**Socioeconomic and Demographic Correlates of Disability Prevalence**

**In India: A Cross-Sectional Study**

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**Abstract**

The present study examines nature and extent of disability prevalence across gender, regions and social groups in India at the district level. Further, it makes an attempt to investigate the association between disability prevalence andthe selected socioeconomic and demographic contextual characteristics across districts. Cross-sectional regression technique was performed to identify and estimate the factors affecting overall disability prevalence and for different types of disabilities available in the census 2011 data. Descriptive Statistics of outcome variables (disability by types) and explanatory variables (socio-economic-demographic characteristics) is also provided for the districts of India in 2011.Based on the estimates of the regression models, the findings of the study suggested that a number of socio-economic-demographic factors affected disability prevalence rates in India. Also, different factors affect ‘disabilities by types’ differently. For total PWDs, the disability rates in the districts increase where there is higher proportion of population who are urban dwellers, living in dilapidated buildings, aged 65 years or above and belong to scheduled tribe communities. On the other hand, the rate of disability prevalence across districts decreases with increasing proportion of the population who are main workers, proportion of the population who are females and also females having higher literacy rates and proportion of the population who are members of SCs. However, the values of some other important variables like provisions of toilet facilities and safe drinking water are statistically insignificant.

As the burden of disability falls disproportionately across geographic regions and socioeconomic groups, public health policies in India should take this variation into account. It is also crucial that the government, civil society, and other stakeholders steps up efforts to improve overall well-being of the disabled population who are largely underprivileged as the available literature shows disabled people suffered from multiple deprivations. Therefore, providing access to basic capabilities to persons with disabilities may be strategically important to reduce the challenges for disabled people in India. The findings of this study are relevant for the design of public health policies and programs in India.

**Keywords:** Socio-economic-demographic characteristics, Prevalence of Disability and its Correlates, Social Protection, Public Policy.

**JEL Classifications:** J11, J14, J18, J21, J71

**1. Introduction**

Disability is part of the human condition. Almost everyone will be temporarily  
or permanently impaired at some point in life, and those who survive to old age  
will experience increasing difficulties in functioning (WHO, 1948 and UNCRPD, 2006). Disability is complex, dynamic, multidimensional, and contested (World report on Disability, 2011). Leni C. (2006) viewed that disability is difficult to define since it varies in type, form and intensity. Traditionally, disability has been defined in terms of “medical model”, however of late there has been a shift from “medical model” to “social model” of disability. In ‘social model’ people are viewed as being disabled by society rather than by their bodies (Oliver, 1990). Of late, researchers have observed the role of social and physical barriers in disability. Hence, disability is increasingly regarded as a major development issue by many development agencies (DFID, 2000).

Amartya Sen (1998) opined that disabled People are not only the most deprived human beings but also the most neglected. Experts world over are of the view thatpeople with disabilities are the largest minority group in the world. Jha (2016) pointed out 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”. It is evident from the body of literature that disability brings in a socio-economic 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 on his household. Despite efforts of government, civil society and disabled rights activists, the largest section belonging to them are living in degenerated conditions. Today, we are living in neo-liberal era where the state has started withdrawing from various services and sectors. In this context, Bhaduri (2008) wrote that as the state withdraws from the service sector, access to basic necessities such as education, health, employment, and food and water security has become increasingly difficult for vulnerable populations. Also, little critical analysis of economic globalization and privatization exists from a disability rights perspective.

An examination of 2001 and 2011 population census of India data suggest that there is socioeconomic and regional divide in prevalence of disability in India (Saikia, 2016). Empirical analysis also suggests that incidence of disability falls disproportionately across different geographic regions and socioeconomic groups. At all India level, there are 2.21% (2.68 crore) persons with disabilities (PWDs) as per census 2011 as against 2.1% in census 2001. As per census 2011, of the total PWDs, 56% are males whereas 44% are females. However, this gender gap disappears and further reverses while approaching older ages. Further, out of total schedules cate population 2.45% are disabled, whereas, it is 2.05% for scheduled tribes. Therefore, disability is more concentrated among Dalits in India. Almost 70% PWDs reside in rural areas whereas 30% in urban areas. As per census 2011, as far as analysis for different types of disabilities is concerned, highest proportion of disability was observed among persons with movement disability (20.28%). It is followed by hearing disability (18.92%), seeing disability (18.77%) and ‘any other’ disability (18.38%). An important aspect to note is very high number of ‘any other’ category of PWDs. The lowest proportion of prevalence of disability was observed among persons with mental illness (2.70%), it is followed by mental retardation (5.62%), speech disability (7.45%) and multiple disability (7.89%).

The present study has been conceptualized with the following rationale. Firstly, disability is an important development issue and poses challenges to the modern state in the era of neo-liberalism. Secondly, disabled population is not only the largest minority groups but also most vulnerable. They suffer from higher incidence of illiteracy, unemployment and poverty. Also, they have poor health outcomes. In addition, they also face social discrimination, stigma, and exclusion. Thirdly, there are only a couple of studies which examined association between disability prevalence and socio-economic-demographic characteristics in India. India has very low per-capita income along with poor nutritional standards, particularly among women, poverty may increase the risk of disability in many ways to a large section of society. Fourthly, India is already missing the opportunities of demographic dividend and increasingly experiencing higher health and environmental risks, which may further worsen the condition of persons with disabilities in particular. Mishra and Mohanty (2017) highlighted that India is on advanced stage of demographic and epidemiological transition that might be leading to increase in disability across age groups. Last but not the least, availability of quality data is the biggest constraint in carrying out research in the disability sector. Besides, experts are pointing out that there is clear sign of underestimation of disability numbers in India. Therefore, understanding the correlates of disability with the limited secondary data is a huge challenge.

Limited public health care facilities, increasingly unaffordable private health services, low level of income and also lower coverage of social security system will lead to higher burden of disability on society. Javed Abidi (2016) analyzed the budgetary trend and points out that since 2008; India spends only 0.009 percent of its GDP on disability. Therefore, the study also urge to provide social protection to this largely underprivileged group. In this context, it is pertinent that the state and society should pay special attention to persons with disabilities, particularly, under the broader ambit of  the social protection policies of the state. In light of these insights the study seeks to examine the socio-economic and demographic factors affecting disability prevalence across districts of India.

**2. Review of Literature**

The term disability involves complex interactions between individual and social environment (Topliss, 1979). The medical model of disability finds strong link between disability and diseases and health problems. So, it considers disability as a health problem. But the World Programme of Action concerning persons with disabilities finds out hosts of factors responsible for disability. This includes social conflicts, natural disasters, accidents, poverty, resource constraints, unhygienic living conditions, physical and social barriers, and psycho-social problems. Disability may exist from birth or may be acquired during a person’s lifetime. Lack of access to health services is a significant cause of disability (WHO, 2002). Elwan (1999) reviewed vast literature on the subject and summarizes that there is higher incidence of disability rates in developing countries which is because of higher illiteracy, lower immunizations, poor nutritional status, lower birth weight, lack of adequate and timely health care lower occupational mobility and higher unemployment rates. Besides, accidents and conflicts are important causes of disability particularly in developing countries.

Existing literature in the Indian context suggest that there are sharp variations with regard to caste, class, religion, region, and gender for the disabled population in India. Social discrimination is one of the most significant problems experienced by people with disability. World Bank report (2007) 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. The lowest section of society particularly in PWD group doesn't have easy access to health and education and remain trapped in vicious circle of poverty. Maulik and Darmstadt (2007) suggested the evidence that malnutritionleads to disability in developing countries. Access to education and labour market are abysmally low for the persons with disability. Mitra and Sambamoorthi (2006) examined that disability is significantly associated with lower employment rates in developing countries. PWDs suffer from poor health, lower educational outcomes, fewer job opportunities and face higher incidence of disability [Elwan, 1999; Yeo and Moore 2003].

Coppin and et. al. (2006) found that higher prevalence of disability is associated with decreasing socio-economic status. There are recent studies which suggest that socio-economic inequalities and prevalence of disability are correlates [Braithwaite and Mont, 2009; Yeo and Moore, 2003 and Elwan, 1999]. Persons with disabilities tend to suffer from physical, mental and sensory impairment, hence, these people systematically get excluded from the development narrative [Appunni and Deshpande, 2009; Meyer and Mok, 2009]. Gannon and Munley (2009) examined that people in older age suffer from multiple disabilities. It means that people tend to more disabled while they start ageing. This pattern holds true for all types of disabilities, that is, disability is an increasing function of age**.** There are several studies which show that hearing and intellectual disability is positively and significantly associated with increasing age (Mishra and Mohanty, 2017). Disability leads to increasing dependency and health spending at households [Gannon and Nolan, 2004; WHO 2001]. In this context, this paper examines the socio-economic and demographic correlates of disability in India.

**2.1. Objective**

**To examine the association between disability prevalence and the socio-economic-demographic characteristics of the districts of India using census 2011 data.**

**2.2. Hypothesis**

Prevalence of disability is associated with a number of socio-economic-demographic characteristics and different factors affect the incidence of ‘disability by type’ differently.

**2.3. Materials and Methods**

The study has made use of Census 2001 and 2011 data across districts of India. There are eight types of disabilities data available in census 2011 namely, disability in seeing, hearing, speech, movement, mental retardation, mental illness, any other disabilities and multiple disabilities. All these eight types of PWDs were included in the study.

With the help of Geographic Information System (GIS) technique, the spatial distribution of disability prevalence was examined at the district level. OLS regression analysis is carried out to understand the association between disability prevalence (by types of disabilities) and socio-economic-demographic characteristics at the district level using census 2011 data, the dependent variable being disability prevalence rates and possible explanatory variables being proportion of female, people aged 60 plus, proportion of SCs and STs, female literacy, urban population, main workers, households with safe drinking water, households in dilapidated buildings, households with two or more dwelling rooms, households with clean fuel for cooking, households accessing banking services and households with no toilet facilities. In addition, descriptive Statistics of outcome variables (Disability by Types) and explanatory variables (socio-economic-demographic characteristics) is also provided for the districts of India in 2011.

**2.4. Statistical Software Used:** OLS regression analysis has been carried out using STATAMP 13.0 software.

**2.5. Explanation of Selected Variables and Building the Regression Models**

The regression equations were used to estimate the socio-economic-demographic factors that affects disability prevalence across districts of India in 2011. The dependent and independent variables of the regression models are as follows:

**Outcome Variables:** The dependent variables in the regression model are total persons with disabilities and all 8 types of disabilities mentioned in census 2011. The data was collected for all the 640 districts and 35 states and union territories. The prevalence of disability was defined as the proportion (percentage) of total PWDs out of total population of that particular district. Further, the study carried out segregated analysis, that is, all eight types of disabilities and their determinants were examined separately. For example; prevalence of movement disability was defined as proportion(percentage) of persons having movement disability out of total persons with disabilities in that particular district, similarly for all categories of disability.

**Explanatory Variables:** After examining the available literature on the subject related to health and disability in India, the selected district level contextual variables (socio-economic-demographic) are as follows:

1) the proportion of population who are females (as nutritional outcome among women is poor), 2) The proportion of the population whose age are over 60 years (elder people tend to have more illness and bodily difficulties), 3) The literacy rates among females, 4) The proportion of the population who are members of SCs, 5) The proportion of the population belonging to STs communities. The constitution of India recognizes the facts that scheduled castes and scheduled tribes are disadvantaged communities. Therefore, these groups also have poor health outcomes than the general population. The census of India does not have data related to income or expenditure of these population groups used in the present study. Hence, a few alternative variables were used as proxies for these indicators. 6) The proportion of the population living in urban areas, 7) The proportion of the population who are main workers (working for six months or more with regard to the reference period). Average living conditions of the households were examined under the following heads; 8) The proportion of the population having access to safe drinking water (i.e., access to water from Tap (treated+untreated)+Hand Pump+Tube Well), 9) The proportion of the households who were living in a dilapidated building, 10) Proportion of households who did not have access to toilet facilities within the premises, 11) Proportion of households who used clean fuel for cooking, 12) Proportion of households with 2 or more dwelling rooms, 13) Proportion of households accessing banking services.

**3. Nature and Extent of Disability Prevalence: Analysis Using Census 2001 and 2011**

Table 1 explains Indian demographic scenario using census 2001 and 2011 data. Further, demographic status of disabled persons in 2001 and 2011 is examined and a statistical comparison is made between them. The total population of India in 2001 was 102.86 crore, which increased to 121.09 crore in 2011. On the other hand, the total number of PWD in 2001was 2.19 crore, which increased to 2.68 crore in 2011. It shows faster rate of growth of disabled persons in India than overall population. In addition, the share of males and females are 51% and 48% respectively in 2001 for all India. However, the share of disabled males and females are 57% and 42% respectively in 2001. Therefore, the gender gap for PWDs are far more compared to total population of India. As compared to 2001 data, in 2011, roughly, the gender composition for India remained the same. However, PWDs gender composition is more volatile. The gender gap in 2011 has slightly narrowed down as its percentage share is 56% and 44% for males and females respectively.

**Table 1: Population of India and Persons with Disabilities in Census 2001 and 2011**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Population of India in 2001**  **(in Crore)** | | | **Disabled Persons of India in 2001**  **(in Crore))** | | |
| **Persons** | **Males** | **Females** | **Persons** | **Males** | **Females** |
| **102.86** | **53.22 Cr** | **49.65 Cr** | **2.19 Cr** | **1.26 Cr** | **0.93 Cr** |
| **Share** | **51.74** | **48.26** | **Share** | **57.54** | **42.46** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Population of India in 2011**  **(in Crore)** | | | **Disabled Persons of India in 2011**  **(in Crore)** | | |
| **Persons** | **Males** | **Females** | **Persons** | **Males** | **Females** |
| **121.09 Cr** | **62.33 Cr** | **58.76 Cr** | **2.68 Cr** | **1.50 Cr** | **1.18 Cr** |
| **Share** | **51.47%** | **48.53%** | **Share** | **55.90%** | **44.10%** |

**Source: Numbers Compiled from Census 2001 and 2011**

It is pertinent to mention here one of the most important findings of the study that men tend to have higher prevalence of disability than that of women in India. The result seems to be contradictory because in many countries it is evident that women have higher disability prevalence rates [WHO (2011), Andrade and et.al., (2011)]. Some of the possible explanations for the unexpected patterns can be as follows: Firstly, most of the studies found that women tend to suffer from chronic conditions that are less lethal or severe as compared to men. In this sense, it can be attributed that there is underreporting of milder form of disability among women in the census figures. Secondly, the possibility of underreporting can also not be ruled out because of perceive sociocultural conditions like idiosyncratic norms and behaviour, stigma attached and tendency to overlook women. Thirdly, there is widespread gender discrimination in terms of nutrition and health care. Thus, excessive mortality rates are evident among women in the age group of 0-5 years in India (Bongaarts, 2015). In this sense, it is possible that because of the double burdens of disability and discrimination, women with disability are subjected to higher death rates relative to men with disability and the females without disabilities.

Table 2 shows social composition of PWDs during 2001 and 2011. There were 2.13% disabled persons in 2001, which increased to 2.21% in 2011. In 2001, It was 2.37% for males and 1.87% for females, which increased to 2.41% for males and 2.01% for females respectively in 2011. For both SCs and STs, proportion of disability has increased between 2001 and 2011. Lowest disability is observed for Indian STs. However, SCs have the highest prevalence of disability and it needs to be stressed upon.

**Table 2: Proportion of Disabled Persons by Social Groups in India**

**As per Census 2001 and 2011**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **2001** |  |  | **2011** |  |  |
| **Social Groups** | **Persons** | **Males** | **Females** | **Persons** | **Males** | **Females** |
| **Total** | 2.13 | 2.37 | 1.87 | 2.21 | 2.41 | 2.01 |
| **SC** | 2.23 | 2.47 | 1.97 | 2.45 | 2.68 | 2.20 |
| **ST** | 1.92 | 2.12 | 1.71 | 2.05 | 2.18 | 1.92 |

**Source: Compiled from Census 2001 and Census 2011**

Table 3 presents share of PWDs for different categories and across different social groups in 2001 and 2011. In 2001, close to half of the PWDs had “in seeing” disability as compared to

18.77% in 2011. Again, SCs had the highest share in 2001 but in 2011, STs had the highest share. In 2001, the persons who had seeing impairment experienced drastic decline. It may be because of estimation error. The number for speech disability has also slightly declined in 2011 from 7.49% to 7.45%. There is very high increase in “hearing” disability from 5.76% to 18.92%. STs have the highest in hearing disability at 19.36%. It is interesting to note that movement disability has significantly declined from 27.87% to 20.28%.

It is important to highlight that only 5 types of disability data were collected in 2001 census. It went up to 8 types of PWD categories in census 2011. In 2001, data was collected only for mental disability, however, it was bifurcated into two groups, mental retardation (R) and mental illness (I), while collecting data in census 2011. For the sake of simplicity and comparative analysis, mental (I) and mental (R) has been clubbed to make a comparative study. In addition, data on two new categories multiple disability and any other disability was collected in 2011. Experts are of the view that precise comparison between the two-time period cannot be done. It is like comparing the incomparable. Both rounds of census data used different methodology to define disability and collect data. Nevertheless, presenting pictures of both the periods will help to understand the demographic composition and help framing public policies in the specific sector. Any-other category has emerged as the fourth largest category of disability. This category was included to overcome the problem of estimation or counting the numbers of persons with disabilities. In other words, those PWDs which are not listed in the census question, the informants were required to report in this category. Census data in the ‘any other ‘ category is significantly large (around 18%). Very high number of any other disability also shows lacunae in the enumeration process of the census. Itmay be possible that theenumerators may not have properly explained the definition of any other disability to the informants. Inaccurate numbers pose challenged to the development policy framing.

Out of total PWDs, there were 10.33% mentally disabled people in 2011, which has slightly declined to 8.31% in 2011. There were 5.62% mentally retarded people and 2.70% mentally ill persons in 2011. Multiple disabled persons constitute 7.89% of the total PWDs and the highest multiple disability is observed for STs. It is important to highlight that “any other” category of PWD has a very high share of the total PWDs, it 18.38%. SCs are the highest in “any other” PWD category.

**Table 3: Proportion of Disabled Persons by Type of Disability and Social Groups in India in Census 2001 and 2011**

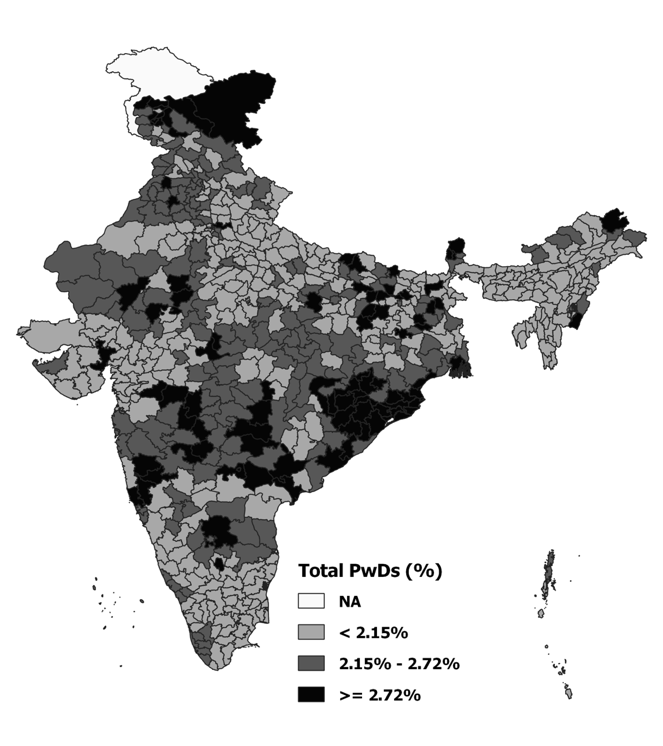
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **2001** |  |  | **2011** |  |  |
| **Type of Disability** | **Total (%)** | **SC (%)** | **ST (%)** | **Total (%)** | **SC (%)** | **ST (%)** |
| **Seeing** | 48.55 | 48.60 | 48.38 | 18.77 | 19.11 | 20.00 |
| **Speech** | 7.49 | 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: Compiled from Census 2001 and 2011 Data**

**3.1. Spatial Analysis of Disability Distribution across Districts of India in 2011**

The following figure presents the spatial image of total disability prevalence in India at the regional level using Geographic Information System (GIS) mapping technique. The prevalence rates are calculated as a proportion of persons with disability out of total population in that particular district. Disability is well spread across most districts of India. However, there are some clusters where there is very higher concentration of incidence of disability. In addition, there are some zones where there is continuous spread of prevalence of disability (beyond the territorial boundary of the states). The regions which have witnessed very high disability prevalence are the states of Jammu and Kashmir, Odisha, some parts of Maharashtra, and Arunachal Pradesh, followed by Rajasthan, Punjab, Haryana, Karnataka, Andhra Pradesh and Chhatisgarh. Comparatively lower incidence of disability can be observed in the states of Tamilnadu, some parts of Kerala, Uttar Pradesh and Bihar.

**Prevalence of Disability across Districts of India in 2011**



**4. Statistical Analysis and Interpretation of Regression Results**

Table 4 presents the summary statistics of different types of disabilities for all the 640 districts as per census 2011.The average value of the percentage of persons with disabilities is 2.15%, and the values vary between 0.76% (minimum) and 4.51% (maximum). The average value of the percentage of males with disabilities is 2.33%, which is higher than females counterpart (1.96). The average values for males vary between 0.72% and 4.76% and the average values for females vary between 0.85% and 4.55%. The average values for seeing PWDs is 17.50%, the minimum value being 7.98% and maximum value being 58.74%, it shows high variability. The standard deviation is 5.17 for persons with seeing disability. As we know that the standard deviation of a data set is a calculated number which explains how close, or how far, the values of that data set are in relation to its mean. Therefore, the more spread-out the data, the higher the standard deviation. The mean prevalence rate of hearing PWDs is 19.29%, the minimum being 9.97% and maximum being 53.54%. The average values of the percentage of persons with speech disability, mental retardation, mental illness and multiple disability are 6.62%, 5.79%, 3.04% and 8.89%. The mean value of persons with movement disability is 21.23%, the minimum value is 4.82% and maximum value is 39.13%. So, there is very high variability and the standard deviation is 6.42%, it is the highest among all types of disabilities. The average value of the percentage of persons with any other disability is 17.64%. and the values vary between 5.80% and 32.53%, the standard deviation being 4.46%.

**Table 4: Descriptive Statistics of Disability by Types (outcome variables) across 640 Districts of India in 2011**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Districts** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| **Persons with Disabilities (PWDs)** | 640 | 2.15 | 0.57 | 0.76 | 4.51 |
| **Male PWDs** | 640 | 2.33 | 0.60 | 0.72 | 4.76 |
| **Female PWDs** | 640 | 1.96 | 0.55 | 0.85 | 4.55 |
| **Seeing PWDs** | 640 | 17.50 | 5.17 | 7.98 | 58.74 |
| **Hearing PWDs** | 640 | 19.29 | 5.65 | 9.97 | 53.54 |
| **Speech PWDs** | 640 | 6.62 | 3.06 | 2.17 | 25.71 |
| **Movement PWDs** | 640 | 21.23 | 6.42 | 4.82 | 39.13 |
| **Mental Retardation** | 640 | 5.79 | 1.68 | 1.42 | 12.11 |
| **Mental Illness** | 640 | 3.04 | 1.47 | 0.69 | 10.26 |
| **Any-other PWDs** | 640 | 17.64 | 4.46 | 5.80 | 32.53 |
| **Multiple PWDs** | 640 | 8.89 | 3.03 | 2.64 | 18.55 |

**Source: Calculated from census 2011 data**

Table 5 shows the descriptive statistics for the exposure variables for all the 640 districts as per census 2011. All of these socioeconomic and demographic characteristics examined vary significantly across districts of India. For example, the proportion of the population who belong to SCs range from a minimum of 0% to a maximum of 50.17%, the proportion of population who are members of STs ranges from 0% to 98.58%. The district level female literacy rate is around 55% on an average, it varies from 24.25% to 88.62%. The proportion of the workers who are main workers constitute about 73%, and ranges from 12% to 96%. If we analyse demographic profile we find that the proportion of females on an average is around 49% across districts, it ranges from 34.79% to 54.22%. Last but not the least, proportion of elderly persons (60 plus) is on an average about 8.60% and it ranges between 2.63% and 17.92%.

**Table 5. Descriptive statistics for explanatory variables across 640 districts of India in 2011 (in %)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Districts** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| **Socioeconomic** |  |  |  |  |  |
| **Proportion of SC** | 640 | 14.86 | 9.13 | 0.00 | 50.17 |
| **Proportion of ST** | 640 | 17.71 | 27.00 | 0.00 | 98.58 |
| **Proportion of Female Literacy** | 640 | 55.23 | 12.41 | 24.25 | 88.62 |
| **Proportion of Urban Population** | 640 | 26.40 | 21.12 | 0.00 | 100 |
| **Proportion of Main Workers** | 640 | 73.29 | 12.65 | 30.65 | 96.4 |
| **Proportion of Households in Dilapidated Buildings** | 640 | 4.99 | 3.11 | 0.23 | 17.74 |
| **Proportion of Households with Safe Drinking Water** | 640 | 79.79 | 19.38 | 1.37 | 99.96 |
| **Proportion of Households with 2 or more Dwelling Rooms** | 640 | 61.99 | 15.08 | 11.57 | 93.65 |
| **Proportion of Households with Clean Fuel for Cooking** | 640 | 27.15 | 21.68 | 1.12 | 98.64 |
| **Proportion of Households Accessing Banking Services** | 640 | 57.27 | 16.48 | 10.27 | 97.77 |
| **Proportion of Households with no Toilet Facility within the Premises** | 640 | 53.22 | 26.33 | 1.13 | 95.22 |
| **Demographic** |  |  |  |  |  |
| **Proportion of Females** | 640 | 48.55 | 1.64 | 34.79 | 54.22 |
| **Proportion of Persons aged 60 plus** | 640 | 8.60 | 2.08 | 2.63 | 17.92 |

**Source: Calculated from census 2011 data**

Table 6 provides the outcome of the linear regression model which assesses the relationships between important socioeconomic and demographic characteristics across districts of India and disability prevalence rates at the district level. There is strong correlation between males disability and females disability, therefore, total persons with disabilities is chosen as the left-hand-side (dependent variable). The outcome of demographic characteristics across districts suggest that Proportion of females and proportion of persons who are 60 or above (elderly population) are significantly associated with disability prevalence. A 1% increase in the number of persons who are above 60 years of age is associated with 0.18% increase in the prevalence of disability. Increase in proportion of females is associated with declining disability prevalence rates, at 1% level of significance.

The findings of the socio-economic determinants of disability prevalence is as follows: The districts where a large proportion of population belong to SCs tend to have lower disability rates, however, opposite is the case with STs. Additional change in female literacy appears to affect disability prevalence rates negatively. Higher level of urbanization indicates the higher level of incidence of disability. Increase in the proportion of main workers is associated with decrease in rates of disability prevalence. It shows gainful employment can have significant impact in reducing the burden of disability. Proportion of households living in dilapidated buildings is positively and statistically significantly associated with disability prevalence, therefore, dilapidated buildings can exacerbate the burden of disability in the districts. The study finds no statistically signification associations between disability prevalence and the proportion of households with safe drinking water, proportion of households with two or more dwelling rooms, proportion of households with clean fuel for cooking, proportion of households accessing banking services, and the proportion of households with no toilet facility within the premises. R-Squared of 0.25 shows that the included explanatory variables could explain only 25% of the total variations in the prevalence of disability.

**Table 6: Socioeconomic and Demographic Determinants of Disability Prevalence Variation across Districts**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Coefficients** | **P-Values** |
| **Socioeconomic** |  |  |
| **Proportion of SC** | -0.006 | 0.045 |
| **Proportion of ST** | 0.004 | 0.001 |
| **Proportion of Female Literacy** | -0.013 | 0.000 |
| **Proportion of Urban Population** | 0.008 | 0.000 |
| **Proportion of Main Workers** | -0.014 | 0.000 |
| **Proportion of Households in Dilapidated Buildings** | 0.033 | 0.000 |
| **Proportion of Households with Safe Drinking Water** | 0.001 | 0.603 |
| **Proportion of Households with 2 or more Dwelling Rooms** | 0.001 | 0.679 |
| **Proportion of Households with Clean Fuel for Cooking** | -0.001 | 0.588 |
| **Proportion of Households Accessing Banking Services** | -0.001 | 0.578 |
| **Proportion of Households with no Toilet Facility within the Premises** | -0.001 | 0.331 |
| **Demographic** |  |  |
| **Proportion of Females** | -0.068 | 0.000 |
| **Proportion of Persons aged 60 plus** | 0.185 | 0.000 |
| **R-Squared** | **0.250** |  |
| **Adjusted R-Squared** | **0.234** |  |

**Source: Calculated from census 2011 data**

**4.1. Socioeconomic and demographic determinants of ‘disability by type’ in India**

This section examines socio-economic and demographic factors that affect prevalence of disability across districts of India in 2011.

Table 7 estimates determinants of persons having visual disability. The findings suggest that the factors which affect overall prevalence of disability does not vary much than that of “seeing disability” in particular. The demographic independent factors, proportion of females and elder population, have statistically significant impact on prevalence of seeing disability. One unit increase in proportion of females is associated with 0.20 units decrease in the prevalence rates of seeing disability, however, opposite is the case with proportion of persons aged 60 plus. After examining socio-economic factors, we find that some of these factors don’t seem to directly affect seeing disability prevalence. No statistically significant association with persons with seeing disability was observed for the exposure variables, proportion of households with safe drinking water, proportion of households with clean fuel for cooking, proportion of households with 2 or more dwelling rooms, proportion of households with no toilet facility within the premises, and proportion of households accessing banking services. It can be observed that although, the districts where a relatively large share of the population belong to ST categories also tend to have higher prevalence rates for seeing disability. However, this is not the case for districts where a large share of the population belong to the SC categories. Districts which are more urbanized also tend to have higher prevalence of disability. Higher Proportion of female literacy and a large proportion of main workers are linked to decrease in seeing disability prevalence rates.

**Table 7. Socioeconomic and Demographic Determinants of Seeing Disability Prevalence Variation across Districts**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Coefficients** | **P-Values** |
| **Socioeconomic** |  |  |
| Proportion of SC | -0.004 | 0.000 |
| Proportion of ST | 0.001 | 0.059 |
| Proportion of Female Literacy | -0.004 | 0.001 |
| Proportion of Urban Population | 0.003 | 0.000 |
| Proportion of Main Workers | -0.005 | 0.000 |
| Proportion of Households in Dilapidated Buildings | 0.013 | 0.000 |
| Proportion of Households with Safe Drinking Water | 0.000 | 0.654 |
| Proportion of Households with 2 or more Dwelling Rooms | 0.000 | 0.937 |
| Proportion of Households with Clean Fuel for Cooking | -0.001 | 0.409 |
| Proportion of Households Accessing Banking Services | -0.001 | 0.354 |
| Proportion of Households with no Toilet Facility within the Premises | 0.000 | 0.927 |
| **Demographic** |  |  |
| Proportion of Females | -0.020 | 0.000 |
| Proportion of Persons aged 60 plus | 0.040 | 0.000 |
| **R-Squared** | **0.163** |  |
| **Adjusted R-Squared** | **0.146** |  |

Table 8 provides estimates of socio-economic and demographic factors which affect prevalence of hearing disability across districts. Proportion of population who are members of SCs does not affect prevalence of hearing disability, as the P-value is statistically insignificant. Rest, all the 12 variables produce statistically significant association, however, the link between disability prevalence and many of the exposure variable does not appear to be theoretically consistent, to the best of my understanding. For example, among the variables which reflect average household living conditions, we found the proportion of households with safe drinking water, proportion of households with two or more dwelling rooms, proportion of households with clean fuel for cooking are linked to increase in disability rates for persons with hearing disability. Similarly, proportion of households with no toilet facility within the premises tend to lower hearing disability prevalence rates. Therefore, these contradictory results require further research and examination, may be beyond social model of enquiring disability question. A 1% increase in the proportion of households availing banking services is associated with decrease in disability prevalence rates. Districts with larger numbers of elderly persons and STs are associated with higher disability rates. Increase in the proportion of females tend to reduce prevalence of hearing disability.

**Table 8. Socioeconomic and Demographic Determinants of Hearing Disability Prevalence Variation across Districts**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Coefficients** | **P-Values** |
| **Socioeconomic** |  |  |
| Proportion of SC | -0.001 | 0.135 |
| Proportion of ST | 0.002 | 0.000 |
| Proportion of Female Literacy | -0.003 | 0.002 |
| Proportion of Urban Population | 0.001 | 0.053 |
| Proportion of Main Workers | -0.005 | 0.000 |
| Proportion of Households in Dilapidated Buildings | 0.012 | 0.000 |
| Proportion of Households with Safe Drinking Water | 0.001 | 0.004 |
| Proportion of Households with 2 or more Dwelling Rooms | 0.001 | 0.003 |
| Proportion of Households with Clean Fuel for Cooking | 0.001 | 0.047 |
| Proportion of Households Accessing Banking Services | -0.001 | 0.053 |
| Proportion of Households with no Toilet Facility within the Premises | -0.001 | 0.042 |
| **Demographic** |  |  |
| Proportion of Females | -0.032 | 0.000 |
| Proportion of Persons aged 60 plus | 0.024 | 0.000 |
| **R-Squared** | **0.241** |  |
| **Adjusted R-Squared** | **0.226** |  |

Table 9 presents estimates of factors affecting speech disability across districts of India in 2011. Districts having larger proportion of SC persons and proportion of households with 2 or more dwelling rooms are associated with decline in prevalence of speech disability. The study found no statistically significant association between speech disability prevalence and Proportion of ST, proportion of female literacy, proportion of urban population, proportion of main workers, proportion of households with safe drinking water, proportion of households with clean fuel for cooking, proportion of households accessing banking services, proportion of households with no toilet facility within the premises, proportion of females. Therefore, it can be inferred that there are only few explanatory variables which have been able to affect prevalence rate among persons having speech disability. A 1% increase in the proportion of population who are over age 60 and proportion of households living in dilapidated buildings are linked to increase in the prevalence of speech disability.

**Table 9 Socioeconomic and Demographic Determinants of Speech Disability Prevalence Variation across Districts**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Coefficients** | **P-Values** |
| **Socioeconomic** |  |  |
| Proportion of SC | -0.004 | 0.000 |
| Proportion of ST | 0.000 | 0.172 |
| Proportion of Female Literacy | 0.000 | 0.845 |
| Proportion of Urban Population | 0.000 | 0.654 |
| Proportion of Main Workers | 0.001 | 0.121 |
| Proportion of Households in Dilapidated Buildings | 0.004 | 0.003 |
| Proportion of Households with Safe Drinking Water | 0.000 | 0.583 |
| Proportion of Households with 2 or more Dwelling Rooms | -0.001 | 0.058 |
| Proportion of Households with Clean Fuel for Cooking | 0.000 | 0.504 |
| Proportion of Households Accessing Banking Services | 0.000 | 0.554 |
| Proportion of Households with no Toilet Facility within the Premises | 0.000 | 0.125 |
| **Demographic** |  |  |
| Proportion of Females | -0.004 | 0.120 |
| Proportion of Persons aged 60 plus | 0.020 | 0.000 |
| **R-Squared** | **0.193** |  |
| **Adjusted R-Squared** | **0.176** |  |

Table 10 examines socio-economic and demographic determinants of movement disability across districts in 2011. The proportion of population who are members of SC is positively linked to higher prevalence of movement disability, it is significant at 10% level. There is no statistically significant association between prevalence of movement disability and the proportion of ST, proportion of main workers, proportion of households accessing banking services**,** proportion of females. The exposure variables which reflect average household living conditions, the study found the proportion of households in dilapidated buildings, proportion of households with safe drinking water, proportion of households with 2 or more dwelling rooms, proportion of households with clean fuel for cooking are negatively associated with prevalence of movement disability. Finally, the proportion of households with no toilet facility within the premises is linked to increase in disability rate. The districts having higher proportion of female literacy is linked to decline in disability prevalence. The districts which are more urbanized tend to have higher prevalence rates for movement disability.

**Table 10. Socioeconomic and Demographic Determinants of Movement Disability Prevalence Variation across Districts**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Coefficients** | **P-Values** |
| **Socioeconomic** |  |  |
| Proportion of SC | 0.002 | 0.069 |
| Proportion of ST | 0.000 | 0.170 |
| Proportion of Female Literacy | -0.003 | 0.000 |
| Proportion of Urban Population | 0.002 | 0.001 |
| Proportion of Main Workers | 0.001 | 0.221 |
| Proportion of Households in Dilapidated Buildings | -0.006 | 0.010 |
| Proportion of Households with Safe Drinking Water | -0.001 | 0.042 |
| Proportion of Households with 2 or more Dwelling Rooms | -0.001 | 0.071 |
| Proportion of Households with Clean Fuel for Cooking | -0.002 | 0.016 |
| Proportion of Households Accessing Banking Services | 0.000 | 0.241 |
| Proportion of Households with no Toilet Facility within the Premises | 0.002 | 0.000 |
| **Demographic** |  |  |
| Proportion of Females | -0.002 | 0.682 |
| Proportion of Persons aged 60 plus | 0.045 | 0.000 |
| **R-Squared** | **0.345** |  |
| **Adjusted R-Squared** | **0.331** |  |

Table 11 presents determinants of mental disability across districts in 2011. The districts observing higher urbanization is associated with higher prevalence of mental disability. A unit increase in proportion of main workers is linked to decline in disability rates. Proportion of SCs/STs and female literacy have statistically insignificant P-values. As far as household living standards is concerned, the study found that the proportion of households with 2 or more dwelling rooms, proportion of households with clean fuel for cooking, proportion of households accessing banking services don’t have statistically significant relations with prevalence of mental disability. The districts having higher share of households living in dilapidated buildings is positively associated with increase the prevalence rate of mental disability. Proportion of households with safe drinking water and proportion of households with no toilet facility within the premises represent negative and significant association with prevalence of mental disability. The two important demographic factors, the proportion of population who are females and the proportion of the population who are above 60 years of age represent positive and statistically significant association with prevalence of mental disability. Finally, R-Squared for mental disability is the highest among all types of disabilities available in the study.

**Table 11. Socioeconomic and Demographic Determinants of Mental Disability Prevalence Variation across Districts**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Coefficients** | **P-Values** |
| **Socioeconomic** |  |  |
| Proportion of SC | -0.0002 | 0.5810 |
| Proportion of ST | 0.0000 | 0.7330 |
| Proportion of Female Literacy | 0.0004 | 0.1150 |
| Proportion of Urban Population | 0.0005 | 0.0010 |
| Proportion of Main Workers | -0.0008 | 0.0000 |
| Proportion of Households in Dilapidated Buildings | 0.0024 | 0.0010 |
| Proportion of Households with Safe Drinking Water | -0.0006 | 0.0000 |
| Proportion of Households with 2 or more Dwelling Rooms | 0.0000 | 0.9460 |
| Proportion of Households with Clean Fuel for Cooking | -0.0003 | 0.1960 |
| Proportion of Households Accessing Banking Services | -0.0002 | 0.1340 |
| Proportion of Households with no Toilet Facility within the Premises | -0.0006 | 0.0000 |
| **Demographic** |  |  |
| Proportion of Females | 0.0055 | 0.0000 |
| Proportion of Persons aged 60 plus | 0.0159 | 0.0000 |
| **R-Squared** | **0.4935** |  |
| **Adjusted R-Squared** | **0.4829** |  |

Table 12 shows the estimates of socio-economic and demographic determinants of prevalence of ‘any-other’ disability across districts in census 2011. Proportion of SCs, STs and urban population are positive and significantly associated with the prevalence of ‘any other’ disability. A 1% increase in the proportion of female literacy and main workers are linked decline in prevalence of any other disability. As far as household characteristics is concerned, the proportion of households living in dilapidated buildings, having two or more dwelling rooms and having access to safe drinking water are positively associated with prevalence of ‘any other’ form of disability. No statistically significant association was observed between prevalence of any other disability and the proportion of households with clean fuel for cooking and accessing banking services. Proportion of households having no access to toilet facilities within the premises negatively and significantly affect the rates of any other form of disability.

The demographic factors, proportion of females show statistically significant and negative association with the disability rates. The percentage of persons who are 60 years and above is positively and significantly linked to prevalence of any other disability.

**Table 12. Socioeconomic and Demographic Determinants of Any-Other Disability Prevalence Variation across Districts**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Coefficients** | **P-Values** |
| **Socioeconomic** |  |  |
| Proportion of SC | 0.002 | 0.001 |
| Proportion of ST | 0.001 | 0.032 |
| Proportion of Female Literacy | -0.004 | 0.000 |
| Proportion of Urban Population | 0.002 | 0.000 |
| Proportion of Main Workers | -0.003 | 0.000 |
| Proportion of Households in Dilapidated Buildings | 0.009 | 0.000 |
| Proportion of Households with Safe Drinking Water | 0.001 | 0.000 |
| Proportion of Households with 2 or more Dwelling Rooms | 0.001 | 0.019 |
| Proportion of Households with Clean Fuel for Cooking | 0.000 | 0.942 |
| Proportion of Households Accessing Banking Services | 0.000 | 0.185 |
| Proportion of Households with no Toilet Facility within the Premises | -0.001 | 0.001 |
| **Demographic** |  |  |
| Proportion of Females | -0.018 | 0.000 |
| Proportion of Persons aged 60 plus | 0.030 | 0.000 |
| **R-Squared** | **0.305** |  |
| **Adjusted R-Squared** | **0.291** |  |

Table 13 provides estimates of socio-economic and demographic factors which affect multiple disability across districts of India in 2011. The model’s outcomes suggest that the proportion of SCs, STs, female literacy, urban population do not affect prevalence of mental disability. Districts with relatively large proportion of the working population have lower prevalence of multiple disability. Among the variables which reflect households living conditions, the study found no statistically significant association between the prevalence of multiple disability and the proportion of households in dilapidated buildings, proportion of households with 2 or more dwelling rooms and proportion of households with clean fuel for cooking. Proportion of households with no toilet facility within the premises and proportion of households with safe drinking water are statistically significant and negative linked to prevalence of multiple disability. The districts with relatively greater households having access to banking services is related to increase in the rate of disability prevalence. There is no statistically significant association between prevalence of multiple disability and proportion of females. A 1% additive change in the proportion of the population who are above 60 years of age is positively and significantly associated with the increase in the prevalence of multiple disability. R-Squared for multiple disability is the lowest among all types of disabilities available in the present study.

**Table 13. Socioeconomic and Demographic Determinants of Multiple Disability Prevalence Variation across Districts**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Coefficients** | **P-Values** |
| **Socioeconomic** |  |  |
| Proportion of SC | 0.000 | 0.362 |
| Proportion of ST | 0.000 | 0.153 |
| Proportion of Female Literacy | -0.001 | 0.153 |
| Proportion of Urban Population | 0.000 | 0.423 |
| Proportion of Main Workers | -0.002 | 0.000 |
| Proportion of Households in Dilapidated Buildings | -0.001 | 0.431 |
| Proportion of Households with Safe Drinking Water | -0.001 | 0.010 |
| Proportion of Households with 2 or more Dwelling Rooms | 0.000 | 0.189 |
| Proportion of Households with Clean Fuel for Cooking | 0.000 | 0.337 |
| Proportion of Households Accessing Banking Services | 0.001 | 0.019 |
| Proportion of Households with no Toilet Facility within the Premises | -0.001 | 0.001 |
| **Demographic** |  |  |
| Proportion of Females | 0.003 | 0.196 |
| Proportion of Persons aged 60 plus | 0.011 | 0.000 |
| **R-Squared** | **0.150** |  |
| **Adjusted R-Squared** | **0.132** |  |

**5. Summary and Concluding Remarks**

The study examined in detail the association between disability prevalence andthe selected socioeconomic and demographic contextual characteristics across districts. Cross-sectional regression technique was performed to identify factors affecting overall disability prevalence and for different types of disabilities available in the census 2011 data.

The outcomes of the linear regression model suggest that demographic characteristics are significantly associated with disability prevalence. The model’s outcome for overall PwDs suggest that districts where a relatively large proportion of the population are over age 60 tend to have higher disability rates. However, increase in proportion of females is associated with decrease in prevalence of disability. Although the districts where a relatively large proportion of the population are members of STs also tend to have higher disability rates, this is not the case for districts where a large proportion of the population are members of SCs. Districts with high female literacy rates and a relatively large proportion of the population who work have lower disability prevalence. At the same time, districts that are more urbanized tend to have higher disability rates. Among the variables that reflect average household living conditions, it was found that the proportion of households living in dilapidated housing to be statistically significantly associated with disability prevalence, an increase in the proportion of households in dilapidated houses is linked to an increase in the disability variable. However, The proportion of households with safe drinking water is not linked to disability prevalence, there is no statistically significant association between the two. The study also found no statistically significant associations between disability prevalence and the proportion of households without a toilet, the proportion of households with two or more dwelling rooms, the proportion of households using clean fuel for cooking, or the proportion of households with access to banking services.

Further, the study was carried out at a disaggregated level for different types of disabilities. Literature shows that different factors affects various types of disabilities differently. For example, socioeconomic and demographic determinants of ‘movement disability’ suggest that proportion of households with safe drinking water and proportion of households with clean fuel for cooking tend to reduce prevalence rate of movement disability significantly. Proportion of households with no toilet facilities within the premises is associated with high incidence of movement disability prevalence.

The findings of this study are relevant for the design of public health policies and programs in India. It is also crucial that the government steps up its efforts to improve the socioeconomic conditions of the underprivileged segments of the population. As older people are especially likely to develop disabilities, and the aging of the population is already underway in several states, public health policy-makers should seek to address these growing disability care needs. In a keynote address, Amartya Sen (1998) pointed out that social intervention against disability had to include prevention as well as management and alleviation. It is high time government, civil society, and other stakeholders focused on the overall well-being of this largest hitherto marginalized and discriminated section. Governments across the world have not paid proper attention for the overall well-being of this particular sector. However, of late globally and in India a number of legislations have been framed to improve the lives of the persons with disabilities. But there is a need to move beyond charity-based approach, medical model and patronizing attitude to social model, as disability is a vital issue and poses challenges to the state of development in the neoliberal paradigm. Therefore, providing access to basic capabilities to persons with disabilities may be strategically important to reduce the challenges for disable people in India.

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