DISCUSSION PAPER SERIES

Evidence of State-Level Variability in the Economic and Demographic Well-Being of People with Disabilities in India

Nidhiya Menon
Susan L. Parish
Roderick A. Rose

I Z A

Evidence of State-Level Variability in the Economic and Demographic Well-Being of People with Disabilities in India

Nidhiya Menon
*Brandeis University
and IZA*

Susan L. Parish
Brandeis University

Roderick A. Rose
University of North Carolina, Chapel Hill

ABSTRACT

Evidence of State-Level Variability in the Economic and Demographic Well-Being of People with Disabilities in India[*]

Among countries with comparable levels of income, India has one of the more progressive disability policy frameworks; however, people with disabilities in India are subject to multiple disadvantages. This paper focuses on state-level variations in outcomes for people with disabilities to provide one explanation for the stark contrast between the liberal laws on paper and the challenges faced by people with disabilities in practice. Using a random coefficients model that allows for state-level differences, we find that households with members with disabilities have 4.2 percent lower marriage rates, monthly per capita expenditure that is lower by 176 Indian Rupees (19 percent of overall average per capita expenditure), and about a 5 percent lower level of completed formal schooling as compared to households without disabled individuals. Tests of parameter constancy across states are almost uniformly rejected indicating the presence of substantial state-level heterogeneity across all models in the outcomes examined.

Corresponding author:

Nidhiya Menon
Department of Economics & IBS
MS 021, Brandeis University
Waltham, MA 02454-9110
USA
E-mail: nmenon@brandeis.edu

I: Introduction

Despite differing estimates, empirical evidence as of 2007 suggests that between 4 to 8 percent of the population in India is comprised of people with disabilities (World Bank, 2007), which translates into 40-90 million people, a substantial number. People with disabilities in India are subject to multiple deprivations and limited opportunities in several dimensions of their lives. Households with people with disabilities are 25 percent less likely to report having 3 meals per day year around, more likely to have members who are illiterate and children who are not enrolled in school, have much lower employment rates, and have limited awareness of entitlements and services available by law for people with disabilities (World Bank, 2007). Hence, these households are likely to be over-represented among the poor and socially marginalized.

The experiences of people with disabilities are in stark contrast to the fact that certain departments in India such as the education sector have been viewed as progressive in their delivery of options to children with distinctive needs (World Bank, 2007). Disability statistics were collected in the Census of India from as early as the late nineteenth century, and the country had special schools that catered to the needs of people with disabilities from about the same time period. However, integration of people with disabilities, and policy commitment to their participation as equals in society occurred only thirty years ago with the passage of four important laws. These included the Mental Health Act, 1987; the People with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 (PWD Act); the Rehabilitation Council of India Act, 1992, and the National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disabilities Act, 1999 (World Bank, 2007). India also ratified the UN Convention on the Rights of Persons with Disabilities in 2007.

The PWD Act of 1995 was the key central legislation that provided certain entitlements in the areas of education, employment, and affirmative action, and other privileges in prevention and early detection of disabilities. The PWD Act of 1995 also provided for non-discrimination in access to public modes of transportation such as railways and buses by requiring that these vehicles be modified in ways to make them accessible to people in wheelchairs, and called for the installation of ramps in government buildings and public primary health centers as well as the provision of braille signs and auditory signals at traffic lights and intersections. Under the PWD Act, the establishment of these entitlements to persons with disabilities was conditional on being "within (the government's) limits of economic capacity and development" (World Bank, 2007).

How does one reconcile the vulnerabilities of Indians with disabilities in practice with the relatively advanced set of laws (among other countries with comparable levels of income) on paper? This is an important question since widespread hardship among people with disabilities persists in India, despite the extant legislation. Under the Constitution of India, obligations to people with disabilities fall under the jurisdiction of state governments and the State List under "Relief of people with disabilities and unemployable" (World Bank, 2007).[1] Hence, state governments in India are primarily responsible for implementing laws and distributing social welfare benefits to people with disabilities. States also have considerable leeway in independently deciding priorities among issues related to disability, and in creating legislation suited to the context of their environment's socio-cultural background (Bagchi, 2003, Sinha, 2004). By comparing outcomes for people with disabilities using a methodology that allows separate paths for each state, this study shows that there is considerable variation across sub-

---

[1] Under India's federal set-up, the State List consists of 66 topics that state governments may legislate on independent of the central government. "Relief of people with disabilities and unemployable" is one of these 66 topics.

2

national entities in the provision of services to people with disabilities in India. Thus while a comprehensive set of commitments to people with disabilities exist by law in India, some states have been more effective than others in the delivery of their obligations.

Evidence of considerable variability at the state-level in providing for people with disabilities is evident when one notes that some states have been pro-active in increasing awareness among people with disabilities about commitments and entitlements (Tamil Nadu, Chhattisgarh, Karnataka, and New Delhi) whereas others have lagged in implementing many of the basic entitlements enshrined in the PWD Act of 1995 (Bihar, Maharashtra, Orissa, Uttar Pradesh). In fact in Uttar Pradesh which is the most populous state in India, 80 percent of households with people with disabilities were unaware of the process of certification as a person with disability (World Bank, 2007). Further, there appears to be little correlation between the economic resources of a state or its institutional capacity and provision of services to persons with impairments. For example Chhattisgarh, a relatively new but poor state, has a well-thought out state-level disability policy that is often touted within India as a "best practice framework" and model for other states. Alternatively Gujarat, a more established state with higher wealth has demonstrated little commitment in implementing a key requirement of the PWD Act of 1995 (has had only one meeting to facilitate center-state coordination in distribution of benefits as of 2003) (World Bank, 2007).[2]

This study examines household-level indicators on education, monthly per capita expenditure, marriage, loss of work due to disability, receipt of government and non-government aid, measures of pre-school intervention, and enrollment in special schools for children with disabilities. The aim is to understand how these outcomes differ between households with and

---

[2] Relative difference in the wealth level of these states is also evident from Table 2 which reports summary statistics for state-wise monthly per capita expenditures.

without members with disabilities. Among households with member(s) with disabilities, this study investigates how these outcomes vary by gender and the number of people with disabilities. The empirical analysis is implemented in a manner that allows sub-national entities (states and union territories) to exhibit different trends in the cross-section. Thus the household comparisons executed are conditional on state-specific variations in the recognition of challenges faced by people with disabilities in India, and state-wise differences in delivery of services to this population.

Results from the state-level random coefficient regression models show that in a comparison of households with no people with disabilities, households with members with disabilities have monthly per capita expenditure that is lower by about Rupees 176 (about 19 percent of overall average per capita expenditures or about 4 US 2002 dollars), marriage rates that are lower by about 4 percent, illiteracy rates that are higher by about 0.5 percent, and rates of completion of secondary school and above that are lower by about 5 percent. As compared to the reference group of households with no persons with disabilities, households with female disabled member(s) have per capita expenditures that are lower by approximately Rupees 158. However, in comparison to households with no persons with disabilities, households with male disabled member(s) have per capita expenses that are lower by about Rupees 190. This leads to the striking observation that households with female disabled member(s) have expenditures that are approximately Rupees 33 higher (4 percent of average monthly per capita expenditure in households with people with disabilities or about 1 US 2002 dollar) as compared to a household with male disabled member(s). Households with disabled female(s) are also significantly less likely to receive non-government aid as compared to households with disabled male(s), highlighting the special vulnerability of households with female persons with disabilities.

Finally, households with multiple members with disabilities do not appear to fare differently as compare to households with a single person with disability – there is no statistically discernible difference between these two types of households in outcomes related to marriage, monthly expenditure, education, or receipt of aid.

Across all models discussed above, tests of parameter constancy reject the null hypothesis that state-level coefficients are the same. That is, there is evidence of significant state-level heterogeneity in the outcomes examined among people with disabilities in India. Alternative techniques including instrumental variables and Wald estimator tests are used to demonstrate the robustness of the main random-coefficient estimates. These results underline the importance of having strong, accountable sub-national institutions that are committed to implementing the provisions of key legislations for people with disabilities in India.

II: Background on Disability Research in India

Although past work has noted the important but incomplete role played by the state in delivery of services and entitlements (Thomas, 2005, World Bank, 2007), there is little empirical work on state-level variations in indicators of economic and demographic well-being among people with disabilities in India. Not surprisingly, disability research in general has tended to focus on the link between disability and poverty (Trani and Loeb, 2010, Braithwaite and Mont, 2009, Hoogeveen, 2005, Yeo and Moore, 2003). This is especially so for India. Thomas (2005) argues that poverty is one of the biggest causes and consequences of disability in India. People with disabilities in India are among the poorest of the poor, often live in rural areas, often are disabled at birth or before school age, are poorly educated, widely unemployed, and especially vulnerable to exploitation and abuse (particularly women). Using 2006 data from Vietnam, another developing country, Mont and Cuong (2011) show the strong inter-linkage between

disability and poverty, particularly when the additional cost of living with disabilities is taken into account. This is especially true in rural areas and in households with children with disabilities (Mont and Cuong, 2011). Filmer (2008) argues that among school-age children (6-17 years) across 13 developing countries, disability-based school participation deficits are often larger than those associated with characteristics such as gender, residence in rural areas, or the household's economic standing. Furthermore, Cuong and Mont (2011) notes that in families where a parent is disabled, non-disabled children tend to have lower primary and secondary school participation rates. Part of this is attributed to the fact that in such households, child's time substitutes for parental time in income generation and household production. Among children with disabilities in India, girls tend to receive less care than boys and are more likely to die as a consequence (Thomas, 2005). Among children with disabilities, girls also tend to receive less education than boys.

In an attempt to improve the educational outcomes of children with disabilities, the government of India has emphasized the development of "special schools" and alternative systems such as informal education centers. However, education experts have criticized the widespread development of such schools and systems as the quality of education offered at these institutions is sub-par, and because attendance at these facilities perpetuates inequalities between children with disabilities and others (Singal, 2006a, Singal 2006b). Moreover, the gender gap in schooling measures remains evident in these institutions as they make little attempt to encourage the schooling of girls with disabilities (Kalyanpur, 2008).

The particular susceptibility of girls with disabilities resonates with other findings for women with disabilities in India. Mehrotra (2004) argues that women with disabilities in India face double discrimination due to the prevalence of traditional gender roles and expectations.

Women with disabilities in rural India are more likely to be divorced, abandoned, married off to the "wrong" person, subject to misconceptions that their disability may be inherited by their children, and often treated as "incomplete" mothers and housewives (Mehrotra, 2004). Among older adults, there is empirical evidence that women are more likely to hide physical impairments if their spouse is still alive (older married women are less likely to report disabilities), and because of cultural differences, older women in northern India appear to be more disadvantaged as compared to their counterparts in southern India (Sengupta and Agree, 2002). Furthermore, rural women with disabilities are the most likely to be disregarded by survey enumerators (Jeffrey and Singhal, 2008). Echoing the need to think of poverty and disability as interlinked, Mehrotra (2004) argues that the availability of resources (that varies along caste, class, and gender lines) has a strong impact on the management of disability.

One reason for the inter-linkage between disability and poverty is the fact that people with disabilities have significantly lower employment rates than average, even though the large majority of this population is capable of working. Using a cross-sectional data set from the state of Tamil Nadu, Mitra and Sambamoorthi (2008) shows that gaps in employment between disabled and non-disabled males cannot be explained by differences in education, health, or productivity. This conclusion is reached since a selectivity-corrected wage equation indicates that wages are not statistically different between disabled and non-disabled males. Alternatively, the lower employment probability of people with disabilities is attributed to differential returns to characteristics and from discrimination in employment opportunities.

Other studies that have found little effect of remedial policies on the employment outcomes of people with disabilities in India include Thompkins (2010). For example, in a study of the Indira Kranthi Program which facilitates micro-lending through self-help groups to people

with disabilities in rural Andhra Pradesh, although the program resulted in increased borrowing, education, and asset ownership, there was negative to zero effects on the labor market participation of the beneficiaries (Thompkins, 2010). The presence of members with disabilities in a household also has important implications for the labor supply of other household members. Estimates from Uttar Pradesh and Tamil Nadu show that about 45 percent of households with people with special needs report another adult being absent from work to provide care for the person with disability (World Bank, 2007).

Complicating the assessment of the security of people with disabilities in India is the relative dearth of nationally representative surveys with detailed data on this population. As of the last decade, there are only two such surveys – the National Sample Survey (NSS) of 2002 and the Census of 2001. Both sources have different definitions for the major types of impairments; the NSS is judged to be better than the Census in terms of hearing, speech, and locomotive impairments (Jeffrey and Singal, 2008). In terms of visual impairments, the NSS 2002 survey disregarded people wearing spectacles and contact lenses but the Census did not.

Relying on the relative strengths of the NSS versus the Census, this study uses the nationally representative information in the former (we will have a conservative bias in our assessment of the visually impaired) to contribute to research on disability in India in two ways. First, we offer one route to reconcile the contrast in the relatively enlightened nature of India's disability policies (for a developing country) with the challenges faced by people with disabilities in every-day life by focusing on state-level heterogeneity in distribution of commitments to the disabled. This is accomplished by using an empirical method that allows for state-level differences among the outcomes analyzed, and to the best of our knowledge, is the first study to explicitly model state-level variation in outcomes of people with disabilities in

India. Second, within this state-specific structural framework, we consider differences in results by gender of the person with disabilities, and by indicators of whether the household has a single member or multiple members with impairments. Although it is qualitatively recognized that in the population of people with disabilities, households with female members with disabilities and those with multiple people with disabilities may be most vulnerable, this study breaks new ground by quantitatively assessing how large the differentials actually are for these sub-sets of people with disabilities.

III: Empirical Methodology

To allow for state-level variations in a comparison of households with and without disabled members, we employ a state-specific random-coefficients linear regression model based on Swamy (1970). Consider the following:

$$y_j = X_j' \beta_j + \epsilon_j$$

Where $j = 1, \ldots, n$ denotes a state, and β_j is the ($k \: x \: 1$) coefficient vector for the jth state.[3] X_j is a ($k \: x \: l$) matrix of control variables with $l = 1, \ldots, m$. Treating parameter heterogeneity as stochastic implies that

$$\beta_j = \beta + \vartheta_j$$

With $E(\vartheta_j) = 0$ and $E(\vartheta_j \vartheta_j') = \pi$. Swamy (1970) provides a solution to finding $\hat{\beta}$ and $\hat{\pi}$ by noting that the resulting generalized least squares (GLS) estimator from stacking the n equations is a weighted-average of the within-panel ordinary least squares (OLS) estimators.[4] The required parameters are estimated using a two-step approach (where the procedure begins by estimating β_j with OLS) outlined in Swamy (1970). Results of these random coefficients linear regression models with conditioning at the state level are reported in Tables 4-8.

---

[3] For clarity of exposition, this discussion ignores subscripts that pertain to the household.
[4] In this context, "panel" refers to states.

Further, Swamy (1970) provides a test of the null hypothesis of parameter constancy between the OLS estimate of β (disregarding the panel structure) and the weighted average of the within-panel OLS estimators. This is a test of whether the panel structure of the data has important implications for results, or whether statistically equivalent estimates may be obtained by pooling the models and ignoring cross-panel variations. Johnston and DiNardo (1997) shows that the test in Swamy (1970) is essentially the same as a test of the null hypothesis that the estimated coefficients are equal in a generalized group-wise heteroskedastic least squares model. Results of these tests, which provide statistical evidence for state-level heterogeneity, are also reported in Tables 4-8.

Finally, although we are cognizant of state-wise deviations, the outcomes and control variables in this study are measured at the household level. This is because we wish to implement a comparison of differences among households with and without disabled members, conditional on state-level heterogeneity. With household level observations, we have multiple households per state, a data set-up that leads to correlations among standard errors at the state level. In order to appropriately account for such correlations, the results tables report bootstrapped standard errors that are clustered at the state level.

IV: Description of Data

Data used in this analysis are constructed by combining the dedicated disability module and the consumer expenditure module of the NSS 2002. The disability module surveys only those households that have disabled member(s). Hence, these data alone do not allow a comparison of outcomes with households that have no disabled individuals. In order to create the appropriate data set that facilitates such a comparison, households in the disability module are merged with households in the consumer expenditure module that was fielded in the same year.

The data set has information on 32,669 households of which 15,201 households (46.53 percent) have one or more disabled members. 9,243 households (34.60 percent) have disabled male member(s), 6,763 households (27.91 percent) have disabled female(s), and 1,180 households (7.76 percent) have both disabled male and disabled female member(s). For purposes of the analysis, children with disabilities are considered in conjunction with adults with disabilities (however, two outcomes pertaining to pre-school interventions and enrollment in special schools are measured only for children with disabilities between 5-18 years of age). Households are the basis of analyses, thus individual level outcomes are aggregated to the household level in the structural estimations that follow.[5] Nationally representative estimates are obtained by using weights provided by the NSS.

The NSS has details on five different types of impairments – mental, visual, hearing, speech, and locomotive. Among the disabled, the most common impairment is that associated with hearing (25.56 percent), followed by mental (24.47 percent) and visual (20.73 percent). Less than one percent of the sample (0.34 percent) reports multiple impairments. For purposes of this study, the different types of disabilities are analyzed together since we do not possess detailed data to model state-level differences in provision of services by disability type. Approximately 43 percent report being disabled from birth and about 60 percent of households with members with disabilities reside in rural India.

Figure 1 reports the state-wise percent of households with disabled member(s) where the comparison group is households with no person(s) with disabilities. The highest proportion of such households is present in the states of Kerala, Nagaland, and Orissa. Among union territories in India (these are directly under central government jurisdiction), almost 60 percent of

---

[5] Discrete outcomes at the individual level are thus averaged to their household means. This is the sample that is used in all models of this research.

households in Lakshadweep have disabled member(s). This study does not exclude union territories from the analysis since five of seven such territories have between 30-50 percent of households with members with disabilities (Daman and Diu, Dadra and Nagar Haveli, Lakshadweep, Pondicherry, and Andaman & Nicobar). We would be disregarding a sizeable proportion of people with disabilities in India if these areas were excluded.

Figure 2 is a state-wise disaggregation of households with disabled male member(s), disabled female member(s), or more than one disabled member. The comparison group for disabled male member(s) is households with no person(s) with disabilities; similarly for disabled female member(s). The comparison group for households with more than one disabled member is households with only one disabled member. Except for the state of Mizoram in northeastern India, the proportion of households with disabled male members exceeds the proportion of households with disabled female members across all states. Some part of this may be explained by the fact that women are less likely to report being disabled, or, as noted above, be overlooked by enumerators especially in rural areas. The highest proportion of households with multiple members with disabilities is present in the states of Himachal Pradesh, Madhya Pradesh, and Maharashtra, and the union territories of New Delhi, Lakshadweep, and Andaman and Nicobar.

Figures 3 and 4 paint a picture of average household economic resources and receipt of government aid among household with and without disabled individuals, respectively. As expected, Figure 3 shows that in general average monthly per capita expenditure is higher in households without disabled members. The sole exception is the union territory of Chandigarh, where monthly expenditure in households with people with disabilities is almost 400 Rupees (about 8 US 2002 dollars) higher than in households without disabled members. A possible explanation for this is provided in Figure 4 which reports that Chandigarh has one of the largest

12

proportions of government aid (for education, vocational training, to purchase aid/appliance, for corrective surgery, or aid in the form of a government/semi-government job) received by households with disabled members. Households with people with disabilities also receive a significant proportion of government aid in Pondicherry, Andaman and Nicobar, and Karnataka. The estimate for Karnataka is interesting since it is in keeping with anecdotal evidence presented in World Bank (2007) of being one of the more advanced states in India in terms of political commitments and delivered outcomes to persons with disabilities.

State-wise disaggregated household means of outcomes, household characteristics, and characteristics of people with disabilities are reported in Tables 1-3. Table 1 shows that household averages of marriage rates vary between 38 to 51 percent across Indian states, and monthly per capita expenditure is lowest in Bihar and Orissa. Dadra and Nagar Haveli has the highest proportion reporting loss of work due to disability whereas Sikkim has the lowest proportion. States are more likely to have illiterate residents or residents with only middle school as compared to completing secondary school and above, and the highest proportions of disabled persons completing a vocational course are found in Andaman and Nicobar, Himachal Pradesh, and Kerala. Receipt of non-government aid (any aid/help other than from the government) is essentially zero across most states. In terms of children with disabilities, the highest proportions of such children attending pre-school interventions are found in Goa, Chandigarh and Gujarat. Among states, Maharashtra and Goa have the highest proportion of such children enrolled in special schools.

State-wise means of household characteristics including rates of self-employment, religion, age, and gender and literacy of the household head are reported in Table 2. Rates of self-employment are uniformly high across most areas of India, and wage/salary earnings are

13

especially low in northeastern states with large rural populations such as Sikkim, Arunachal Pradesh, and Assam. Hinduism is the dominant household religion in several large states (Uttar Pradesh, Madhya Pradesh, Karnataka, Andhra Pradesh and Tamil Nadu), and the northeast states of Nagaland and Mizoram in particular have very high proportions of households belonging to Scheduled Castes and Scheduled Tribes (lower caste denominations in India). Most households in India have male heads, and the highest proportion of illiterate heads is found in the southern state of Andhra Pradesh. Finally, many households across India live in independent houses; however, the houses themselves are often not made of stable materials such as concrete (unstable structures).

Table 3 presents means of the characteristics of disabled individuals. Several of these estimates have been discussed above and presented in Figures 1-2. In terms of those reporting being disabled from birth, the highest proportions are found in Chandigarh, New Delhi, Sikkim, and Lakshadweep. For age of onset of disability for those who were not born with impairments, the lowest ages are reported in Chandigarh, New Delhi, Nagaland, and Jharkhand.

V: Results

Results from the state-level random coefficients linear regression models are reported in Tables 4-8. Table 4 shows a comparison of demographic and economic outcomes between households that have disabled member(s) and households that have no individuals with disabilities. Overall, the results are as hypothesized. Households with members with disabilities have a 4.2 percent lower probability of marriage, Rupees 176 lower monthly per capita expenditure, a marginally higher rate of illiteracy, and an approximately 5 percent lower probability of being educated up to the secondary school level and above. Households with

people with disabilities are also significantly less likely to have members who have completed diploma or certificate courses.

The unexpected result in Table 4 is the significant positive coefficient on middle school which indicates that in comparison to households with no disabled members, those with people with disabilities are more likely to have individuals who have completed middle school. The middle school variable is an indicator for all who have completed up to middle school and thus includes individuals with primary schooling as well. Thus, the variable may reflect the fact that primary schooling in India is relatively widespread.

Table 4 also reports tests of parameter constancy - a test for equivalence in coefficient estimates across states. The *p*-values for all outcomes indicate that the null hypothesis can be rejected, that is, there is statistically discernible variation in parameters across states. This rejection indicates the presence of substantial state-level heterogeneity in the six outcomes analyzed. Hence, states in India differ considerably when gauged on the basis of the outcomes in Table 4. As noted above, the standard errors in Table 4 are clustered to adjust for non-independence at the state level.

Table 5 reports results for a comparison of household with disabled male(s) and households without any people with disabilities. Overall, the trends seen in outcomes in Table 4 are reflected here. Furthermore, chi-squared tests of parameter constancy continue to reject the null hypothesis that there is no state-level heterogeneity across all outcomes considered. Table 6 is a mirror of the model in Table 5 as it looks at the relative deprivation of households with disabled female(s) versus households that have no members with disabilities. Again, the pattern evident in Tables 4 and 5 resonates here and there is continuing statistical evidence that state-level variation is substantial. A comparison of effects in Tables 5 and 6 leads to an interesting

observation – in relation to households that have no disabled members, those with disabled female(s) have slightly *higher* levels of monthly per capita expenditure (of about Rupees 33, which is 4.4% of the average monthly per capita expenditure in households with disabled members) as compared to households with disabled male(s). This is despite the fact that households with female members with disabilities are significantly more likely to be illiterate as compared to households with no people with disabilities, whereas households with male members with disabilities show no differential in this outcome relative to the comparison group. The higher level of expenditure in households with disabled women is consistent with qualitative evidence in Thomas (2005) which notes that where men and women have similar levels of impairments, women are likely to continue to work.

The remaining results pertain to estimates from a comparison of households with individuals with disabilities of different genders, and households with multiple individuals with disabilities versus households with only one disabled member. Table 7 presents a comparison of households with only disabled female(s) versus households with only disabled male(s). Results show that households with disabled females have significantly lower marriage rates, higher monthly per capita expenditure (noted above), and are also about 4 percent more likely to report that disability caused loss of work. In comparison to households with disable male(s), households with women with disabilities are more likely to be illiterate and less likely to have completed middle school. There are no significant differences in receipt of government aid, but notably, households with disabled females are about 0.3 percent less likely to receive aid from non-government sources. Although the magnitude of this coefficient is not substantial, this result underscores the particular susceptibilities of this group of households and points to the possibly high marginal returns that may accrue from expansion of non-government sources of credit, such

as micro-finance, to this population of individuals with disabilities in India. Tests of state-level parameter constancy fail to reject in 3 of the 12 outcomes considered – person with disabilities completed vocational course, person with disabilities received non-government aid, and child with disabilities enrolled in a special school, indicating that for these outcomes there is little statistical evidence of state-level differences.

Finally, Table 8 presents a comparison of households with more than one disabled member versus households with only one disabled member. The intent of this model is to judge whether having multiple members with impairments poses significantly different burdens on households as compared to having just one person with disabilities in the home. In short, there is no evidence for differing relative economic well-being from the estimates in Table 8 as the indicator for households with multiple members with disabilities is insignificant across most outcomes analyzed. Furthermore, tests of state-level parameter constancy fail to reject in two cases – completion of vocational course and receipt of non-government aid – indicating that for these outcomes there is no statistically perceptible state-level heterogeneity.

VI: Further Evidence for Results

A question that requires attention is whether the indicator for disability is exogenous. That is, is the indicator variable for households with members with disabilities influenced by measurement error or correlation with omitted variables? Measurement error might result if there is under-reporting of disability as might happen in the case of women with impairments in rural areas. However, note that such under-reporting leads to a *conservative* bias in our estimates. That is, with the inclusion of such members in our sample, our results should only increase in magnitude and possibly, in significance. Hence, correcting for under-reporting by including more (representative) individuals with disabilities is not likely to undermine the results of this study.

Endogeneity in the indicator of households with members with disabilities might also result due to correlation with omitted variables. Hence for example, if women with poor nutrition are more likely to bear children with impairments and also more likely to live in resource-constrained households, then not controlling for health investments in mothers may lead to spurious correlations between disability indicators and average household expenditure. There might be similar artificial correlations created between the disability indicators and the probability of marriage in the household. We address this issue by instrumenting for disability and then re-estimating the models in Table 4 to demonstrate that our results remain unaltered.[6]

The instruments that we use for disabled status are whether parents of people with disabilities were blood related, and whether an individual with disabilities can take care of him or herself. These variables are clearly correlated to disability, but conditional on disability, are unlikely to have independent effects on the household outcomes considered in Table 4. Results of the instrumental variable regressions are reported in Table 9. A comparison of parameters in this table with those in Table 4 for corresponding outcomes shows that the instrumental variable (IV) estimates are quite close to the random-coefficients estimates. For example, the IV results indicate that in households with disabled members, average monthly per capita expenditure is lower by about Rupees 227. The corresponding coefficient in Table 4 is Rupees 176. Except for illiteracy (where we lose significance), the parameters for other outcomes are even closer across Tables 4 and 9.

---

[6] We demonstrate the robustness of only the indicator for households with members with disabilities in Table 4 since this encompasses households with disabled male(s), households with disabled female(s), and households with more than one disabled member. Furthermore, since it is not clear how standard errors are to be adjusted for presence of predicted variables in random-coefficients linear regression models, we estimate two-stage least squares models with region fixed effects (each region is a conglomeration of states) to implement a method that is broadly structurally equivalent. Two-stage least squares models have the added advantage of reporting tests of instrument validity.

The substance of the results in Table 9 rests on the validity of the instruments. In this regard tests of under-identification (Kleibergen-Paap LM statistic) and over-identification (Hansen's *J* statistic) are reported in the table. These tests provide evidence that the instruments have sufficient power (the *p*-values associated with the Kleibergen–Paap statistic uniformly reject the null that the model is under-identified), and are valid (the *p*-values associated with Hansen's *J* statistic uniformly indicate that we cannot reject the hypothesis that the instruments are uncorrelated with the error term and correctly excluded from the estimation equation). Taken together, the evidence in Table 9 indicates that the disability indicator is treated correctly and the random-coefficient results in Tables 4-8 are robust.

We implement another check on the integrity of the IV results by constructing their Wald estimator equivalent. This is accomplished by using a discrete version of the variable which indicates whether the parents of people with disabilities are blood-related as the (only) identifying instrument and then following Angrist (1991) and Angrist and Pischke (2009) to construct the IV estimate as the difference in the reduced-form means divided by the difference in the first-stage means.[7] Table 10 reports the Wald estimator results for the household outcomes considered in Table 4. A quick comparison reveals that the estimates in Table 10 are very close to those in Table 4, indeed, even closer than the IV estimates in Table 9.

The substance of the Wald estimator results in Table 10 rests on the validity of the claim that the only reason why the expected value of household outcomes (such as average expenditure) conditional on the identifying instrument changes as the instrument changes is

---

[7] We constructed an alternate version of the Wald estimator by reducing the data to district means following the argument made in Moffitt (1996). These results are not reported in the paper but are broadly consistent with the main results in Table 4 and the IV results in Table 9. We lose some precision in estimates because of the reduced number of observations when the data are reduced to district means.

variation in the expected value of disability status conditional on the instrument. One way to justify this claim is to demonstrate the absence of an association between the instrument and personal characteristics such as caste or gender which are, in some sense, not determined concurrently with disability status (Angrist and Pischke, 2009).[8] These tests are presented in Table 11. The estimates in Table 11 show that conditional on household characteristics, the identifying instrument is not significantly correlated to whether the household's religion is Hinduism, whether the household belongs to Scheduled Caste or Scheduled Tribe denominations, whether the household belongs to Other Backward Classes, or whether the gender is male. Results in Tables 9-11 provide evidence in favor of the assertion that the disability indicator is treated correctly in the random coefficient results of Tables 4-8.

VII: Conclusion and Policy Implications

Outcomes for people with disabilities in India are inconsistent with the aims of its disability legislation, or its ratification of the UN Convention on the Rights of Persons with Disabilities. By using a random-coefficients regression model that allows for differing state-level paths, this study provides evidence of state-level disparities in the economic well-being of people with disabilities in India. Since under the Constitution of India, primary responsibility for delivery of services and commitments to people with impairments rests at the state level, focusing on this sub-national entity enables a clearer understanding of where implementation is weak. In terms of most demographic and economic measures of well-being analyzed in this paper, households with members with disabilities fare significantly worse as compared to households without people with disabilities. In particular, households with individuals with

---

[8] Another way of thinking about this is that we want to demonstrate a lack of correlation between the instrument and other omitted variables that might influence household outcomes such as average expenditure and education levels.

disabilities have 4.2 percent lower marriage rates, Rupees 176 lower monthly per capita expenditures (about 4 US 2002 dollars), higher rates of illiteracy, and about 5 percent lower levels of secondary schooling and above. Similar trends hold when the analysis is disaggregated by gender of the individual with disabilities, where households with female disabled members are found to be particularly vulnerable. Finally, in general, households with multiple individuals with disabilities are not found to fare much worse in terms of the outcomes examined as compared to households with one disabled member. The robustness of these results is established using two alternate methods (instrumental variables and the Wald estimator) that check for possible endogeneity in the measure of household-level disability that is used in this study. Tests for parameter constancy across states are almost uniformly rejected, indicating the presence of substantial state-level heterogeneity across all models in the outcomes examined.

These results imply that an important way to improve the economic well-being of people with disabilities in India may rest on improving services at the state-level. In particular, a fruitful route might be to extend government aid to this population, particularly households with disabled women. In the same vein, since households with disabled women are found to receive less non-government aid as compared to households with disabled men, facilitating access to this source of credit, such as that from micro-finance, may be especially beneficial. A more pro-active state-government role in furthering access to small loans (perhaps by acting as a part-guarantor) would be invaluable in relaxing resource constraints for people with disabilities in India. Furthermore, better mechanisms for increasing service outreach to smaller administrative units (districts and Panchayati Raj institutions) within a state may also bring tangible benefits that have a significant impact on the lives of people with disabilities, and women with disabilities in particular.

References

Angrist, Joshua. 1991. "Grouped-data Estimation and Testing in Simple Labor-Supply Models," *Journal of Econometrics* 47: 243-266.

Angrist, Joshua, and Jorn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton and Oxford: Princeton University Press.

Bagchi, Amaresh. 2003. "Rethinking Federalism: Changing Power Relations Between the Center and The States," *Journal of Federalism* 33(4): 21-42.

Braithwaite, Jeanine, and Daniel Mont. 2009. "Disability and Poverty: A Survey of World Bank Poverty Assessments and Implications," forthcoming in *Alter: The European Journal of Disability Research*.

Cuong, Nguyen Viet, and Daniel Mont. 2011. "Does Parental Disability Matter to Child Education?" World Bank Policy Research Working Paper, No. 5743.

Filmer, Deon. 2008. "Disability, Poverty, and Schooling in Developing Countries: Results from 14 Household Surveys," *World Bank Economic Review* 22(1): 141-163.

Hoogeveen, Johannes. 2005. "Measuring Welfare for Small but Vulnerable Groups: Poverty and Disability in Uganda," *Journal of African Economies* 14(4): 603-631.

Jeffrey, Roger, and Nidhi Singal. 2008. "Measuring Disability in India," *Economic and Political Weekly* 43 (12 and 13): 22-24.

Johnston, Jack, and John DiNardo. 1997. *Econometric Methods*. 4th edition. New York: McGraw-Hill.

Kalyanpur, Maya. 2008. "The Paradox of Majority Underrepresentation in Special Education in India," *The Journal of Special Education* 42(1): 55-64.

Mehrotra, Nilika. 2004. "Women, Disability, and Social Support in Rural Haryana," *Economic and Political Weekly* 39(52): 5640-5644.

Mitra, Sophie, and Usha Sambamoorthi. 2008. "Disability and the Rural Labor Market in India: Evidence for Males in Tamil Nadu," *World Development* 36(5): 934-952.

Moffitt, Robert. 1996. "Identification of Causal Effects Using Instrumental Variables: Comment," *Journal of the American Statistical Association* 91(434): 462-465.

Mont, Daniel, and Nguyen Viet Cuong. 2011. "Disability and Poverty in Vietnam," *World Bank Economic Review* 25(2): 323-359.

Sengupta, Manisha, and Emily Agree. 2002. "Gender and Disability Among Older Adults in North and South India: Differences Associated with Coresidence and Marriage," *Journal*

of Cross-Cultural Gerontology 17: 313-336.

Singal, Nidhi. 2006a. "Inclusive Education in India: International Concept, National Interpretation," *International Journal of Disability, Development and Education* 53(3): 351-369.

Singal, Nidhi. 2006b. "An Ecosystemic Approach for Understanding Inclusive Education: An Indian Case Study," *European Journal of Psychology of Education* 21(3): 239-252.

Sinha, Aseema. 2004. "The Changing Political Economy of Federalism in India: A Historical Institutionalist Approach," *India Review* 3(1): 25-63.

Swamy, P.A. V. B. 1970. "Efficient Inference in a Random Coefficients Regression Model," *Econometrica* 38: 311-323.

Thomas, Phillipa. 2005. "Mainstreaming Disability in Development: India Country Report," Disability Knowledge and Research Report.

Thompkins, Allison. 2010. "Micro-lending in India: An Equal Access Possibility," MIT: Job Market Paper.

Trani, Jean-Francois, and Mitchell Loeb. 2010. "Poverty and Disability: A Vicious Cycle? Evidence from Afghanistan and Zambia," *Journal of International Development* (in press).

Yeo, Rebecca, and Karen Moore. 2003. "Including people with disabilities in Poverty Reduction Work: Nothing About Us, Without Us," *World Development* 31(3): 571-590.

World Bank. 2007. "People with Disabilities in India: From Commitments to Outcomes," *Human Development Unit: South Asia Region*: 1-186.

Figure 1: State-wise percent of households with disabled member(s).
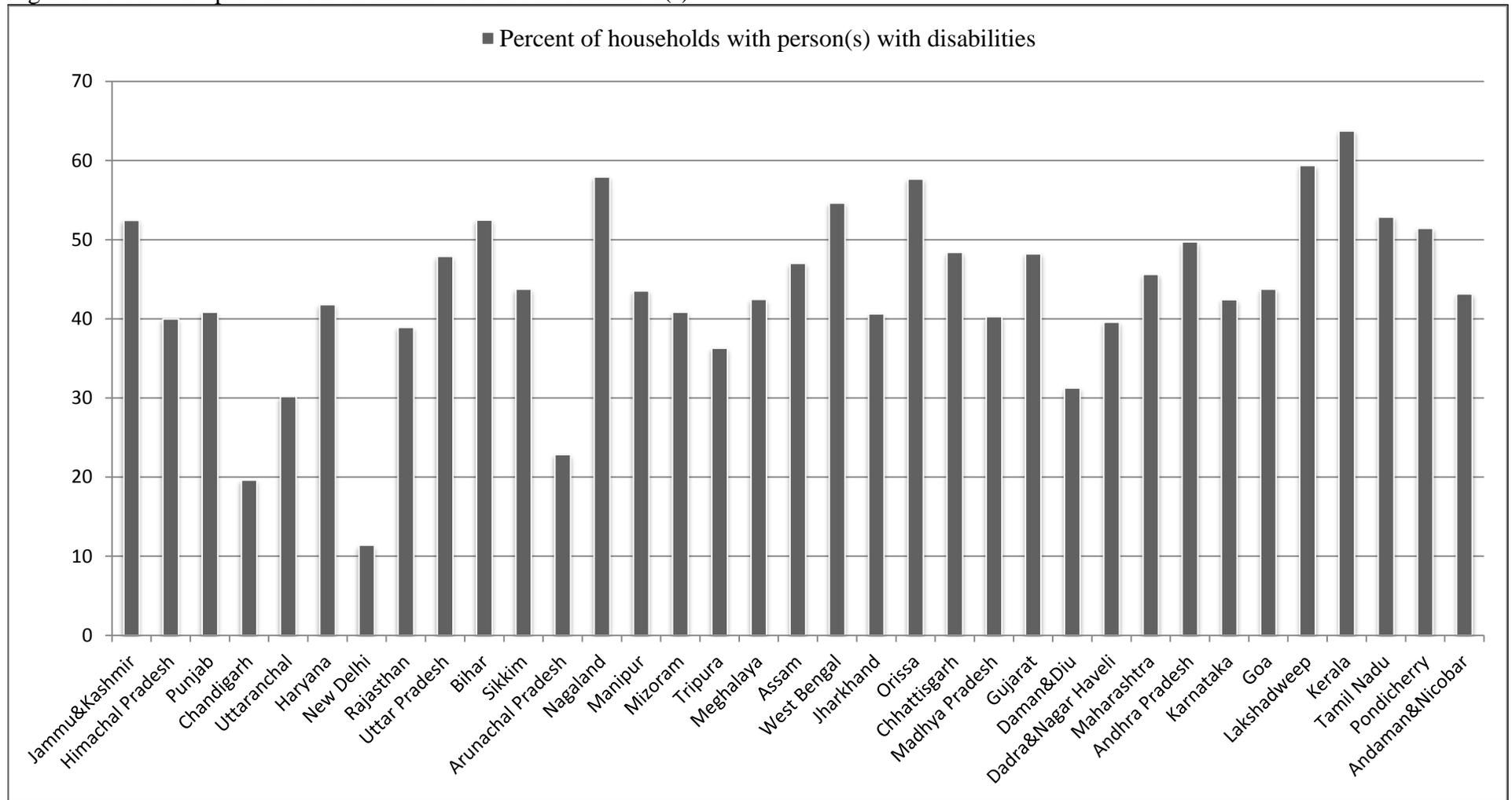
Notes: Author's calculations. Estimates weighted to national level with weights provided by NSSO (2002).

Figure 2: State-wise percent of households with disabled male(s), disabled female(s), or multiple disabled member(s).
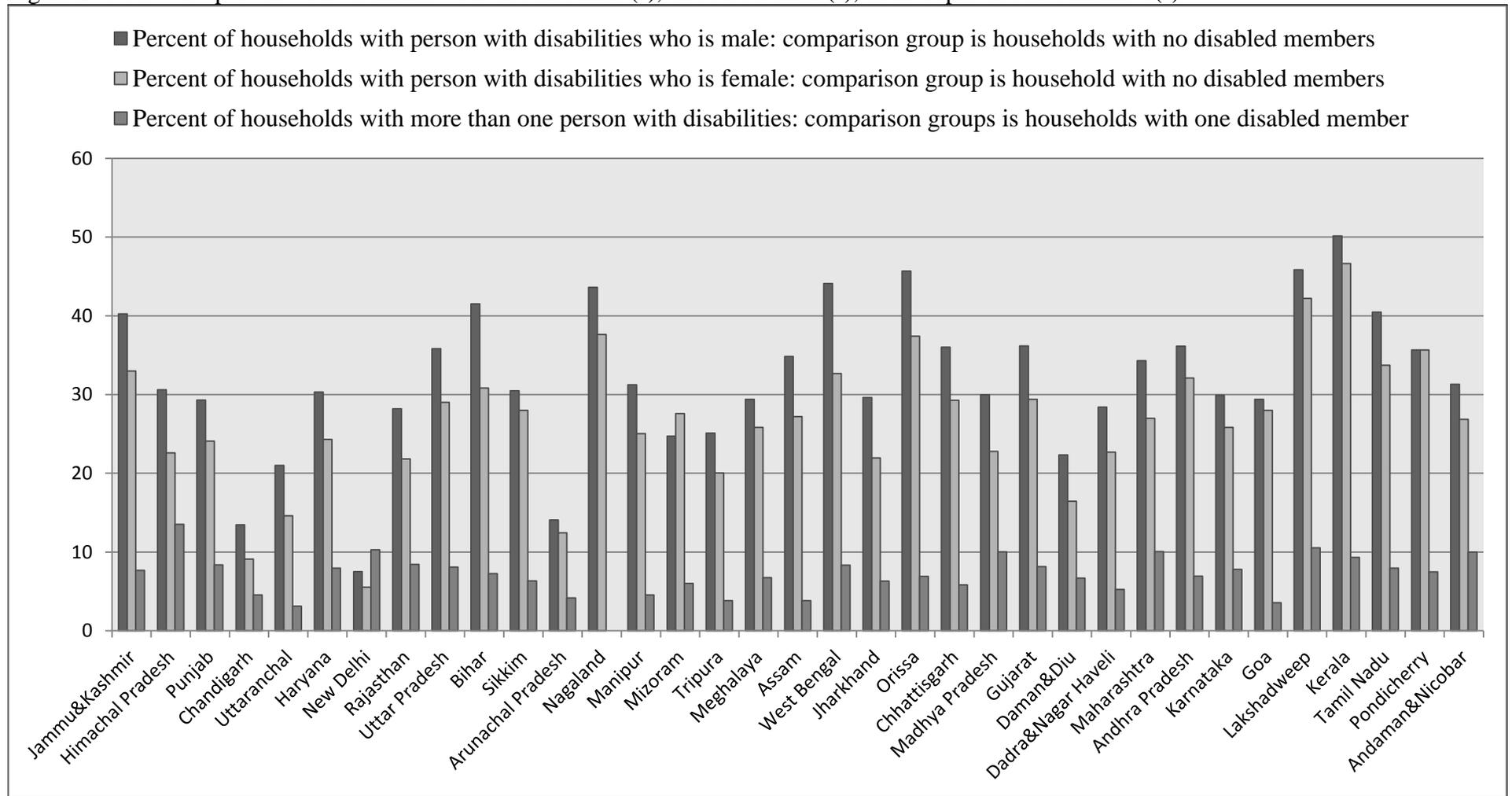
Notes: Author's calculations. Estimates weighted to national level with weights provided by NSSO (2002).

Figure 3: State-wise average monthly per capita expenditure in households with and without disabled member(s).

Notes: Author's calculations. Estimates weighted to national level with weights provided by NSSO (2002).

Figure 4: State-wise percent of households with disabled member(s) that receive government aid.

Notes: Author's calculations. Estimates weighted to national level with weights provided by NSSO (2002).

Table 1: Summary statistics of outcomes at household level.

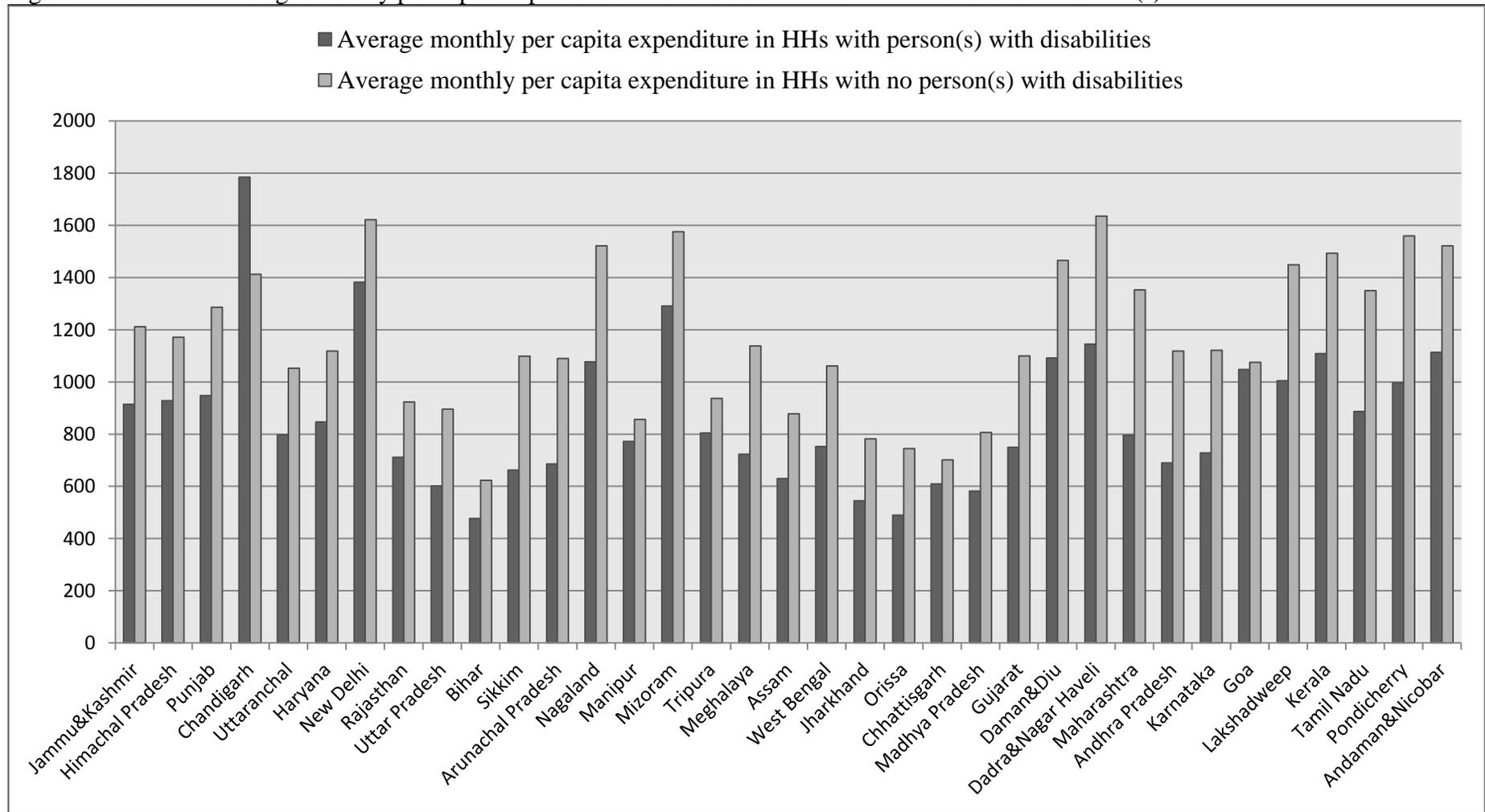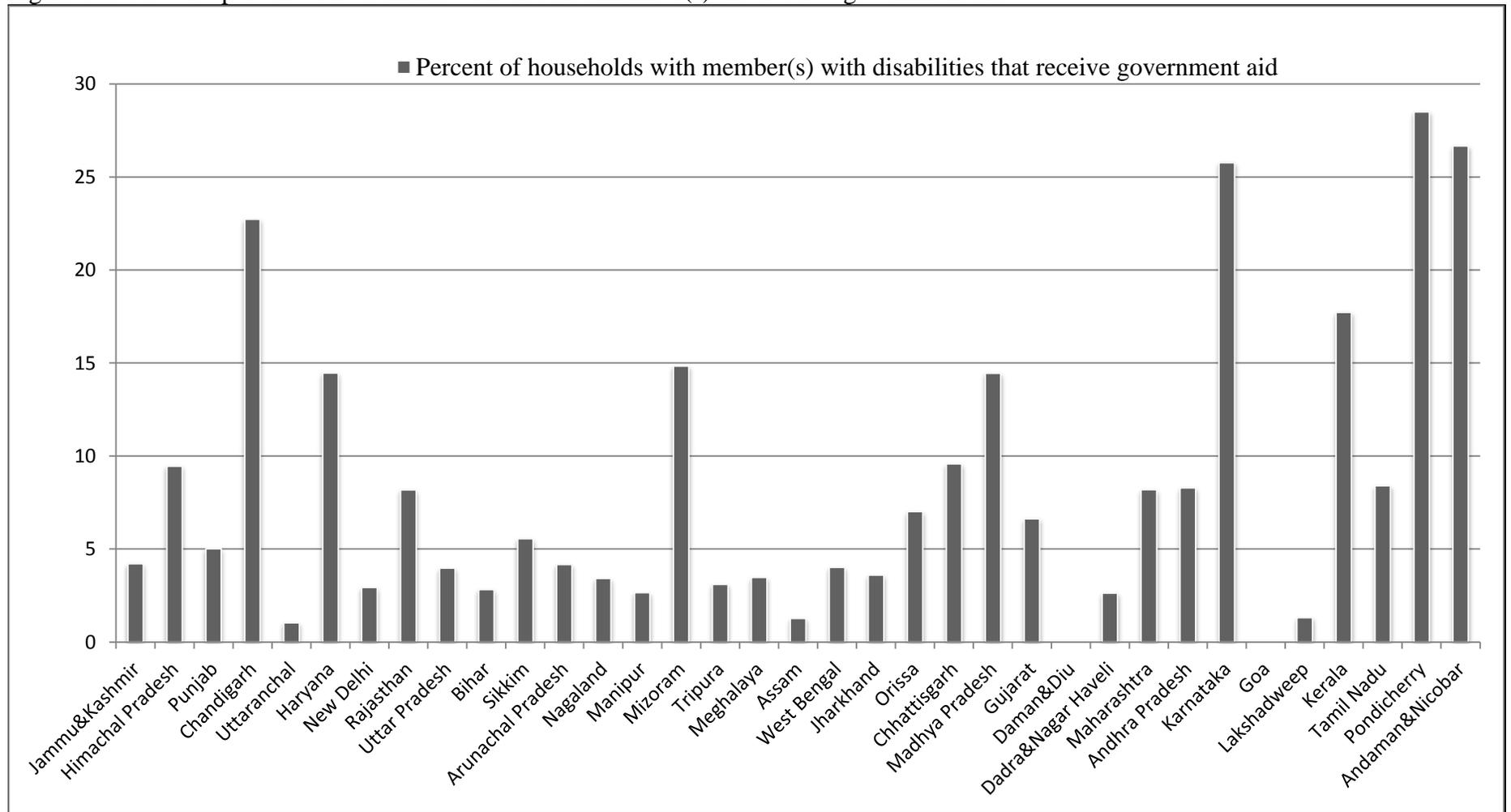| State	person is married	monthly per capita expend.	disability caused loss of work	person is illiterate	person is middle schooled	person has secondary sch. & above	person has diploma or cert. course	disabled person did voc. course	disabled pers. rec. govt. aid	disabled pers. rec. n-govt. aid	disabled child att. pre-s. int.	disabled child en. in sp. sc.
Jammu & Kash.	0.449	1055.962	0.540	0.388	0.376	0.226	0.010	0.009	0.042	0.000	0.014	0.020
Himachal Prad.	0.499	1073.794	0.568	0.288	0.414	0.277	0.021	0.057	0.095	0.023	0.188	0.100
Punjab	0.472	1147.634	0.556	0.364	0.375	0.252	0.009	0.015	0.050	0.006	0.000	0.052
Chandigarh	0.529	1485.620	0.667	0.283	0.464	0.243	0.010	0.045	0.227	0.000	0.333	0.500
Uttaranchal	0.440	975.320	0.405	0.330	0.413	0.249	0.007	0.010	0.010	0.021	0.083	0.053
Haryana	0.459	1004.986	0.675	0.348	0.406	0.235	0.011	0.006	0.145	0.004	0.085	0.146
New Delhi	0.480	1594.812	0.462	0.179	0.410	0.384	0.027	0.015	0.029	0.015	0.167	0.263
Rajasthan	0.489	840.773	0.667	0.468	0.373	0.151	0.007	0.012	0.082	0.011	0.080	0.044
Uttar Pradesh	0.453	754.425	0.627	0.481	0.352	0.162	0.005	0.012	0.040	0.008	0.067	0.025
Bihar	0.474	546.208	0.553	0.552	0.305	0.141	0.002	0.005	0.028	0.007	0.023	0.018
Sikkim	0.418	907.517	0.304	0.259	0.569	0.166	0.006	0.000	0.056	0.000	0.333	0.231
Arunachal Prad.	0.451	997.251	0.152	0.363	0.405	0.219	0.013	0.000	0.042	0.042	0.118	0.000
Nagaland	0.409	1264.426	0.300	0.138	0.647	0.206	0.008	0.021	0.034	0.021	0.019	0.000
Manipur	0.416	819.553	0.358	0.277	0.434	0.278	0.011	0.023	0.027	0.004	0.194	0.097
Mizoram	0.383	1459.716	0.277	0.104	0.598	0.290	0.007	0.025	0.148	0.027	0.074	0.048
Tripura	0.470	888.994	0.406	0.231	0.571	0.195	0.003	0.038	0.031	0.010	0.161	0.102
Meghalaya	0.398	961.552	0.302	0.204	0.591	0.192	0.012	0.018	0.035	0.000	0.075	0.040
Assam	0.419	761.490	0.361	0.239	0.540	0.217	0.003	0.005	0.013	0.019	0.040	0.041
West Bengal	0.494	892.346	0.465	0.291	0.497	0.206	0.005	0.018	0.040	0.020	0.094	0.088
Jharkhand	0.467	685.523	0.529	0.426	0.380	0.185	0.009	0.011	0.036	0.012	0.080	0.013
Orissa	0.471	597.170	0.565	0.406	0.423	0.162	0.009	0.003	0.070	0.000	0.111	0.012
Chhattisgarh	0.464	656.989	0.552	0.410	0.421	0.158	0.011	0.008	0.096	0.006	0.047	0.029
Madhya Prad.	0.471	715.831	0.637	0.419	0.415	0.160	0.006	0.015	0.145	0.001	0.041	0.022
Gujarat	0.509	931.087	0.519	0.346	0.458	0.187	0.009	0.019	0.066	0.014	0.261	0.091
Daman & Diu	0.438	1348.917	0.625	0.199	0.467	0.317	0.017	0.000	0.000	0.000	0.000	0.125
Dadra & N. H.	0.518	1441.273	0.786	0.176	0.423	0.356	0.045	0.026	0.026	0.000	0.125	0.286
Maharashtra	0.484	1098.449	0.609	0.287	0.454	0.247	0.011	0.018	0.082	0.018	0.243	0.265
Andhra Pradesh	0.484	905.486	0.615	0.446	0.356	0.192	0.006	0.016	0.083	0.006	0.058	0.076
Karnataka	0.455	954.509	0.541	0.321	0.404	0.258	0.017	0.008	0.258	0.005	0.134	0.066
Goa	0.427	1063.292	0.222	0.312	0.413	0.272	0.003	0.036	0.000	0.000	0.750	0.333
Lakshadweep	0.447	1184.885	0.429	0.168	0.614	0.192	0.026	0.000	0.013	0.000	0.250	0.000
Kerala	0.477	1248.113	0.548	0.155	0.561	0.258	0.026	0.047	0.177	0.016	0.237	0.441
Tamil Nadu	0.497	1104.969	0.486	0.278	0.435	0.267	0.020	0.014	0.084	0.027	0.163	0.152
Pondicherry	0.467	1270.471	0.516	0.220	0.466	0.294	0.020	0.033	0.285	0.009	0.200	0.250
Andaman & N.	0.452	1345.520	0.176	0.289	0.474	0.229	0.008	0.067	0.267	0.000	0.214	0.000

Notes: Weighted to national level with weights provided by NSSO (2002). Table reports mean proportions in all columns except column (2), where monthly per capita expenditure is reported in 2002 Indian Rupees.

Table 2: Summary statistics of household characteristics.

State	rural area	HH is self-emp.	HH has wage/ salary earn.	HH religion is Hindu	HH is SC/ST	age of head	head is male	head is illiterate	HH lives in indep. house	HH lives in a flat	Structure of HH is not concrete
Jammu & Kashmir	0.572	0.601	0.174	0.383	0.128	47.529	0.958	0.368	0.893	0.069	0.161
Himachal Pradesh	0.833	0.542	0.113	0.950	0.321	49.733	0.796	0.298	0.810	0.177	0.042
Punjab	0.493	0.427	0.340	0.466	0.356	45.985	0.909	0.388	0.849	0.112	0.063
Chandigarh	0.286	0.411	0.366	0.813	0.214	37.634	0.982	0.196	0.482	0.295	0.045
Uttaranchal	0.597	0.541	0.211	0.846	0.302	46.877	0.849	0.324	0.698	0.261	0.104
Haryana	0.552	0.472	0.281	0.914	0.253	44.413	0.948	0.313	0.794	0.156	0.094
New Delhi	0.054	0.325	0.575	0.836	0.176	40.735	0.925	0.141	0.489	0.340	0.037
Rajasthan	0.620	0.573	0.184	0.875	0.300	43.739	0.910	0.430	0.818	0.085	0.179
Uttar Pradesh	0.657	0.577	0.235	0.815	0.242	44.768	0.913	0.422	0.854	0.072	0.153
Bihar	0.812	0.493	0.342	0.867	0.200	44.899	0.914	0.461	0.864	0.072	0.250
Sikkim	0.778	0.458	0.177	0.729	0.243	42.785	0.920	0.233	0.622	0.347	0.108
Arunachal Pradesh	0.686	0.521	0.179	0.279	0.721	41.407	0.905	0.383	0.833	0.007	0.542
Nagaland	0.698	0.595	0.163	0.040	0.940	44.226	0.952	0.071	0.869	0.095	0.076
Manipur	0.609	0.584	0.221	0.591	0.328	48.558	0.889	0.278	0.940	0.028	0.280
Mizoram	0.321	0.438	0.375	0.038	0.975	45.105	0.864	0.020	0.804	0.183	0.112
Tripura	0.722	0.447	0.195	0.910	0.443	45.575	0.905	0.200	0.931	0.017	0.222
Meghalaya	0.667	0.529	0.260	0.208	0.797	43.820	0.844	0.159	0.964	0.034	0.198
Assam	0.771	0.606	0.177	0.732	0.276	44.710	0.912	0.177	0.926	0.049	0.287
West Bengal	0.567	0.464	0.347	0.771	0.297	45.881	0.905	0.262	0.729	0.144	0.129
Jharkhand	0.629	0.499	0.254	0.844	0.344	43.623	0.911	0.371	0.877	0.079	0.138
Orissa	0.739	0.459	0.301	0.944	0.378	45.036	0.887	0.362	0.864	0.056	0.305
Chhattisgarh	0.677	0.442	0.381	0.952	0.385	44.784	0.905	0.363	0.923	0.044	0.020
Madhya Pradesh	0.573	0.539	0.307	0.887	0.317	44.444	0.934	0.371	0.872	0.062	0.076
Gujarat	0.469	0.435	0.351	0.883	0.263	44.461	0.922	0.301	0.815	0.073	0.063
Daman & Diu	0.333	0.271	0.344	0.927	0.156	42.479	0.823	0.125	0.750	0.146	0.031
Dadra & Nagar H.	0.500	0.240	0.427	0.917	0.427	38.313	0.969	0.156	0.583	0.208	0.031
Maharashtra	0.410	0.372	0.433	0.781	0.231	44.917	0.895	0.239	0.489	0.122	0.049
Andhra Pradesh	0.580	0.362	0.421	0.870	0.238	43.568	0.857	0.469	0.737	0.209	0.185
Karnataka	0.485	0.394	0.375	0.837	0.216	45.427	0.851	0.345	0.822	0.083	0.065
Goa	0.500	0.234	0.234	0.578	0.047	44.328	0.734	0.313	0.547	0.094	0.125
Lakshadweep	0.500	0.297	0.328	0.125	0.953	44.156	0.578	0.188	0.938	0.016	0.016
Kerala	0.599	0.363	0.216	0.608	0.131	51.647	0.756	0.138	0.931	0.034	0.112
Tamil Nadu	0.390	0.336	0.402	0.862	0.202	46.255	0.849	0.260	0.682	0.208	0.137
Pondicherry	0.231	0.313	0.370	0.837	0.125	47.178	0.841	0.216	0.582	0.346	0.192
Andaman & Nic.	0.540	0.252	0.424	0.633	0.094	45.662	0.892	0.309	0.432	0.396	0.187

Notes: Weighted to national level with weights provided by NSSO (2002). Table reports mean proportions in all columns except (6), which reports mean age in years.

Table 3: Summary statistics of characteristics of people with disabilities at the household level.

State	HH has disabled mem.	HH has disabled male(s)	HH has disabled fem(s)	HH has more than one disabled mem.	Person had disability from birth	Age of onset of disability	Parents blood rel.	Disabled mem. can self-care
Jammu & Kashmir	0.525	0.403	0.330	0.077	0.315	40.770	0.028	0.918
Himachal Pradesh	0.400	0.306	0.226	0.135	0.296	41.832	0.006	0.956
Punjab	0.409	0.293	0.241	0.084	0.392	43.494	0.057	0.934
Chandigarh	0.196	0.135	0.091	0.045	0.500	26.955	0.000	0.964
Uttaranchal	0.302	0.210	0.146	0.031	0.484	32.410	0.003	0.969
Haryana	0.418	0.303	0.243	0.079	0.450	37.721	0.002	0.948
New Delhi	0.114	0.075	0.055	0.103	0.512	26.490	0.005	0.970
Rajasthan	0.389	0.282	0.218	0.085	0.409	39.034	0.007	0.929
Uttar Pradesh	0.479	0.358	0.290	0.081	0.351	36.108	0.025	0.928
Bihar	0.525	0.415	0.308	0.073	0.453	32.259	0.036	0.908
Sikkim	0.438	0.305	0.280	0.063	0.512	39.992	0.003	0.972
Arunachal Pradesh	0.229	0.141	0.124	0.042	0.438	35.396	0.138	0.971
Nagaland	0.579	0.436	0.376	0.000	0.349	28.279	0.190	0.976
Manipur	0.435	0.313	0.251	0.046	0.291	40.750	0.020	0.947
Mizoram	0.408	0.247	0.276	0.060	0.482	35.234	0.047	0.974
Tripura	0.363	0.251	0.200	0.038	0.395	33.022	0.028	0.953
Meghalaya	0.424	0.294	0.258	0.067	0.326	30.477	0.013	0.974
Assam	0.470	0.348	0.272	0.038	0.356	32.860	0.028	0.953
West Bengal	0.546	0.441	0.327	0.084	0.367	35.897	0.018	0.939
Jharkhand	0.406	0.296	0.220	0.063	0.497	28.867	0.048	0.929
Orissa	0.577	0.457	0.374	0.069	0.295	40.931	0.030	0.954
Chhattisgarh	0.484	0.360	0.293	0.058	0.356	35.051	0.022	0.941
Madhya Pradesh	0.403	0.300	0.228	0.100	0.412	35.183	0.039	0.926
Gujarat	0.482	0.362	0.294	0.082	0.377	38.386	0.033	0.915
Daman & Diu	0.313	0.224	0.165	0.067	0.433	34.824	0.000	1.000
Dadra & Nagar H.	0.396	0.284	0.227	0.053	0.401	39.576	0.000	0.890
Maharashtra	0.456	0.343	0.270	0.100	0.370	41.143	0.090	0.929
Andhra Pradesh	0.497	0.361	0.321	0.070	0.385	40.030	0.162	0.936
Karnataka	0.424	0.299	0.258	0.078	0.400	40.772	0.112	0.931
Goa	0.438	0.294	0.280	0.036	0.429	46.698	0.031	0.906
Lakshadweep	0.594	0.458	0.422	0.105	0.511	41.881	0.102	0.969
Kerala	0.638	0.501	0.466	0.093	0.324	42.050	0.039	0.921
Tamil Nadu	0.529	0.405	0.337	0.080	0.336	42.519	0.185	0.926
Pondicherry	0.514	0.357	0.357	0.075	0.324	39.797	0.101	0.957
Andaman & Nic.	0.432	0.313	0.269	0.100	0.458	36.059	0.086	0.963

Notes: Weighted to national level with weights provided by NSSO. Table reports mean proportions in cols. (1) – (5), (7) – (8). Mean age in years in column (6).

Table 4: Random-coefficients regressions of household outcomes: comparison of households with disabled member(s) and households without disabled member(s).

	Outcomes					
	person is married	monthly per capita expenditure	person is illiterate	person is middle schooled	person has secondary school & above	person has diploma or certificate course
Household has disabled member(s)	-0.042***	-176.408***	0.005*	0.049***	-0.046***	-0.005***
	(0.004)	(18.005)	(0.003)	(0.004)	(0.004)	(0.001)
Test of parameter constancy						
χ^2 value	1388.44	3740.57	3712.50	2317.83	1838.33	848.47
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Includes household characteristics	YES	YES	YES	YES	YES	YES
HH Observations	32601	32603	32596	32596	32596	32596
Number of States	35	35	35	35	35	35

Notes: Weighted to national level with weights provided by NSSO (2002). Comparison group is households without disabled member(s). Table reports state-level random-coefficient regression estimates. Bootstrapped standard errors, clustered by state, in parentheses. *p*-values in square brackets. Household characteristics included are rural status, whether the household is self-employed, whether it has wage/salary earning, whether the religion of the household is Hinduism, whether the household belongs to SC/ST groups, age, gender, and literacy status of the household head, and indicators of household structure. The notation *** is p<0.01, ** is p<0.05, * is p<0.10. Regressions include a constant term.

Table 5: Random-coefficients regressions of household outcomes: comparison of households with disabled male(s) and households without disabled member(s).

	Outcomes					
	person is married	monthly per capita expenditure	person is illiterate	person is middle schooled	person has secondary school & above	person has diploma or certificate course
Household has disabled male	-0.048***	-190.939***	-0.001	0.057***	-0.046***	-0.005***
	(0.005)	(17.164)	(0.003)	(0.005)	(0.005)	(0.001)
Test of parameter constancy						
χ^2 value	1154.12	3075.37	2942.18	1841.58	1523.50	756.18
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Includes household characteristics	YES	YES	YES	YES	YES	YES
HH Observations	26669	26671	26666	26666	26666	26666
Number of States	35	35	35	35	35	35

Notes: Weighted to national level with weights provided by NSSO (2002). Comparison group is households without disabled member(s). Table reports state-level random-coefficient regression estimates. Bootstrapped standard errors, clustered by state, in parentheses. *p*-values in square brackets. Household characteristics included are rural status, whether the household is self-employed, whether it has wage/salary earning, whether the religion of the household is Hinduism, whether the household belongs to SC/ST groups, age, gender, and literacy status of the household head, and indicators of household structure. The notation *** is p<0.01, ** is p<0.05, * is p<0.10. Regressions include a constant term.

Table 6: Random-coefficients regressions of household outcomes: comparison of households with disabled female(s) and households without disabled member(s).

	person is married	monthly per capita expenditure	person is illiterate	person is middle schooled	person has secondary school & above	person has diploma or certificate course
			Outcomes			
Household has disabled female	-0.031***	-157.748***	0.017***	0.038***	-0.049***	-0.005***
	(0.005)	(16.546)	(0.003)	(0.006)	(0.004)	(0.001)
Test of parameter constancy						
χ^2 value	1007.10	2668.57	2670.62	1599.25	1301.65	667.95
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Includes household characteristics	YES	YES	YES	YES	YES	YES
HH Observations	24190	24192	24186	24186	24186	24186
Number of States	35	35	35	35	35	35

Notes: Weighted to national level with weights provided by NSSO (2002). Comparison group is households without disabled member(s). Table reports state-level random-coefficient regression estimates. Bootstrapped standard errors, clustered by state, in parentheses. *p*-values in square brackets. Household characteristics included are rural status, whether the household is self-employed, whether it has wage/salary earning, whether the religion of the household is Hinduism, whether the household belongs to SC/ST groups, age, gender, and literacy status of the household head, and indicators of household structure. The notation *** is $p<0.01$, ** is $p<0.05$, * is $p<0.10$. Regressions include a constant term.

Table 7: Random-coefficients regressions of household outcomes: comparison of households with only disabled female(s) and households with only disabled male(s).

	Outcomes											
	person is married	monthly pc expenditure	disability caused loss of work	person is illiterate	person is middle schooled	person has sec. sch. & above	person has diploma or cert. course	dis. person did voc. course	dis. person rec. govt. aid	dis. person received non-govt aid	dis. child attended pre-sch interven.	dis. child enroll. in special school
Household has disabled female	-0.016***	38.847**	0.038**	0.016***	-0.017***	-0.001	-0.0003	-0.001	-0.005	-0.003**	0.018	-0.013
	(0.004)	(17.101)	(0.018)	(0.003)	(0.004)	(0.004)	(0.001)	(0.002)	(0.004)	(0.001)	(0.015)	(0.019)
Test of parameter constancy												
χ^2 value	655.30	1938.32	505.82	2070.93	1455.08	791.34	547.97	323.23	870.44	281.39	325.09	88.52
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.239]	[0.000]	[0.840]	[0.000]	[0.583]
Includes HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
HH Observations	15191	15191	5722	15188	15188	15188	15188	15181	15182	15182	3331	659
Number of states	35	35	31	35	35	35	35	35	35	35	35	24

Notes: Weighted to national level with weights provided by NSSO (2002). Comparison group is households with only disabled male. Table reports state-level random-coefficient regression estimates. Bootstrapped standard errors, clustered by state, in parentheses. *p*-values in square brackets. Household characteristics included are rural status, whether the household is self-employed, whether it has wage/salary earning, whether the religion of the household is Hinduism, whether the household belongs to SC/ST groups, age and literacy status of the household head, and indicators of whether the individual was disabled from birth and age of onset of disability for individuals who were not born disabled. The notation *** is p<0.01, ** is p<0.05, * is p<0.10. Regressions include a constant term.

Table 8: Random-coefficients regressions of household outcomes: comparison of households with more than one person with disabilities and households with only one disabled person.

					Outcomes				
	person is married	monthly pc expenditure	person is illiterate	person is middle schooled	person has sec. sch. & above	person has diploma or cert. course	dis. person did voc. course	dis. person rec. govt. aid	dis. person received non-govt aid
Household has more than one member with disabilities	0.005 (0.016)	-31.536 (22.816)	-0.007 (0.007)	0.024** (0.011)	-0.010 (0.009)	0.00003 (0.001)	0.006 (0.005)	0.004 (0.009)	0.001 (0.002)
Test of parameter constancy									
χ^2 value	589.61 [0.000]	1729.99 [0.000]	1957.40 [0.000]	1351.65 [0.000]	755.49 [0.000]	546.08 [0.000]	326.14 [0.118]	859.66 [0.000]	258.76 [0.947]
Includes HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES
HH Observations	15045	15045	15042	15042	15042	15042	15035	15036	15036
Number of States	34	34	34	34	34	34	34	34	34

Notes: Weighted to national level with weights provided by NSSO (2002). Comparison group is households with a disabled member. Cannot estimate models for disability caused loss of work, disabled child attended pre-school intervention, and disabled child enrolled in special school due to insufficient variation. The state of Nagaland was also excluded due to insufficient variation. Table reports state-level random-coefficient regression estimates. Bootstrapped standard errors, clustered by state, in parentheses. *p*-values in square brackets. Household characteristics included are rural status, whether the household is self-employed, whether it has wage/salary earning, whether the religion of the household is Hinduism, whether the household belongs to SC/ST groups, age and literacy status of the household head, and an indicator of whether the individual was disabled from birth. The notation *** is p<0.01, ** is p<0.05, * is p<0.10. Regressions include a constant term.

Table 9: Instrumental variables regressions of household outcomes: comparison of households with disabled member(s) and households without disabled member(s).

| | *Outcomes* | | | | | |
	person is married	monthly per capita expenditure	person is illiterate	person is middle schooled	person has secondary school & above	person has diploma or certificate course
Household has disabled member(s)	-0.056***	-227.062***	0.005	0.050***	-0.051***	-0.004*
	(0.006)	(39.051)	(0.006)	(0.011)	(0.010)	(0.002)
Under-identification test						
Kleibergen - Paap LM statistic	16.841	16.840	16.842	16.842	16.842	16.842
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Over-identification test						
Hansen *J* statistic	0.065	0.150	0.881	0.925	0.081	1.146
	[0.799]	[0.699]	[0.348]	[0.336]	[0.776]	[0.284]
Includes household characteristics	YES	YES	YES	YES	YES	YES
HH Observations	32601	32603	32596	32596	32596	32596
Number of States	35	35	35	35	35	35

Notes: Weighted to national level with weights provided by NSSO (2002). Comparison group is households without disabled member(s). Table reports two-stage least squares models. Standard errors, clustered by state, in parentheses. *p*-values in square brackets. Household characteristics included are rural status, whether the household is self-employed, whether it has wage/salary earning, whether the religion of the household is Hinduism, whether the household belongs to SC/ST groups, age, gender, and literacy status of the household head, indicators of household structure, and regional indicators for northern, western, eastern, and central states. A test for the equivalence of the regional indicators is rejected for all outcomes except the last one – person has diploma or certificate course (these results are not reported but are available on request). The notation *** is p<0.01, ** is p<0.05, * is p<0.10. Regressions include a constant term.

Table 10: Wald estimator results for household outcomes: comparison of households with disabled member(s) and households without disabled member(s).

	Outcomes					
	person is married	monthly per capita expenditure	person is illiterate	person is middle schooled	person has secondary school & above	person has diploma or certificate course
Household has disabled member(s)	-0.037***	-205.272***	0.004	0.046***	-0.045***	-0.004***
	(0.004)	(18.776)	(0.006)	(0.005)	(0.005)	(0.001)
Under-identification test						
Kleibergen - Paap LM statistic	18.283	18.281	18.283	18.283	18.283	18.283
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Weak identification test						
Kleibergen – Paap F statistic	1541.833	1541.550	1541.463	1541.463	1541.463	1541.463
10% maximal IV size	16.380	16.380	16.380	16.380	16.380	16.380
Includes household characteristics	YES	YES	YES	YES	YES	YES
HH Observations	32601	32603	32596	32596	32596	32596
Number of States	35	35	35	35	35	35

Notes: Weighted to national level with weights provided by NSSO (2002). Comparison group is households without disabled member(s). Standard errors, clustered by state, in parentheses. *p*-values in square brackets. Household characteristics included are rural status, whether the household is self-employed, whether it has wage/salary earning, whether the religion of the household is Hinduism, whether the household belongs to SC/ST groups, age, gender, and literacy status of the household head, indicators of household structure, and regional indicators for northern, western, eastern, and central states. A test for the equivalence of the regional indicators is rejected for all outcomes except the last one – person has diploma or certificate course (these results are not reported but are available on request). The notation *** is p<0.01, ** is p<0.05, * is p<0.10. Regressions include a constant term.

Table 11: Robustness of the Wald estimator results: Tests of whether instrument is correlated with personal characteristics that are independent of disability status.

	Personal characteristics			
	HH religion is Hinduism	HH belongs to Scheduled Caste or Scheduled Tribe	HH belongs to Other Backward Classes	Gender is male
Whether parents of disabled member were blood-related	-0.009 (0.013)	0.038 (0.024)	0.020 (0.016)	-0.001 (0.007)
Includes household characteristics	YES	YES	YES	YES
HH Observations	32603	6103	6103	6103
Number of States	35	35	35	35

Notes: Weighted to national level with weights provided by NSSO (2002). Comparison group is households without disabled member(s). Table reports OLS regressions. Standard errors, clustered by state, in parentheses. Household characteristics included are rural status, whether the household is self-employed, whether it has wage/salary earning, age, gender, and literacy status of the household head, indicators of household structure, and regional indicators for northern, western, eastern, and central states. The notation *** is p<0.01, ** is p<0.05, * is p<0.10. Regressions include a constant term.