

Temporal and Spatial Discourse of Disability Divides in India: A District-Level Analysis

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Abstract

The study quantifies and compares the prevalence of each type of disability across gender, regions and social groups of India. A cursory glance across the districts (using GIS mapping) shows that the incidence of disability is distributed across every nook and corner. There is a marginal increase in the proportion of persons with disabilities (PWDs) in 2011 relative to 2001. Its prevalence is more among males than females. Its decadal growth is higher in the urban areas. Further, it's more among scheduled castes (SCs). Although there is a significant improvement in data collection in the 2011 Census, concerns have been raised in the present study about the enumeration process. Close to one-third of PWDs belong to "any-other" and "multiple categories" which reveal lacunae in the estimates. Besides, there is an apparent underestimation of disability data because of deep-seated stigma among women and inadequate coverage of mental health issues in the country. Based on the estimates of the regression model, the findings suggest that improvement in educational standards among women, creating employment opportunities and improving average living conditions can significantly reduce disability. However, there is a growing elderly population and increasing age is associated with rising disability. As the burden of disability falls disproportionately across geographic regions and socioeconomic groups, public health policies should take this variation into account. Thus, providing access to basic capabilities to PWDs may be strategically important to reduce the challenges for the disabled.

Keywords: Correlates of disability, Census of India, social groups, gender, regions, ageing, GIS Mapping.

I. Introduction

Persons with disabilities (PWDs) are the largest minority groups in the world (Khanday & Akram 2012). Jha (2016) argued that "disability cuts across class, caste, gender, race, religion, ethnicity, and nationality, but mostly a differently-abled person's first identity among their other identities is their disability" (p. 5). According to Mont (2007), the disability prevalence rates mostly depend on the kind of data sources used and methodological approaches followed. The author reported that global estimations from international agencies like the World Bank or the UN show that about 10-12 per cent of the world's population suffer from at least one disability. The WHO Global Burden of Disease Study (2017) reported that the global burden of disability increased by 52 per cent between 1990 and 2017. Further, WHO in its report on "Disability and Health" highlights that "over a billion people, about 15 per cent of the world's population, have some form of disability. The rates of disability are increasing due to population ageing and increases in chronic health conditions, among other causes" (WHO, 2018).

Sen (2004) noted that persons with disabilities are not only the most deprived but also most neglected. United Nations (2018) in the "Disability and Development Report" suggests that the PWDs experience much higher hardships in life even to meet their basic needs. DFID (2018) reported that "the global situation and wellbeing of the majority of people with disabilities has not improved. In low and middle-income countries, people with disabilities and their families are poorer than people

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Acknowledgement: This paper is based on a part of the author's Ph.D. thesis under the supervision of Professor Santosh Mehrotra at The Centre for Informal Sector and Labour Studies, Jawaharlal Nehru University, New Delhi. The author is grateful to him for providing valuable inputs and guidance.

without disabilities in nearly all socioeconomic indicators. People with disabilities face intersecting and compounding forms of discrimination on the grounds of gender, sexuality, impairment type, age, race, ethnicity, religion or belief, and location which all contribute to disability-related exclusion” (p. 5).

In the context of India, the disabled communities are disadvantageously placed in the society. Disability brings in a socioeconomic burden and the dynamics of life undergoes a major change as disability sets in. It not only has its implications on the individual but also his household. Saikia et al. (2016) showed that there is also a wide socioeconomic and regional divide in the prevalence of disability in India. Mishra and Gupta (2006) found that individuals born with a disability or acquiring it after birth begin a life with limited opportunities and are also starved of services and facilities available to persons who are not disabled, and, therefore, disability acts as a hurdle for their self-development. World Bank (2009) reveals that disabled people are among the most excluded in Indian society, facing widespread social stigma, income poverty and limited access to education and jobs.

However, the availability of robust data in India has been a stumbling block for substantive research in this area. It is as low as 2.21 per cent as per 2011 Census. Alternative estimates using robust and sophisticated measures present a higher prevalence of disability. World Bank (2009) noted that “while estimates vary, there is growing evidence that people with disabilities comprise between 5 and 8 per cent of the Indian population, around 55-90 million individuals” (p. xi). During the 11th Plan¹ (2007-12), the erstwhile Planning Commission suggested that the disability figures are possibly 5-6 per cent of the total population, which is much higher than the official estimates.

Singal and Jeffery (2008) argued that there is a lack of precise and reliable estimate of the number of persons with disabilities in India. It raises serious concerns that, given the deep-seated stigma surrounding disability, many persons with severe impairments, mainly rural disabled and women, are excluded from Census and surveys. In this context, Reddy and Sree (2015) put forth that “any attempt at the enumeration of persons with disabilities is a challenging task for the simple reason that the constructions on impairments, both physical and mental, are deeply embedded in the social fabric.”

In the light of these insights, the study examines temporal and spatial variations in the prevalence of disability and the socioeconomic-demographic factors that affect disability prevalence across the districts of India.

Objectives

The objectives of the study are: (a) to quantify the prevalence of disability by gender, region, social groups and type of disability at all-India level using Census of 2001 and 2011 data; (b) to calculate and map (using GIS technique) disability prevalence among men and women at the district level using 2011 Census data; and (c) to examine the association between disability prevalence and major socio-economic-demographic characteristics of the districts using 2011 Census data.

Hypotheses

Based on the objectives of the study, the following hypotheses are formulated for empirical verification: (H1) there are large geographical and social disparities in the prevalence of disability in India; i.e., the burden of disability is disproportionately concentrated in certain regions and population groups; and (H2) prevalence of disability is associated with several socioeconomic and demographic characteristics, and various factors affect the incidence of disability differently.

¹ The Eleventh Five Year Plan, Planning Commission, Government of India. A section on Empowering Persons with Disabilities.

II. Data and Methods

The study is conducted at all-India, state and district levels using secondary data. It covers disability data available in the Censuses of 2001 and 2011 for different types of disabilities, namely, disability in seeing, hearing, speech, movement, mental retardation, mental illness, any-other and multiple disabilities. Five types of disability data were collected in the 2001 Census, namely, persons with seeing, hearing, speech, movement and mental disability. The list expanded to eight types of PWD categories in Census 2011. In 2001, data were collected only for mental disability which was bifurcated into two groups, mental retardation (R) and mental illness (I), while collecting data in Census of 2011. For the sake of simplicity and comparative analysis, mental (I) and mental (R) have been clubbed to make a comparative study. In addition, data on two new categories multiple disabilities and any other disability were collected for the first time in the 2011 Census. Therefore, technically a precise comparison between the two time periods is difficult. Multiple disabilities cover three types of disabilities. Any-other category has emerged as the fourth largest (one-fifth of total PWDs) category of disability in Census of 2011. This category was included in the Census to overcome the problem of estimation or counting the number of persons with disabilities. In other words, those PWDs who are not listed in the Census, the informants were required to report in this category.

The paper comprehensively examines the temporal and spatial variations in the prevalence of the various types of disability and differentials by social groups, age-cohorts, genders and sectors (rural and urban) in India. It carries out a comparative analysis and examines decadal growth in the prevalence of disability between these two periods. It attempts to understand the links between social groups and types of disabilities. Further, the analysis is drilled down to the state and district levels. To understand the holistic scenario in the incidence of disability, ArcGIS software is used. In this context, maps showing the prevalence of different types of disabilities are drawn across the districts. To understand the district profiles which are relevant for our study, descriptive statistics have been presented.

Explanation of the selected variables and building of the disability determinant model

To identify the socioeconomic and demographic factors that affect the prevalence of disability, cross-sectional regression analysis was carried out in the study. The disability determinant model was specified as follows:

Outcome variable

Dependent variables in the regression model are total persons with disabilities. The data was collected for all the 640 districts and 35 states and union territories available in Census of 2011. The prevalence of disability was defined as the proportion (percentage) of total PWDs out of a total population of that particular district.

Explanatory variables

Several socioeconomic-demographic factors affect the prevalence and incidence of disability. Justification of these variables is self-explanatory in general. However, the justification for the inclusion of these variables has been provided wherever needed. After examining the available literature on the subject related to health and disability in India, the selected district level contextual variables are listed as follows: (1) Proportion of population which is female (as nutritional outcome among women is poor); (2) Proportion of population whose age is over 60 years (elder people tend to have more illness and bodily difficulties); (3) Literacy rates among females; (4) Proportion of the population which is SC; (5) Proportion of population belonging to STs communities. The constitution of India recognises SCs and STs as disadvantaged communities. They have poor health outcomes than the general population. The Census of India does not have data related to income or expenditure of these groups used in the present study. Hence, a few alternative variables were used

as proxies for these indicators; (6) Proportion of population living in urban areas; (7) Proportion of population which are main workers (working for six months or more with regard to the reference period). Average living conditions of households were examined under the following heads; (8) Proportion of population having access to safe drinking water (i.e., tap water from treated sources+hand pump+tube well); (9) Proportion of households which lived in a dilapidated building; (10) Proportion of households which did not have access to latrine facilities within the premises (lack of toilet facilities is often associated with communicable and non-communicable diseases, which can directly or indirectly lead to disabilities or can exacerbate the disabilities); (11) Proportion of households which used clean fuel for cooking (arrived at by adding Kerosene+LPG/PNG+electricity+biogas). Unavailability of clean fuel for cooking is often linked to a number of disabilities; (12) Proportion of households with two or more dwelling rooms; and (13) Proportion of households accessing banking services, better banking facility or financial inclusion which is associated with better access to finance when in need and access to government welfare schemes.

III. Temporal and Spatial Analysis of Disability Prevalence

Table 1 shows that out of 121.10 crore population of India in 2011 of Census, 2.70 crore persons have been enumerated as disabled which was 2.20 crore in the year 2001, showing a decadal growth of 22.4 per cent during 2001 and 2011. As per Census data of 2011, on an average, one out of ten families includes a disabled member. Decadal growth is the higher in urban areas than rural areas. Persons belonging to the vulnerable sections of society (SCs and STs) had a higher increase. In urban areas, there is a drastic increase in the decadal growth among the persons belonging to ST communities (81.75%), which could be the result of urbanisation, displacement and migration. Gender-wise, female PWDs recorded higher decadal growth than their male counterpart. Again, it is higher in urban areas than rural regions. Growth is the highest among STs, followed by SCs and overall population. However, in urban areas, STs recorded significantly higher growth rate than SCs and total population. The same pattern can be observed among female STs.

Table 1: Absolute number of persons with disabilities by residence, gender and social groups in India in 2001 and 2011.

	Census 2001			Census 2011			Decadal Growth		
	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
Total	21906769	12605635	9301134	26814994	14988593	11826401	22.41	18.90	27.15
SCs	3711110	2127877	1583233	4927433	2770592	2156841	32.78	30.20	36.23
STs	1618166	903899	714267	2140763	1144627	996136	32.30	26.63	39.46
Rural									
Total	16388382	9410185	6978197	18636358	10410559	8225799	13.72	10.63	17.88
SCs	3036356	1738176	1298180	3798625	2136872	1661753	25.10	22.94	28.01
STs	1500725	835854	664871	1927319	1028040	899279	28.43	22.99	35.26
Urban									
Total	5518387	3195450	2322937	8178636	4578034	3600602	48.21	43.27	55.00
SCs	674754	389701	285053	1128808	633720	495088	67.29	62.62	73.68
STs	117441	68045	49396	213444	116587	96857	81.75	71.34	96.08

Source: Calculated from Censuses of India, 2001 and 2011.

Table 2 shows that there were 2.12 per cent persons with disabilities in India which increased to 2.21 per cent in 2011. The highest proportion of individuals with disabilities can be seen among SC communities (2.45% in 2011), and least among STs (2.05%). However, it is important to highlight that the decadal growth among SCs is higher than the total and almost equivalent to STs. The proportion of persons with disability is lower in urban areas (2.17%) as against (2.24%) in rural areas. However, decadal growth is much higher in urban areas. It means a higher rate of urbanisation is linked to the higher prevalence of disability. Gender analysis suggests that there is an increase in the proportion of female PWDs in 2011 relative to 2001. The proportion is higher in rural areas than urban ones. It is the highest among SCs who are female PWDs and living in rural areas (2.22%).

However, the proportion in the 2011 Census has declined among males and has increased among females relative to 2001 Census.

Several studies suggest that the intensity of disability is more among marginalised and vulnerable sections of the society like SCs and STs. In general, persons born with disabilities in these categories face the double brunt of caste-based discrimination on the one hand, and deprivation of opportunities and discrimination on the other hand. Pal (2010) views that these communities are more likely to be afflicted with the trauma of disability and caste identity. Therefore, such intertwined problems may cause multiple disadvantages which are emotionally traumatic and can lead to permanent psychological damage. Further, Mehrotra (2013) mentions, “The intensity of discrimination, deprivation and exclusion experienced by persons with disabilities belonging to lower castes are more when compared to others”.

Table 2: Proportion of population with disability in respective social groups, genders and regions in India in 2001 and 2011.

	Census 2001			Census 2011		
	Persons	Males	Females	Persons	Males	Females
Total	2.12	2.37	1.87	2.21	2.40	2.01
SCs	2.23	2.47	1.97	2.45	2.68	2.20
STs	1.92	2.12	1.71	2.05	2.18	1.92
Rural						
Total	2.21	2.47	1.93	2.24	2.43	2.03
SCs	2.28	2.53	2.02	2.47	2.70	2.22
STs	1.94	2.14	1.74	2.05	2.18	1.92
Urban						
Total	1.93	2.12	1.71	2.17	2.34	1.98
SCs	2.01	2.23	1.77	2.38	2.60	2.14
STs	1.68	1.89	1.46	2.04	2.21	1.87

Source: Calculated from Censuses of India, 2001 and 2011.

As per Census of 2011, there was 2.68 crore PWDs in India out of which 0.5 crores were SCs (18.38%) and almost 0.2 crores (7.97%) STs. The proportion of the population belonging to SC and ST communities of PWDs is about 2.45 per cent and 2.05 per cent respectively of the total population. Table 3 presents the proportion of disabled persons by type of disability and social groups in India in Censuses of 2001 and 2011. The incidence of disability drastically declined for persons with seeing, movement and mental disability. However, these declines are offset by the rise in the decadal growth of individuals with hearing and speech disability. A number of factors can be attributed to these empirical inconsistencies which mainly emanate from the change in methods and definition of disability data collection in 2011 Census. In 2001, close to half of the PWDs had “in seeing” disability as compared with 18.77 per cent in 2011. Again, SCs had the highest share in 2001, but STs had the highest share in 2011. Persons who had seeing impairment experienced a drastic decline in 2011. It may be partly because of changes in the methods of estimation. One-eyed individuals were considered as disabled in Census 2001, whereas, as per the Census 2011 such persons were not. In addition, in the Census of 2011 enumerator were asked to apply a simple test to ascertain blurred vision. In Census of 2001 no such instructions were given and were mostly based on self-reporting.

The number of persons with speech disability has also slightly declined in 2011 from 7.49 per cent to 7.45 per cent. A person was recognised as having “speech disability” if he/she was dumb or whose speech was not understood by a listener of normal comprehension and hearing. The definition was made clearer in Census of 2011 to record persons with a speech disability. For instance, “persons who speak in single words and are not able to speak in sentences” were specifically treated as disabled. There was a very high increase in “hearing” disability from 5.76 per cent to 18.92 per cent. STs have the highest in hearing disability at 19.36 per cent. Persons using hearing aid have been treated as disabled in Census of 2011. They were not treated as disabled in the Census 2001. Further, persons having problem in hearing through one ear although the other ear is functioning normally was considered having a hearing disability in Census of 2001. But in Census of 2011 such persons

were not considered as disabled. Movement disability has significantly declined from 27.87 per cent to 20.28 per cent in 2011. There was also a major revision in the category of movement disability. The highest number of persons are rerecorded in the category of movement disability.

Out of total PWDs, there were 10.33 per cent mentally disabled people in 2001 which slightly declined to 8.31 per cent in 2011. There were 5.62 per cent mentally retarded people and 2.70 per cent mentally ill persons in 2011. Even after combining these two categories, there is a little decline in the proportion of persons with mental disability. Multiple disabled persons constituted 7.89 per cent of the total PWDs, and the highest multiple disabilities were among STs. Multiple disabilities covered three types. “Any other” category of PWDs has a high share of the total PWDs i.e., 18.38 per cent. SCs are the highest in “any other” PWD category. This category was included for the first time in 2011 to overcome the problem of estimation or counting the numbers of persons with disabilities. In other words, those PWDs who were not listed in the Census, the informants were required, to report them in this category. Census data in the “any other” category is significantly large (around 18%). A very high number of “any other” disability also shows lacunae in the enumeration process of the Census. It may be possible that the enumerators may not have properly explained the definition of any other disability to the informants. Inaccurate numbers pose a challenge to policy framing.

Table 3: Proportion of disabled persons by type of disability and social groups in India in 2001 and 2011

Type of disability	Census of 2001			Census of 2011		
	Total (%)	SC (%)	ST (%)	Total (%)	SC (%)	ST (%)
Seeing	48.55	48.60	48.38	18.77	19.11	20.00
Speech	7.49	7.30	7.50	7.45	5.19	5.27
Hearing	5.76	5.75	7.72	18.92	17.45	19.36
Movement	27.87	29.13	27.95	20.28	20.50	22.42
Mental	10.33	9.22	8.45	8.31	7.49	7.55
Mental retardation	-	-	-	5.62	5.11	4.92
Mental illness	-	-	-	2.70	2.38	2.63
Multiple	-	-	-	7.89	7.31	8.93
Any other	-	-	-	18.38	22.94	16.47

Source: Calculated from Censuses of India, 2001 and 2011.

IV. Disability Prevalence across the States: Evidence from Censuses of 2001 and 2011

A cursory glance at the state-wise distribution of persons with disabilities suggests that PWDs are scattered across every nook and corner in India. Table 4 presents the share of PWD males and females out of the total population in the corresponding states and makes a comparative study between 2001 and 2011 Census data. The Table is self-explanatory, still an attempt is being made to explain this in brief. According to the 2001 Census, Sikkim experienced the highest prevalence of disability at 3.77 per cent, followed by Arunachal Pradesh, Jammu and Kashmir, and Odisha. Southernmost states of Kerala, Puducherry and Tamil Nadu, which are economically better off, had higher disability prevalence. Karnataka and Andhra Pradesh had a lower incidence of disability, almost about the same at around 1.80 per cent. Some north-eastern states like Nagaland, Manipur and Meghalaya had the least prevalence of disability. Goa had a minimum disability (1.17%). Bihar, Uttar Pradesh, Madhya Pradesh, Rajasthan, West Bengal and Gujarat are adjacent in terms of disability prevalence: it ranged from 2 per cent to 2.5 per cent. Among the bigger states, Maharashtra had the least number of PWDs.

Census data of 2011 shows that many states have reduced the incidence of disability significantly, some others are on the same situation while in others it worsened. In Sikkim it declined but was still the highest in 2011, followed by Odisha and Jammu and Kashmir. Disability prevalence declined in some southern states. However, it worsened in Andhra Pradesh and Maharashtra. Except for Sikkim, Lakshadweep and Puducherry, it has improved and is among the lowest for most north-eastern states and union territories.

Thus, the southern states reported more number of persons with disabilities than their northern counterparts. Kulkarni and Gaiha (2019) pointed out that the southern states have provided better welfare measures to the PWDs and more comprehensively than the northern states. Therefore, they may not have reported the prevalence of disability.

Table 4: Proportion of total disabled persons in 2001 and 2011

States	Census 2001			Census 2011		
	Persons	Males	Females	Persons	Males	Females
Jammu & Kashmir	2.98	3.20	2.74	2.88	3.08	2.65
Himachal Pradesh	2.57	2.93	2.19	2.26	2.48	2.04
Punjab	1.74	1.95	1.51	2.36	2.59	2.09
Chandigarh	1.73	1.88	1.52	1.40	1.51	1.27
Uttarakhand	2.29	2.62	1.96	1.84	2.00	1.67
Haryana	2.15	2.41	1.85	2.16	2.34	1.95
NCT of Delhi	1.70	1.90	1.46	1.40	1.54	1.24
Rajasthan	2.50	2.86	2.11	2.28	2.39	2.17
Uttar Pradesh	2.08	2.37	1.75	2.08	2.26	1.88
Bihar	2.27	2.62	1.90	2.24	2.47	1.98
Sikkim	3.77	3.95	3.55	2.98	3.03	2.92
Arunachal Pradesh	3.03	3.82	2.15	1.93	2.00	1.86
Nagaland	1.33	1.39	1.27	1.50	1.58	1.41
Manipur	1.31	1.41	1.21	2.05	2.17	1.93
Mizoram	1.80	1.91	1.69	1.38	1.48	1.28
Tripura	1.84	2.04	1.64	1.75	1.89	1.60
Meghalaya	1.24	1.30	1.18	1.49	1.56	1.42
Assam	1.99	2.16	1.81	1.54	1.61	1.46
West Bengal	2.30	2.55	2.04	2.21	2.41	2.00
Jharkhand	1.66	1.90	1.41	2.33	2.52	2.14
Odisha	2.78	3.05	2.49	2.96	3.18	2.74
Chhattisgarh	2.02	2.21	1.82	2.45	2.60	2.29
Madhya Pradesh	2.33	2.62	2.02	2.14	2.36	1.89
Gujarat	2.06	2.29	1.81	1.81	1.95	1.66
Daman & Diu	2.00	1.92	2.12	0.90	0.86	0.96
Dadra & Nagar Haveli	1.84	1.91	1.74	0.96	0.98	0.93
Maharashtra	1.62	1.85	1.37	2.64	2.91	2.35
Andhra Pradesh	1.79	2.01	1.57	2.68	2.89	2.47
Karnataka	1.78	2.00	1.55	2.17	2.35	1.98
Goa	1.17	1.29	1.04	2.26	2.30	2.22
Lakshadweep	2.77	2.89	2.63	2.50	2.53	2.48
Kerala	2.70	2.96	2.46	2.28	2.46	2.11
Tamil Nadu	2.63	2.52	2.74	1.64	1.82	1.45
Puducherry	2.65	3.03	2.28	2.42	2.67	2.17
Andaman & Nicobar Islands	1.98	2.19	1.73	1.75	1.90	1.58

Source: Calculated from Censuses of India, 2001 and 2011.

V. Distribution of Incidence of Disability across Districts of India in 2011

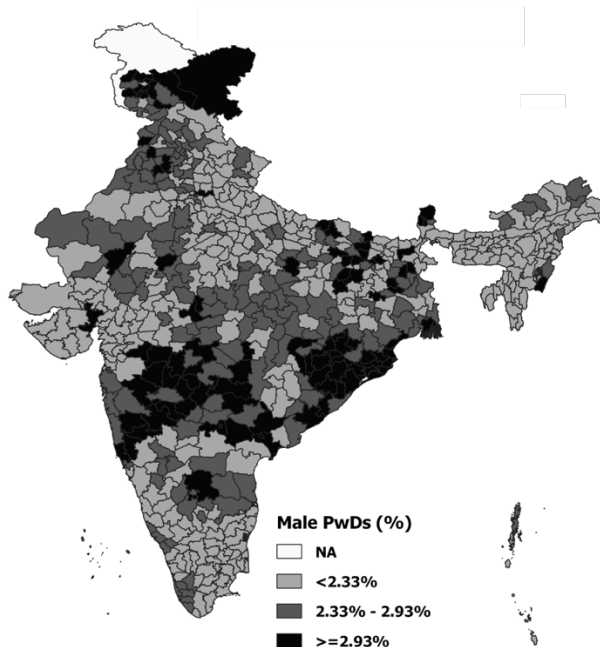
Evidence from GIS mapping

This section illustrates disability prevalence across regions of India with the help of Geographical Information System (GIS Mapping). It examines disability distribution at the district level using 2011 Census data.

Spatial images of incidence of male and female disability across districts of India is depicted in Figures 1 and 2. It is visible that the male and female topographical examples are fundamentally the same. The prevalence rates are calculated as a proportion of persons with male and female disabilities out of their respective population groups in districts. The following GIS maps are self-explanatory. The geographical patterns of males and females with disabilities are similar to each

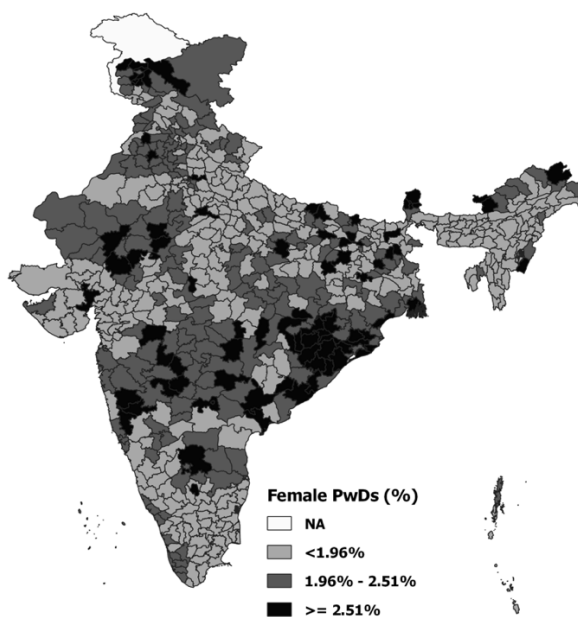
other. There are many spatial zones which have higher concentrations of disability. On the other hand, there are discontinuous spatial zones where there is lower disability. Therefore, a cursory glance across the districts suggests that disability is prevalent in every nook and corner of India. However, there are some regions (gender-wise) which are more disadvantageously placed.

Figure 1: Prevalence of disability across districts of India for Males in 2011



Source: Census of India, 2011

Figure 2: Prevalence of disability across districts of India for females in 2011.



Source: Census of India, 2011.

Although the incidence of disability is lower among women than men, it is evenly distributed and the pattern is largely similar to that of males. However, female disability is relatively lower in the eastern parts of Jammu and Kashmir, followed by some parts of Karnataka and southern Maharashtra. The highest disability prevalence (about 3% and above) can be observed in continuation from the eastern districts of Odisha to the southern parts of Maharashtra in the west. Further, there are some smaller clusters of high disability prevalence spread across the districts of Jammu and Kashmir, Rajasthan, parts of Punjab and Haryana, and northeast regions (most parts of Sikkim and Arunachal Pradesh). Spatial zones with lower disability are states of the southern region (Karnataka, Tamil Nadu and parts of Kerala), followed by states of western India (Gujarat and some districts of Maharashtra). They are followed by North Indian states (most parts of Bihar and Uttar Pradesh).

VI. Socioeconomic and Demographic Correlates of Disability Prevalence

The term disability involves complex interactions between individual and social environment (Topliss, 1979). The United Nations (1982) in the World Programme of Action (WPA) concerning persons with disabilities noted hosts of factors responsible for it. This includes social conflicts, natural disasters, accidents, poverty, resource constraints, unhygienic living conditions, physical and social barriers, and psycho-social problems. A disability may exist from birth or may be acquired during lifetime. Coppin et al. (2006) found that a higher prevalence of disability is associated with decreasing socioeconomic status. Poor living conditions, particularly among lower caste groups, can make them more vulnerable to disability. Persons with disabilities tend to suffer from a physical, mental and sensory impairment. Hence, these people systematically get excluded from the development narrative (Appunni & Deshpande, 2009; Meyer & Mok, 2019).

Some studies suggest that socioeconomic inequalities and prevalence of disability are correlates (Braithwaite & Mont, 2009; Yeo & Moore, 200; Elwan, 1999). Gannon and Munley (2009) say people of older age suffer from multiple disabilities. It means that people tend to be more disabled while they start ageing. This pattern holds good for all types of disabilities, that is, disability is an increasing function of age. In this context, Mishra and Mohanty (2017) noted that hearing and intellectual disabilities are positively associated with increasing age. Besides, lack of access to health services is a significant cause of disability (WHO, 2002).

Table 5: Descriptive statistics for the outcome and explanatory variables across 640 districts of India in 2011 (in percentage)

Variables	Mean	SD	Min	Max
Persons with Disabilities (PWDs)	2.15	0.57	0.76	4.51
Socioeconomic variables				
Proportion of SCs	14.86	9.13	0.00	50.17
Proportion of STs	17.71	27.00	0.00	98.58
Proportion of female literacy	55.23	12.41	24.25	88.62
Proportion of urban population	26.40	21.12	0.00	100
Proportion of main workers	73.29	12.65	30.65	96.4
Proportion of households in dilapidated buildings	4.99	3.11	0.23	17.74
Proportion of households with safe drinking water	66.24	23.30	0.74	99.96
Proportion of households with 2 or more dwelling rooms	61.99	15.08	11.57	93.65
Proportion of households with clean fuel for cooking	27.15	21.68	1.12	98.64
Proportion of households accessing banking services	57.27	16.48	10.27	97.77
Proportion of households with no toilet facility within premises	53.22	26.33	1.13	95.22
Demographic variables				
Proportion of females	48.55	1.64	34.79	54.22
Proportion of persons aged 60 plus	8.60	2.08	2.63	17.92

Source: Calculated from Census of India, 2011.

Table 5 shows the descriptive statistics for the outcome and exposure variables for all the 640 districts as per Census of 2011. These characteristics are examined significantly across the districts.

For instance, the average value of the percentage of persons with disabilities is 2.15 per cent, and the values vary between 0.76 per cent (minimum) and 4.51 per cent (maximum). The proportion of the population which belongs to SC communities ranges from a minimum of 0 per cent to a maximum of 50.17 per cent. The corresponding figures for STs range from 0 per cent to 98.58 per cent. The district-level female literacy rate is around 55 per cent on an average, varying from 24.25 per cent to 88.62 per cent. The proportion of such persons living in urban areas is 27 per cent. The proportion of the workers who are main workers constitutes about 73 per cent and ranges from 12 per cent to 96 per cent. As for the average living conditions, about 66 per cent households have access to safe drinking water. However, their condition is worse in accessing clean fuel for cooking for which the mean value is only about 27 per cent. Around 53 per cent households do not have toilet facilities within the premises. Finally, only about 57 per cent households have access to banking services. The demographic profile indicates that the proportion of females on an average is around 49 per cent across districts, it ranges from 34.79 per cent to 54.22 per cent. Last but not the least, the proportion of elderly persons (60 years and above) is on an average 8.60 per cent, ranging between 2.63 per cent and 17.92 per cent.

Table 6 provides the outcome of the linear regression model which assesses the relationships between important socioeconomic and demographic characteristics across districts and disability prevalence rates at the district level. There is a strong correlation between male and female disability and, therefore, total persons with disabilities are chosen as the left-hand-side (dependent variable). The outcome of demographic characteristics across districts suggests that the proportions of females and of persons who are 60 years or above (elderly population) are significantly associated with disability prevalence. A one per cent increase in the number of persons who are above 60 years of age is associated with 0.18 per cent increase in the prevalence of disability. An increase in the proportion of females is associated with declining disability prevalence rates at one per cent level of significance.

Table 6: Socioeconomic and demographic determinants of disability prevalence variations across districts of India in 2011.

Variables	Coefficients	P-Values
Socioeconomic variables		
Proportion of SCs	-0.003	0.247
Proportion of STs	0.003	0.005
Proportion of female literacy	-0.014	0.000
Proportion of urban population	0.008	0.000
Proportion of main workers	-0.014	0.000
Proportion of households in dilapidated buildings	0.039	0.000
Proportion of households with safe drinking water	-0.003	0.010
Proportion of households with 2 or more dwelling rooms	0.001	0.784
Proportion of households with clean fuel for cooking	-0.001	0.778
Proportion of households accessing banking services	-0.001	0.649
Proportion of households with no toilet facility within the premises	-0.001	0.790
Demographic variables		
Proportion of females	-0.072	0.000
Proportion of persons aged 60 plus	0.185	0.000
R-Squared	0.257	
Adjusted R-squared	0.241	

Source: Estimated from Census of India, 2011.

The findings of the socioeconomic and demographic correlates of disability prevalence are as follows: Districts where a large proportion of population belongs to STs tend to have higher disability rates. However, no statistically significant link is observed concerning SC communities. An additional change in female literacy appears to reduce disability prevalence rates at one per cent of significance. A higher level of urbanisation indicates higher incidence of disability. Although social determinants of health outcomes (i.e., of disability) are much worse in rural areas than urban areas, a higher level of urbanisation is linked to a higher level of incidence of disability at one per cent level of significance. Increase in the proportion of main workers is associated with a decrease in rates of

disability prevalence. It shows that gainful employment can have a significant impact in reducing disability. The proportion of households living in dilapidated buildings is positively and statistically significantly associated with disability. Therefore, dilapidated buildings can exacerbate disability in the districts. A unit increase in the accessibility or availability of safe drinking water appears to reduce disability at one per cent level of significance.

However, the study finds no statistically significant association between disability prevalence and proportion of households with two or more dwelling rooms, proportion of households with clean fuel for cooking, proportion of households accessing banking services and proportion of households without toilet facility within the premises. R-squared of 0.25 shows that the included explanatory variables could explain only 25 per cent of the total variations in the prevalence of disability.

VII. Implications and Conclusions

Disability inclusive policies are a developmental challenge to modern states. A concern has been raised in the present study about the enumeration process. Available literature and empirical investigations carried out here show that there is an underestimation of disability prevalence in India, particularly among women mostly caused by sociocultural practices and inadequate enumeration process. Proper and accurate counting under specific categories and age cohorts of disability would better target to the desired groups of individuals, ensuring that benefits are not misappropriated.

Further, it stresses that the policymakers need to modify and expand the definition of disability used in the Census of India to produce an internationally comparable estimate of disability prevalence. It is important that the government comprehensively defined the disabled and what constitutes disability from both medical and social perspectives. There is an urgent need to improve the quality and reliability of disability data. By applying appropriate methods, significant improvement in data collection is possible. Properly training the enumerators and awareness among the respondents are the initial steps. More inclusive nature of data is expected if some of the disabled enumerators are involved at the data collection level. In addition, the disabled communities should also be involved at the upper stage of designing and executing public health policies. The upcoming round of Census enumeration to be conducted in 2021 has gained momentum. There is underreporting in the disability estimates of India. The issues examined here may lead to improvement and robustness in the validity and reliability of India's disability estimates in the coming Census survey under the broader ambit and commitment to the Agenda for Sustainable Development Goals for the year 2030.

The literature shows that there are sharp variations concerning caste, class, religion, region and gender for the disabled population in India. Social discrimination is one of the most significant problems experienced by such people. Disability brings in a socioeconomic burden and the dynamics of life undergoes a major change as disability sets in. It not only has implications on the individual but also his household. A cursory glance across the district level distribution of persons with disabilities suggests that the PWDs are scattered across every nook and corner in India with significant variations over time and space. The paper provides evidence that the incidence of disability is higher among the marginal and vulnerable sections of society than others.

Increase in life expectancy and faster growth of elderly disabled population would present a variety of socioeconomic and healthcare policy challenges in the context of changing family relations and severely limited income support for the older section of the society. Such issues become more relevant as India is already missing the opportunities of demographic dividend. Further, the "disability-determinant regression model" of the paper reveals that several socioeconomic and demographic factors are associated with higher incidence and prevalence of disability at the district level. Thus, understanding temporal and spatial variations and socioeconomic and regional divides in the disability sector are crucial for designing public health policies.

Limited public health care facilities, increasingly unaffordable private health services, low level of income and lower coverage of social security system will lead to a higher burden of PWDs on the society which calls for urgent provisioning of social protection and affirmative actions on the part of all the stakeholders.

Despite efforts of the government, civil society and disability rights activists, the largest section from them live in degenerated conditions. It is high time for them to focus on the holistic wellbeing of this largest hitherto marginalised, stigmatised and discriminated section of the society and accordingly make efforts to amalgamate them in the mainstream society. There is also a need for effective policy interventions to balance regional development and framing disability inclusive policies, particularly in the context of local idiosyncrasies. The country has no choice but to pay attention to the overall wellbeing of the disability sector.

India has enacted legislations in line with international conventions and standard practices to improve the lives of the persons with disabilities. Nonetheless, there is a need to move beyond the charity-based approach, medical model and patronising attitude. Most importantly, the recent global pandemic “COVID-19” gives an opportunity to the government to reorient its health strategies towards the disability sector.

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