 0.001	0.61(0.57	< 0.001	0.79(0.74-0.85)	< 0.001	0.92(0.85-0.99)	0.0
Richest	0.43(0.41-0.45)	< 0.001	0.57(0.54-0.6)	< 0.001	0.37(0.35-0.39)	< 0.001		< 0.001	0.7(0.65-0.75)	< 0.001	0.91(0.84-0.99)	0.
Region							0.5(0.47-@354); a. <u>s.</u>					
Northern (Ref)	1		1		1		1 mila		1		1	
Southern	1.94(1.83-2.05)	< 0.001	1.52(1.43-1.61)	< 0.001	1.54(1.45-1.64)	< 0.001	1.1(1.03- ig 18)	0.006	1.51(1.4-1.62)	< 0.001	1.7(1.57-1.84)	<0.
Western	1.19(1.12-1.28)	< 0.001	1.07(1-1.15)	0.053	1.01(0.93-1.08)	0.883	0.88(0.828).96	0.002	1.31(1.21-1.42)	< 0.001	1.49(1.37-1.63)	<0.
Eastern	1.34(1.26-1.42)	< 0.001	1.18(1.11-1.26)	< 0.001	1.2(1.13-1.28)	< 0.001	1(0.93-1.927) 1 025	0.981	1.07(1-1.16)	0.062	0.92(0.84-0.99)	0.0
North-eastern	1.57(1.46-1.68)	< 0.001	1.58(1.47-1.7)	< 0.001	1.47(1.37-1.59)	< 0.001	1.52(1.41-1.65)	< 0.001	0.84(0.76-0.93)	0.001	0.82(0.74-0.92)	0.0
Central	1.08(1.02-1.15)	0.01	1(0.94-1.06)	0.96	1.05(0.98-1.12)	0.182	0.91(0.85-0.97	0.006	0.87(0.81-0.94)	< 0.001	0.63(0.58-0.69)	<0.

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Supplementary T disabilities per th	Table 2: Result 1e 76 th round of	ts from f the Na	n Multivariate SS, India (Con	binary l it)	ogistic regression analys	/ copyright;;;)ncludin	1386/miopen-202ct Block of living with different Insertion Network (Market Control of Living Vibright	types of
	Othe	er types	of disabilities			g for	9 1	
	Un-adjusted OR (95% CI)	p-	Adjusted OR	p- value		uses uses		
Age (Years)		Value		Value		rela		
<18 (Ref)	1		1			ted 1	j ci z z	
18-35	0 98(0 83-1 16)	0.8	1 46(1 21-1 77)	< 0.001		int S		
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65+	3 3(2 78-3 9)	< 0.001	6.01(4.81-7.5)	< 0.001		ata r		
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Social groups						mila	en contraction de la contracti	
Scheduled tribe (Ref)	1		1			r tec	ne	
Scheduled caste	0.78(0.69-0.88)	< 0.001	0.82(0.72-0.94)	0.004		hnol	7, 20	
Other backward class	0.68(0.61-0.76)	< 0.001	0.71(0.63-0.81)	< 0.001		logie)25 a	
Others	0.91(0.81-1.02)	0.098	0.89(0.78-1.01)	0.066		.S.	at Agence	
Education level						90.0	Jenc	
Illiterate (Ref)	1		1			•	U	
Primary	0.84(0.76-0.91)	< 0.001	0.88(0.8-0.98)	0.018			Bibliograph	
Secondary	0.79(0.72-0.86)	< 0.001	0.89(0.81-0.99)	0.034		9.44	угар	

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and Higher Education	0.93(0.81-1.07)	0.334	0.97(0.83-1.14)	0.713
Religion				
Hindu (Ref)	1		1	
Muslim	0.83(0.74-0.92)	< 0.001	0.88(0.79-0.98)	0.021
Others	1.18(1.04-1.34)	0.01	1.09(0.94-1.26)	0.239
Marital status				
Un-married (Ref)	1		1	
Currently married	0.97(0.9-1.04)	0.409	0.48(0.42-0.54)	< 0.001
Widowed	1.89(1.68-2.12)	< 0.001	0.55(0.46-0.66)	< 0.001
Divorced/separated	2.57(1.86-3.54)	< 0.001	1.29(0.92-1.81)	0.142
Wealth				
Poorest (Ref)	1		1	
Poor	0.63(0.57-0.71)	< 0.001	0.72(0.64-0.8)	< 0.001
Middle	0.66(0.59-0.73)	< 0.001	0.76(0.68-0.85)	< 0.001
Richer	0.72(0.65-0.8)	< 0.001	0.84(0.75-0.94)	0.002
Richest	0.78(0.7-0.86)	< 0.001	0.88(0.78-0.99)	0.038
Region				
Northern (Ref)	1		1	
Southern	2.66(2.28-3.1)	< 0.001	2.62(2.25-3.07)	< 0.001
Western	2.9(2.48-3.4)	< 0.001	2.82(2.4-3.31)	< 0.001
Eastern	3.09(2.67-3.59)	< 0.001	3.23(2.77-3.77)	< 0.001
North-eastern	2.12(1.77-2.53)	< 0.001	1.98(1.64-2.38)	< 0.00
Central	1.17(1-1.38)	0.056	1.26(1.07-1.49)	0.007

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Epidemiology of disability and access to disability support and rehabilitation services in India: a secondary data analysis a National Sample Survey (2018)

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Keywords:	Disabled Persons, PUBLIC HEALTH, Health Equity	





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5	2	rehabilitation services in India: a secondary data analysis a
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10	5	Moonis Mirza*, Vandana Esht ¹ *, Madhur Verma ^{*#} , Bajarang Bahadur*, Ajit
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56 Abstract

Objective: The aim of this study was to examine the epidemiology of disability in India and
assess access to disability support and rehabilitation services by people with disability (PWD).
Design: This study is a secondary analysis of data from the 76th round of the National Sample
Survey (2018), focusing on disability in India.

Setting: The survey employed a stratified two-stage sampling design based on Census 2011,
covering all states and union territories of India. Villages and urban blocks were selected in the
first stage, while households were chosen in the second stage across rural and urban areas.

Participants: The survey included data from a population of 576,796 individuals residing in
1,18,152 households from 8,992 village/urban blocks (5,378 rural villages and 3,614 urban
blocks). The analysis focused on 1,07,125 individuals (61,707 males and 45,305 females) who
reported at least one disability.

Outcome measures: The primary outcome was "any disability". Secondary outcomes included
access to disability support and rehabilitation services, which assessed difficulties in accessing
public buildings and transport, loss of employment after disability, availability of government
support, enrolment in special schools, and possession of a disability certificate.

Results: The overall weighted disability prevalence was 2.2%, with significant disparities across socio-demographic characteristics. Among PWD, 45.9% of those who acquired disability after birth were aged between 15 and 59, and 20.8% received no government aid. About 40% of PWD struggled to use public transport, and 57.7% had difficulties accessing public buildings. Additionally, 60.7% reported job loss due to disability, and 69.6% lacked a disability certificate.

78 Conclusion: This study highlights disparities faced by PWD in accessing disability support79 and rehabilitation services. There is an urgent need for concerted efforts to minimise such

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em to contribute to society with their true potential.

eywords: Disability, inequity, disparities, accessibility, health access.

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86 Strengths and limitations of this study

One of the very first comprehensive assessments of accessibility issues of people living
 with disability, based on data from the 76th round of the National Sample Survey (2018).

- We estimated the proportion of people with disability who could access basic services through a weighted analysis that makes the results generalisable and highlights actionable points.
- 92 The lack of a standardised definition of disability was the critical limitation of the study,
 93 which restricts sub-national and national comparisons over time and regions.

• The possibility of estimates being affected by recall bias and social desirability bias cannot be ruled out.

We were limited by the number of variables available in the primary data, which
restricted us from making further conclusions about the social inclusion of people with
disability.

100 INTRODUCTION

As per the United Nations Convention on the Rights of Persons with Disabilities (CRPD), people with disability (PWD) include those who have long-term physical, mental, intellectual, or sensory impairments which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others.[1] Disability is a global concern, impacting 1.3 billion people, or 16% of the population.[2] The World Health Organisation (WHO) and the World Bank's World Report on Disability highlight that 80% of the global disabled population is of working age, with a substantial proportion residing in developing countries.[3] India is one of the most populous countries, with a concerning proportion of PWD.[4] With the increasing proportion of the geriatric population, the burden of disability has also proportionately increased (from 21.9 to 26.8 million) over the last two rounds of the national census (2001-2011).[5,6] The reports from the 2011 Census and the 76th round of the National Sample Survey (NSS) estimate disability prevalence to be around 2.2%.[7] However, the fifth round (2019-21) of the Indian National Family Health Survey (a large-scale nationally representative survey with repeated cross-sectional design) estimates an overall disability prevalence of 4.52%.[8] The discrepancy in available estimates is due to methodological differences, poor quality and inconsistent data, and lack of a standardised definition, which underscores the intricate nature of disability.[9,10]

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The CRPD identifies disability as an evolving concept and highlights the constantly changing
needs of PWD, which are largely unmet. [11–13] The different articles of CRPD (6, 7, 9, 24,
and 27) focus on key aspects such as gender, age, accessibility, education, and employment to
empower PWD by addressing specific needs. For instance, Article 6 caters to gender-related
needs, which may include protections against gender-based discrimination and access to
reproductive healthcare, while Articles 7 and 24 focus on the needs of children with disability
and ensure inclusive education. Article 9 ascertains that older adults with disability have access

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to necessary social and healthcare services. These measures aim to enable independent living and full participation in all aspects of life, ensuring that PWD are not deprioritised compared to the general population.[14–18] The limited priority given to the needs of PWD in society increases the existing disparities, leading to poorer health outcomes, lower educational attainment, and reduced economic opportunities, thereby exacerbating social inequities.[19] Addressing these disparities is a global priority as mandated by the second principle of the Sustainable Development Goals (SDGs), "Leave no one behind", which is the central, transformative promise of the Agenda 2030.[20] International human rights law, including the CRPD, Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), Convention on the Rights of the Child (CRC), International Covenant on Civil and Political Rights (ICCPR), International Covenant on Economic, Social and Cultural Rights (ICESCR), collectively uphold the principles of equality and non-discrimination, obligate each country to address the inequalities faced by PWD, ensuring that they have equitable access to services, full participation in society, and protection from exclusionary practices.[1,21] Between March 2007 and January 2025, 192 parties, including India, formally agreed to the CRPD. Despite progress, there remains a gap in fully recognising and upholding the rights and needs of PWD.[19] The needs of PWD can span from *personal functional assistance* (daily activities and extent of disability), social integration (living conditions, caregivers, and public accessibility), economic rehabilitation (impact on employment and finances) to service access (certification and receipt of government/Non-Government Organization (NGO) support) necessitating a comprehensive approach.[22] However, access to such services is less studied, so it is crucial to highlight disparities that affect the disability care continuum and limit the efforts to minimise social exclusion of PWD and foster a social environment that is inclusive and accessible to all. [22][23]

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Previous literature from India has primarily focused on the epidemiology of disability.[10] The lack of disability-friendly infrastructure, affordable assistive technologies, support services, including personal assistance, therapy, aids and vocational rehabilitation, and comprehensive care perpetuates inequalities.[24] However, it remains underexplored by the scientific community. Within this context, the 76th NSS collects data regarding disability and access of people with disability to various disability support and rehabilitation services, thus providing an opportunity to study them. [7] Thus, the primary aim of the study was to explore the epidemiology of disability and the accessibility of PWD to various disability support and rehabilitation services to provide insights for specific interventions.

METHODS

159 Data sources

We conducted a secondary analysis of the cross-sectional data from the 76th National Sample Survey (NSS) conducted by the Ministry of Statistics, Planning, and Implementation (MoSPI) between July and December 2018. MoSPI has formulated a code of ethics and sets out certain standards of conduct for the members of the Survey Committees (group of people appointed to conduct and supervise the survey). The data for NSSO is collected per the Collection of Statistics Act, 2008, which ensures transparency in data collection by issuing public notifications outlining the subject, purpose, and methodology of the survey. Participation in these surveys is generally voluntary, with respondents providing implied consent by answering survey questions after being informed about the study's objectives. Additionally, the Act mandates confidentiality safeguards, ensuring that collected data is used solely for statistical purposes. While respondents are legally obligated to provide accurate information, the data remains anonymous and protected. Thus, the NSSO follows ethical guidelines to uphold privacy while maintaining the integrity of national statistics.[25] The NSS collects socio-economic data using interviews through scientific sampling methods and serves as a crucial

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tool to gauge various socio-economic aspects across all states of India. Its primary objective is
to identify unmet needs within the population, thereby aiding the government in formulating
effective policies to address them.

The survey made its first attempt to collect information on the number of PWD during the 15th round (July 1959 - June 1960).[26] In the 76th round, the main objective of the survey was to estimate indicators of incidence and prevalence of disability, cause of disability, age at onset of disability, facilities available to the PWD, difficulties faced in accessing public building/public transport, arrangement of regular caregiver, out-of-pocket expense relating to disability, etc. using a structured questionnaire.[27] Further, estimates were obtained on various employment and unemployment particulars in usual status for the household members with at least one disability. For PWD aged 12 to 59 years, information was collected on whether or not they received vocational/technical training and details related to such training.

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Sampling design and sample size

The 76th NSS employed a stratified two-stage sampling design, utilising Census 2011 as the sampling frame.[7] The survey commenced on 1st July 2018 for six months. In the first stage, villages/urban blocks were selected, followed by the selection of households in rural and urban areas in the second stage. This round of NSS encompassed all states and union territories of India except the villages in Andaman and Nicobar Islands, which are difficult to access, covering a total of 8,992 village/urban blocks (5,378 rural villages and 3,614 urban blocks) and including 118,152 households representing a population of 576,796 individuals (402,589 in rural areas and 173,980 in urban areas). Within this, the present study focuses on 1,07,125 individuals, consisting of 61,707 males and 45,418 females, who reported at least one disability during the survey.

58 197 Study variables
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60 198 Dependent variable

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The presence of "any disability" was our primary de ariable. MoSPI defines a "Person with disability" as a person with a long-term mental, intellectual or sensory impairment which, in interaction with barriers, h ll and effective participation in society equally with others.[7] The variable is created presence of at least one condition among all seven disability types, elaborated subsequ

1. Locomotor disability: A person was categorise g with locomotor disability based on a positive response to any of the following the tions: *(i) whether having difficulty* in using hands, fingers, toes, body moveme uding cerebral palsy, muscular dystrophy); (ii)whether having loss of sensation dy due to paralysis, leprosy, other reasons; or (iii)whether having deformity of th art(s) like hunch back, dwarfism, deformity due to leprosy, caused by acid attack

- 2. Visual disability: It was identified using a dire on: "Whether having difficulty in seeing, counting fingers of hand from a distance eet (with spectacles, if using, and both eyes taken together)."
- 3. Hearing disability: The categorisation was the question: "Whether having difficulty in hearing day-to-day conversational without hearing aid, if using, and both ears taken together)"
- 4. Speech and language disability: It was asse ng a question: "Whether having difficulty in speech (unable to speak like a nor *n*/ speech is not comprehensible, including laryngectomy, aphasia) which is base ch disability."
- 5. Intellectual disability: The variable has been based on the question: "Whether having difficulty in understanding/ comprehe communicating in doing daily activities". The manuscript adopts the term 'inte disability' in place of the outdated and potentially stigmatising term 'mental retard at was used in the original survey,

and better aligns with current international standards and person-first language conventions.

6. Mental illness: This disability was identified when there was a positive response to any of the three conditions: "(i) whether having unnecessary and excessive worry and anxiety, repetitive behaviour/ thoughts, changes of mood or mood swings, talking/laughing to self, staring in space; (ii) whether having unusual experiences of hearing voices, seeing visions, strange smell or sensation or strange taste; or (iii) whether having unusual behaviour or difficulty in social interactions and adaptability."

7. Other disability: To identify other types of disability of the persons, the following question was used: "Whether having any of the following: Parkinson's disease, multiple sclerosis, other chronic neurological conditions, thalassemia, haemophilia, sickle cell disease".

The access to disability support and rehabilitation services by the PWD were secondary dependent variables. For this study, we adopted the United Nations CRPD definition of 'disability support,' which is stated as 'the means to ensure that PWD can fully enjoy their rights and participate equally in society." The original survey assessed disability support by estimating the proportion of PWD ever receiving any aid/help (received aid/help from government, or received aid/help from organisations other than government, did not receive aid/help), living arrangement (living alone or with a spouse, living with others), arrangement of regular caregiver (care-giver required but not available, care-giver is not required, care-giver is available), access to public transport (yes, no), accesses to public building (yes, no), difficulty faced in accessing public building (difficulty faced due to stairs and non-availability of ramp, grooved tiles or lift, in opening doors, no seating arrangement: in the waiting area, at the point of receiving service, no special toilet seats, no sign for direction/ instruction/no public announcement system, no difficulty faced, and others), employed/working before onset of

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disability (yes, no), disability causing loss or change in job (loss of work, change of work , no
loss or change of work), having disability certificate (yes, no), and percentage of disability as
per certificate (40-60%, 60-80%, >80%, and none of these). Disability certificate is issued to
PWD by the competent medical authorities notified by the State/UT Government and aims to
encourage transparency, efficiency and ease of delivering the government benefits to the person
with disabilities and to ensure uniformity.[28,29]

254 Predictor variables

The predictor variables were chosen in the present study following a literature review and the scope of data collected in the original survey.[30–33] We included age group (completed years) categorised as; up to 5, 6-17, 18-35, 36-49, 50-65 and 65+ completed years, sex (male, female), marital status (never married, ever married, widowed, divorced/separated), area of residence (rural, urban), educational attainment (non-literate, literate but not formal, upto primary, upto secondary), preferred religion (Hindu, Islam, others), social group (scheduled tribe, scheduled caste, other disadvantaged classes (terminology used in the survey was "other backward classes"), general), wealth index (poorer, poor, middle, richer, richest), regions of India (northern, southern, western, eastern, north-eastern and central). For readers outside India, the term 'backward class, schedule caste and schedule tribe' refers to socially and educationally disadvantaged groups legally recognised by the constitution of India, that have historically faced discrimination and marginalisation, and aim to promote social justice by reducing disparities, enhancing representation in education and employment, and fostering socio-economic inclusion. [34]

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Specifically, PWD were characterised using variables like causes of disability (disease, other
than disease due to burn, injuries other than burn, other causes), age at the onset of disability
(0 to 4, 5 to 14, 15 to 59, and 60 years and above), the origin of disability from birth (yes, no,
not known), disability commenced in last 365 days (yes, no), place of occurrence of disability

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(workplace, road, home, other places), treatment taken/undergoing treatment (yes: consulting doctor, otherwise, yes: consulting doctor, plus undergoing treatment, otherwise, attending special school/special therapy, cannot afford treatment, no treatment available for the disability, not required and not known).

Statistical methods

The prevalence, along with the dispersion of all disability variables, was estimated as part of a univariate analysis by using already calculated sampling weights with clustering as provided with the datasets.[35] The details of sampling weight have been described in the NSS 76th round report. We used the SVY command to sample weights.[36] Further, the prevalence of all disability types was estimated per socio-economic characteristics, and the associations were tested using bivariate analysis through a chi-squared test. The access to different services was depicted using weighted proportions. Missing data were handled using the Available Case Analysis (ACA) technique, where estimates were generated based on the available data. This resulted in varying sample sizes across variables but allowed for greater data retention than listwise deletion. Little's MCAR (Missing Completely at Random) test assessed whether the missingness was related to observed variables. The test results indicated that the data were not missing completely at random but were likely dependent on observed variables, suggesting that the data were missing at random (MAR). Therefore, the use of ACA was considered appropriate for preserving more data while minimising potential bias compared to listwise deletion. Further, a sensitivity analysis was conducted to assess the robustness of the findings to different missing data handling techniques. Results obtained using ACA were compared with those from Complete Case Analysis (CCA), and the findings were consistent across the two methods. Lastly, multivariable binary logistic regression analysis was used to explore the independent variables affecting the likelihood of living with 'any disability' coded as 1 and 0. Additionally, binary logistic regressions are employed on all seven types of disability. The

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analysis depicted the unadjusted and adjusted odds ratios (95% confidence interval). All pvalues<0.05 were considered statistically significant. All the analysis was done using Stata
(version 17.0). Graphical maps were created using MS Excel sheets to depict the regional
disparities.

- 302 Patient and public involvement
- 303 None.

RESULTS

Table 1 provides a comprehensive overview of the weighted prevalence of different types of disability across various socio-demographic characteristics in India. Of the participants, 107,125 (2.2%) had at least one form of disability. The majority of such participants had a locomotor disability 61,981 (1.36%), followed by hearing 15,294 (0.30%), visual 11,977 (0.23%), speech-related 12,661 (0.23), intellectual disability 8,564 (0.16%), mental illness 6,751 (0.16%), and other types 3,121 (0.05%) of disability. The highest prevalence of any disability, locomotor, speech and 'other' disability was seen in 50-65 years. However, the proportion of participants with visual and hearing disability was highest in the eldest age group, while intellectual disability and mental illness were highest in the 6-35 years age group. Disability prevalence was notably higher among older individuals, males, rural populations, and those from lower socioeconomic backgrounds with minimal or no educational attainment, and living in the southern part of India.

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We further assessed the origin of disability as per the type (Table 2). The most common cause of locomotor and speech disability was disease 28,673 (46.3%), 1246 (61.9%), while 'other causes' were most commonly involved in visual 538 (46.5%) and hearing 637 (49.7%) disability. Around 11,488 (18.5%) of PWD had their disability from birth. Of the total participants, 2987 (6.1%) participants acquired their disability in the last year preceding the

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survey. The most common place of disability origin was road 5977 (41.9%), followed by home, 4693 (32.9%). Only 17,329 (28%) of PWD were consulting doctors and undergoing treatment. Table 3 depicts the living conditions of PWD and access to crucial services, and Supplementary Table 1 provides results in more detail for each type of disability. Overall, nearly half of the PWD who did not have disability since birth were between 15 and 59 years old (45.9%), while nearly one-fifth (20.8%) had received aid or help from the government. 57% of PWD lived with their spouses, and 62.8% reported that caregivers were available. About 40% reported an inability to use public transport, while 54.4% reported inaccessibility to public buildings. Further, 57.7% of PWD reported facing difficulties while accessing public buildings. Around 60.7% of PWD reported a loss of work due to disability onset, and 69.6% did not have any official document certifying their disability for administrative purposes. Figure 1 further depicts the geographic disparities in the PWD's access to basic services.

Table 4 demonstrates the multivariable binary logistic regression analysis results to present the socio-demographic variables affecting the likelihood of living with any disability. We found a significantly higher likelihood of living with disability with increasing age (Adjusted Odds ratio: 58.4; 95% Confidence Interval: 55.4-61.5 in >65 years vs up to 5 years), urban residence (1.3; 1.2-1.3) vs rural, social castes (1.3; 1.3-1.3 in general caste) vs scheduled tribes, and living in a Southern region of India (1.1; 1.1-1.2) compared to those from North India. However, female sex (0.6; 0.6-0.6), more years of education (0.3; 0.3-0.3), Islam followers (0.9; 0.9-0.9), currently married/widowed vs never married (0.3; 0.3-0.3), and higher socio-economic status (0.5; 0.5-0.5) depicted significantly lower likelihood of living with disability. Supplementary Table 2 provides results from the more detailed regression analysis for each type of disability.

344 DISCUSSION

We report an investigation that assesses the epidemiology of PWD and their access to disability
 support and rehabilitation services in India using nationally representative data. Our key

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findings have profound policy implications. First, we identify concerning disparities in disability prevalence across socio-demographic groups. Second, one-fifth of PWD reported acquiring their disability at birth. Third, the most common place of disability origin was the road, followed by home. Fourth, approximately half of PWD reported challenges in using public transport and buildings. Lastly, the majority of PWD reported a loss of work due to disability onset and lacked official certification of their disability.

Disability prevalence was notably higher among older individuals, males, rural populations, and those from lower socio-economic backgrounds. Despite a modest 2.2% prevalence rate, this figure represents around 30 million people in India, and it is expected to rise, indicating an urgent need for attention. While there was a preponderance of males with locomotor disability, speech and language disabilities were significantly higher in females. As per the estimates obtained from the previous 36th, 47th, and 58th rounds of NSS, there is a constant rise in disability prevalence in rural (1.8% in the 36th round to 2.3% in the 76th round) as well as urban (1.4% in the 36th round to 2.0% in the 76th round) areas, with the overall increase from 1.6% in the 36th round in year 1981 to 2.2% in the 76th round in the year 2018.[7] Secondary analysis of another national survey (NFHS-5) depicts an overall disability prevalence of 0.95%, with a higher proportion of locomotor disability (0.4%), followed by mental illness (0.2%).[37] We observed that a high proportion of survey participants had their disability from birth. However, the available data limits our further understanding of such disability, whether the onset was intrauterine or acquired during the birthing process. Such limited information still necessitates mitigation strategies targeting pregnant females by ensuring accessibility to screening for intra-uterine pathologies causing disability, such as Down's syndrome and intellectual disability, and later extending the access to screening for auditory and visual disability.[38] Further, adopting more rigorous screening toolkits and investigations for newborns at the primary healthcare level through the expansion of the Rashtriya Bal Swasthya

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Karyakram (Indian National program that involves screening of children from birth to 18 years of age for 4 Ds- Defects at birth, Diseases, Deficiencies and Development delays, spanning 32 common health conditions for early detection and free treatment and management, including surgeries at the tertiary level) would help in increasing the scope for early psychological or therapeutic interventions that would impact the quality of life of children with disability.[39] In addition, the Pradhan Mantri Jan Arogya Yojana (PM-JAY) offers free healthcare for children with disability who are not covered under the RBSK scheme.[40,41]

The most common place of disability origin was the road, followed by home. Trauma is an important cause of locomotor disability, and in India, it is the second most common cause of locomotor disability.[42] Previous estimates suggest that road crashes maximally impact the poorest quintiles. A lack of appropriate safety gear while on the road is often a factor in road trauma. People who experience road trauma often have inadequate access to medical and social safety nets after injury.[43,44] Anecdotal evidence from Chandigarh, a Union Territory of India, suggests that strict compliance with traffic rules can mutually benefit the public and the administration. On one side, it reduces morbidity due to road traffic accidents, while on the other side, penalties due to non-compliance generate revenues and raise awareness. An increasing number of domestic accidents is equally concerning.[45] Domestic accidents may be underreported as most of the domestic injuries are considered minor, often neglected, and may be easily forgotten and subject to recall bias. This changing trend is similar to many developed nations where more accidents happen at home than anywhere else. We expect an increase in such incidents with increasing population and population density. Domestic accidents depend on the physical and social environment and also on the functional capacity of the individual. While road traffic accidents are unforeseen and unexpected, it is generally accepted that domestic accidents can be prevented and minimised by taking adequate safety measures well in time.[46]

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We observed that there is scope for improving the accessibility of public buildings and transport for the PWD; these facilities must accommodate the PWD's needs. Various schemes and initiatives demonstrate the Indian government's commitment to securing the rights and welfare of disabled populations in the country. India's commitment to the United Nations Convention on the Rights of PWD (UNCRPD) is embodied in the Rights of Persons with Disabilities Act of 2016 (RPWD Act, 2016). It emphasises dignity, autonomy, and non-discrimination for PWD.[47] The Act further mandates inclusive education, vocational training, and self-employment opportunities without discrimination. To increase the accessibility of public buildings, the RPWD Act 2016 and the National Building Code of India 2016 outline expanded guidelines for building accessibility.[48] Compliance with these standards has been made compulsory, with responsibility falling on those involved in commissioning, designing, constructing, or managing built environments. The building design must adhere to relevant legislation, including equality and safety regulations. This focus on accessibility has fostered the adoption of universal design concepts, leading to numerous best practices for creating inclusive environments. These encompass accessible buildings, parking areas, parks, and recreational facilities, reflecting a concerted effort to ensure equal access and inclusion for PWD in the built environment.

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414 Government schemes to improve inclusion and access

The government has a variety of healthcare schemes, such as the Assistance to Disabled
Persons for Purchase/Fitting of Aids and Appliances (ADIP), which caters to the specific needs
of PWD and provides assistive devices, aids such as wheelchairs, hearing aids, and prosthetic
limbs at subsidised rates.[49] The Deendayal Disabled Rehabilitation Scheme (DDRS)
provides financial assistance to NGOs for various rehabilitation services for PWD.[50]
However, the scheme faces inconsistencies in service availability across different states. The
lack of standardisation in rehabilitation programs results in variable quality of care, while

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administrative delays in fund disbursement further hinder its effectiveness.[51] Moreover, rural
and economically weaker sections often struggle to access these services, limiting the scheme's
reach and equity. While DDRS aligns with the principle of equal opportunities under the
RPWD Act of 2016, its impact is weakened by poor implementation and inadequate monitoring
mechanisms. Apart from catering to the healthcare needs of PWD, we must address specific
issues related to health and ethics and the need to shift societal attitudes toward PWD to
improve social inclusion.[52]

In addition to health-related needs, the government of India has taken several steps to secure PWD's social rights. The Right to Education Act (RTE) aims to provide free and compulsory education for children with disability up to 18 years.[53] The 'Samagra Shiksha Abhiyan' integrates children with disability into mainstream education.[54] The National Education Policy 2020 also prioritises "inclusion" by aiming to fully integrate children with disability into the mainstream education system, providing necessary accommodations and support to ensure their active participation in the learning process without segregation or discrimination; this includes accessible infrastructure, specialised teaching methods, and assistive technologies tailored to individual needs.[55] Training gaps among teachers working with PWD, a lack of assistive technology, and poor enforcement of inclusive education policies hinder meaningful inclusion.[56] The government-funded higher education institutions in India reserve 5% of seats for PWD to foster diversity and enhance employment opportunities. However, the effectiveness of such policies is hindered by challenges [57], such as infrastructural barriers, lack of accessible learning materials, and inadequate support services. Many PWD lack access to skill development programs, limiting their employability. The government also provides financial assistance and benefits to PWD through schemes like the National Handicapped Finance and Development Corporation (NHFDC), which offers loans and subsidies for education and training or self-employment ventures.[58]

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Employment can enhance social sustainability and individual well-being.[59] However, we observed that a very high proportion of PWD had a change or loss of their jobs due to the onset of disability. Loss of jobs can be linked to the social stigma associated with impairment or disability and the perception of such people being less productive. Many employers have illfounded views about the work-related abilities of PWD; these negative views are often a result of interrelated concerns that permeate the entire employment cycle.[60] It is to be emphasised that negative attitudes toward disability disempower PWD and lead to social exclusion. By contrast, a healthy society encourages positive attitudes toward PWD and promotes social inclusion.[61] Various initiatives have been introduced to promote employment opportunities for PWD. However, a lack of awareness and red tape discourages many PWD from receiving employment benefits. While the RPWD Act mandates non-discrimination in employment, the absence of accountability measures continues to hinder its success. Many PWD also lack formal certification as seen in our study, restricting their access to essential services and benefits.[62][63]

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Other prominent schemes introduced for PWD in India include the National Handicapped Finance and Development Corporation (NHFDC), which provides financial assistance to persons with disability for self-employment, education, and training; Scheme for Implementation of Persons with Disabilities Act (SIPDA) to create barrier-free environments and improve the quality of life for PWD; Accessible India Campaign (Sugamya Bharat Abhiyan) focuses on making public infrastructure and transportation accessible for people with disability and Inclusive Education for Disabled at Secondary Stage (IEDSS) supports the inclusive education of students with disability at the secondary level.[58][64][65] Despite multiple policy frameworks supporting disability inclusion, several gaps remain in implementation and enforcement. [66] The mere existence of legislation and policies does not

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472 guarantee their effectiveness. There is a pressing need for stronger monitoring mechanisms, 473 improved financial transparency, and enhanced awareness campaigns to bridge the gap 474 between policy intent and real-world impact. The government must prioritise accountability 475 measures to ensure scheme implementation, and greater investment in infrastructure and 476 assistive technologies to create an inclusive environment for PWD. [67]

477 Strengths and limitations

The study's major strength lies in its novelty by bringing social science and medicine to a common platform. The estimates generated using weighted analysis are nationally representative and depict strong external validity due to their national coverage, stratified sampling approach, and standardised definitions. The emerging results can serve as robust evidence to help guide policy that improves accessibility. The present study takes a novel approach by initially delineating the proportions of various types of disability. Subsequently, it delves into the analysis concerning "any disability," thus unveiling unique characteristics within this broader category. By doing so, the study not only broadens the scope of understanding but also highlights the nuanced interplay between different types of disability and the socio-demographic backgrounds of PWD. This shift towards a more inclusive analysis holds promise for informing policy decisions and healthcare interventions tailored to address the complex needs of people with disabilities.

The major limitation lies in the study's cross-sectional nature, which limits the assessment of causality and temporal associations and is susceptible to recall bias, particularly when assessing disability from birth. We need more qualitative studies to better assess the impact of inaccessibility to basic support and rehabilitative services.[12] As a secondary analysis, we are limited by the number of variables that can further explain issues affecting accessibility to services. Due to the limited number of explanatory variables, the possibility of residual confounding cannot be negated. There was also non-uniformity in the sample size when Page 23 of 48

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assessing different qu ions related to the impact of disability, but it was handled using available case analys echniques to generate estimates and retain more data compared to listwise deletion. Last some terms used in the manuscript, like the categorisation of disability (e.g., using "mental r dation" instead of "intellectual disability"), the terminology used to describe social classe "backward classes" instead of "disadvantaged classes") are noninclusive, outdated, pe ived as offensive by PWD, and lack alignment with the global vision targeting inclusion a discrimination. However, these terms are retained so that the ith the original survey report, which would help prevent confusion in manuscript is coheren case some readers wa o refer to the original report. **Policy implications a** recommendations

A few policy implication s and recommendations emerged from the study. Given the increasing prevalence of disabili and the concurrent escalating proportion of the geriatric population, we need to work on in oving accessibility for PWD. A large number of disability originating from birth calls for e robust antenatal and neonatal screening protocols supported by adequate counselling rehabilitation services. Our results depict that a high proportion of PWD have a caretake Previous studies have suggested that empowering the caretakers can help improve the qua of life of PWD.[68] We must simultaneously think of ways (like investing in developing nore assistive devices and making them affordable) to help us share the added burden on egivers.[68] Despite many schemes extended by the government to enhance the social inc ion of PWD that have been briefly described in the manuscript, there is a need for health ocacy drives to sensitise the population about the needs of PWD, improve social inclus and minimise discrimination. The use of non-inclusive language in the original dataset us in the study necessitates using more appropriate language to promote inclusivity. It is recon ended that future national surveys focus on more inclusive language, which is compliant with the CRPD and the globally ongoing disability rights movements.

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CONCLUSIONS

While previous research has primarily emphasised individual heterogeneity among PWDs, our study indicated that a large proportion of PWD experience systemic disparities in accessing disability support and rehabilitation services. The high prevalence varies significantly as per the studied socio-demographic characteristics, reinforcing the urgent need for targeted interventions. We acknowledge that while individual differences exist, these do not negate the common challenges faced by PWDs in securing equitable access to essential services. Despite government initiatives, there remain gaps in accessibility, public awareness, and enforcement of disability rights. There is an urgent need for concerted efforts to minimise these disparities, enhance the well-being and participation of PWD, and empower them to contribute meaningfully to society. Furthermore, our findings underscore that many disabilities originate from birth or early childhood, yet the availability of early screening, diagnostic services, and timely interventions remains inadequate. Strengthening antenatal and neonatal screening, particularly for intrauterine conditions and birth-related complications, could significantly improve early detection and management of disabilities. As a society, we must work toward reshaping societal and institutional perceptions of disability, shifting the focus from viewing disability as a personal deficit or burden to recognising it as a societal construct that can be addressed through inclusion, accessibility, and policy-driven structural changes. A more inclusive and disability-friendly society is essential not only for ensuring the dignity and rights of PWD but also for achieving socioeconomic development and social justice. These efforts align with India's commitment to the CRPD and contribute to the global vision set by the 2030 Agenda for Sustainable Development, which recognises the promotion of PWD's rights, perspectives, and well-being as a fundamental prerequisite for a more sustainable and inclusive world.

Declarations

Acknowledgements: This study used the National Sample Survey (NSS), 76th round Person with Disability in India Survey 2018. The authors gratefully acknowledge members of the study field team, including those who were involved in mapping/listing/segmentation and the primary survey during data collection. The authors also acknowledge all the respondents' active participation in this study.

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Competing interests: None.

Ethics statement: The ethical approvals were not deemed necessary since it was a secondary data analysis. No patient-level data were used in this paper. However, the original survey was conducted by the Ministry of Statistics and Programme Implementation (MOSPI), which is mandated to act as the nodal agency for the integrated development of the statistical systems in India. The Ministry, as part of its comprehensive decision-making process on various matters, has formulated a Code of Ethics for Members of the various Committees constituted by MOSPI or by the Organizations, Institutions, bodies, etc., funded by it that follow the principles of ethics and set out certain standards of conduct for the members of the Committees to protect the confidentiality of the data/information acquired by them by virtue of their membership in such Committees.

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Data availability statement: Data (Reference ID: DDI-IND-MOSPI-NSSO-76Rnd-Sch26.0-July2018 December 2018) is freely available on the website of the Ministry of Statistics and Programme Implementation (GOI) MOSPI's https://microdata.gov.in/nada43/index.php/catalog/154/overview, and can be accessed as per standard protocols.

Contributors: MM, BB, and MA conceptualised the study, MV and AKJ collected data, drafted the manuscript, and reviewed it. VE, MV, and AKJ did the analysis and drafted the

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5 6	573	points of view. All the authors read and approved the final version of the manuscript. MM	Л
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9 10	575		
11 12	576	References	
13	577	1. United Nations. Convention on the Rights of Persons with Disabilities [Internet]. Huma	n
14 15	578	Rights Instruments. 2008 [cited 2024 Dec 16]. Available from	
16 17	579	https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-	
18 19	580	persons-disabilities	
20	581	2. World Health Organization. Global report on health equity for persons with disabilitie	s
21 22	582	[Internet]. 2023 [cited 2024 Dec 10]. Available from: https://www.knowledge-actior	1-
23 24	583	portal.com/en/content/global-report-health-equity-persons-disabilities	
25	584	3. World Health Organization. World Report on Disability [Internet]. 2011 [cited 2022 Fe	b
26 27	585	9]. p. 1–27. Available from	
28 29	586	www.who.int/about/licensing/copyright_form/en/index.html	
30 31	587	4. Pattnaik S, Murmu J, Agrawal R, Rehman T, Kanungo S, Pati S. Prevalence, pattern an	d
32	588	determinants of disabilities in India: Insights from NFHS-5 (2019–21). Front Publi	с
33 34	589	Health. 2023;11:1036499.	-
35 36	590	5. Ministry of Statistics and Programme Implementation(GOI) - MOSPI. Elderly in Indi	a
37 38	591	2021 [Internet]. 2021 [cited 2024 Dec 16]. Available from	
38 39	592	https://mospi.gov.in/sites/default/files/publication reports/Elderly in India 2021.pdf	
40 41	593	6. Paul K, Saha S. Burden of Disability in India (1881–2011). Journal of Multidisciplinar	у
42 43	594	Research in Healthcare. 2015 Oct 5;2(1):31–54.	
44 45	595	7. Ministry of Statistics and Program Implementation Government of India. Persons wit	h
43 46	596	Disabilities in India-NSS 76th report [Internet]. NSS Report No 583 (76/26/1). 201	8
47 48	597	[cited 2024 Dec 12]. p. 209. Available from	1:
49 50	598	https://www.mospi.gov.in/sites/default/files/publication_reports/Report_583_Final_0.	р
51	599	df	
52 53	600	8. International Institute for Population Sciences. National Family Health Survey (NFHS)-
54 55	601	5) 2019-21 [Internet]. India Report. 2022 [cited 2024 Dec 16]. Available from	1:
56 57	602	https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf	
57 58 59 60			

BMJ Open

1 2			
3 4	603	9.	Rashmi R, Mohanty SK. Socioeconomic and geographic variations of disabilities in
5	604		India: evidence from the National Family Health Survey, 2019–21. Int J Health Geogr.
6 7	605		2024 Dec 1;23(1):1–16.
8 9	606	10.	Chanda S, Sekher T V. Identification of Disability for Inclusive Development: Lessons
10 11	607		from Disability Census of Kerala, India. Sage Open. 2023;13(3).
12	608	11.	Department of Economic and Social Affairs. Disability and Development Report 2018
13 14	609		[Internet]. United Nations. 2019 [cited 2024 Dec 16]. Available from:
15 16	610		https://www.un.org/development/desa/disabilities/wp-
17 18	611		content/uploads/sites/15/2019/07/disability-report-chapter2.pdf
19	612	12.	Chavan BS. Relevance of qualitative research in disability. Journal of Disability
20 21	613		Management and Rehabilitation. 2015;1(1):1–2.
22 23	614	13.	United Nations. Convention on the Rights of Persons with Disabilities [Internet]. Human
24 25	615		Rights Instruments. 2008 [cited 2024 Dec 16]. Available from:
26	616		https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-
27 28	617		persons-disabilities
29 30	618	14.	United Nations- Division for Inclusive Social Development (DISD). Article 24 -
31 32	619		Education [Internet]. Social Development Issues-Disability. [cited 2024 Dec 15].
33	620		Available from: https://social.desa.un.org/issues/disability/crpd/article-24-education
34 35	621	15.	United Nations- Division for Inclusive Social Development (DISD). Article 27 – Work
36 37	622		and employment [Internet]. Social Development Issues-Disability. [cited 2024 Dec 12].
38 39	623		Available from: https://www.un.org/development/desa/disabilities/convention-on-the-
40	624		rights-of-persons-with-disabilities/article-27-work-and-employment.html
41 42	625	16.	United Nations- Division for Inclusive Social Development (DISD). Article 6 - Women
43 44	626		with disabilities [Internet]. Social Development Issues-Disability. [cited 2024 Dec 12].
45	627		Available from: https://social.desa.un.org/issues/disability/crpd/article-6-women-with-
46 47	628		disabilities
48 49	629	17.	United Nations- Division for Inclusive Social Development (DISD). Article 7 - Children
50 51	630		with disabilities [Internet]. Social Development Issues-Disability. [cited 2024 Dec 12].
52	631		Available from: https://social.desa.un.org/issues/disability/crpd/article-7-children-with-
53 54	632		disabilities
55 56	633	18.	United Nations- Division for Inclusive Social Development (DISD). Article 9 -
57 58	634		Accessibility [Internet]. Disability. [cited 2024 Dec 10]. Available from:
59	635		https://social.desa.un.org/issues/disability/crpd/article-9-accessibility
60			
			20

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1

1 2												
3 4	636	19.	Sophie Mitra AP and BV. Disability and Poverty in Developing Countries: A Snapshot									
5 6	637		from the World Health Survey [Internet]. The World Bank - Social Protection and Lab.									
7	638		2011 [cited 2024 Dec 17]. Available from:									
8 9	639		https://documents1.worldbank.org/curated/en/501871468326189306/pdf/625640NWP									
10 11	640		0110900PUBLIC00BOX361487B.pdf									
12 13	641	20.	United Nations. Transforming our world: the 2030 Agenda for Sustainable Development									
14	642		[Internet]. Department of Economic and Social Affairs Sustainable Development. 2015									
15 16	643		[cited 2024 Dec 12]. Available from: https://sdgs.un.org/2030agenda									
17 18	644	21.	United Nations. International Human Rights Law [Internet]. Instruments & mechanisms.									
19	645		[cited 2024 Dec 10]. Available from: https://www.ohchr.org/en/instruments-and-									
20 21	646		mechanisms/international-human-rights-law									
22 23	647	22.	World Bank Group. Disability Inclusion [Internet]. Understanding Poverty. 2023 [cited									
24	648		2024 Dec 12]. Available from: https://www.worldbank.org/en/topic/disability									
25 26	649	23.	Saran A, Hunt X, White H, Kuper H. Protocol: Effectiveness of interventions for									
27 28	650		improving social inclusion outcomes for people with disabilities in low- and									
29 30	651		middle-income countries: A systematic review. Campbell Systematic Reviews. 2021									
31	652		Sep 29;17(3):e1191.									
32 33	653	24.	Centers for Disease Control and Prevention. Disability and Health Disability Barriers									
34 35	654		[Internet]. Disability Inclusion. [cited 2024 Dec 17]. Available from:									
36	655		https://www.cdc.gov/ncbddd/disabilityandhealth/disability-barriers.html									
37 38	656	25.	Ministry of state for statistics and Program implementation. Handbook on Collection of									
39 40	657		statistics act, 2008 [Internet]. Ministry of Law and Justice. 2008 [cited 2025 Mar 4].									
41 42	658		Available from:									
43	659		https://www.mospi.gov.in/sites/default/files/main_menu/handbook_%20collection_of_									
44 45	660		statistic_act/hand_col_stat_act_2008.pdf									
46 47	661	26.	Ministry of Statistics and Programme Implementation G of I. Note on sample design									
48	662		and estimation procedure of NSS 76th round. Ministry of Statistics and Programme									
49 50	663		Implementation, Government of India.									
51 52	664	27.	National Sample Survey Office, Ministry of Statistics and Program Implementation									
53 54	665		Government of India. Schedule 26: Survey of persons with disabilities [Internet].									
55	666		Seventy-Sixth round: July, 2018 - December, 2018, 2018. 2018 [cited 2024 Dec 12].									
56 57	667		Available from:									
58 59	668		https://www.mospi.gov.in/sites/default/files/NSS7612dws/NSS_76_sch_26.0.pdf									
60												

Page 29 of 48

BMJ Open

1 2											
3	669	28.	Government of Assam H and FW. Disability Certificate Health & Family Welfare								
4 5	670		Government Of Assam, India [Internet]. Disability Certificate. [cited 2025 Feb 17].								
6 7	671		Available from: https://hfw.assam.gov.in/information-services/disability-certificate								
8 9	672	29.	Disabilities. D of E of P with. Unique Disability ID [Internet]. Ministry of Social Justice								
10 11	673		and Empowerment, Governmenet of India of India. [cited 2025 Mar 3]. Available from:								
12	674		https://swavlambancard.gov.in/faqs								
13 14	675	30.	Okoro CA, Hollis ND, Cyrus AC, Griffin-Blake S. Prevalence of Disabilities and Health								
15 16	676		Care Access by Disability Status and Type Among Adults - United States, 201								
17	677		MMWR Morb Mortal Wkly Rep. 2018 Aug 17;67(32):882–7.								
18 19	678	31.	Ozawa MN, Hun Yeo Y. Race/ethnicity and socioeconomic class as correlates of								
20 21	679		disability in old age. J Gerontol Soc Work. 2008;51(3-4):337-65.								
22 23	680	32.	Kavanagh AM, Krnjacki L, Aitken Z, Lamontagne AD, Beer A, Baker E, et al.								
24	681		Intersections between disability, type of impairment, gender and socio-economic								
25 26	682		disadvantage in a nationally representative sample of 33,101 working-aged Australians.								
27 28	683		Disabil Health J. 2015 Apr 1;8(2):191–9.								
29 30	684	33.	Courtney-Long EA, Carroll DD, Zhang QC, Stevens AC, Griffin-Blake S, Armour BS,								
31	685		et al. Prevalence of Disability and Disability Type Among AdultsUnited States, 2013.								
32 33	686		MMWR Morb Mortal Wkly Rep. 2015 Jul 31;64(29):777-82.								
34 35	687	34.	Department of Social Justice and Empowerment M of SJ and EG of I. About the								
36 37	688		Division Department of Social Justice and Empowerment - Government of India								
38	689		[Internet]. [cited 2025 Mar 3]. Available from:								
39 40	690		https://socialjustice.gov.in/common/31548								
41 42	691	35.	Ministry of Statistics and Programme Implementation(GOI) - MOSPI. India - Survey of								
43 44	692		Persons with Disabilities NSS 76th Round : July 2018 - December 2018 - Overview								
45	693		[Internet]. Central Data Catalog. 2018 [cited 2024 Dec 10]. Available from:								
46 47	694		https://microdata.gov.in/nada43/index.php/catalog/154/overview								
48 49	695	36.	Stata. SVY estimation — Estimation commands for survey data [Internet]. [SEM] sem								
50	696		- Structural equation model estimation command. [cited 2024 Dec 17]. Available from:								
51 52	697		https://www.stata.com/manuals13/svysvyestimation.pdf								
53 54	698	37.	Rashmi R, Mohanty SK. Socioeconomic and geographic variations of disabilities in								
55 56	699		India: evidence from the National Family Health Survey, 2019-21. Int J Health Geogr								
57	700		[Internet]. 2024 Dec 1 [cited 2025 Mar 3];23(1):1-16. Available from: https://ij-								
58 59 60	701		healthgeographics.biomedcentral.com/articles/10.1186/s12942-024-00363-w								

Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

38. Acharya K. Prenatal testing for intellectual disability: Misperceptions and reality with lessons from down syndrome. Dev Disabil Res Rev. 2011 Jan 1;17(1):27–31. 39. Bailey DB, Skinner D, Warren SF. Newborn Screening for Developmental Disabilities: Reframing Presumptive Benefit. Am J Public Health. 2005 Nov;95(11):1889. 40. National Health Authority, Government of India. Pradhan Mantri Jan Arogya Yojana (PM-JAY) [Internet]. About PM-JAY. 2019 [cited 2024 Dec 10]. Available from: https://nha.gov.in/PM-JAY 41. Ministry of Health and Family Welfare. Government of India. RBSK-Rashtriya Bal Swasthya Karyakram [Internet]. Schemes. 2024 [cited 2024 Dec 10]. Available from: https://rbsk.mohfw.gov.in/RBSK/ 42. Dhole RS, Gaur KA, More NS, Popalwar H, Lokhande V. Study of locomotor disability due to various types of Trauma. National journal of medical research. 2015;5(3):194-8. 43. Musselwhite CBA, Avineri E, Susilo YO, Bhattachary D. Public attitudes towards motorcyclists' safety: A qualitative study from the United Kingdom. Accid Anal Prev. 2012 Nov;49:105-13. 44. World Bank Group. Traffic crash injuries and disabilities: The burden on Indian society [Internet]. Policy Document. 2021 [cited 2024 Dec 17]. Available from: https://www.worldbank.org/en/country/india/publication/traffic-crash-injuries-and-disabilities-the-burden-on-indian-society 45. Cole EOB, Christie SA, Oke R, Motwani G, Dickson D, Chendjou W, et al. Too serious to ignore: The epidemiologic and economic burden of home injuries in the Southwest Region of Cameroon—A community-based study. Bourgeois D, editor. PLoS One. 2022 Sep 22;17(9):e0274686. 46. Rehman T, Sulgante S, Sekhar S. Prevalence and pattern of domestic accidents in the field practice area of Jawaharlal Institute of Urban Health Centre, Puducherry: a cross-sectional analytical study. J Inj Violence Res. 2020;12(1). 47. Department of Empowerment of Persons with Disabilities. The Rights of persons with disabilities act 2016 [Internet]. Policy Document. 2016 [cited 2024 Dec 11]. Available from: https://legislative.gov.in/sites/default/files/A2016-49 1.pdf 48. Bureau of Indian Standards. National building code of India 2016 (NBC 2016) [Internet]. SP 7: 2016. cited Dec 21]. Available from: https://www.bis.gov.in/standards/technical-department/national-building-code/

Page 31 of 48

1

59 60

BMJ Open

es (DEPwD). Assistance to opliances (ADIP) [Internet]. rd.gov.in/adip/ s (DEPwD), Government of S) [Internet]. Schemes. 2023 ddrs/ Services in India: Issues and cited 2025 Mar 3];1(1):69. 23893941/ tems and Policies Guide for	Protected by co
on. Research Triangle Park,	pyri
ted 2024 Dec 10]. Available	ght, including (
iksha [Internet]. 2021 [cited ov.in/about.html ernment of India. National Dec 17]. Available from: /NEP_Final_English_0.pdf P, Rahayu B, et al. Teacher - and middle-income Asia- stematic Reviews [Internet]. 1287. Available from: or Students With Disabilities 320–882. Available from: ilities (DEPwD). National	Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.
ternet]. Organizations Under	lolo
tps://depwd.gov.in/national-	gies.
ility-related deprivation on family socioeconomic status	

1 2			
3 4	734	49.	Department of Empowerment of Persons with Disabilities (DEPwD). Assistance to
5	735		Persons with Disabilities for Purchase/Fitting of Aids /Appliances (ADIP) [Internet].
6 7	736		Scheme. [cited 2024 Dec 17]. Available from: https://depwd.gov.in/adip/
8 9	737	50.	Department of Empowerment of Persons with Disabilities (DEPwD), Government of
10 11	738		India. Deendayal Divyangjan Rehabilitation Scheme (DDRS) [Internet]. Schemes. 2023
12	739		[cited 2024 Dec 10]. Available from: https://depwd.gov.in/ddrs/
13 14	740	51.	Kumar SG, Roy G, Kar SS. Disability and Rehabilitation Services in India: Issues and
15 16	741		Challenges. J Family Med Prim Care [Internet]. 2012 [cited 2025 Mar 3];1(1):69.
17	742		Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC3893941/
18 19	743	52.	Hayes AM, Bulat J. Disabilities Inclusive Education Systems and Policies Guide for
20 21	744		Low- and Middle-Income Countries. RTI Press Publication. Research Triangle Park,
22 23	745		NC: RTI Press; 2017 Jul.
24	746	53.	Centre for Civil Society. Right To Education [Internet]. [cited 2024 Dec 10]. Available
25 26	747		from: https://righttoeducation.in/know-your-rte/about
27 28	748	54.	Ministry of Education, Government of India. Samagra Shiksha [Internet]. 2021 [cited
29 30	749		2024 Dec 17]. Available from: https://samagra.education.gov.in/about.html
31	750	55.	The Ministry of Human Resource Development; Government of India. National
32 33	751		Education Policy, 2020 [Internet]. 2020 [cited 2024 Dec 17]. Available from:
34 35	752		https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
36 37	753	56.	Ahmed SK, Jeffries D, Chakraborty A, Carslake T, Lietz P, Rahayu B, et al. Teacher
38	754		professional development for disability inclusion in low- and middle-income Asia-
39 40	755		Pacific countries: An evidence and gap map. Campbell Systematic Reviews [Internet].
41 42	756		2022 Dec 1 [cited 2025 Mar 3];18(4):e1287. Available from:
43	757		https://onlinelibrary.wiley.com/doi/full/10.1002/cl2.1287
44 45	758	57.	Bera M, Kartick Chandra Pramanik P. Access Challenges For Students With Disabilities
46 47	759		In Higher Education. 2023 [cited 2025 Mar 3];11:2320-882. Available from:
48 49	760		www.ijcrt.org
50	761	58.	Department of Empowerment of Persons with Disabilities (DEPwD). National
51 52	762		divyangjan finance and development corporation-India [Internet]. Organizations Under
53 54	763		DEPwD. 2024 [cited 2024 Dec 10]. Available from: https://depwd.gov.in/national-
55	764		handicapped-finance-and-development-corporation/
56 57	765	59.	Qiu N, Jiang Y, Sun Z, Du M. The impact of disability-related deprivation on
58 50	766		employment opportunity at the neighborhood level: does family socioeconomic status

employment opportunity at the neighborhood level: does fa 766 matter? Front Public Health. 2023 Aug 9;11:1232829. 767

1			
2 3	768	60.	Bonaccio S, Connelly CE, Gellatly IR, Jetha A, Martin Ginis KA. The Participation of
4 5	769	00.	People with Disabilities in the Workplace Across the Employment Cycle: Employer
6 7	770		Concerns and Research Evidence. J Bus Psychol. 2020 Apr 1;35(2):135–58.
8	771	61.	Babik I, Gardner ES. Factors Affecting the Perception of Disability: A Developmental
9 10	772	011	Perspective. Front Psychol. 2021 Jun 21;12:702166.
11 12	773	62.	Jameel S. Disability in the Context of Higher Education: Issues and Concerns in India.
13 14	774		Electronic Journal for Inclusive Education. 2011 Jan 1;2(7).
15	775	63.	Moumita Barman. Barriers to higher education for persons with disabilities block their
16 17	776		meaningful growth. News article - The Siasat Daily. 2024 Jan 26;
18 19	777	64.	Department of Empowerment of Persons with Disabilities (DEPwD), Government of
20 21	778		India. Scheme for Implementation of the Rights of Persons with Disabilities Act, 2016
22	779		(SIPDA) [Internet]. Schemes. 2016 [cited 2024 Dec 12]. Available from:
23 24	780		https://depwd.gov.in/sipda/
25 26	781	65.	Ministry of Education, Government of India. Inclusive Education of the Disabled at
27 28	782		Secondary Stage [Internet]. About MoE. 2016 [cited 2024 Dec 17]. Available from:
29 30	783		https://www.education.gov.in/iedss
31	784	66.	Disempowering the Empowered: The Systemic Failures of India's Disability Welfare
32 33	785		Schemes [Internet]. [cited 2025 Mar 3]. Available from:
34 35	786		https://www.salzburgglobal.org/news/fellows/article/disempowering-the-empowered-
36 37	787		the-systemic-failures-of-indias-disability-welfare-schemes
38	788	67.	Lawson A, Pineda VS, Walker J, Jain S, Jain M. Revisiting the Conceptual Terrains of
39 40	789		the Right to Accessibility in India: The Role of Judicial Enforcement. Laws 2024, Vol
41 42	790		13, Page 54 [Internet]. 2024 Aug 16 [cited 2025 Mar 3];13(4):54. Available from:
43 44	791		https://www.mdpi.com/2075-471X/13/4/54/htm
45	792	68.	Arasu S, Shanbhag D. Quality of Life and Burden of Caregiving Among the Primary
46 47	793		Caregivers of Children with Disability in Rural Karnataka. J Family Med Prim Care.
48 49	794		2021 Aug 27;10(8):2804–9.
50 51	795		
52	796 797		
53 54	/ 5/		
55 56			
57 58			
59 60			

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		pyright	0en-202	
1	Table 1. Prevalence of different types of disabilities across different socio-demo		24-09 19	c characteristics, NSS, 76 th
2	round, India (n=576,796)	jdin	20 0	

	Locomotor N (%)	Vision N (%)	Hearing N (%)	Speech N (%)	Intellectual disability^ N (%)	Mental Illness N (%)	ĪN (%)ān)	Any one disability N (%)
	61981 (1.36)	11977 (0.23)	15294 (0.30)	12661 (0.23)	8564 (0.16)		1 1 1 1 1 1 1 1 1 1	107,125 (2.20
Age Group (completed years)							2025. Pigne	
up to 5	1494 (2.2)	182 (1.5)	311 (2)	907 (7.3)	445 (5.3)			2839 (2.5)
`6-17	7290 (10.8)	1210 (9.2)	1977 (12.6)	4515 (35.8)	3492 (41.2)	1060 (15.4)		16695 (14.4)
18-35	11546 (18)	1386 (10.7)	2036 (13.3)	3273 (26.4)	2796 (33)	1915 (27.6)	and 1 (19.8)	20673 (18.8)
36-49	11434 (18.1)	1557 (12.3)	2118 (13)	1812 (13.8)	1113 (12.4)	1646 (25)	dat 478 (14.8)	18665 (17.2)
50-65	16627 (27.9)	3609 (31.1)	3843 (25.1)	1495 (11.4)	561 (6.5)	1409 (21.3)	BB64 5 (21.9)	26420 (25.7)
65+	13590 (23)	4033 (35.2)	5009 (34)	659 (5.3)	157 (1.6)	680 (10.1)		21833 (21.4)
Sex								
Male	36862 (58.7)	6014 (50.2)	7993 (52)	7554 (60.4)	5202 (61.7)	3856 (56.8)	1 1 64 (58.9)	61707 (57.3)
Female	25110 (41.3)	5958 (49.8)	7296 (48)	5106 (39.6)	3359 (38.3)	2893 (43.2)	1955 (41.1)	45396 (42.7)
Marital Status							and	
Never Married	16912 (24.7)	2719 (20.8)	3987 (24.2)	8708 (67.8)	7450 (86.9)	3281 (46.1)	si. 1 3 14 (40.4)	36813 (31.4)
Ever Married	33257 (55.3)	5541 (46.9)	7094 (47.5)	3086 (25.3)	791 (9.3)	2381 (35.8)	a 1402 (47.2)	50108 (48.8)
Widowed	11293 (19)	3616 (31.5)	4024 (27.1)	690 (5.4)	190 (2.1)	775 (12.5)	1936 6 (11.1)	18933 (18.5)
divorced/separated	519 (1)	101 (0.8)	189 (1.1)	177 (1.4)	133 (1.8)	314 (5.5)		1271 (1.3)
Area of residence)25 at	
Rural	42222 (71.6)	8809 (76.3)	11121 (74.9)	9164 (72.9)	5974 (69.9)	4772 (73.1)	2255 (62.4)	75091 (72.8)
Urban	19759 (28.4)	3168 (23.7)	4173 (25.1)	3497 (27.1)	2590 (30.1)	1979 (26.9)	1666 (37.6)	32034 (27.2)
Educational attainment							Bib	
Non-literate	26376 (44.5)	7160 (62.6)	8365 (57.3)	7119 (56.9)	5846 (69.3)	3285 (49.6)		50848 (48.9)
Literate but not formal	15002 (23.2)	2483 (19.4)	3700 (22.9)	3428 (26.7)	1858 (21)	1629 (23.3)		26145 (23.3)
				1			ique de	

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	I	1	1	I	I	ight, include 1623 (24.1)	·2024-09	
Upto primary		1987 (15.5)	2782 (16.9)	1908 (14.9)	808 (9.1)	<u>u</u>		25210 (23.1)
Upto secondary	3718 (5.8)	347 (2.6)	447 (2.9)	206 (1.5)	52 (0.6)	214 (3.1) j	2 38 (8.2)	4922 (4.6)
Preferred Religion						oru	15	
Hindu	49548 (81.9)	9479 (82.9)	12090 (82.6)	9658 (78.7)	6540 (78.7)	5063 (74.7)		84742 (81.5)
Islam	8375 (12.5)	1601 (12.5)	1927 (11.7)	2021 (15.6)	1366 (15.9)	1167 (18.4)		14658 (12.9
Others	4058 (5.6)	897 (4.6)	1277 (5.7)	982 (5.7)	658 (5.4)	521 (6.9) e	27 5 (6.5)	7725 (5.5)
Social Group						0		
Scheduled Tribe	6049 (8.3)	1491 (9.1)	1923 (9.5)	1478 (9.4)	822 (7.2)	670 (7.8)		11729 (8.7)
Scheduled Caste	12240 (20.4)	2407 (21.3)	2805 (19.4)	2467 (20.5)	1602 (19.2)	1269 (19.9)	2 5 4 (17.8)	20925 (20.4
Other disadvantaged classes*	26861 (44.7)	5205 (46)	6583 (45.5)	5482 (44.7)	3806 (45.8)	2915 (45.7)	29 67 (40.2)	46223 (44.9
General	16831 (26.6)	2874 (23.6)	3983 (25.6)	3234 (25.4)	2334 (27.8)	1897 (26.6)	8 (29.7)	28248 (26)
Wealth Index				F		ng, J	· Nor	
Poorer	17681 (30.2)	3919 (35.1)	4933 (34.7)	3552 (30.1)	2025 (25.3)	1932 (31)	823 (25.8)	31259 (31)
Poor	12553 (20.5)	2474 (20.8)	3005 (19.4)	2746 (21.4)	1773 (20.9)	1364 (20.5)	524 (16.2)	21959 (20.7
Middle	11468 (18.2)	2271 (18.5)	2730 (17.4)	2434 (18.5)	1751 (20)	1302 (18.1)	\$\$0(17.3)	20058 (18.3
Richer	10440 (16)	1864 (14.4)	2480 (15.4)	2080 (15.8)	1611 (18.3)	1161 (16.8)	593 (19.9)	17946 (15.9
Richest	9839 (15.1)	1449 (11.1)	2146 (13)	1849 (14.2)	1404 (15.5)	992 (13.6) 1 .	6 1 (20.7)	15903 (14.1
Regions of India						ar teo	June	
Northern	8787 (14.4)	1478 (13.1)	1692 (11.7)	1347 (11.1)	1144 (13.5)	931 (14.2)	216 (7.6)	14305 (13.8
Southern	13448 (23)	2814 (24.7)	4013 (27.3)	2958 (24.8)	2141 (25.6)	1447 (21.3)	734 (25.5)	23699 (23.3
Western	8387 (12.7)	1286 (10.1)	1740 (11.1)	1423 (11.3)	1293 (15.2)	706 (10.6)	5 4 0 (17.7)	13708 (12.3
Eastern	12790 (20.3)	2538 (21.9)	3238 (22.5)	3248 (27.1)	1762 (21.3)	1672 (26.3)	95 4 (30.4)	23061 (21.8
North-Eastern	3858 (2.1)	1335 (4.5)	1620 (3.7)	1308 (3.4)	594 (2)	582 (2.7)	2 82 (2.4)	8839 (2.8)
Central	14711 (27.4)	2526 (25.6)	2991 (23.8)	2377 (22.4)	1630 (22.6)	1413 (24.8)	4 8 -5 (16.3)	23513 (26)
Ferminology used in the su	rvey was *"	other backwa	rd classes" a	nd ^"mental	retardation".		ف	
				2			raphique de l	
		For peer review	only - http://br	njopen.bmj.cor	n/site/about/gu	idelines.xhtml		

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BMJ Open Table 2. Percentage distribution of different disability types and their associated information, NSS 76 th round													
	Locomotor	Visual	Hearing	Speech and language	Intellectual disability*	Matental Matental Matental Matental	Other types of disability	Any Disat					
Total sample size	61980	1156	1281	2013	1217	us es may	768	61980					
Causes of disability						eign rela							
Disease	28673 (46.3)	454 (39.3)	484 (37.8)	1246 (61.9)	NA	etheed t	NA	NA					
Other than disease due to burn	723 (1.2)	88 (0.7)	1 (0.1)	8 (0.4)	NA	o tex	NA	NA					
Injuries other than burn	13876 (22.4)	156 (13.5)	158 (12.4)	105 (5.2)	NA	May 2025. Downloaded from http:// EnseignementSuperieut (ABES) ses related to text and data mining	NA	NA					
Other causes	18702 (30.2)	538 (46.5)	637 (49.7)	654 (32.5)	NA	d fro	NA	NA					
Disability from Birth						a ABE							
Yes	11,488 (18.5)	91 (7.9)	198 (15.4)	1041 (51.7)	955 (78.5)		119 (15.5)	11,488 (1					
No	50,052 (80.8)	1062 (91.9)	1081 (84.4)	964 (47.9)	258 (21.2)	40 ≩ (7 ⊉ 6)	645 (84)	50,052 (8					
Not Known	440 (0.7)	3 (0.2)	2 (0.2)	8 (0.4)	4 (0.3)		4 (0.4)	440 (0.7					
Disability commenced in last 365 days				19		pen.bmj.cor (1 afning, and							
sample size	48741	1034.2	1052.4	938.7	251.6	stmi.	628.6	48741					
Yes	2987 (6.1)	72 (7)	65 (6.2)	100 (10.6)	11 (4.4)	$4(\mathbf{P}(1)\mathbf{G})$	48 (7.7)	2987 (6.					
No	45754 (93.9)	961 (93)	987 (93.8)	839 (89.4)	240 (95.6)	35 <u>4</u> (8 9 8)	580 (92.3)	45754 (93					
Place of occurrence of disability						nologies.							
Sample size	14281	161	157	105	33	i at A jies.	63	14281					
Workplace	2308 (16.2)	13 (8.3)	30 (19.2)	11 (10.9)	2 (6.9)	9 (1 Ig	11 (18.1)	2308 (16					
Road	5977 (41.9)	46 (28.5)	43 (27.5)	41 (38.7)	9 (25.9)	35 (40	15 (23.8)	5977 (41					
Home	4693 (32.9)	93 (57.9)	73 (46.3)	45 (42.4)	19 (58.5)	33 (38 8)	31 (49.5)	4693 (32					

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Other places	1302 (9.1)	9 (5.3)	11 (7)	8 (8)	3 (8.7)	24-09 02 2	5 (8.6)	1302 (9.1
Treatment taken/undergoing treatment						Vbmjopen-2024-096220 on 15 May 2025. Downloaded from http:// 9. Enseignement Superieut (ABES) . 4 by copyright, including for uses related to text and data mining 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2		
Sample size	61980	1156	1281	2013	1217	May Ense	768	61980
yes: consulting doctor	35,923 (58)	566.6 (49)	617 (48.2)	1,080 (53.7)	710 (58.4)		330 (43)	35923 (58
Otherwise	1565 (2.5)	22 (1.9)	34 (2.7)	42 (2.1)	36 (2.9)	d Go	6 (0.7)	1564.5 (2.5
Yes: consulting doctor, plus undergoing treatment	17329 (28)	375 (32.4)	418 (32.7)	719 (35.7)	355 (29.2)	1947anc	397 (51.7)	17329 (28
Otherwise	860 (1.4)	34 (2.9)	21 (1.7)	20 (1)	4 (0.3)	l data 1 data 1 data	8 (1)	860 (1.4)
Attending special school/special therapy	116 (0.2)	2.9 (0.3)	0 (0)	4 (0.2)	6 (0.5)	n http:// ABES) . a mining	0 (0)	116 (0.2)
Cannot afford treatment	2040 (3.3)	75 (6.4)	73 (5.7)	72 (3.6)	55 (4.6)	1 2 (3.3)	8 (1)	2040 (3.3
No treatment available for the disability	699 (1.1)	13 (1.1)	8 (0.6)	17 (0.8)	16 (1.3)	9,7 41 tratiling,	5 (0.7)	699 (1.1)
Not required	2717 (4.4)	60 (5.2)	97 (7.6)	47 (2.3)	26 (2.1)	, and	14 (1.8)	2717 (4.4
Not known	732 (1.2)	8 (0.7)	12 (0.9)	13 (0.7)	9 (0.7)	<u>عارى المجارية المجارية المحاومة المح</u>	1 (0.1)	732 (1.2)
Note: Causes of disability were reco Disability commenced in the l during the last 365 days befor The place of occurrence was r disability was burn, injury or *Original survey used the to	ast 365 days wa e the survey. recorded for ind other than burn.	s recorded for ividuals with a	those individi	uals who did no	t have a disabi	ility Grome bir		
	For peer r	eview only - ht		omj.com/site/abc	out/guidelines.>			

Table 3. Access to disability support and rehabilitation services by the person with disability as per the 76th round of the National Sample Survey (2018), India

	1 • \	Weighted percenta
	analysis)	
	. 1	17.2
		9.0
	~	45.9
		28.0
	ind above	20.0
	vornmont	20.8
		4.1
		75.1
		73.1
	2 5001150	57.0
		43.0
		43.0
	available	0.1
		37.1
		62.8
	available	02.0
Access to public Transport (n=01,380)	Vac	59.6
		40.4
Accesses to public building (n=61.080)	110	40.4
Accesses to public bunding (n=01,380)	Vac	45.6
		54.4
Difficulty faced accessing public building (n= 27,756)	110	54.4
	les or lift	57.7
		4.4
		1.6
		0.8
		0.7
		0.7
		27.6
	2	7.0
ge at the onset of disability* (n= 48,727) 0 to 4 year 5 to 14 year 15 to 59 year 60 years and abov crecipt of aid/help (n=61,712) Received aid/help from Governmer Received aid/help from organisations other than governmer Did not receive aid/hel ving arrangement(n=61,962) Living alone or with a spous Living with other rrangement of regular caregiver(n=61,980) Care-giver required but not availabl Care-giver is availabl care-giver is not require Care-giver is availabl recess to public Transport (n=61,980) Yee N fficulty faced accessing public building (n= 27,756) difficulty faced accessing public building (n= 27,756) difficulty faced accessing public building (n= 27,756) difficulty faced idue to stairs and non-availability of ramp, grooved tiles or lif in opening door no seating arrangement: in the waiting are at the point of receiving servic no special toilet seat no sign for direction/ instruction/no public announcement syster no difficulty face no sign for direction/ instruction/no public announcement syster no difficulty face N sability causing loss or change in job(n= 21,559) loss of wor change of wor no loss or change of wor aving Disability as per Certificate (n=20,213) 40- <609 ≥60-\$09		7.0
(n=sample included in the analysis) e at the onset of disability* (n= 48,727) 0 to 4 years 5 to 14 years 15 to 59 years 60 years and above ceipt of aid/help (n=61,712) Received aid/help from Government Received aid/help from organisations other than government Did not receive aid/help ving arrangement(n=61,962) Living alone or with a spouse Living with others rangement of regular caregiver(n=61,980) Care-giver required but not available Care-giver is not required Care-giver is not required Net fficulty faced accessing public building (n= 27,756) difficulty faced accessing public building (n= 27,756) difficulty faced is no sign for direction/ instruction/no public announcement system no difficulty faced no sign for direction/ instruction/no public announcement system no difficulty faced no loss or change of work no loss or change of work Net reentage of Disability as per Certificate (n=20,213) 40 - <60%		40.3
	No	59.7
Disability causing loss or change in job(n= 21,559)		
(n=sample included in the analysis e at the onset of disability* (n= 48,727) 0 to 4 year 5 to 14 year 15 to 59 year 60 years and above seipt of aid/help (n=61,712) Received aid/help from Governmen Received aid/help from organisations other than governmen Did not receive aid/help ing arrangement(n=61,962) Living alone or with a spouse Living with other rangement of regular caregiver(n=61,980) Care-giver required but not available Care-giver is not required Care-giver is not required Care-giver is not required Care-giver is not required Ve Not resses to public building (n=61,980) Ye Not resses to public building (n=61,980) Ye Not resses to public building (n=61,980) Ye Not resses to public building (n=77,756) difficulty faced: due to stairs and non-availability of ramp, grooved tiles or liff in opening door no seating arrangement: in the waiting are at the point of receiving servic no sign for direction/ instruction/no public announcement system no difficulty faced to ther ployed/working before onset of disability (For person of age 15 years and we; n=55,819) Ye Not ability causing loss or change in job(n= 21,559) loss of worl change of worl no loss or change of worl no loss or change of worl Not recentage of Disability as per Certificate (n=20,213) 40- <609 >60-<809		60.7
		18.3
6		21.3
č		
	Yes	30.4
	No	69.6
Percentage of Disability as per Certificate (n=20.213)		
	40- <60%	49.3
	60-<80%	30.3
	<u>60-<80%</u> >80%	36.3 12.8

4 *For those who have not had a disability since birth.

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	Unadjusted Odds ratio (95% C.I)	p-value	Adjusted Odds ratio (95% C.I)	p-value
Age Group (Completed years)				1
Up to 5 years	Reference value		Reference value	
6 - 18 years	2.1(2-2.1)	< 0.001	3.5(3.4-3.7)	< 0.001
19-35 years	2.3(2.2-2.4)	< 0.001	8.4(8-8.8)	< 0.001
36-49 years	3.5(3.4-3.7)	< 0.001	17.6(16.8-18.5)	< 0.001
50-65 years	6.4(6.1-6.7)	< 0.001	25.8(24.5-27.1)	< 0.001
65+ years	17.5(16.7-18.2)	< 0.001	58.4(55.4-61.5)	< 0.001
Sex	17.0(10.7 10.2)	0.001		0.001
Male	Reference value		Reference value	
Female	0.7(0.7-0.7)	< 0.001	0.6(0.6-0.6)	< 0.001
Place of Residence	0.7(0.7 0.7)	0.001		0.001
Rural	Reference value		Reference value	
Urban	1.02(1.01-1.03)	0.03	1.3(1.2-1.3)	< 0.001
Social Group	1.02(1.01 1.05)	0.05	1.5(1.2 1.5)	-0.001
Scheduled Tribe	Reference value		Reference value	
Scheduled Caste	1.1(1.1-1.1)	< 0.001	1.1(1.1-1.2)	< 0.001
Other disadvantaged classes*	1.1(1-1.1)	<0.001	1.1(1.1-1.2)	<0.001
General	1.1(1.1-1.1)	<0.001	1.3(1.3-1.3)	<0.001
Educational attainment	1.1(1.1-1.1)	<0.001	1.5(1.5-1.5)	<0.001
No education	Reference value		Reference value	
Upto Primary class	0.5(0.5-0.5)	< 0.001	0.5(0.5-0.5)	< 0.001
Upto Secondary Class	0.4(0.4-0.4)	<0.001	0.4(0.4-0.4)	<0.001
Graduate & above		<0.001		<0.001
Preferred Religion	0.3(0.3-0.4)	<0.001	0.3(0.3-0.3)	<0.001
Hindu	Reference value		Reference value	
		< 0.001		< 0.001
Islam Othors	0.8(0.8-0.9) 0.9(0.9-1)	< 0.001	0.9(0.9-0.9) 1(1-1.1)	0.019
Others Others	0.9(0.9-1)	<0.001	1(1-1.1)	0.019
Never married	Defenence value		Defenence velve	
	Reference value	<0.001	Reference value	<0.001
Currently married	1.3(1.3-1.3)	<0.001	0.3(0.3-0.3)	<0.001
widowed	5.9(5.8-6.1)	<0.001	0.6(0.5-0.6)	<0.001
Divorced/separated	4.4(4.1-4.8)	< 0.001	1.1(1-1.2)	0.011
Wealth Index				_
Poorest	Reference value	<0.001	Reference value	<0.001
Poor	0.6(0.6-0.6)	< 0.001	0.7(0.7-0.7)	<0.001
Middle	0.6(0.5-0.6)	< 0.001	0.6(0.6-0.6)	< 0.001
Richer	0.5(0.5-0.5)	< 0.001	0.5(0.5-0.6)	<0.001
Richest	0.4(0.4-0.4)	< 0.001	0.5(0.5-0.5)	< 0.001
Regions of India				
Northern	Reference value	.0.001	Reference value	.0.001
Southern	1.42(1.39-1.46)	< 0.001	1.1(1.1-1.2)	<0.001
Western	1.13(1.1-1.16)	< 0.001	1(1-1.1)	0.065
Eastern	1.15(1.13-1.18)	< 0.001	1(0.9-1)	0.001
North-eastern	1(0.97-1.03)	0.961	1(1-1)	0.361
Central	1.01(0.98-1.03)	0.653	0.9(0.8-0.9)	< 0.001

Table 4. Multivariable binary logistic regression analysis exploring the likelihood of living with any disability per the 76th round of the NSS, India 1 2

1 FIGURE LEGEND

- 2 Figure 1. Geographical disparities in the difficulties faced by people living
- 3 with disability as per the 76th Round of the National Sample Survey, India

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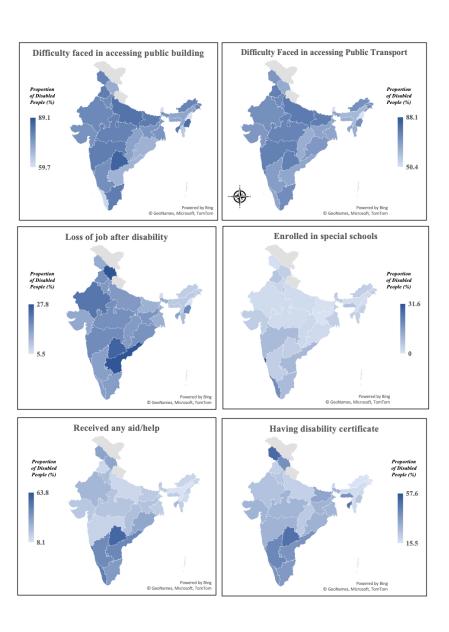


Figure 1: Geographical disparities in the difficulties faced by the people living with disabilities as per the 76th Round of the National Sample Survey, India

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BMJ Open Supplementary Table 1: Living conditions of the people living with different types of of the second for the National Sample Survey Organization India (2017-18)

Living conditions of the people (<i>n</i> = <i>sample included in the analysis</i>)	Locomotor	Visual	Hearing 2025.	Speech	Intellectual disability^	Mental illness	Others
	Weighted %	Weighted %	Weighted &	Weighted %	Weighted %	Weighted %	Weighted %
Age at the onset of disability		-	4.2 tar				
0 to 4 years	17.2	3.0	4.2 ft a	21.0	51.0	10.1	9.9
5 to 14 years	9.0	2.3	3.0 de 17.4 fro 75.4 m BB b	9.6	17.3	12.3	7.0
15 to 59 years	45.9	22.1	17.4 at fro	40.9	24.0	40.5	49.2
60 years and above	28.0	72.6	75.43 E	28.4	7.7	37.1	33.8
Total number of participants	48,737	1,035	1,05 🛱 😕 👼	946	259	395	632
Receipt of aid/help			g.				
Received aid/help from Government	20.8	22.2	20.7	29.2	37.2	25.5	20.0
Received aid/help from organisations other than			8.6g				
government	4.1	10.2	8.6 n	4.0	3.3	6.0	2.7
Did not receive aid/help	75.1	67.7	70.89	66.8	59.5	68.5	77.3
Total number of participants	61,712	1,145	1,272	2,010	1,215	521	766
Living arrangement			mil				
Living alone or with a spouse	57.0	43.5	41.6 ^{ar} , u	26.8	4.1	35.4	55.8
Living with others	43.0	56.5	58.4 ^{ec}	73.2	95.9	64.6	44.2
Total number of participants	61,962	1,156	1,28 6	2,013	1,217	523	768
Arrangement of regular caregiver			1,28 <u>6</u> 22 9				
Care-giver required but not available	0.1	0.0	0.0 .0 .0	0.1	0.9	0.0	0.3
Care-giver is not required	37.1	11.5	15.7 G	8.8	5.6	10.8	13.4
Care-giver is available	62.8	88.6	84.2 C	91.1	93.6	89.2	86.3
Total number of participants	61,980	1,156	1,281 Bi io 29.4 a	2,013	1,217	523	768
Accesses to public building			olio				
Yes	45.6	25.4	29.4 gra	27.2	26.0	26.0	29.9

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			yright <u>, 128 fu</u> 70.6 in <u>cl</u> udin				
No	54.4	74.6	70.6 24	72.8	74.0	74.0	70.1
Total number of participants	61,980	1156	1281 8	2013	523	523	768
Difficulty faced accessing public building	,		40.7 uding for				
difficulty faced: due to stairs and non-availability of			on ng fi				
ramp, grooved tiles or lift	57.7	63.2	60.7°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°	55.4	49.7	46.7	52.2
in opening doors	4.4	1.6	1.3 8 6 1	2.8	1.0	7.6	2.8
no seating arrangement: in the waiting area	1.6	3.0	2.9 a c c	0.7	1.4	1.7	2.1
at the point of receiving service	0.8	5.7	1.3 cs Figure 1.	0.9	0.8	1.3	0.3
no special toilet seats	0.7	0.4		0.7	0.0	0.8	0.9
no sign for direction/ instruction/no public			o tej				
announcement system	0.3	2.2	2.0 to be a	2.2	2.1	1.3	0.0
no difficulty faced	27.6	8.4	17.6 ^d ried	15.2	17.7	24.2	25.8
others	7.0	15.4	13.3tr	22.1	27.4	16.3	15.8
Total number of participants	27,756	330		537	330	134	226
Working before onset (For >15 years and above)			inin				
Yes	40.3	44.4	35.9 • • • • • • • • • • • • • • • • • • •	32.7	5.6	38.5	53.6
No	59.7	55.6	64.1 g	67.3	94.4	61.5	46.4
Total number of participants	55,819	1093	1173 -	1353	690	448	667
Disability causing loss or change in job			ng				
loss of work	60.7	75.3	72.8° is	86.5	80.9	84.2	82.8
change of work	18.3	11.0	5.7 <u>s</u>	5.2	2.7	8.7	5.9
no loss or change of work	21.3	13.7	21.5 <u>8</u> . S	8.3	16.4	7.1	11.4
Total number of participants	21,559	465	21.5 <u>1</u> 90 404 a r June	425	37	165	343
Having Disability Certificate			ech				
Yes	30.4	14.0	م ا 16.1	41.7	59.8	29.9	24.9
No	69.6	86.0	16.10 20 83.90 25	58.3	40.2	70.1	75.1
Total number of participants	61,980	1156	1281 S 1281	2013	1217	523	768
Percentage of Disability as per Certificate			lgei				
40% or more but less than 60%	49.3	23.2	22.5 c	16.9	14.6	27.7	29.7
60% or more but less than 80%	36.3	37.6		32.3	35.5	43.0	37.3
80% or more	12.8	38.7	34.2 Bit 42.2 Si 1.1 Si	50.3	49.1	29.0	31.7
none of these	1.6	0.5	1.1 g	0.5	0.8	0.4	1.3

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Supplementary disabilities per				ate bina	ary logistic re	gression	136/bmjopen-202400 cted by copyright, scied by copyright, analy analy	ploring th	e likelihood o	f living	g with different	types o
	L	ocomoto	r disability		Spee	ch and lan	guage disability		I	ntellect	ual disability	
Covariates	Un-adjusted OR (95% CI)	p- value	Adjusted OR (95% CI)	p-value	Un-adjusted OR (95% CI)	p-value	Adjustod 5	p-value	Un-adjusted OR (95% CI)	p- value	Adjusted OR (95% CI)	p-value
Age (Years)	X						2025. ignei elate					
<18 (Ref)	1		1		1				1		1	
18-35	2.39(2.27-2.53)	< 0.001	4.08(3.84-4.33)	< 0.001	1.07(0.99-1.15)	0.07	8 85(8 16- 9 49)	< 0.001	14(10.28-19.08)	< 0.001	65.34(47.81-89.31)	< 0.00
35-49	3.91(3.7-4.13)	< 0.001	7.89(7.4-8.41)	< 0.001	0.93(0.86-1.01)	0.089	8.85(8.16-2000) 9.87(8.98-10-2000) 9.87(8.98-10-2000)	< 0.001	19.06(13.98-25.99)	< 0.001	156.16(113.91-214.1)	< 0.00
50-59	6.83(6.47-7.21)	< 0.001	12.36(11.6-13.17)	< 0.001	0.85(0.78-0.92)	< 0.001	7 21(6 52 景徳)寺	< 0.001	18.05(13.23-24.62)	< 0.001	135.71(98.75-186.49)	< 0.00
65+	14.92(14.12-15.77)	< 0.001	23.27(21.79-24.85)	< 0.001	0.82(0.74-0.91)	< 0.001	6.22(5.49-30)	< 0.001	19.12(13.94-26.21)	< 0.001	126.17(91.08-174.77)	< 0.00
Gender	11.52(11.12 15.77)		23.27(21.75 21.03)		0.02(0.710.91)				19.12(13.9+20.21)		120.17()1.00 171.77)	
Male (Ref)	1		1		1	0.	g, s		1		1	
female	0.69(0.68-0.7)	< 0.001	0.58(0.57-0.59)	< 0.001	0.71(0.68-0.73)	< 0.001	0.69(0.67-	< 0.001	0.79(0.75-0.83)	< 0.001	0.75(0.71-0.79)	< 0.00
Place of residence							n.bn					
Rural (Ref)	1		1		1		1 an c		1		1	
Urban	1.09(1.07-1.11)	< 0.001	1.27(1.24-1.3)	< 0.001	0.88(0.85-0.92)	< 0.001	1.14(1.09-¥19)	< 0.001	0.96(0.91-1.01)	0.12	1.09(1.03-1.16)	0.00
Social groups							mila					
Scheduled tribe (Ref)	1		1		1		1 tec		1		1	
Scheduled caste	1.27(1.23-1.31)	< 0.001	1.17(1.13-1.21)	< 0.001	1.02(0.96-1.09)	0.493	1.12(1.04- <u>0.</u> 2) 28	0.002	1.16(1.06-1.28)	0.002	1.22(1.11-1.35)	< 0.00
Other disadvantaged		< 0.001		< 0.001	0.98(0.92-1.04)		0 g	< 0.001	, , , , , , , , , , , , , , , , , , ,		1.31(1.2-1.44)	< 0.00
classes* Others	1.19(1.16-1.23) 1.26(1.22-1.3)	< 0.001	1.14(1.1-1.17) 1.21(1.17-1.25)	< 0.001	0.98(0.92-1.04)	0.482	1.22(1.15- 5 .31)	< 0.001	1.15(1.06-1.25)		1.55(1.4-1.71)	< 0.00
Education level	1.20(1.22-1.3)		1.21(1.17-1.23)		0.97(0.91-1.03)	0.32	1.46(1.56-1.59)g		1.20(1.13-1.37)	<0.001	1.55(1.4-1.71)	
Illiterate (Ref)	1		1		1		B 1 B 5		1		1	
Primary	0.58(0.56-0.59)	< 0.001	0.84(0.82-0.86)	< 0.001	0.51(0.49-0.53)	< 0.001	0.24(0.23-0.25)	< 0.001	0.53(0.5-0.56)	< 0.001	0.52(0.49-0.56)	< 0.00
Secondary	0.57(0.56-0.58)	< 0.001	0.76(0.74-0.78)	< 0.001	0.25(0.24-0.26)	< 0.001		< 0.001	0.47(0.44-0.49)	< 0.001	0.32(0.49-0.36)	< 0.00

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Religion						902) cluc					
Hindu (Ref)	1	1		1		;luding		1		1	
Muslim	0.84(0.82-0.86)	<0.001 0.96(0.94-0.99)	0.004	1.05(1-1.11)	0.031	0.83(0.79-288) 0.83	0	1.16(1.09-1.24)	< 0.001	1.08(1.01-1.16)	0
Others	0.84(0.82-0.87)	<0.001 0.99(0.95-1.03)	0.607	1.07(1-1.14)	0.057	<u>ка</u> 1.13(1.05- 6.24) 2	0.001	1.08(0.99-1.18)	0.101	1.17(1.06-1.29)	0.0
Marital status						rela					
Un-married (Ref)	1	1		1		related to		1		1	
Currently married	1.89(1.86-1.93)	<0.001 0.52(0.51-0.54)	< 0.001	0.31(0.3-0.33)	< 0.001	0 15(0 14-8 14)	0	0.66(0.62-0.69)	< 0.001	0.13(0.12-0.14)	<0.
Widowed	5.99(5.83-6.15)	<0.001 0.93(0.89-0.97)	0.001	0.53(0.49-0.57)	< 0.001	0.15(0.14 (3)) 0.15(0.14 (3)) 0.16(0.15 - and feight 0.66(0.56 - dat	0	· · ·	< 0.001	0.22(0.19-0.24)	<0.
Divorced/separated	2.98(2.7-3.28)	<0.001 0.92(0.83-1.01)	0.091	1.79(1.54-2.09)	< 0.001	0.66(0.56-6 43)		9.06(8.02-10.23)	< 0.001	1.76(1.54-2.02)	<0.
Wealth	2.50(2.7 5.20)					data		5.00(0.0 2 10. 2 0)		1	
Poorest (Ref)	1	1				rom http (ABES) ata minir		1		1	
Poor	0.67(0.66-0.69)	<0.001 0.78(0.76-0.8)	< 0.001	0.77(0.73-0.81)	< 0.001	0.81(0.77-0.85)	0	0.7(0.65-0.75)	< 0.001	0.83(0.77-0.89)	<0.
Middle	0.6(0.59-0.62)	<0.001 0.67(0.66-0.69)	< 0.001	0.67(0.64-0.71)	< 0.001	0.74(0.7-0		0.66(0.62-0.71)	< 0.001	0.8(0.74-0.86)	<0.
Richer	0.55(0.54-0.56)	<0.001 0.58(0.57-0.6)	< 0.001	0.58(0.55-0.61)	< 0.001	0.69(0.65		0.6(0.55-0.64)	< 0.001	0.75(0.69-0.81)	<0.
Richest	0.52(0.51-0.54)	<0.001 0.52(0.5-0.53)	< 0.001	0.52(0.49-0.55)	< 0.001	0.71(0.66- a .75)		0.52(0.48-0.56)	< 0.001	0.7(0.64-0.77)	<0.
Region											
Northern (Ref)	1	1		1		1 simil	101	1		1	
Southern	1.26(1.22-1.3)	<0.001 0.97(0.94-1)	0.073	1.78(1.67-1.9)	< 0.001	1.84(1.72- 6 97)	< 0.001	1.25(1.15-1.36)	< 0.001	1.05(0.96-1.15)	0.
Western	1.12(1.08-1.15)	<0.001 0.99(0.95-1.02)	0.429	1.23(1.14-1.32)	< 0.001	1.29(1.19- ¥ 39) ~	< 0.001	0.88(0.79-0.97)	0.008	0.84(0.76-0.93)	0.
Eastern	1.02(0.99-1.05)	0.288 0.86(0.84-0.89)	<0.001	1.7(1.59-1.81)	< 0.001	1.29(1.19-7.39) 1.42(1.33 252)5	< 0.001	1.25(1.16-1.36)	< 0.001	1.12(1.03-1.22)	0.0
North-eastern	0.69(0.66-0.71)	<0.001 0.66(0.63-0.69)	< 0.001	1.59(1.47-1.71)	< 0.001	1.64(1.51-1.78)	< 0.001	1.01(0.91-1.12)	0.833	0.95(0.85-1.06)	0.
Central	1.03(1-1.05)	0.075 0.94(0.91-0.97)	< 0.001	1.08(1.01-1.15)	0.026	0.85(0.79-0.92)	< 0.001	0.93(0.85-1.01)	0.073	0.85(0.78-0.93)	<0.0

Terminology used in the survey was **other backward classes and ^mental retardation.*

			from Multivaria e NSS, India (C		ary logistic reg	gression	136/bmjopen-2024090220 o cted by copyright spicluding n analy	loring th	e likelihood o	f living	with different	types o
		Hearing	disability			Visual o	disability 🖣 🕺			Intellectu	al disability^	
	Un-adjusted OR (95% CI)	p- value	Adjusted OR (95% CI)	p- value	Un-adjusted OR (95% CI)	p- value	Adjustedn BR (95% QIE	p-value	Un-adjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age (Years)							2025. relate					
<18 (Ref)	1		1		1		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1		1	
18-35	1.95(1.73-2.2)	< 0.001	5.16(4.55-5.85)	0	10.37(1.94-2.65)	< 0.001	6.57(5.59 a 3	< 0.001	1.88(1.7-2.08)	< 0.001	33.33(30-37.04)	< 0.001
35-49	3.23(2.87-3.64)	< 0.001	9.31(8.14-10.65)	0		< 0.001	13.95(11.29)	< 0.001	1.17(1.05-1.31)	0.005	34.13(30.24-38.51)	< 0.001
50-59	6.63(5.91-7.45)	< 0.001	15.34(13.43-17.52)	0	31.04(9.17-12.36)	< 0.001	29.2(24.7 d \$4.48)	< 0.001	0.65(0.57-0.74)	<0.001	18.86(16.39-21.71)	< 0.001
65+	20.67(18.42-23.2)	< 0.001	38.97(34.06-44.58)	0	43.68(23.92-32.23)	1	61.23(51.74-76.47)	< 0.001	0.4(0.33-0.48)	< 0.001	11.39(9.26-14.01)	< 0.001
Gender							ninii http					
Male (Ref)	1		1		1		i g. br		1		1	
female	0.96(0.93-0.99)	0.012	0.73(0.7-0.75)	< 0.001	1.04(1.01-1.08)	0.022	0.76(0.73 5).79	< 0.001	0.68(0.65-0.71)	< 0.001	0.76(0.73-0.8)	< 0.001
Place of residence	,,,,,,						inin en.b					
Rural (Ref)	1		1		1				1		1	
Urban	0.86(0.83-0.9)	< 0.001	1.07(1.03-1.12)	0.001	0.83(0.8-0.86)	< 0.001	1.08(1.04 .13	0.001	1(0.96-1.05)	0.894	1.18(1.11-1.24)	< 0.001
Social groups							mili					
Scheduled tribe (Ref)	1		1		1		June ar te		1		1	
Scheduled caste	0.89(0.84-0.94)	< 0.001	0.95(0.89-1.01)	0.084	0.99(0.93-1.06)	0.734	1.04(0.97a1.12)	0.228	1.2(1.1-1.3)	< 0.001	1.24(1.13-1.36)	< 0.00
Other disadvantaged		< 0.001					1.03(0.97ຄ.1)ມ			< 0.001		< 0.001
<u></u>	0.9(0.86-0.95)	0.002	1.02(0.96-1.08)		0.92(0.87-0.98)				1.23(1.14-1.32)	< 0.001	1.49(1.37-1.63)	< 0.001
Education level	0.92(0.87-0.97)	0.002	1.14(1.07-1.21)	< 0.001	0.85(0.8-0.91)	< 0.001	1.02(0.95-1.0	0.576	1.26(1.17-1.37)		1.91(1.74-2.09)	
Illiterate (Ref)							, B					+
Primary	1	< 0.001	1	< 0.001	1	< 0.001		< 0.001		< 0.001		< 0.00
Secondary	0.47(0.45-0.48)	< 0.001	0.65(0.62-0.68)	< 0.001	0.36(0.35-0.38)	<0.001	0.57(0.55-0.6 2 0.43(0.4-0.45)	< 0.001	0.34(0.32-0.35) 0.13(0.12-0.14)	< 0.001	0.1(0.1-0.11) 0.03(0.03-0.04)	< 0.00

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and Higher Education	0.22(0.2-0.25)	< 0.001	0.29(0.27-0.33)	< 0.001	0.2(0.18-0.23)	< 0.001	oyright, ii).378 0.33(0.2977).3788	<0.001	0.04(0.03-0.05)	< 0.001	0.01(0.01-0.01)	<0.0
Religion							0220 Iudii					
Hindu (Ref)	1		1		1		ng f		1		1	
Muslim	0.8(0.76-0.84)	< 0.001	0.88(0.84-0.93)	< 0.001	0.85(0.8-0.89)	< 0.001	1(0.94-1.06) 5 100-1-1-06	0.995	1.05(0.99-1.12)	0.089	0.71(0.67-0.76)	<0.0
Others	1.11(1.05-1.18)	< 0.001	1.08(1.01-1.16)	0.024	0.99(0.92-1.06)	0.802	0.94(0.87 9 9 9 9 9	0.112	1.05(0.97-1.14)	0.195	1.27(1.15-1.39)	<0.0
Marital status							0.94(0.87517elate					
Un-married (Ref)	1		1		1				1		1	
Currently married	1.63(1.57-1.7)	< 0.001	0.42(0.39-0.45)	< 0.001	1.87(1.78-1.96)	< 0.001	0.36(0.33	< 0.001	0.09(0.09-0.1)	< 0.001	0.03(0.03-0.03)	<0.
Widowed	7.49(7.16-7.84)	< 0.001	0.77(0.72-0.84)	< 0.001	9.8(9.31-10.31)	< 0.001		< 0.001	0.17(0.15-0.19)	< 0.001	0.04(0.03-0.05)	<0.
Divorced/separated	4.27(3.68-4.97)	< 0.001	1.15(0.98-1.35)	0.096	3.26(2.67-3.99)	< 0.001	0.6/(0.54) (1.54) (1.5) (1.5)	< 0.001	1.56(1.31-1.85)	< 0.001	0.36(0.3-0.44)	<0.
Wealth					60		(AB					
Poorest (Ref)	1		1		1		(ABES)		1		1	
Poor	0.6(0.57-0.63)	< 0.001	0.74(0.71-0.78)	< 0.001	0.62(0.59-0.65)	< 0.001	0.8(0.76-0-84)	< 0.001	0.87(0.82-0.93)	< 0.001	0.93(0.87-1)	0.0
Middle	0.54(0.51-0.56)	< 0.001	0.67(0.64-0.7)	< 0.001	0.56(0.54-0.59)	< 0.001	0.73(0.69 1.77	< 0.001	0.85(0.8-0.91)	< 0.001	0.92(0.86-0.99)	0.0
Richer	0.49(0.47-0.52)	< 0.001	0.62(0.59-0.65)	< 0.001	0.47(0.44-0.49)	< 0.001	0.61(0.57,).64	< 0.001	0.79(0.74-0.85)	< 0.001	0.92(0.85-0.99)	0.0
Richest	0.43(0.41-0.45)	< 0.001	0.57(0.54-0.6)	< 0.001	0.37(0.35-0.39)	< 0.001	0.5(0.47-@354)	< 0.001	0.7(0.65-0.75)	< 0.001	0.91(0.84-0.99)	0.
Region							d si.					
Northern (Ref)	1		1		1		1 mila		1		1	
Southern	1.94(1.83-2.05)	< 0.001	1.52(1.43-1.61)	< 0.001	1.54(1.45-1.64)	< 0.001	1.1(1.03- 16 18)	0.006	1.51(1.4-1.62)	< 0.001	1.7(1.57-1.84)	<0.
Western	1.19(1.12-1.28)	< 0.001	1.07(1-1.15)	0.053	1.01(0.93-1.08)	0.883	0.88(0.8270.96	0.002	1.31(1.21-1.42)	< 0.001	1.49(1.37-1.63)	<0.
Eastern	1.34(1.26-1.42)	< 0.001	1.18(1.11-1.26)	< 0.001	1.2(1.13-1.28)	< 0.001	1(0.93-1.92)	0.981	1.07(1-1.16)	0.062	0.92(0.84-0.99)	0.0
North-eastern	1.57(1.46-1.68)	< 0.001	1.58(1.47-1.7)	< 0.001	1.47(1.37-1.59)	< 0.001	1.52(1.41-1.65)		0.84(0.76-0.93)	0.001	0.82(0.74-0.92)	0.0
Central	1.08(1.02-1.15)		, , , , , , , , , , , , , , , , , , ,	0.96	1.05(0.98-1.12)	0.182	0.91(0.85-0.97	0.006	0.87(0.81-0.94)	< 0.001	0.63(0.58-0.69)	<0.

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Terminology used in the survey was *other backward classes and ^mental retardation.

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Supplementary T disabilities per th	Sable 2: Result e 76 th round of	ts fron f the N	n Multivariate SS, India (Con	binary t)	BMJ Open analysic regression analysic for uses related to text and data mining. At training, and similar technologies.	fferent types of
	Othe	er types	of disabilities		for 1	
	Un-adjusted OR (95% CI)	p- value	Adjusted OR (95% CI)	p- value	uses r	
Age (Years)					elat	
<18 (Ref)	1		1		ted t	
18-35	0.98(0.83-1.16)	0.8	1.46(1.21-1.77)	< 0.001	o te	
35-49	1.23(1.04-1.46)	0.018	2.37(1.91-2.93)	< 0.001	t up er ar	
50-59	1.84(1.56-2.17)	< 0.001	3.51(2.84-4.34)	< 0.001	d e ur de ur	
65+	3.3(2.78-3.9)	< 0.001	6.01(4.81-7.5)	< 0.001	Ata n Ata n	
Gender					ninië ES	
Male (Ref)	1		1			
female	0.81(0.75-0.87)	< 0.001	0.8(0.74-0.86)	< 0.001	l tra	
Place of residence	X					
Rural (Ref)	1		1			
Urban	1.2(1.12-1.29)	< 0.001	1.21(1.11-1.31)	< 0.001		
Social groups						
Scheduled tribe (Ref)	1		1		ir tec	
Scheduled caste	0.78(0.69-0.88)	< 0.001	0.82(0.72-0.94)	0.004	7, 2	
Other disadvantaged classes*	0.68(0.61-0.76)	< 0.001	0.71(0.63-0.81)	< 0.001	ologie:	
Others	0.91(0.81-1.02)	0.098	0.89(0.78-1.01)	0.066	s. t Ag	
Education level	· · · · · · · · · · · · · · · · · · ·				es. es.	
Illiterate (Ref)	1		1			
Primary	0.84(0.76-0.91)	< 0.001	0.88(0.8-0.98)	0.018	Bibliographiq	
Secondary	0.79(0.72-0.86)	< 0.001	0.89(0.81-0.99)	0.034		

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and Higher Education	0.93(0.81-1.07)	0.334	0.97(0.83-1.14)	0.713	
Religion					
Hindu (Ref)	1		1		
Muslim	0.83(0.74-0.92)	< 0.001	0.88(0.79-0.98)	0.021	
Others	1.18(1.04-1.34)	0.01	1.09(0.94-1.26)	0.239	-
Marital status					
Un-married (Ref)	1		1		
Currently married	0.97(0.9-1.04)	0.409	0.48(0.42-0.54)	< 0.001	
Widowed	1.89(1.68-2.12)	< 0.001	0.55(0.46-0.66)	< 0.001	
Divorced/separated	2.57(1.86-3.54)	< 0.001	1.29(0.92-1.81)	0.142	
Wealth					
Poorest (Ref)	1		1		
Poor	0.63(0.57-0.71)	< 0.001	0.72(0.64-0.8)	< 0.001	16.
Middle	0.66(0.59-0.73)	< 0.001	0.76(0.68-0.85)	< 0.001	er revie
Richer	0.72(0.65-0.8)	< 0.001	0.84(0.75-0.94)	0.002	· / Q
Richest	0.78(0.7-0.86)	< 0.001	0.88(0.78-0.99)	0.038	
Region					
Northern (Ref)	1		1		
Southern	2.66(2.28-3.1)	< 0.001	2.62(2.25-3.07)	< 0.001	
Western	2.9(2.48-3.4)	< 0.001	2.82(2.4-3.31)	< 0.001	
Eastern	3.09(2.67-3.59)	< 0.001	3.23(2.77-3.77)	< 0.001	
North-eastern	2.12(1.77-2.53)	< 0.001	1.98(1.64-2.38)	< 0.001	
Central	1.17(1-1.38)	0.056	1.26(1.07-1.49)	0.007	

Terminology used in the survey was **other backward classes and ^mental retardation.*

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