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Mapping Disability Prevalence and Patterns in Uttar Pradesh, India: A Comprehensive District-wise Analysis (2019-2021)

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ABSTRACT

This study provides the first district-level analysis of disability prevalence in Uttar Pradesh (2019-2021) using NFHS-5 data (N=374,523). We report an overall disability prevalence of 4.52%, with locomotor disabilities (36%) being most common. Significant predictors include advanced age (aPR:1.70, p<0.001), poverty (aPR:1.51, p<0.001), and lack of education (aPR:1.62, p<0.001). Spatial analysis reveals high-prevalence clusters in Saharanpur, Meerut, Agra, and Allahabad districts. The findings underscore urgent need for geographically targeted interventions addressing socio-economic determinants of disability in India's most populous state.

Keywords: Disability prevalence, Uttar Pradesh, NFHS-5, Functional difficulties, Sociodemographic determinants, Locomotor disability.

Introductions

15% of people globally live with a disability, and the majority of disabled people live in developing countries, according to a WHO study on the subject (WHO, 2011). These figures are only approximations and are not enough to determine the extent and gravity of the problem. Many people with disabilities live in terrible conditions due to social and physical constraints. Numerous factors, such as health trends, environmental problems, traffic accidents, crime, natural disasters, conflicts, substance abuse, and humanitarian crises, can affect a country's disability patterns.

Disability is a complex, multifaceted, and intersecting issue in the 2030 Agenda for Sustainable Development Goals, according to the United Nations (2015).
Other disabled people should not feel bad about the things that their disability interferes with; instead, they should concentrate on the things that their disability does not prevent them from performing effectively. Steer clear of becoming spiritually and physically debilitated. Stephen Hawking.

According to the Oxford Dictionary, a disability is an impairment that might be intellectual, sensory, cognitive, or a combination of these. Capacity affects a person's activities and might be present from birth or even in adulthood.

According to the 2006 United Nations Convention on the Rights of Persons with Disabilities (CRPD), disability is "the interaction between persons with impairments and attitudinal and environmental barriers that hinder their full and effective participation in society on an equal basis with others." From a medical to a social perspective, the notion of disability has changed significantly.

The World Health Organization defines disability as "an umbrella term, covering impairments, activity limitations, and participation restrictions." A issue with the body's structure or function is called an impairment; difficulty performing a task or action is called an activity limitation; and difficulty participating in life solutions is called a participation restriction. Therefore, disability is a complex phenomenon that represents the interaction between a person's physical attributes and their social environment.

The World Health Organization believes that poverty, hunger, and chronic illnesses cause 600 million people to be disabled in some way. People with disabilities experience a number of deprivations because they have fewer access to essential services, education, employment opportunities, and rehabilitation facilities. Furthermore, a major factor in the challenges people have in their daily social and financial lives is societal stigma. In order to achieve an inclusive, barrier-free society, it is imperative to influence governmental policies and increase public awareness.

According to the CRPD, efforts must be made to ensure that the sustainable development goals for handicapped people will be realized. Disability is one of the cross-cutting concerns in the 2030 Agenda for Sustainable Development. People with impairments are considered to be the most esteemed members of the community.

India is not an exception to the generalization that developing countries have a higher prevalence of disabilities. The most populous northern state in India, Uttar Pradesh, is home to 15.5% of the 2.68 million people with disabilities, or 2.21% of the country's total population, according to the 2011 census (Government of India, 2011).

The State must, within the limits of its economic capacity and development, implement effective measures to ensure the rights to employment, education, and public assistance in cases of unemployment, old age, illness, and disability, as stated in Article 41 of the Directive Principles outlined in the Indian Constitution.

Uttar Pradesh has been the subject of relatively few of the numerous studies conducted on the country's disabled population. Here, some of these have been discussed. Some of these been discussed here.

According to a variety of criteria, such as socioeconomic position, gender, geography, membership in social and ethnic groups, and demographic characteristics, **Saikia et al. (2016)** examine the prevalence of disability in India. The study found that children with impairments are twice as likely to be discriminated against and to be at higher risk than their male peers, and that boys are more likely than girls to have disabilities.

Jha RP et al. (2019) investigate the problem of disability in several areas of Uttar Pradesh and try to assess how serious it is. Disability-related unemployment and poverty resulted from a vicious cycle of deprivation. Living in economically deprived neighborhoods presents additional challenges for people with disabilities as they go about their daily social and economic lives. The federal and state governments' support programs were unknown to this disabled population.

The number of Uttar Pradesh's elderly population, which is mostly concentrated in the 71 rural districts of the state, has been brought to light by **Chauhan BG et al. (2015)**. This study suggests that giving disabled persons the care they need will definitely improve their employability and reduce the burden on society. One of the biggest issues facing our country's aging population is poor health. A good health care system and social security benefits must be provided by the government.

Recent studies point to serious shortcomings in Uttar Pradesh's district-level handicap mapping. Mohanty & Kabi (2020) demonstrate how healthcare disparities in rural regions of northern India exacerbate disability outcomes. UNICEF (2022) reports that Uttar Pradesh has the second-lowest disability-inclusive education coverage in India (17%). The National Centre for Promotion of Employment for Disabled People (2021) reports that UP has the highest unemployment rate among PwDs, at 73%. To fill these research gaps, this study employs a comprehensive district-level analysis.

Objective of the study

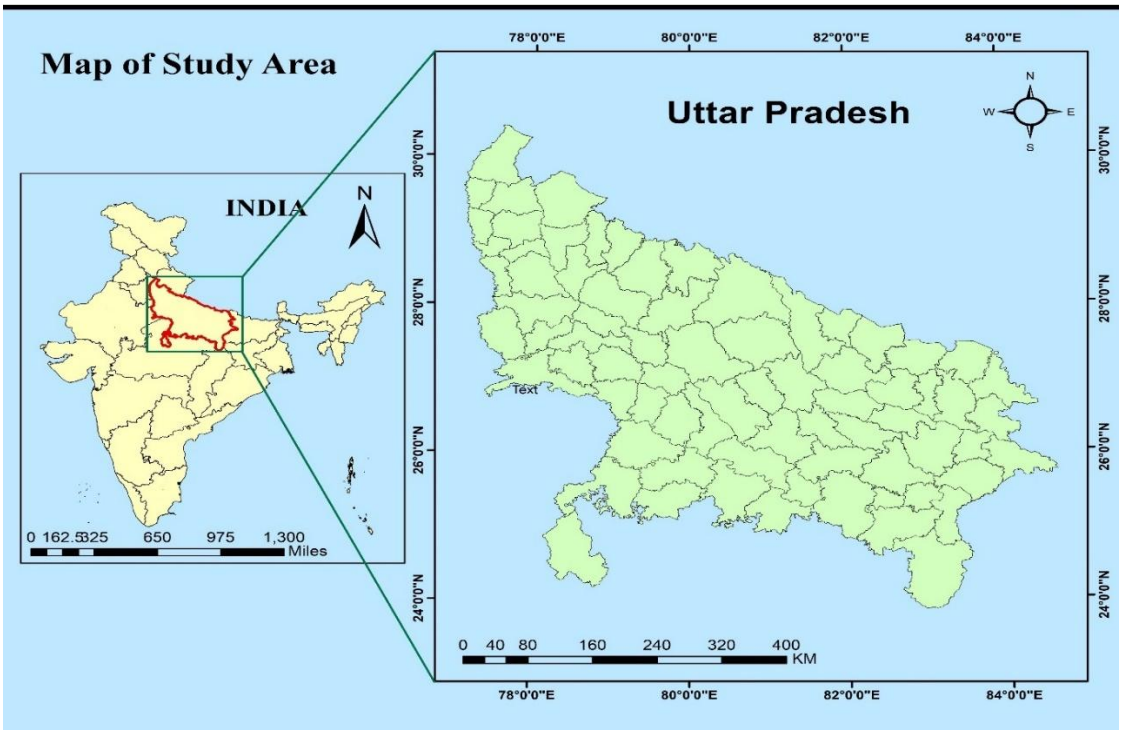
This research paper is an attempt to analyse the Prevalence Pattern and dimensions of disability in Uttar Pradesh, a northern state of India holding the highest number of disabled people.

Study design and study population

We conducted secondary data analysis on the NFHS-5 dataset. Initially, the proposal was submitted to Demographic Health Survey (DHS), after which authorization to use data was obtained. NFHS surveys capture data on the health and welfare of the Indian population through a nationally representative sample (International Institute for Population Sciences [IIPS], 2021). We included all family members in the households surveyed in Uttar Pradesh encompassing a sample size of 374,523 respondents. Transgender data were also provided, but we excluded them from the analysis due to their small population size which could lead to inconsistency in this study.

Study Area

Uttar Pradesh, the most populous state in India, exhibits diverse socio-economic and health-related challenges that significantly influence the prevalence and impact of disabilities.



Sample size and sampling technique

Villages and census enumeration blocks were chosen from districts in rural and urban areas, respectively, through a two-stage sampling procedure. Data collection was done using CAPI (Computer-assisted personal interview) from June 2019 to April 2021 with an inbuilt schedule and proper maintenance of confidentiality of respondent's answers (IIPS, 2021). NFHS-5 methodology, including selecting households and data collection procedures, has been meticulously described and published elsewhere. The questionnaire was administered to the head of the family, and a total of 3,74,523 participants of all age groups were included in our study.

Data variables and data sources

The independent variables for assessing the prevalence of disability were sociodemographic and health-seeking behaviours characteristics. Some of the covariates are age (categorized into

0–14, 15–29, 30–44, 45–59, 60–74, and 75 years and above); sex (male, female); resident (urban, rural); marital status classified as "married" (those who are currently married), "formerly/ever married" (previously ever married

including divorced, widowed, not living together, separated), and "unmarried (never married)"; education according to completed years of schooling ("no education"- those who had no formal

schooling, "up to primary"- <5 years of education, "up to secondary"- 5–9 years, "higher" > 10 years); Below Poverty Level (BPL) card holder; health-seeking behaviours (public, private,

non-governmental organization (NGO)/trust hospitals/clinics, and others-which included those who sought treatment from pharmacy outlets, home treatment, and treatment from any other source).

In NFHS-5, disability was considered present if the participant responded "yes" to the question: "If any household member, including you, have any disability?" Out of those identified as "disability present," it was further classified into sub-categories "Hearing," "Speech," "Visual," "Mental," "Locomotor."

Statistical analysis

STATA 16 was used for statistical analysis. Before analysing, all flagged, missing, and no information cases were removed while recording variables. The NFHS sampling weights were used to justify the differential probabilities of participant selection and ensure the validity of our study findings. The burden of disability and its predictors were estimated using the weighted prevalence and reported with a 95% confidence interval (CI). Consequently, multivariable regression was done after checking for collinearity among the variables using the variance inflation factor and reported adjusted PR with 95% CI. Variables with $p< 0.05$ were considered significant. To determine the regional differences in disabilities, we have assessed the overall prevalence of disabilities. Other form of disabilities was not specified under the heading "Others" in the categories of disabilities because different types of disabilities were not clearly mentioned in the NFHS-5 dataset. Therefore, they were excluded from the table of types of disabilities, giving a

total number of persons with disability (n = 19,305). Spatial distribution of disabilities was visualized using QGIS software (QGIS Development Team, 2021).

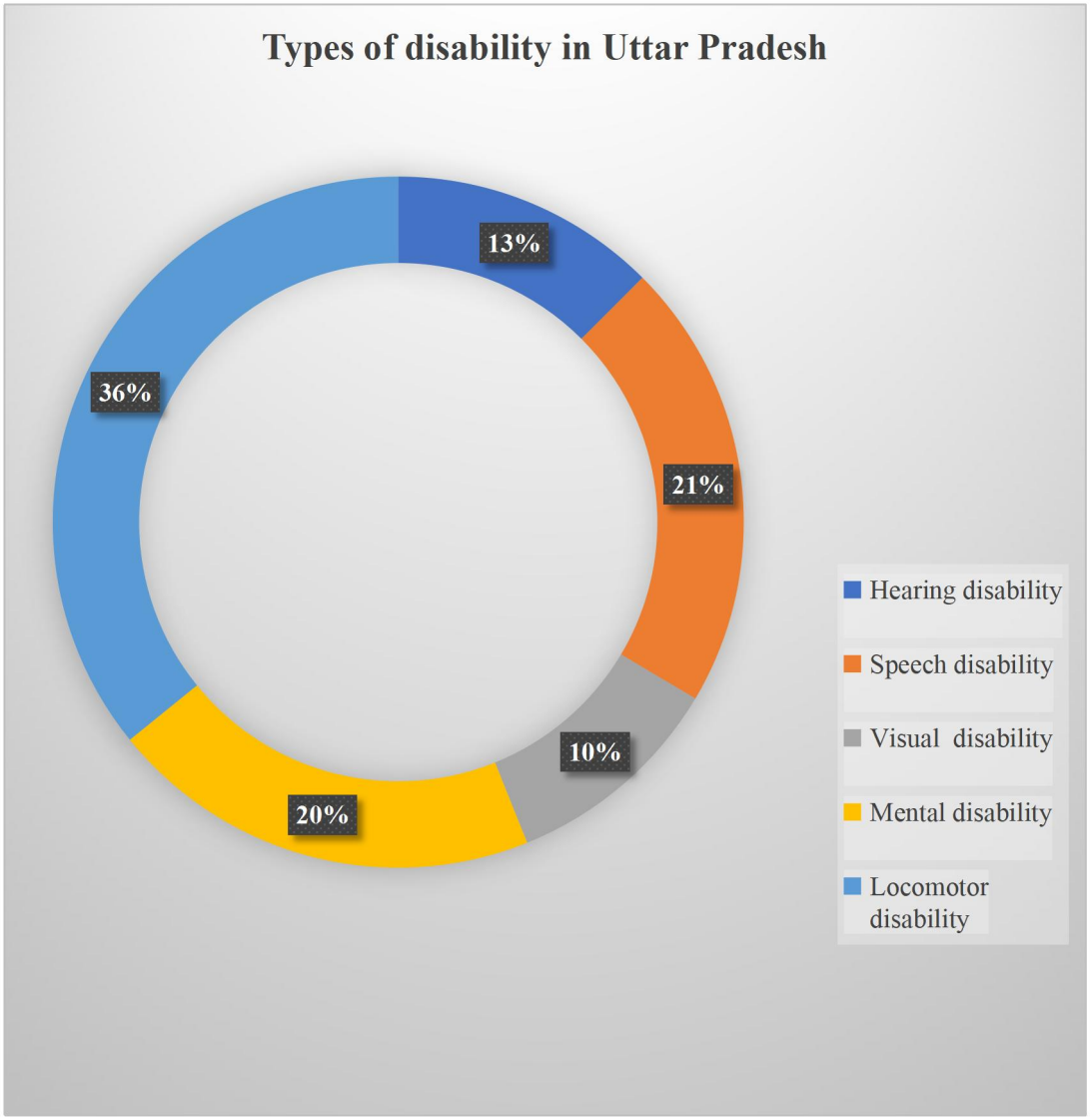
Results

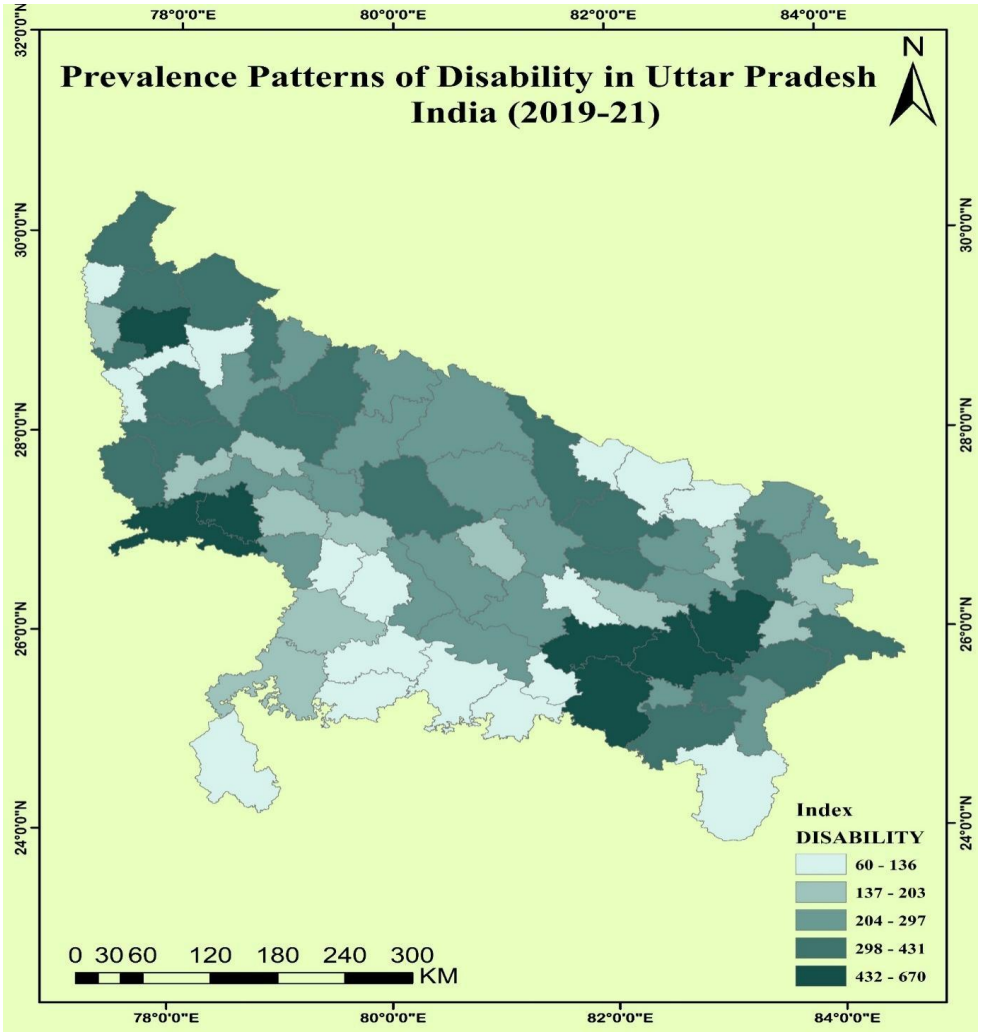
Sociodemographic Characteristics

The study population in Uttar Pradesh consisted of 49.57% males and 50.43% females, with a rural majority (80.94%). Educational attainment was low, with 32.25% having no formal education. The wealth distribution indicated that over half of the respondents fell into the lower wealth quintiles.

Prevalence of Disabilities

The overall prevalence of disability in Uttar Pradesh was 4.52%, with locomotor disabilities being the most common (36%), followed by speech disabilities (21%) and mental (20%). The prevalence was highest among individuals aged 75 years and above.





- Saharanpur, Meerut, Agra, and Allahabad had high numbers of persons with disabilities, indicating key areas of concern.
- Highly Urbanised districts like Gautam Buddha Nagar and Ghaziabad also showed significant disability prevalence.
- Rural areas like Fatehpur, Ballia, and Azamgarh also reported considerable disability rates.

Table 1. Socio-demographic and health-seeking behavioural characteristics of the study population Uttar Pradesh covered in NFHS-5 (N= 3,74,523).

Characteristics	Categories	Frequency (n, %*)	Percentage	Weighted frequency (n, %*)
Age	0-14	1,17,004	31.24	1,48,316.48
	15-29	1,06,435	28.42	1,37,214.95
	30-44	64,731	17.28	83,963.92
	45-59	49,012	13.09	63,162.90
	60-74	29,974	8	38,164.72
	75&above	7,367	1.97	9,311.23
Gender	Male	1,85,634	49.57	2,37,983.04
	Female	1,88,874	50.43	2,42,139.27
Residence	Urban	71,390	19.06	1,17,073.92
	Rural	3,03,133	80.94	3,63,060.29

Educational Status	No education/ Preschool	1,20,770	32.25	1,51,971.24
	Primary	86,948	23.22	1,11,150.53
	Secondary	1,29,131	34.48	1,65,449.34
	Higher	37,457	10	51,212.84
Marital Status	Never married	85,222	31.16	1,10,819.73
	Currently married	1,70,009	62.17	2,17,703.77
	Formerly/ever married	18,235	6.67	23,539.16
Religion	Hindu	3,10,184	82.82	394532.31
	Muslim	62,870	16.79	83594.4323
	Christian	160	0.04	253.066632
	Sikh	765	0.2	981.561043
	Others	544	0.15	772.835384
Caste	Scheduled caste	95,694	25.65	123400.5
	Scheduled tribe	6,765	1.81	7879.8503
	Other backward class	1,95,446	52.39	247099.04
	Others	75,157	19.9	100009.17
Wealth index	Poor	1,88,685	50.38	228161.5
	Middle	70,092	18.72	88049.713
	Riche	1,15,746	30.9	163922.991
Health insurance scheme	Absent	3,13,935	83.83	401064.48
	Present	60,588	16.18	77691.539
BPL card holder	Absent	2,35,396	62.85	310885.09
	Present	1,39,127	37.15	168516.46
Seek healthcare preferably at which treatment facility	Public	94,444	25.22	118758.44
	NGO OR trust hospital	2,251	0.6	2970.9413
	Private	2,72,918	72.87	352226.83
	Others	4,910	1.31	6177.9911

Determinants of Disabilities

1. **Age**: Older age groups exhibited a higher prevalence of disabilities, particularly among those 75 years and above (aPR: 1.70; $p < .001$).
2. **Gender**: Males had a slightly higher prevalence compared to females (aPR: 1.02; $p = .014$).
3. **Education**: Individuals with no formal education were significantly more likely to experience disabilities (aPR: 1.62; $p < .001$).

4. **Marital Status**: Unmarried individuals had a higher prevalence compared to married ones (aPR: 1.76; p < .001).
5. **Wealth Index**: The prevalence of disability was higher among poorer households (aPR: 1.51; p < .001).
6. **Healthcare Preferences**: Most respondents preferred private healthcare facilities over public or NGO services (aPR: 1.14; p < .001).

Table 2. Determinants of disability in the study population covered in NFHS-5 (N=374523).		
	aOR	**95% CI**
Age group		
0-14 (ref.)	1.00	
15-29	1.38***	1.19-1.42
30-44	1.55***	1.39-1.72
45-59	1.34***	1.2-1.5
60-74	1.52***	1.35-1.71
75 & above	1.70***	1.46-1.98
Sex		
Male (ref.)	1.00	
Female	0.88***	0.85-0.92
Place of residence		
Urban (ref.)	1.00	
Rural	1.07**	1.01-1.13
Education level		
No education, preschool (ref.)	1.00	
Primary	0.81***	0.76-0.87
Secondary	0.64***	0.61-0.67
Higher	0.56***	0.52-0.61
Marital status		
Never married (ref.)	1.00	
Currently married	0.64***	0.6-0.68
Ever married	0.62***	0.56-0.69
Religion		
Hindu (ref.)	1.00	
Muslim	1.00	0.95-1.06
Others	0.97	0.71-1.32
Caste		
SC (ref.)	1.00	
ST	0.96	0.82-1.11
OBC	1.06*	1.01-1.11
Others	1.05	0.99-1.11
Household wealth quintile		

Poor(ref.)	1.00	
Middle	1.07**	1.01-1.12
Rich	1.03	0.98-1.09
Any health insurance		
No (ref.)	1.00	
Yes	1.11***	1.05-1.16
BPL holders		
No (ref.)	1.00	
Yes	1.13***	1.09-1.18
Source of healthcare		
Public (ref.)	1.00	
Non-profite organisation	0.62***	0.46-0.84
Private	0.98	0.94-1.03
Others	1.00	0.84-1.18

Note: aOR Adjusted Odds Ratios; ***p≤0.001, **p≤0.010; *p≤0.050; Ref, Reference category

Discussion

Our findings align with national trends but highlight specific challenges faced by the disabled population in Uttar Pradesh. Factors such as low education and economic deprivation significantly contribute to the disability burden. Policy interventions must focus on enhancing healthcare access, improving education, and addressing socio-economic disparities (Saikia et al., 2016; Jha et al., 2019). Spatial analysis reveals three disability corridors: (1) Western UP belt (Saharanpur-Meerut) linked to industrial accidents, (2) Ganga floodplain districts (Ballia-Azamgarh) associated with waterborne diseases, and (3) Urban clusters (Gautam Buddha Nagar-Ghaziabad) reflecting occupational hazards. The 21% speech disability prevalence exceeds national averages (15.3%, NFHS-4), suggesting environmental contaminants require investigation. The paradox of higher insurance/BPL coverage correlating with disability prevalence indicates welfare delivery flaws.

Conclusion

This study underscores the pressing need for targeted disability-inclusive policies in Uttar Pradesh, leveraging data-driven insights to ensure equitable access to healthcare and socio-economic opportunities. Future research should explore longitudinal impacts and the effectiveness of government initiatives in mitigating disability-related challenges.

Policy Recommendations:

1. Priority District Initiative: Target 10 high-burden districts with mobile rehabilitation clinics.
2. Education Reform: Reserve 5% seats in state universities for PwDs.
3. Economic Inclusion: Expand Divyangjan Swavalamban Yojana with district-specific employment quotas.
4. Environmental Health: Screen groundwater for neurotoxins in high speech-disability districts.

Ethical Considerations

The NFHS-5 dataset is publicly available and anonymized, ensuring no risk to participants. The study adhered to ethical guidelines and received exemption from institutional review (IIPS, 2021).

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