Disability, Poverty, and Schooling in Developing Countries: Results from 14 Household Surveys

Deon Filmer

Analysis of 14 household surveys from 13 developing countries suggests that 1–2 percent of the population have disabilities. Adults with disabilities typically live in poorer than average households: disability is associated with about a 10 percentage point increase in the probability of falling in the two poorest quintiles. Much of the association appears to reflect lower educational attainment among adults with disabilities. People of ages 6–17 with disabilities do not live in systematically wealthier or poorer households than other people of their age, although in all countries studied they are significantly less likely to start school or to be enrolled at the time of the survey. The order of magnitude of the school participation deficit associated with disability—which is as high as 50 percentage points in 3 of the 13 countries—is often larger than deficits related to other characteristics, such as gender, rural residence, or economic status differentials. The results suggest a worrisome vicious cycle of low schooling attainment and subsequent poverty among people with disabilities in developing countries. JEL codes: O15, J14, I32, I20, I10

With more than 100 million primary school–age children not attending school worldwide (UNESCO 2005), the target of universal education, endorsed by more than 180 countries as a part of the Millennium Development Goals, remains elusive. Children with disabilities face particular hurdles in attending and completing school in developing countries. While there has been much discussion about policy interventions to increase access to schooling for children with disabilities (see, for example, Peters 2003; World Bank 2003), little systematic empirical analysis has been conducted on which to base this policy.

The lack of analysis largely reflects the lack of appropriate and comparable data. Almost a decade ago, Elwan (1999) described the lack of empirical work

Deon Filmer is a senior economist in the Development Research Group at the World Bank; his email address is dfilmer@worldbank.org. Tomoki Fuji, Johannes Hoogeveen, Elizabeth King, Daniel Mont, Susan Peters, and Dan Rees provided helpful comments on an earlier draft. Dilip Parajuli provided excellent research assistance. A supplemental appendix to this article is available at http://wber.oxfordjournals.org/.

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on the association between disability and poverty in the developing world; such work is still missing.[1] This study aims to start filling some knowledge gaps using existing data on the prevalence of disability and its association with poverty and schooling in 12 developing, and 1 transition, countries.

Defining disability is complicated—and controversial. The purely medical definitions used in the past are giving way to definitions that incorporate continuous measures of the activities that people can undertake, the extent of their participation in society and social and civic life, and the role of adaptive technologies (Mont 2007). The World Health Organization's International Classification of Functioning, Disability and Health (ICF) describes disability as an umbrella term for impairments, activity limitations, and participation restrictions as part of a broader classification scheme covering three main domains: body functioning and structure, activities and participation, and environmental factors.[2] The interaction of aspects of all three of these domains determines individual welfare and social policy choices facing governments.[3]

The main goal of this article is descriptive. Many of the basic facts about disability, poverty, and schooling in developing countries are unknown or have not been systematically addressed. To contribute to the foundations of policy development, this article analyzes the data to investigate the interactions between impairment and schooling and their relation with poverty. It finds that disability among youth is not typically associated with household poverty but that it is systematically and significantly related to lower school participation, which in turn increases poverty in adulthood.

The article is organized as follows. Section I compares definitions and the prevalence of disability across the household surveys covered. Section II investigates the association with poverty by examining the extent to which young people with disabilities live in households with lower economic status and the extent to which disability and schooling are related to poverty in adulthood. Section III investigates the association between disability and school participation among school-age youth. Section IV draws conclusions and makes the case for better data.

I. Data

The data come from 14 nationally representative household surveys in 13 countries. Five surveys—from Bolivia (1997), Cambodia (2000), Chad (2004), Colombia (1995), and India (1992)—are Demographic and Health Surveys

1. An early exception is Afzal (1992), who analyzes disability and its correlates in Pakistan. Yeo and Moore (2003) review some of the literature on poverty and disability, but the work they refer to is typically not based on large-scale surveys.

2. A guide to the ICF is available at http://www3.who.int/icf/.

3. Haveman and Wolfe (2000, p. 998) emphasize that an economic definition of disability refers to characteristics that "constrain normal daily activities or cause substantial reduction in productivity on the job."

(DHS). Two surveys—from Jamaica (1998) and Romania (1995)—are associated with the Living Standards Measurement Study (LSMS) surveys. Two other surveys—from Burundi (2000) and Mongolia (2000)—are End of Millennium Multiple Indicator Cluster Surveys (MICS2) carried out under the guidance of the United Nations Children's Fund (UNICEF). Five surveys—from Cambodia (1999), Indonesia (2000), Mozambique (1996), South Africa (1995), and Zambia (2003)—are national socioeconomic surveys (SES).[4] These types of surveys are typically used to calculate poverty statistics or to derive basic health indicators, such as child mortality, or the use of health services; they underlie much empirical poverty and social analysis in developing economies. Most of the surveys have a sample size of about 5,000–25,000 households, with India (88,512 households) and Indonesia (65,762 households) as outliers (table 1).

All DHS, LSMS, and MICS2 surveys were reviewed for questions on disability, with all surveys with a clear question on disability for the relevant age range included.[5] The SES from Cambodia, Indonesia, Mozambique, South Africa, and Zambia are some of the most recent in the world with information on disability. There are relatively few data of this kind in developing countries: the datasets, and therefore the countries, for this analysis were selected on the basis of data availability and are not necessarily representative of developing countries in general.

This is clearly a heterogeneous group of countries. The population living on less than $1 a day ranges from 2 percent in Jamaica and Romania to 55 percent in Burundi; under-five mortality—an indicator of basic health status—ranges from 20 per 1,000 live births in Jamaica to 212 per in Mozambique (see table 1). The sample includes five countries in Sub-Saharan Africa, four in Asia, three in Latin America and the Caribbean, and one in Eastern Europe. While heterogeneity has the advantage that the results will reflect a range of underlying conditions, it has the disadvantage that little draws these countries together other than the availability of data for this analysis. The definitions of disability in these datasets are most closely consistent with a focus on impairment—and as such fall mostly under ICF's "body functioning and structure" domain. This is arguably an advantage, because impairment such as blindness or the lack of a limb is typically easy to verify.

Selective misreporting of morbidity has long been recognized as a potential problem in studies of the relation between health and other socioeconomic

4. DHS data are available at http://www.measuredhs.com; LSMS data are available at http://www.worldbank.org/lsms; MICS2 data are available at http://www.childinfo.org; national SES are available from the countries' national statistics offices. Despite the general consistency of DHS surveys across countries, disability is not a part of the "core" DHS module; information on disability is therefore not typically collected as a part of DHS. Identifying questions relating to disability required reviewing the country-specific components of the datasets.

5. Surveys with fewer than 50 disabled people between the ages of 6 and 17 were dropped from the analysis, because they represented too few observations on which to draw inferences. DHS data from Mozambique and MICS2 data from Myanmar and Sierra Leone were excluded on this basis.

TABLE 1. Basic Statistics on Countries and Surveys

Country/year of survey	Type of survey	GDP per capita (2000 PPP dollars)	Population living on less than a $1 a day (percent)	Under-five mortality rate (per 1,000 live births)	Number of households surveyed	Type of disability covered	Size of population ages 6–17	Number of people ages 6–17 with disabilities
Bolivia 1997	DHS	2,349	20	105	12,028	All	16,605	75
Burundi 2000	MICS2	584	55	190	3,979	Physical	5,865	73
Cambodia 1999	SES	1,741	34	135	6,001	All	10,881	96
Cambodia 2000	DHS	1,859	34	135	12,236	Physical	23,765	214
Chad 2004	DHS	1,241	—	208	5,366	All	9,952	57
Colombia 1995	DHS	6,207	3	31	10,107	All	11,951	130
India 1992	NFHS (DHS)	1,692	42	123	88,512	Visual, physical	140,297	1,337
Indonesia 2003	SES	3,204	8	48	65,762	All	64,136	326
Jamaica 1998	LSMS	3,611	2	20	7,375	Physical, mental	6,964	58
Mongolia 2000	MICS2	1,610	27	65	6,000	Visual, hearing	7,645	245
Mozambique 1996	SES	700	38	212	8,250	All	14,520	156
Romania 1995	LSMS	6,210	2	26	24,560	All	13,777	82
South Africa 2005	SES	11,044	11	68	28,192	All	30,151	454
Zambia 2003	SES	823	76	182	9,713	All	19,075	223

— not available.

Note: PPP is purchasing power parity; DHS is Demographic and Health Survey; MICS2 is End of Millennium Multiple Indicator Cluster Survey; SES is Socioeconomic Survey; NFHS is National Family Health Survey; LSMS is Living Standards Measurement Study survey. Data for all countries except Burundi cover 6- to 17-year-olds; age range in Burundi is 6- to 14-year-olds. Poverty rates are for the following years: Bolivia 1997; Burundi 1998; Cambodia 1997; India 1993; Indonesia 2002; Jamaica 1999; Mongolia 1998; Mozambique 1996; Romania 1998; South Africa 2000; and Zambia 2003. Under-five mortality data on Burundi, Cambodia, Colombia, Indonesia, Jamaica, and South Africa are for 2000. Data on India are for 1990. Data on Bolivia, Mozambique, and Romania are for 1995. Data on Chad, South Africa, and Zambia are for 2005. "All" types of disabilities include visual, hearing, speech, physical, and mental disabilities. See appendix table A-1 for the precise wording and types of disabilities covered by each survey.

Source: World Bank (various years); author's analysis based on data described in the text.

characteristics (Gertler, Rose, and Glewwe 2000). To overcome this problem Gertler and Gruber (2002) use responses to questions regarding activities of daily living when analyzing the impact of major illness on household consumption in Indonesia. Yount and Agree (2005) use activities of daily living in analyzing gender differences in disability among the elderly in Egypt and Tunisia.

Despite the relative ease of verifying the types of disabilities in the study datasets, it is nevertheless possible that there is selective reporting. Some respondents and interviewers, for example, might interpret blindness as partial sight, whereas others might interpret it to mean complete inability to see. It is also possible that mental disability is selectively recognized and reported by some respondents. Selective reporting is usually assumed to result in higher reporting of disabilities by wealthier socioeconomic groups. Under this assumption the estimates reported here would underestimate the relation between disability and poverty.[6]

Despite the fact that all 14 surveys have an impairment definition of disability, substantive differences remain across datasets. Nine surveys use an "extensive" definition that includes visual, hearing, speech, physical, and mental disability. But even within this group, the definition of each type of impairment varies. In the Cambodia SES, for example, the physical disability category contains a detailed list of potential cases ("amputation of one limb; amputation of more than one limb; unable to use one limb; unable to use more than one limb; paralyzed lower limbs only; paralyzed all four limbs"). In contrast, in Jamaica a single category covers "physical or mental disability." More generally, in some countries the definition is stricter than in others. In Mongolia sight and hearing are described as "with difficulty"; in other surveys they are characterized as "blind" and "deaf" (the wording of the questions on disability in these surveys is provided in appendix table A-1).

The second main data constraint is the fact that the surveys do not typically identify large numbers of people with disabilities. Any subsequent analysis therefore suffers from imprecision. The smallest number of cases of disability among 6- to 17-year-olds are in Chad (57) Jamaica (58), Burundi (73), and Bolivia (75). Standard errors are often large for the results reported below, although the main finding—the deficit in school participation among people with disabilities—is consistently statistically significant.

6. A large body of literature covers the selective reporting of disability in the context of social programs targeting disability. Higher benefits are typically hypothesized to result in higher rates of reported disability. For a recent empirical demonstration, see Duggan, Rosenheck, and Singleton (2006). Some program aspects, such as hurdles in accessing benefits, may reduce self-declared disability (see the discussion in Parsons 1991). At least one study (Benitez-Silva and others 2004) finds no systematic bias in self-reported disability compared with bureaucratic assessment among adult applicants for Social Security benefits in the United States. Reported disability might also be an unintended consequence of a different set of programs. Figlio and Getzler (2002) argue that increases in the use of learning achievement tests for school accountability in the United States has led to an increase in reported disability among students, because schools can exclude these students from average scores.

A last data constraint concerns the measurement of household poverty. All LSMS and SES surveys include household per capita consumption expenditures, the variable typically used in poverty analysis. For these datasets economic status quintiles based on per capita consumption expenditures can therefore be used. DHS and MICS2 data do not include consumption expenditures. For these datasets, an index of household consumer assets and housing characteristics (an economic status index) are used to classify households into quintiles (following Filmer and Pritchett 2001). In the Cambodia SES, which encountered problems collecting consumption data, and the South Africa SES, which does not include a full consumption module, an index based on assets and housing quality variables is also used.[7]

II. Prevalence of Disability and Association with Household Economic Status

The first issue these data are used to explore is the prevalence of disability and its association with household economic status among youth 6- to 17-years-old. The next issue is the relation among disability, poverty, and education attainment among adults.

Prevalence of Disability among 6- to 17-Year-Olds

Estimates of the prevalence of disability range from 0.49 percent (Chad) to 3.2 percent (Mongolia) (table 2). These figures are consistent with those that appear in the United Nations statistical database on disability (DISTAT).[8] In that database, which compiles results from more than 65 surveys and censuses in developing economies between 1970 and 1992, the mean prevalence rate is 1.7 percent for the entire population and 0.7 for children under 14. Using a definition of disability consistent with the one adopted in the datasets analyzed here, LeRoy, Evans, and Deluca (2000) find a prevalence of disability among 5- to 15-year-olds of 2.07–2.62 percent in Ireland, Italy, Switzerland, and the United States.[9]

Perhaps surprisingly, of the 14 surveys analyzed here, those that list more types of impairments do not systematically identify a higher percentage of the population as disabled. In countries that include visual, hearing, speech, physical, and mental disabilities, for example, prevalence ranges from 0.49 in Bolivia and Chad to 1.38 in South Africa—close to the entire range across all

7. Consistent with typical poverty analysis, quintiles are derived on the basis of the distribution of people across the economic status measure.

8. The database is available at http://unstats.un.org/unsd/demographic/sconcerns/disability/disab2.asp. A summary of the country-level DISTAT information is available in the supplemental appendix to this article, accessible at http://wber.oxfordjournals.org/.

9. The U.S. rate of 2.1 rises to 4.4 percent if "speech and language disability" (a separate category from "mute and deaf/mute") is included. When people with difficulty in learning, remembering, or concentrating are added, the rate increases to about 6 percent (Freedman, Martin, and Schoeni 2004).

TABLE 2. Prevalence of Disability among 6- to 17-Year-Olds, by Household Economic Status Quintile

Country	All	Quintile 1 (poorest)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (richest)	*p*-values on economic status variables[a]	
							Dummy variables	Continuous
Bolivia	0.49 (0.07)	0.45 (0.12)	0.43 (0.12)	0.54 (0.15)	0.64 (0.19)	0.39 (0.14)	0.82	0.78
Burundi[b]	1.24 (0.21)	1.28 (0.50)	1.19 (0.69)	1.19 (0.42)	1.28 (0.36)	1.28 (0.30)	1.00	0.62
Cambodia (Socioeconomic Survey)	0.87 (0.12)	0.91 (0.24)	0.84 (0.24)	0.87 (0.34)	0.81 (0.28)	0.94 (0.18)	1.00	0.95
Cambodia	0.86 (0.07)	1.00 (0.17)	1.01 (0.16)	0.77 (0.15)	0.65 (0.14)	0.90 (0.16)	0.40	0.39
Chad	0.49 (0.09)	0.46 (0.19)	0.32 (0.14)	0.64 (0.22)	0.49 (0.20)	0.55 (0.12)	0.72	0.70
Colombia	1.08 (0.10)	1.24 (0.24)	1.34 (0.25)	1.03 (0.22)	0.72* (0.17)	1.05 (0.26)	0.24	0.15
India	1.03 (0.04)	1.20 (0.09)	1.13 (0.09)	0.92** (0.08)	1.03 (0.07)	0.84*** (0.08)	0.01	0.01
Indonesia	0.50 (0.03)	0.70 (0.08)	0.55 (0.08)	0.41** (0.07)	0.50* (0.08)	0.38*** (0.06)	0.02	0.08
Jamaica	0.82 (0.11)	1.01 (0.28)	1.06 (0.26)	0.48 (0.18)	0.68 (0.24)	0.88 (0.30)	0.29	0.63
Mongolia	3.20 (0.27)	3.40 (0.57)	3.01 (0.50)	2.88 (0.56)	2.81 (0.50)	3.92 (0.63)	0.62	0.14
Mozambique	1.19 (0.13)	0.87 (0.17)	0.81 (0.20)	1.58* (0.36)	1.39 (0.29)	1.29 (0.28)	0.14	0.60
Romania	0.60 (0.07)	0.91 (0.19)	0.47* (0.13)	0.54 (0.16)	0.47* (0.13)	0.58 (0.14)	0.38	0.13
South Africa	1.38 (0.09)	1.50 (0.20)	1.46 (0.19)	1.67 (0.21)	1.22 (0.17)	1.06 (0.24)	0.27	0.26
Zambia	1.32 (0.11)	1.46 (0.26)	1.32 (0.22)	1.40 (0.28)	1.24 (0.23)	1.16 (0.22)	0.88	0.36

Difference with poorest quintile: ***Statistically significant at the 1 percent level; **statistically significant at the 5 percent level; *statistically significant at the 10 percent level.

Note: The Numbers in parentheses are robust standard errors.

[a]The *p*-values report of the test of joint siginificance of the set of dummy variables for quinitiles 2–5 and of the continuous measure of economic status and its square in a probit regression of disablity on economic status.

[b]Age range Burundi is 6–14.

Source: Author's analysis based on data described in the text.

the surveys. The highest prevalence rate in this collection of datasets is observed in Mongolia (3.20 percent), which includes only visual and hearing impairments, while the rates are lower in Burundi (1.24 percent) and the Cambodia DHS (0.86 percent), which cover only physical disabilities.

Of course, this variability combines both actual differences in prevalence and differences in survey techniques. In Cambodia, which conducted two surveys separated by only one year, the survey with the more extensive definition of disability does not yield the higher prevalence: the SES in 1999, with a broad definition of disability, identifies 1.51 percent of the population as disabled, whereas the DHS in 2000, with a narrow definition (restricted to physical disabilities), identifies 1.57 percent of the population as disabled. Clearly, there is substantial variation across surveys in how people with disabilities are identified; cross-country comparisons in prevalence can be made only with caution.[10]

Despite the lack of cross-country comparability in the definitions and measurement of disability, these surveys are still useful in describing the association of disability with other characteristics. That is, conditional on a particular definition, the analysis is valid for a given survey because the definition is common to all individuals in that survey. Moreover, it is less likely that cross-country comparisons of the association between disability and other characteristics suffer from these problems. But even this comparison needs to be treated with some caution: if, for example, some types of disabilities are more closely associated with a correlate than others, then surveys that include that type of disability will show a higher association with the correlate than those that do not. If loss of a limb is more closely associated with poverty than are other types of impairments, for example, then (everything else being equal) a survey that includes loss of a limb in its definition of disability will yield a higher correlation between disability and poverty.

Do Youth with Disabilities Live in Poorer Households?

The prevalence of disability among 6- to 17-year-old tends to be slightly lower in richer quintiles, but the association is not always monotonic. Moreover, India and Indonesia are the only countries in which the prevalence of disability in the richest quintile is statistically significantly different from that in the poorest quintile. In India, prevalence in the richest quintile is about a third of that in the poorest quintile; in Indonesia it is about half (see table 2).

Two additional tests of the association between disability and poverty were carried out. The first entailed estimating a probit regression of disability on dummy variables for living in a household of each economic status quintile and then determining the joint statistical significance of these dummy variables (that is, a joint version of the quintile-by-quintile tests). This approach allows

10. Developing good data on disability is difficult: United Nations (2001) contains a guide to doing so. See Mont (2007) for a recent review.

for a great degree of nonlinearity in the association, because the coefficient can be different for each quintile and the approach does not impose monotonicity. However, it is possible that the small number of young people with disabilities means that there will be very few cases within each quintile and that therefore even a joint test of the coefficients on the quintile dummy variables may not have enough power to identify a significant association.

To address this potential problem, the second approach entailed a probit regression of disability on the continuous variable measuring economic status (per capita household expenditures or an index of assets and housing characteristics) and its square. This approach allows less flexibility, but it does not rely on quintile-specific estimates of prevalence, which may be imprecise.

In both tests, India and Indonesia are the only countries in which either the joint test on the dummy variables or on economic status and its square yield a statistically significant association. These are the countries with the largest sample sizes, which gives rise to the concern that it is simply the power of the test that is low in the other countries. However, as discussed below, the same datasets yield large and statistically significant gaps in schooling in all countries, suggesting that it is not simply an issue of power.[11] In sum, these results do not suggest that, as a general rule, youth with disabilities are more likely to live in poorer households, although this is the case in two of the 14 datasets.

Disability, Poverty, and Schooling in Adulthood

Disability is a strong correlate of poverty in adulthood. Haveman and others (1999) show that income in the United States in 1991 of households headed by a person with a disability was roughly half the mean for the population as whole (even after accounting for transfers from social programs) and the rate of poverty about twice as high as the overall population's. Hoogeveen (2005) estimates that 42 percent of households headed by a person with a disability were poor in Uganda in 1991 but that just 25 percent of other households were.[12]

The analysis of the relation between disability and economic status should be interpreted as an association and not necessarily a cause or consequence. Disability is both a determinant of poverty, because it lowers earning power and consumption expenditures (Haveman and Wolfe 2000; Gertler and Gruber 2002), and a consequence of poverty, because the cumulative deprivations of

11. The results are consistent if (as suggested by a referee) one estimates the reverse regression of the probability of being poor as a function of whether a school-age child has a disability controlling for other covariates (that is, a specification analogous to the schooling model estimated below). In this approach, disability is statistically insignificantly related to poverty in all the countries when poverty is defined as being in the poorest two quintiles. The association is statistically significant in India and Indonesia if poverty is defined as being in the poorest quintile (results are available in the supplemental tables of this article, available at http://wber.oxfordjournals.org/).

12. Hoogeveen (2005, p. 606) defines disability among household heads differently than the datasets used here. In that survey, a head of household is considered disabled if the disability "prevents him or her from being actively engaged in labor activities during the past week."

poverty such as inadequate infant or child development, or exposure to dangerous working conditions, can manifest themselves in disability. Moreover, the presence of a person with a disability entails direct costs, which lower standards of living (Jones and O'Donnell 1995; Haveman and Wolfe 2000; Zaidi and Burchardt 2005).

Twelve of the datasets include information on the disability status of adults. A probit regression model was estimated in which the dependent variable is a dummy variable equal to 1 if a person of 20–50 lives in a household in the two poorest quintiles.[13] The first model estimates the association with disability after controlling for a set of basic characteristics: age, age-squared, a dummy variable for being male, urban residence, and dummy variables for region of residence. Disability is statistically significantly related to an increase in the probability of being poor in eight of the datasets (table 3). Among these, having a disability is associated with a 5.0–14.5 percentage point increase in the probability of being in the two poorest quintiles. In the remaining four datasets the association is positive but not statistically significant.

The second model adds years of schooling completed to the set of correlates of poverty, thereby controlling for the effect of schooling on poverty. The coefficient on disability becomes statistically insignificant in several countries—and turns from being significantly positive to significantly negative in several others.[14] In all cases, the coefficient on years of schooling is statistically significantly negative: each additional year of schooling is associated with about a 2–5 percentage point reduction in the probability of being in the two poorest quintiles.[15]

These results suggest that disability and poverty are related in adulthood and that much of this association is mediated by education: after accounting for the lower educational attainment of adults with a disability there is no longer a systematic positive relation between disability and poverty. This finding suggests that ensuring that youth with disabilities do not have lower educational attainment could be a powerful way to reduce the likelihood that they live in poverty as adults. The next section shows just how great a challenge this is.

III. Disability and Schooling

Consider now the relation between disability and schooling among youth (table 4). Six- to seventeen-year-olds with disabilities are almost always substantially less likely to be in school than their peers without disabilities.

13. Qualitatively similar results are obtained if just the poorest quintile is used.

14. This effect is caused by years of schooling alone. The results are qualitatively similar if only years of schooling enter the model and all other correlates are dropped.

15. The results presented in the supplemental appendix, available at http://wber.oxfordjournals.org/, do not support the notion that there is an interactive effect between disability and schooling: when included, an interaction term is always insignificantly different from zero and small in magnitude in all countries.

TABLE 3. Association between Disability, Schooling, and the Probability of Being in the Bottom Two Economic Status Quintiles among Adults 20–50

Country	Model 1, excluding schooling but including other variables	Model 2, including schooling and other control variables		Number of observations (4)	Number of people with disabilities (5)
	Coefficient on: disability (1)	Coefficient on: disability (2)	Coefficient on: years of schooling (3)		
Bolivia	0.145*** (0.052)	0.013 (0.057)	−0.037*** (0.002)	18,632	179
Cambodia (Socioeconomic Survey)	0.015 (0.040)	0.013 (0.046)	−0.027*** (0.003)	9,195	251
Cambodia	0.129*** (0.028)	0.092*** (0.029)	−0.047*** (0.002)	23,191	504
Chad	0.056 (0.077)	0.021 (0.074)	−0.037*** (0.005)	7,128	138
Colombia	0.131*** (0.033)	−0.052* (0.031)	−0.050*** (0.002)	18,807	309
India	0.068*** (0.012)	0.052*** (0.012)	−0.049*** (0.001)	199,140	309
Indonesia	0.083*** (0.024)	−0.030 (0.023)	−0.042*** (0.001)	121,964	774
Jamaica	0.133*** (0.048)	0.084* (0.048)	−0.024*** (0.002)	10,197	188
Mozambique	0.015 (0.032)	0.006 (0.032)	−0.019*** (0.003)	13,909	366
Romania	0.050* (0.028)	−0.068** (0.028)	−0.046*** (0.002)	30,584	356
South Africa	0.097*** (0.018)	−0.020 (0.020)	−0.061*** (0.002)	44,539	1,766
Zambia	0.015 (0.034)	−0.039 (0.035)	−0.032*** (0.002)	18,596	377

***Statistically significant at the 1 percent level; **statistically significant at the 5 percent level; *statistically significant at the 10 percent level.

Note: The Numbers in parentheses are robust standard errors. Explanatory varible differ across models. Model 1 includes disability, age, age-squared, and dummy varibles for gender, urban residence, and region. Model 2 includes years of schooling and all the variable from model 1.

Source: Author's analysis based on data described in the text.

The shortfall among children aged 6–11 ranges from 10 percentage points in India to almost 60 percentage points in Indonesia. The gap is also large among older children, ranging from 15 percentage points in Cambodia to 58 percentage points in Indonesia (exceptions are India, where the gap is just 4 percentage points, and Burundi, where there is no gap). The gaps are typically larger among the older group: the median shortfall is 21 percentage points among 6- to 11-year-olds and 25 percentage point among 12- to 17-year olds.

Schooling Deficits Controlling for Individual, Household, and Community Characteristics

To the extent that disability is correlated with other factors that affect schooling, such as poverty, age, and urban or rural residence, the raw difference in school participation between children with and without disabilities may give a misleading picture. For each survey, an adjustment was carried out by estimating a multivariate probit model with school participation as the dependent variable and an indicator of disability as the explanatory variable (table 5). The estimates also include, as explanatory variables, the potentially confounding variables—age and age-squared, a dummy variable for a child's gender, a dummy variable for urban residence, dummy variables for each economic status quintile, and dummy variables for region of residence.[16]

The adjusted deficit in school participation is more than 50 percentage points in Bolivia, Indonesia, and Romania; 24–45 percentage points in Cambodia, Colombia, Jamaica, Mongolia, South Africa, and Zambia; 14–18 percentage points in Burundi, Chad, and Mozambique; and 8 percentage points in India. In all countries, the difference is large and statistically significantly different from zero. In most countries, the unadjusted deficits are of comparable orders of magnitude: the estimated deficits are usually smaller after adjusting for confounding variables, but the effect of the adjustment is not typically large.

The results for the probability that a person has ever attended school are similar to those for current school participation. As the deficit is of a similar order of magnitude, the results imply that a substantial part of the deficit in schooling attainment among people with disabilities comes from the fact that they never attended school at all. Analysis of the Kaplan-Meier grade survival curves (table S.2 in the supplemental appendix, available at http://wber.oxfordjournals.org/) suggests that most of the difference in attainment can be attributed to the decision (or the ability) to enter school. Nevertheless, in seven countries, the deficit at grade 1 widens as children progress through the school system: in Bolivia, Colombia, Indonesia, Jamaica, Romania, South Africa, and Zambia the deficit associated with disability increases by about 7–10

16. Similar results (presented in the supplemental appendix, available at http://wber.oxfordjournals.org/) are found if nearest neighbor matching (using the same set of explanatory variables for matching) is used.

TABLE 4. Percentage of 6- to 17-Year-Olds Reported to Be in School, by Country

	Age 6–11			Age 12–17		
Country	Without disability	With disability	Difference	Without disability	With disability	Difference
Bolivia	0.95 (0.00)	0.38 (0.08)	0.57*** (0.08)	0.83 (0.01)	0.39 (0.11)	0.44*** (0.11)
Burundi[a]	0.38 (0.01)	0.19 (0.06)	0.19*** (0.06)	0.48 (0.02)	0.48 (0.10)	0.00 (0.10)
Cambodia (Socioeconomic Survey)	0.58 (0.01)	0.18 (0.06)	0.40*** (0.06)	0.68 (0.01)	0.31 (0.08)	0.37*** (0.08)
Cambodia	0.67 (0.01)	0.38 (0.06)	0.29*** (0.06)	0.62 (0.01)	0.47 (0.06)	0.15*** (0.06)
Chad	0.36 (0.02)	0.24 (0.12)	0.12 (0.12)	0.43 (0.03)	0.25 (0.09)	0.18* (0.10)
Colombia	0.92 (0.01)	0.56 (0.08)	0.36*** (0.08)	0.74 (0.01)	0.29 (0.06)	0.45*** (0.06)
India	0.70 (0.01)	0.60 (0.02)	0.10*** (0.02)	0.35 (0.00)	0.32 (0.02)	0.04* (0.02)
Indonesia	0.89 (0.00)	0.29 (0.04)	0.59*** (0.04)	0.76 (0.00)	0.18 (0.04)	0.58*** (0.04)
Jamaica	0.99 (0.00)	0.71 (0.09)	0.29*** (0.09)	0.86 (0.01)	0.50 (0.11)	0.36*** (0.11)
Mongolia	0.58 (0.01)	0.41 (0.05)	0.17*** (0.04)	0.73 (0.02)	0.47 (0.05)	0.26*** (0.05)
Mozambique	0.49 (0.01)	0.34 (0.08)	0.15** (0.08)	0.48 (0.01)	0.29 (0.06)	0.19*** (0.06)
Romania	0.79 (0.01)	0.58 (0.11)	0.22** (0.11)	0.84 (0.01)	0.36 (0.07)	0.48*** (0.07)
South Africa	0.96 (0.00)	0.76 (0.04)	0.21*** (0.04)	0.95 (0.00)	0.70 (0.04)	0.25*** (0.04)
Zambia	0.62 (0.01)	0.42 (0.06)	0.20*** (0.06)	0.75 (0.01)	0.58 (0.06)	0.17*** (0.06)

***Statistically significant at the 1 percent level; **statistically significant at the 5 percent level; *statistically significant at the 10 percent level.

Note: Numbers in parentheses are robust standard errors.

[a]Age range in Burundi is 6–14.

Source: Author's analysis based on data described in the text.

TABLE 5. Schooling Deficits among 6- to 17-Year-Olds with Disabilities

Country	Current school participation			Ever-attended school		
	Average among 6- to 17-year olds without disabilities (1)	Unadjusted deficit (2)	Deficit adjusted for other factors (3)	Average among 6- to 17-year olds without disabilities (4)	Unadjusted deficit (5)	Deficit adjusted for other factors (6)
Bolivia	0.90	−0.51*** (0.07)	−0.61*** (0.08)	0.98	−0.47*** (0.07)	−0.46*** (0.08)
Burundi[a]	0.41	−0.12** (0.06)	−0.16*** (0.05)	0.45	−0.14** (0.06)	−0.19*** (0.05)
Cambodia (Socioeconomic Survey)	0.63	−0.39*** (0.05)	−0.45*** (0.05)	0.72	−0.46*** (0.05)	−0.56*** (0.06)
Cambodia	0.65	−0.22*** (0.04)	−0.26*** (0.05)	0.74	−0.20*** (0.04)	−0.31*** (0.05)
Chad	0.39	−0.14* (0.08)	−0.14* (0.08)	0.43	−0.12* (0.07)	−0.13 (0.09)
Colombia	0.83	−0.42*** (0.05)	−0.43*** (0.06)	0.95	−0.47*** (0.05)	−0.48*** (0.06)
India	0.54	−0.08*** (0.02)	−0.08*** (0.02)	0.74	−0.05*** (0.02)	−0.07*** (0.02)
Indonesia	0.82	−0.59*** (0.03)	−0.67*** (0.03)	0.94	−0.46*** (0.03)	−0.53*** (0.05)
Jamaica	0.93	−0.33*** (0.08)	−0.28*** (0.09)	1.00	−0.25*** (0.07)	−0.19*** (0.06)
Mongolia	0.65	−0.20*** (0.04)	−0.28*** (0.04)	0.80	−0.17*** (0.04)	−0.37*** (0.05)
Mozambique	0.49	−0.18*** (0.05)	−0.18*** (0.05)	0.61	−0.12** (0.05)	−0.14*** (0.05)
Romania	0.82	−0.39*** (0.06)	−0.53*** (0.07)	0.90	−0.30*** (0.06)	−0.50*** (0.07)
South Africa	0.96	−0.23*** (0.03)	−0.25*** (0.03)	0.85	−0.20*** (0.03)	−0.30*** (0.05)
Zambia	0.68	−0.18*** (0.04)	−0.24*** (0.05)	0.77	−0.16*** (0.04)	−0.23*** (0.05)

***Statistically significant at the 1 percent level; **statistically significant at the 5 percent level; *statistically significant at the 10 percent level.

Note: Adjusted differentials correspond to the marginal effect of disability in a probit regression of school participation that includes age, age-squared, and dummy variables for gender, urban residence, economic quintile, and region. Numbers in parentheses are robust standard errors.

[a]Age range in Burundi is 6–14.

Source: Author's analysis based on data described in the text.

percentage points between grades 1 and 8.[17] These countries have relatively high grade 1 completion rates, suggesting that even in countries that are able to get most children into school, special effort may be needed to get children with disabilities into school and to keep them there.

There is substantial heterogeneity across countries in the schooling deficit associated with disability. Part of this variation might be due to differences in the definition of disability. In a survey with a more stringent definition of disability, one might observe a larger deficit, because such a survey would identify individuals who would have to overcome greater obstacles in order to access education. The fact that the two surveys from Cambodia yield schooling deficits that are about 20 percentage points apart suggests that this is a plausible explanation.

Another part of this variation likely relates to overall enrollment. It would not be surprising to observe larger deficits in countries in which enrollment among children without disabilities is high: in these countries there would be more scope to observe a bigger deficit. The schooling deficit does tend to be smaller in countries with the lowest overall enrollment (Burundi, Chad, India, and Mozambique) and larger in countries with higher overall enrollment (Bolivia, Indonesia, and Romania): the correlation between the school participation deficit and the level of participation among youth without a disability is about −0.4 across the 14 datasets (the correlation is similar for the probability of ever having attended school). But the relation is not perfect: in Jamaica and South Africa, for example, where overall school participation is high, the deficit associated with disability is about average for the surveys analyzed here.

Finally, part of the variation in the schooling deficit associated with disability is likely related to differences in the social and policy environment. Countries in which there is greater stigma toward people with disabilities or less effort has been made to ensure their access to schooling will undoubtedly have larger deficits associated with schooling. However, this is but one of many potential explanations of why results might differ across countries.

"Endogeneity" of Disability and Schooling

Disability among 6- to 17-year olds could be partly the result of poverty, which may have a direct effect on the probability of school attendance. Adjusting for economic status in estimating the association between schooling and disability mitigates the potential for such bias. More generally, however, it is possible that other—unobserved—factors affect both the probability of being disabled and the probability of attending school. Indeed, households that disfavor investing in both children's health and education in favor of other types of expenditures are more likely to have infants and children with poor health—who might develop a disability as a result—and low schooling. In this case disability and schooling would be related, but the association would merely reflect

17. The deficit in grade 1 ranges from 15 percentage points in Zambia to 48 percentage points in Bolivia.

parental neglect (see Strauss and Thomas 1995; Haddad, Hoddinott, and Alderman 1997).

One way to address this potential problem is to use a household fixed-effects approach. Such an approach controls for all—observed and unobserved—household-level characteristics common to all children in a household. In such a model the source of identification of the difference in school participation is between children with and children without a disability in the same household. Any generalized household-specific above- or below-average investment in children will have been netted out. Implementing such an approach involves revising the set of control variables used in the "adjusted" models reported in table 5 and replacing all household-, community-, and regional variables with a set of dummy variables each equal to one for each household.[18]

A household fixed-effects specification can be estimated only on the subsample of households that include at least one youth with disabilities and one without (table 6). The results of re-estimating the basic multivariate results without household fixed-effects on the subsample are consistent with those obtained using the full sample, despite the potentially selected nature of this subsample. The household fixed-effects results for current school participation and for ever-attended school are likewise similar to those that exclude fixed-effects for the subsample. In one country (Burundi) the magnitude of the effect increases, in another (Mozambique) it decreases. But in most countries the estimated impact is virtually indistinguishable, suggesting that the association between disability and schooling among 6- to 17-year-olds is not simply a reflection of fixed household attributes, such as parental neglect, but rather a more direct effect of disability on schooling.

Relative Magnitude of School Participation Deficits

How large is the deficit in school participation relative to other sources of inequality? The multivariate models can be used to compare school participation gaps associated with disability, gender, urban or rural residence, and economic status (figure 1).[19]

The deficit associated with disability is clearly large compared with other sources of inequality. In almost all countries it is larger than the deficit associated with being female (which is a "surplus" in some countries). In most countries it is substantially larger than the deficit associated with rural residence, and it is usually larger even than the gap between the poorest and richest quintiles, typically one of the strongest predictors of enrollment.[20] The exceptions are Burundi, Chad, and particularly India, where wealth gaps are larger than all other gaps; Burundi and Mozambique, where rural-urban gaps are larger than

18. In this section, the probit model is replaced by a linear probability model.

19. In each case the deficit is estimated at the means of the other variables.

20. See Filmer (2005) for a comparison of wealth and gender gaps. See Ainsworth and Filmer (2006) for a comparison of the gaps associated with wealth and with orphan status.

TABLE 6. Effect of Disability on Schooling of 6- to 17-Year-Olds in Households with at Least One Child with and One Child without a Disability

	Current school participation		Ever attended school			
Country	Basic multivariate specification (1)	Household fixed-effects specification (2)	Basic multivariate specification (3)	Household fixed-effects specification (4)	Total number of observations (5)	Number ages 6–17 with disabilities (6)
Bolivia	−0.50*** (0.08)	−0.49*** (0.09)	−0.43*** (0.08)	−0.44*** (0.10)	187	61
Burundi[a]	−0.24*** (0.06)	−0.31*** (0.08)	−0.22*** (0.06)	−0.30*** (0.08)	136	61
Cambodia (Socioeconomic Survey)	−0.36*** (0.06)	−0.39*** (0.07)	−0.40*** (0.06)	−0.42*** (0.07)	265	82
Cambodia	−0.21*** (0.04)	−0.22*** (0.05)	−0.23*** (0.04)	−0.23*** (0.04)	649	189
Chad	−0.10 (0.10)	−0.07 (0.11)	−0.07 (0.10)	−0.03 (0.11)	218	52
Colombia	−0.39*** (0.05)	−0.39*** (0.07)	−0.48*** (0.06)	−0.48*** (0.07)	276	98
India	−0.05*** (0.02)	−0.06** (0.02)	−0.04** (0.02)	−0.05** (0.02)	3,574	1,138
Indonesia	−0.51*** (0.04)	−0.51*** (0.06)	−0.43*** (0.04)	−0.44*** (0.06)	545	208
Jamaica	−0.34*** (0.12)	−0.40*** (0.12)	−0.28*** (0.09)	−0.34*** (0.11)	110	42
Mongolia	−0.25*** (0.04)	−0.24*** (0.05)	−0.28*** (0.04)	−0.28*** (0.04)	557	201
Mozambique	−0.23*** (0.06)	−0.13** (0.06)	−0.16** (0.05)	−0.11* (0.06)	370	121
Romania	−0.41*** (0.09)	−0.44*** (0.10)	−0.34*** (0.07)	−0.36*** (0.10)	136	52
South Africa	−0.18*** (0.03)	−0.21*** (0.04)	−0.19*** (0.03)	−0.21*** (0.04)	1,039	361
Zambia	−0.17*** (0.05)	−0.20*** (0.05)	−0.18*** (0.04)	−0.19*** (0.05)	700	253

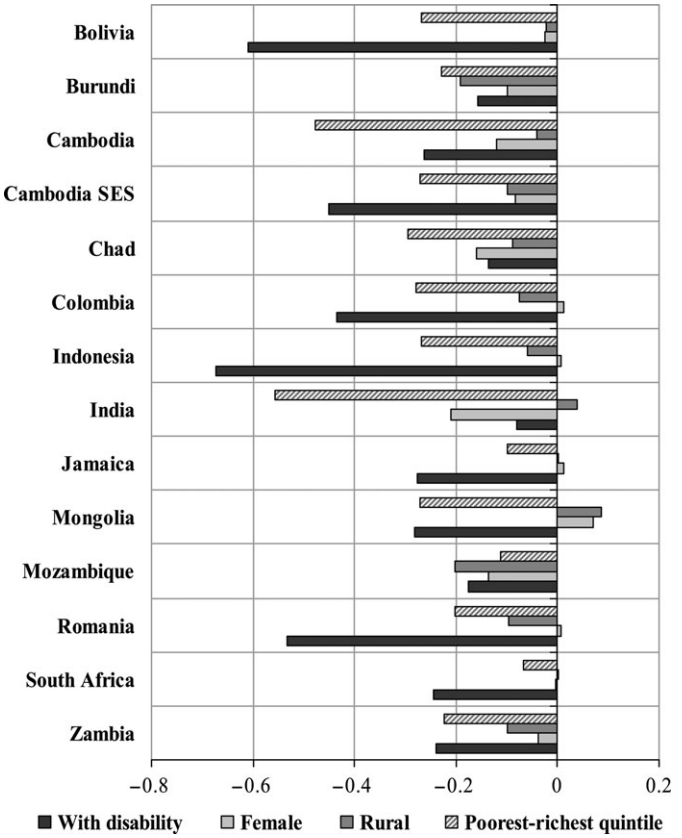
***Statistically significant at the 1 percent level; **statistically significant at the 5 percent level; *statistically significant at the 10 percent level.

Note: Coefficients are from linear probability models. Basic specification includes age, age-squared, and dummy variables for gender, urban residence, economic quintile, and region; household fixed-effects specification includes age, age-squared, and a dummy variable for gender. Numbers in parentheses are robust standard errors.

[a]Age range in Burundi is 6–14.

Source: Author's analysis based on data described in the text.

FIGURE 1. Deficits in School Participation Associated with Various Characteristics



Note: Deficits shown are the marginal effects of dummy variables for each characteristic in multivariate probit models for 6- to 17-year-olds, except in Burundi, where the sample covers children ages 6–14.

Source: Author's analysis based on data described in the text.

those for disability; and Mongolia and Zambia, where wealth gaps are only slightly smaller than those for disability. In most countries, however, the gap in school participation between children with and without disabilities is about twice as large as that associated with rural residence or wealth.[21]

21. An interesting additional question would be whether disability interacts with other characteristics in a way that reduces or exacerbates inequalities. A straightforward way to investigate this hypothesis is to estimate the multivariate model of school participation and include interaction terms between disability and each of the other covariates. Given the relatively small number of sample observations, however, the data do not typically yield statistically significant interaction terms—even when the magnitude of the interaction is relatively large—suggesting an inability to estimate these interactions with much precision. Because it is hard to assess whether this is caused solely by statistical power, these results are not reported here. They are reported in the supplemental appendix, available at http://wber.oxfordjournals.org/.

IV. Conclusions

This analysis of data from 14 nationally representative household surveys confirms the many data problems that earlier research has identified as hampering the establishment of a broad empirical base for developing policies targeted to people with disabilities in poor countries. The variation across surveys in the definition of disability makes cross-country comparisons difficult. The small number of people identified as disabled in surveys makes it hard to precisely estimate patterns in the data beyond simple correlations.

Despite these limitations, but keeping them in mind, the data are nevertheless revealing. Consistent with similar surveys the 14 surveys analyzed here identify about 1–2 percent of the population as having a disability. One country with two surveys and varying definitions suggests that the percentage is not always sensitive to the exact definition: different definitions can yield similar prevalence rates, and similar definitions can yield different prevalence rates. In addition, other aspects of the surveys, such as the training of enumerators or the use to which interviewees expect the survey to be put, might affect the overall estimated prevalence rates.

Analysis of these datasets provides little evidence to suggest that children with disabilities are generally more or less likely to live in richer or poorer households. Adults with disabilities do typically live in poorer households, but much of this association appears to come from the fact that they have lower educational attainment. Given this finding, it is particularly worrisome that children with disabilities are almost always much less likely to participate in schooling than are other children. They are also less likely to start school, and in some countries they have lower transition rates. The school participation disability deficit is typically larger than deficits associated with characteristics such as gender, rural residence, or economic status.

This analysis suggests that in developing countries disability is associated with long-run poverty, in the sense that children with disabilities are less likely to acquire the human capital that will allow them to earn higher incomes. In all countries, the schooling gap between children with and without disabilities starts at grade 1, suggesting that efforts are needed to boost enrollments of children with disabilities at the earliest grades in order to increase education attainment for this population. The result that the disability deficit widens from grade to grade in countries that have achieved relatively high enrollment among children without disabilities suggests that special effort may be needed to keep children with disabilities in school.

The results of this analysis should be treated as tentative. Better data are needed. Establishing clear and consistent measures of disability for use in household surveys and national censuses would be a start. A recent review (Mont 2007) suggests that questions that focus on functionality, concentrate on a core set of activities, and allow for variation in the degree of functional limitation (as opposed to the mere presence or absence of a limitation) should

be preferred. To build the quantitative evidence base for empirically grounded policies, these questions must be implemented within samples that are large enough to allow detailed analysis. An important complement to the information that would emerge from the analysis of such data would be evaluations of the impact of alternative interventions that attempt to increase enrollments among children and youth with disabilities.

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Appendix

Table A-1. Definition of Disabilities in Covered Surveys

Country/year of survey	Name of survey	Definition used in survey	Question from survey instrument
Bolivia 1997	DHS	Mentally retarded, deaf, mute, blind, paralyzed, crippled	Does [X] have any of the following extreme physical impediments?
Burundi 2000	MICS2	Presence of a physical handicap (missing upper or lower limbs, or other body part)	Specific wording not available.
Cambodia 1999	SES	Amputation of one or more limbs, inability to use one or more limbs, blind, deaf, mute, mentally disturbed, permanent disfigurement, other	Does X have a disability? If "yes," what type of disability does X have? [respondent chooses from coded answers]; What was the cause of the disability? [respondent chooses from coded answers].
Cambodia 2000	DHS	Physical impairment	Is there a person who usually lives in your household who has any type of physical impairment? Please give the name of each individual who has a physical impairment. For each individual, then ask: "Has X been physically impaired since birth, or was X's impairment due to an accident?" [respondent chooses from coded answers].

(Continued)

TABLE A-1. Continued

Country/year of survey	Name of survey	Definition used in survey	Question from survey instrument
Chad 2004	DHS	Missing limb, deformed limb, blind, deaf, mute, missing body part, behavioral	Is there a person in your household who . . .is missing a part of the body, for example a hand, an arm, or a leg, has difficulty seeing or is almost or completely blind; has difficulty hearing or is deaf; who has difficulty speaking or is mute; who is missing an extremity such as finger tips, toes, nose or ear; who has behavioral problems.
Colombia 1995	DHS	Blind, deaf, mute, paralysis or missing limb, mental retardation, behavioral problem.	Does [X] have one of the following health problems and how did they acquire the problem? [respondent chooses from coded answers].
India 1992	NFHS (DHS)	Blind, limb impairment of	Does anyone [in household] suffer from: with separate answers for: "Blindness?" with options "yes: partial; yes: complete; "no" and for "Any physical impairment of limbs?" with options "yes: hands"; "yes: legs"; "yes: both".
Indonesia 2003	SUSENAS	Blind, deaf, mute, physical disability, mental disability.	Have a disability? If yes: "Type of disability" [respondent chooses from coded answers]; "Cause of disability" [respondent chooses from coded answers].
Jamaica 1998	LSMS	Physical or mental disability.	Is X physically or mentally disabled?
Mongolia 2000	MICS2	Difficulty seeing, difficulty hearing	Specific wording not available.
Mozambique 1996	SES	Blind, deaf, mute, mental disability paralysis, amputated arm(s), amputated leg(s), other.	Have a disability? If yes: "Type of disability" [respondent chooses from coded answers]; "Cause of disability" [respondent chooses from coded answers].

(Continued)

TABLE A-1. Continued

Country/year of survey	Name of survey	Definition used in survey	Question from survey instrument
Romania 1995	LSMS	Amputation of limb, paralysis of limbs, ankylosis of limbs or column, physical deformation, unilateral or bilateral blindness, deafness, muteness, epilepsy, mental retardation, mental disorder	Do you suffer from a handicap? If yes: "Type of handicap" [respondent chooses from coded answers].
South Africa 2005	General household survey	Sight (blind/severe visual limitation), hearing (deaf, profoundly hard of hearing), communicating (speech impairment), physical (for example needs wheel chair, crutches or prosthesis, limb or hand usage limitation), intellectual (serious difficulties in learning, mental retardation), emotional (behavioral, psychological problems), other	I am now going to ask about disabilities experienced by any persons within the household. Is X limited in his/her daily activities, at home, at work or at school, because of a long-term physical, sensory, hearing, intellectual, or psychological condition, lasting six months or more? If yes, "what difficulty or difficulties does X have?" [respondent chooses from coded answers].
Zambia 2003	LCMS	Blind, partially sighted, deaf, dumb, crippled, mentally retarded, mentally ill, former mental patient	Is X blind, partially sighted, deaf, dumb, crippled, mentally retarded, mentally ill, ex-mental [sic], or has multiple disabilities?

Note: DHS is Demographic and Health Survey; MICS2 is End of Millennium Multiple Indicator Cluster Survey; SES is Socioeconomic Survey; NFHS is National Family Health Survey; SUSENAS is National Socioeconomic Survey; LSMS is Living Standards Measurement Study survey; LCMS is Living Conditions Monitoring Survey.

Source: Author compilation.

REFERENCES

Afzal, Mohammad. 1992. "Disability Prevalence and Correlates in Pakistan: A Demographic Analysis." *Pakistan Development Review* 31(3):217–57.

Ainsworth, Martha, and Deon Filmer. 2006. "Children's Schooling: AIDS, Orphanhood, Poverty, and Gender." *World Development* 34(6):1099–128.

Benitez-Silva, Hugo, Moshe Buchinsky, Hiu Man Chan, Sofia Cheidvasser, and John Rust. 2004. "How Large Is the Bias in Self-Reported Disability?" *Journal of Applied Econometrics* 19(6):649–70.

Duggan, Mark, Robert Rosenheck, and Perry Singleton. 2006. *Federal Policy and the Rise in Disability Enrollment: Evidence for the VA's Disability Compensation Program.* NBER Working Paper 12323. Cambridge, Mass.: National Bureau of Economic Research.

Elwan, Ann. 1999. *Poverty and Disability: A Survey of the Literature*. Social Protection Discussion Paper 9932. Washington, D.C.: World Bank.

Figlio, David, N., and Lawrence S Getzler. 2002. *Accountability, Ability and Disability: Gaming the System.* NBER Working Paper 9307. Cambridge, Mass.: National Bureau of Economic Research.

Filmer, Deon. 2005. "Gender and Wealth Disparities in Schooling: Evidence from 44 Countries." *International Journal of Education Research* 43(6):351–69.

Filmer, Deon, and Lant Pritchett. 2001. "Estimating Wealth Effects without Expenditure Data—or Tears: With an Application to Educational Enrollments in States of India." *Demography* 38(1):115–32.

Freedman, Vicki, Linda G. Martin, and Robert Schoeni. 2004. "Disability in America." *Population Bulletin* 59(3):1–32.

Gertler, Paul J., and Jonathan Gruber. 2002. "Insuring Consumption against Illness." *American Economic Review* 92(1):51–70.

Gertler, Paul J., Elaina Rose, and Paul Glewwe. 2000. "Health." In M. Grosh, and P. Glewwe eds., *Designing Household Survey Questionnaires for Developing Countries: Lessons from 15 Years of the Living Standards Measurement Study*. Washington, D.C.: World Bank.

Haddad, Lawrence, John Hoddinott, and Harold Alderman. 1997. *Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy*. Baltimore, Md.: Johns Hopkins University Press for the International Food Policy Research Institute.

Haveman, Robert, Karen Holden, Barbara Wolfe, Paul Smith, and Kathryn Wilson. 1999. "The Changing Economic Status of U.S. Disabled Men: Trends and Their Determinants, 1982–1991." *Empirical Economics* 24:571–598.

Haveman, Robert, and Barbara Wolfe. 2000. "The Economics of Disability and Disability Policy." In A. J. Culyer, and J. P. Newhouse, eds., *Handbook of Health Economics*. Vol. 1. Amsterdam, New York: Elsevier Science B.V.

Hoogeveen, Johannes G. 2005. "Measuring Welfare for Small but Vulnerable Groups Poverty and Disability in Uganda." *Journal of African Economies* 14(4):603–31.

Jones, Andrew, and Owen O'Donnell. 1995. "Equivalence Scales and the Costs of Disability." *Journal of Public Economics* 56(2):273–89.

LeRoy, Barbara W., Peter Evans, and Marcella Deluca. 2000. "United States and European School-Aged Disability Prevalence: An Investigative Study to Elaborate Differences." Organisation for Economic Co-operation and Development, Paris. (www.oecd.org/dataoecd/9/59/27133749.pdf)

Mont, Daniel. 2007. *Measuring Disability Prevalence*. Social Protection Discussion Paper 706. Washington D.C.: World Bank.

Parsons, Donald O. 1991. "Self-Screening in Targeted Public Transfer Programs." *Journal of Political Economy* 99(4):859–76.

Peters, Susan J. 2003. "Inclusive Education: Achieving Education for All by Including those with Disabilities and Special Needs." Disability Group, Human Development Network, World Bank, Washington, D.C. (http://siteresources.worldbank.org/DISABILITY/Resources/Education/Inclusive_Education_En.pdf)

Strauss, John, and Duncan Thomas. 1995. "Human Resources: Empirical Modeling of Household and Family Decisions." *Handbook of Development Economics*. Vol. 3. New York: North-Holland Press.

United Nations. 2001. *Guidelines and Principles for the Development of Disability Statistics*. Statistics on Special Population Groups, Series Y, No. 10. New York: Statistics Division.

UNESCO (United Nations Educational, Scientific and Cultural Organization). 2005. *Education for All Monitoring Report 2005: The Quality Imperative*. Paris: UNESCO.

World Bank. 2003. "Education for All: Including Children with Disabilities: Summarized Lessons Learned and Key Policy Findings on the World Bank's Work in Education." *Education Notes*. Human Development Network, World Bank, Washington, D.C.

———. Various years. *Word Development Indicators*. Washington, D.C.: World Bank.

Yeo, Rebecca, and Karen Moore. 2003 "Including Disabled People in Poverty Reduction Work: 'Nothing about Us, without Us.'" *World Development* 31(3):571–90.

Yount, Kathryn M., and Emily Agree. 2005. "Differences in Disability among Older Women and Men in Egypt and Tunisia." *Demography* 42(1):169–87.

Zaidi, Asghar, and Tania Burchardt. 2005. "Comparing Incomes When Needs Differ: Equivalization for the Extra Costs of Disability in the U.K." *Review of Income and Wealth* 51(1):89–114.