Is there a Disability Gap in Employment Rates in Developing Countries?

SUGURU MIZUNOYA
UNICEF, Nairobi, Kenya,

and

SOPHIE MITRA
Fordham University, New York, USA

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Address for correspondence: Department of Economics, Fordham University, 441 East Fordham Road, Bronx, NY 10458-9993, United States, mitra@fordham.edu, ph: 718 817 5337, fax: 718 817 3518

Abstract. - This paper examines differences in employment rates between persons with and without disabilities in 15 developing countries using the World Health Survey. We find that people with disabilities have lower employment rates than persons without disabilities in nine countries. Across countries, disability gaps in employment rates are more often found for men than women. The largest disability gap in employment rates is found for persons with multiple disabilities. For countries with a disability gap, results from a logistic decomposition suggest that observable characteristics of persons with/without disabilities do not explain most of the gap.

Key words - disability, employment, self-employment, developing countries, logit decomposition

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1. INTRODUCTION

This study aims to draw a profile of the employment status of persons with disabilities compared to persons without disabilities in 15 developing countries using the World Health Survey (WHS). This survey provides for the first time disability data that is internationally comparable.

Disability has occupied a very minor role to date in development policy and research circles. Yet it is estimated that disability affects 10 to 15% of adults worldwide (WHO 1981; WHO & World Bank 2011) and recent evidence based on internationally comparable data shows that developing countries have higher disability prevalence than developed countries (WHO & World Bank 2011; page 28). This result stands in contrast with prior comparison of country level estimates that typically showed higher disability prevalence in high income countries compared to low and middle income countries (WHO & World Bank 2011; page 31). However, this result was due, at least in part, to the disability measures under use in low and middle income countries often using impairment or functional limitation questions, while high income countries use activity limitation measures which tend to be higher. In addition, over the 2000s, disability has increasingly been regarded as a development issue by multilateral agencies (UNDP 2008, World Bank 2007a), bilateral donors (e.g. DFID 2000), as well as scholars (Majumder, Misra & Walls 2005; Mitra 2005; Kett, Lang & Trani 2009).

In December 2006, the United Nations General Assembly adopted the Convention on the Protection and Promotion of the Rights and Dignity (CRPD) of persons with disabilities, which marked a shift in views on disability from a social welfare to a human rights issue. Several articles of the Convention are relevant to the economic wellbeing of persons with disabilities, in particular regarding the rights to education, health, work and employment, and finally the right to an adequate standard of living and social protection[1]. As of January 2012, 107[2] countries have ratified the Convention, and 39 are developing countries[3]. This study

provides a baseline profile of the employment status of persons with disabilities in 2003 in 15 developing countries, which can inform the monitoring of the CRPD implementation. While research has been conducted on the economic well being of persons with disabilities in developed countries, including their employment (e.g., OECD 2003), very little has been done in a developing country context (Yeo & Moore, 2003). The purpose of this paper is to fill part of the gap in the literature on economic well-being and disability in developing countries by analyzing differences in employment between adults with and without disabilities in 15 developing countries. This research is timely since it can inform policies related to the economic empowerment of persons with disabilities as governments, civil society organizations and international organizations develop policies to implement the CRPD.

There is a large empirical literature on disability and employment covering many developed countries (OECD 2003 and 2009) and transition countries (OECD 2003; Mete 2008). In these studies, persons with disabilities are shown to have lower employment rates than persons without disabilities. In developing countries, studies published in peer-reviewed journals are limited and to our knowledge cover only eight countries. They all find lower employment rates for persons with disabilities (Hoogeven 2005 (Uganda); Mitra 2008 (South Africa); Mitra & Sambamoorthi 2008 (India); OECD 2003 (Mexico); Palmer et al 2010 (Vietnam); Rischewski et al 2008 (Rwanda); Trani & Loeb 2010[4] (Afghanistan and Zambia)).[5] Expanding to other studies, a similar finding is also found in Eide et al (2003b, 2009) (Namibia and Mozambique), Kamaleri et al (2011) (Lesotho), Loeb et al (2004) (Malawi), and Zambrano (2006) (Peru), but not in Zimbabwe (2003a). Drawing any general conclusion from this literature is problematic. First, studies use different methods: some studies only present employment or non-employment rates across disability status (e.g., Palmer et al 2010; Rischewski et al 2008), while other studies resort to multivariate analysis using a variety of

empirical strategies which can be difficult to compare (e.g., Mitra 2008; Mitra & Sambamoorthi 2008). Second, the household survey data used in these studies are not strictly comparable across countries, often because of their different measures of disability. Some studies measure disability through functional limitations (e.g., Trani et al 2010), while others use broad activity limitations (e.g., Mitra 2008) or impairment measures (e.g. Rischewski et al 2008).

This paper uses a unique data set, the World Health Survey (WHS), collected by the World Health Organization (WHO) in 69 countries with a consistent measure of disability and employment in all countries. This is the first cross sectional international survey conducted to provide reliable and internationally comparable data on disability and this paper is the first systematic study of employment rates across disability status and their determinants in developing countries. The main objective of this paper is twofold. First, it measures the disability gap in employment rates in 15 developing countries at a given point in time. Second, this study examines the determinants of employment across disability status, and the demographic and human capital characteristics that may explain the disability gap in employment rates. In other words, it strives to find if the gap in employment rates between persons with and without disabilities in selected countries is attributable to differences in demographic, human capital and other observed characteristics.

2. BACKGROUND

This section attempts to point out the factors that can influence the employment of persons with disabilities. We start by using, as a theoretical framework, the standard labor-leisure choice model (Kaufman & Hotchkiss, 2006). Under this model, the onset of a disability can affect employment through several channels. On the supply side, the onset of a disability may alter the individual's budget constraint and/or preferences of time spent on work versus

leisure. Regarding the budget constraint, if there are fixed expenditures in association with the disability, it might have an income effect that may make the person want to work more. At the same time, if disability cash transfers or social insurance programs are available, that would have an income effect that may make the person want to work less. In addition, the opportunity cost of working may increase given additional time and costs associated with travelling to work, which may lead to a substitution effect making the person want to work less. Regarding preferences, if leisure is understood broadly (to include self care activities), the marginal utility of leisure time may be affected by disability onset. It could increase if for instance the disability requires a lot of self-care time or time spent receiving health care/rehabilitation services. At the same time, the marginal utility of consumption may be affected by disability onset. It could increase if disability leads to extra expenditures in association with the disability (e.g. more health care expenditures in countries with no universal insurance coverage). These supply side effects are negative or positive, and suggest that disability may lead to reduced, increased or unchanged labor supply, depending on whether negative or positive effects prevail.

On the demand side, the productivity of workers may be reduced by disability onset. The extent of this negative effect of disability on employment is expected to vary depending on a variety of factors, starting with the individual's type of disability and how it relates to his/her occupation. In an agrarian economy, as is often the case in developing countries, most jobs are in the primary sector (agriculture, forestry) and may involve heavy manual labor, which persons with walking or carrying limitations may not be able to do. At the same time, he marginal cost of labor may increase, especially in a context where employers are mandated to pay for reasonable accommodations in the workplace. These two demand side effects may lead to lower market wages and less employment for persons with disabilities. Overall, in the context of the labor leisure choice model, although most of the effects described above point

toward a lower probability of employment, the impact of disability on employment is theoretically undetermined and is therefore an empirical question.

In addition, if the disability is visible, discrimination may contribute to a gap in employment between persons with and without disabilities. Discrimination may occur due to prejudice, differential information about the average productivity of persons with and without disabilities (statistical discrimination), or the exploitation of workers by employers (Becker, 1971; Baldwin & Johnson, 2005). Discrimination may also take place on the supply side: through negative attitudes and low expectations, household members may provide an environment that is not conducive to a person with disability's entry into the labor force. To our knowledge, this form of discrimination has received very little attention in the literature on employment and disability. It has to be noted that identifying disability based employment discrimination is complex: the challenge lies in disentangling the effects of discrimination due to disability from the effects of the disability on productivity, preferences and budget constraint. Another challenge lies in assessing how these various effects vary depending on the environment, including the institutional environment: for instance, antidiscrimination laws may indeed affect earnings and employment differentials across disability status.

Overall, while most of the effects above point toward a reduced probability of employment, the effect of disability on employment is an empirical question and the significance and magnitude of the effect is expected to vary across contexts. For instance, the effect of disability on employment will depend on the accessibility of the work environment, the availability of workplace accommodations, and the presence of discrimination (Baldwin & Johnson 2005). The relevance and intensity of some of these pathways depends on the cultural context in so far as negative attitudes toward the employment potential of persons

with disabilities in society at large or within the household might limit access to work (Mitra & Sambamoorthi 2008). The policy context is also relevant: for instance, are there vocational rehabilitation programs available? Are there disability insurance or assistance programs? Such programs, depending on how they are designed and put into practice, could facilitate, limit or not affect access to employment for persons with disabilities. In several developed countries, the labor market disincentive effect of such programs has been a concern (OECD 2003).

In developing countries, it is unclear whether one might expect disability gaps in employment rates to be more or less extensive than in developed countries. Safety nets or insurance programs in relation to disability are rarely available in developing countries, so their possible labor market disincentive effect is in general not a concern. In addition, in developing countries, most employment is found in the informal sector, where people are self-employed or work in microenterprises. The informal sector has commonly been characterized as an "easy-entry sector that workers can enter to earn some cash in preference to earning nothing" (Fields 2005). Fields explains that "barriers to entry to such occupations are small or non-existent. In some contexts, primarily urban, all that would-be workers need to do is make a minimal investment in the product or service to be sold." This ease of entry into the informal sector helps explain the relatively low level of unemployment rates in many developing countries, and may facilitate the access to the labor market for persons with disabilities compared to mainly formal labor markets. At the same time, in developing countries, because antidiscrimination legislations, workplace accommodations, vocational rehabilitation programs that could boost employment for persons with disabilities are more scarce, one could expect to find a disability gap in employment rates.

3. DATA AND METHODS

(a) The World Health Survey

The WHS was administered in 2002-2003 in 69 countries. One of the primary objectives of the WHS (Ustun et al 2003) was to develop a means of providing low-cost, valid, reliable and internationally comparable health information. The WHS follows a stratified sample design with weights in in the countries under study. For each household, one household informant responded to a household questionnaire. In addition, within each household, an individual respondent of 18 years of age or older was selected randomly using Kish tables (Kish 1965). That person then responded to an individual level questionnaire, including questions about his or her own demographic characteristics, disability and health, employment, and education. It should be noted that the labor market data in the WHS is limited to the employment status of the respondent[6]. The job search status of the individual is not known, hence the analysis below will not address labor force participation and unemployment.

This study focuses on working age individual respondents aged 18 to 60. We used 60 years as the cut-off point instead of 64 to avoid including persons who in some countries might have transitioned to early retirement pension or old age cash transfer programs. The study covers 15 developing countries[7], including seven countries in Africa (Burkina Faso, Ghana, Kenya, Malawi, Mauritius, Zambia, Zimbabwe), four countries in Asia (Bangladesh, Laos, Pakistan, Philippines) and four countries in South America and the Caribbean (Brazil, Dominican Republic, Mexico, Paraguay). These developing countries are not necessarily representative of all developing countries, but have been chosen based on WHS data availability on disability and economic indicators.[8] It should also be noted that the developing countries covered in this study are heterogeneous in their level of development as well as in their legislative and policy backgrounds with respect to employment and disability. Thirteen of the 15 countries have ratified the CRPD. In these countries, the results of this study might be used as a baseline evaluation of the employment of persons with disabilities in 2003, five

years or so before they ratified the CRPD. Eleven out of the 15 countries also have national legislation on the rights of persons with disabilities as part of the Constitution or in specific laws (Brazil, Dominican Republic, Ghana, Kenya, Malawi, Mauritius, Mexico, Paraguay, Philippines, Zambia and Zimbabwe). All were adopted before the WHS data was collected. Some of these countries also have large universal means-tested programs, while others (Bangladesh, Brazil and Mauritius) have large programs targeted at persons with disabilities (Government of Mauritius 2008, Social Security Administration 2008a and 2008b). The Dominican Republic and Zimbabwe also have such programs, but no information could be found on their sizes (Social Security Administration 2008a, 2008b). Mexico has a large program of conditional cash transfers that might reach a significant portion of households with disabilities. Therefore, in some of these countries above, there might be a significant insurance against the negative consequences of disability on economic outcomes, which might affect the correlation between disability and employment. It is, however, beyond the scope of this study to assess the possible labor market consequences of these programs.

(b) Measures of Disability

Classifying individuals by disability status is not an easy task. There is no agreed international standard to measure disability. Disability measures are expected to vary depending on research objectives (Mont 2007; Loeb, Eide, Mont 2008). The WHS provides a number of questions that can be used to measure disability. The Health State Description module of the WHS has a number of questions on functional and activity limitations and participation restrictions. This study uses two measures of disability that attempt to follow the recommendations of the United Nations Washington Group on Disability Statistics (the Washington Group thereafter)[9]. The Washington Group has developed and tested several disability questions and made recommendations for a short list and a long list of questions to be included in household surveys or censuses. These questions have been tested and found to

be robust in several countries, including in developing countries (e.g. Loeb, Eide, Mont 2008). This study uses two disability measures which use two sets of questions that match, as much as possible, the short and long lists of questions of the Washington Group as presented in XXXX (2012). The *base measure* of disability used in the study is built by selecting WHS selections that best match the Washington Group's short list of questions. It includes four questions related to four difficulties: difficulty in seeing/recognizing people across the road (while wearing glasses/lenses); difficulty moving around; difficulty concentrating or remembering things; and difficulty with self care. In the WHS, for each difficulty, individuals could respond on a scale of 1 to 5 as follows: 1) no difficulty, 2) mild difficulty, 3) moderate difficulty, 4) severe difficulty and 5) extreme difficulty/unable to do. For this study, if a person reports a severe or extreme/unable difficulty in any of the above four questions, he or she is classified as having a disability.[10] This study provides an estimate of the prevalence of disability based on self-reports of severe or extreme difficulties only, and not of moderate difficulties. Indeed, earlier research has shown that moderate difficulties may not be as reliably self-reported as severe difficulties (Lafortune et al (2007; 17); Miller et al (2010)). In addition, persons with disabilities were broken down by the number of disabilities (severe or extreme difficulties) they report: single disability (one difficulty) and multiple disabilities (more than one difficulty) in this paper.

Generally, it is preferable to use more than one disability measure in empirical disability research due to the absence of an agreed standard. A second measure of disability is therefore used: it is called the *expanded measure* of disability hereafter. The expanded measure has the above four questions of the base measure and four additional ones as follows: difficulty in seeing/recognizing object at arm's length (while wearing glasses/lenses); difficulty with personal relationships/participation in the community; difficulty learning a new task; and difficulty dealing with conflicts/tension with others. Like for the base measure, a person with

a severe or extreme/unable to do difficulty in at least one of these eight functioning domains is considered to have a disability. The expanded measure is thus broad and captures three functional limitations (seeing across the road, seeing at arm's length and concentrating) and five activity limitations/ participation restrictions (moving around, self-care, learning, personal relationships/ participation in the community, and dealing with conflicts/tension with others).

Compared to earlier research on employment and disability, the major advantages of the WHS are that (a) disability related questions were identically formulated in all countries, and, (b) the questionnaires were translated using cognitive interviews and cultural applicability and psychometric tests for reliability. At the same time, the WHS has some noteworthy limitations with respect to measuring disability. It did not collect data on hearing limitation (WHO World Bank 2011; p. 26) nor on communication limitation, which may lead to a downward bias in estimating disability prevalence and as a result makes this paper unable to completely represent the employment situation of all persons with disabilities. In addition, the time dimension of the disability questions is the short-term. Respondents were asked to report difficulties in functioning during the last 30 days prior to the interview, which might lead to an upward bias in estimating disability prevalence due to acute short-term health conditions not resulting in disability. In addition, the WHS lacks data on the age at disability onset, which prevents us from identifying persons who acquired a disability during their working age years or earlier.

(c) Logistic Regressions on Employment

The choice between whether or not to be employed is modeled as a binary variable, estimating the likelihood of employment using maximum likelihood estimates. The dependent variable in the model is a dummy indicating whether the person is employed. The following specification is used:

(1) $$\Pr(y_i = 1) = \log it^{-1}(\sum_{l=1}^{k} b_l x_i + cz_i) \quad for \quad i = 1,...,n, \quad l = 1..k.$$

where y_i indicates the dichotomous outcome variable of employment in *ith* individual, where 1 indicates the *i*th individual is employed and 0 is not employed; x_i is individual demographic and human capital characteristics, and z_i is a dummy variable where 1 indicates that this individual has a disability while 0 indicates this individual does not have any disability. The coefficient *c* is the coefficient of main interest. If the coefficient *c* is negative and significant, then it suggests that persons with disabilities are less likely to be employed everything else being equal. Independent variables control for worker productivity through education dummies and work experience as measured by age. Throughout the regression analysis below, we separate the analysis of the employment of men and women as persons may be facing gender related barriers to employment.

It could be argued that the model above might suffer from reverse causality from employment to disability or unobserved heterogeneity, in other words that disability and employment are endogenous. In particular, given that the disability measure is based on self reported limitations, one could be concerned that persons who are not employed may be more likely to report a severe limitation, and hence be classified as having a disability. However, there is evidence (Benitez-Silva et al 2004) showing that disability self-reported indicators are reasonable predictors of a person's objective health status, in particular if disability measures are not work limitations, which is the case in this study. In addition, employment might have positive or negative effects on health and functional or activity limitations. For instance, employment might have a negative impact on mental health and functioning through occupational stress or a positive one for instance through increased social networking. A strategy to deal with such endogeneity with cross-sectional data is to use a model with an

instrumental variable, i.e. a variable that determines disability but not employment. The literature in this area is small (Schultz and Tansel 1998; Schultz 2008). Given the challenge in finding an appropriate instrumental variable in the data set at hand, this paper does not address the potential problem of endogeneity of self-reported disability and employment status and does not provide evidence on the net impact of disability on employment status once endogeneity has been addressed. Instead, this paper (i) presents descriptive evidence on employment rates across disability status, and (ii) analyzes whether differences in observable characteristics explain the disability gap in employment rates through a decomposition approach.

(d) Decomposition

The model (1) above implicitly assumes that coefficients of productivity-related individual characteristics such as education are the same for persons with and without disabilities. However, for the study of economic outcomes of minority groups, it is preferable not to make this assumption given that minority groups could have different returns to education and work experience than majority groups. The literature on employment and wages of minority groups thus generally avoids making such an assumption by using a decomposition approach. In this paper, a decomposition of the disability gap in employment rates will be conducted to provide further insights on the determinants of employment for persons with and without disabilities. Since a logit model will be used in the analysis, the non-linear decomposition technique proposed by Fairlie (1999; 2003) will be used[11].

The basic approach follows the logic of Blinder-Oaxaca decomposition (Blinder 1973; Oaxaca 1973). A non-linear equation could be represented by $Y = F(X\hat{\beta})$, where F can be the cumulative distribution function from the logistic distribution, then the decomposition can be represented by

$$(2) \qquad \bar{Y}^{ND} - \bar{Y}^{D} = \left[\sum_{i=1}^{N^{ND}} \frac{F(X_i^{ND}\hat{\beta}^{ND})}{N^{ND}} - \sum_{i=1}^{N^{D}} \frac{F(X_i^{D}\hat{\beta}^{ND})}{N^{D}} \right] + \left[\sum_{i=1}^{N^{D}} \frac{F(X_i^{D}\hat{\beta}^{ND})}{N^{D}} - \sum_{i=1}^{N^{D}} \frac{F(X_i^{D}\hat{\beta}^{D})}{N^{D}} \right]$$

where $\hat{\beta}^{ND}$ and $\hat{\beta}^{D}$ represent the estimated coefficients from the logit regressions among the non-disabled (*ND*) and the disabled (*D*) and X_i^{ND} and X_i^{D} represent observed characteristics in each group. The first component is the "explained portion" of the employment gap due to group differences in observed distributions of *X*. The second component is the "unexplained portion" of the gap, which is due to differences in the returns to independent variables. The most cited problem with the above decomposition (e.g., Oaxaca, 1973) is termed the "index number problem", i.e. the results may vary depending on which group is used as a reference. This refers to the weights and distributions used in the terms. As a way to try and solve this index number problem, Neumark (1988) and Oaxaca and Ransom (1994) propose a specification in which the coefficient estimates from a pooled logistic regression of disabled and non-disabled males represent an absence of discrimination. It has to be noted that in the pooled regression, disability is not used as a covariate. In this paper, we present results from a pooled regression, which we also briefly compare, as a robustness check, to results based on equation (2).

4. RESULTS

(a) Disability Prevalence among adults (aged 18-60)

The disability prevalence rates among working age adults, males and females of the 15 countries under study are presented in Table 1. Prevalence using the base measure ranges from a low of 3.59% in Lao PDR to a high of 16.13% in Bangladesh. Prevalence rates are higher using the expanded measure (Appendix 1): the range of the disability prevalence using the expanded measure is between 7.46% in Mexico and 21.87% in Brazil. In addition, prevalence estimates in Table 1 show that in all countries, the prevalence of single disability

is higher than that of multiple disabilities. Finally, in all countries, disability prevalence is systematically higher for females than males. This result holds when the expanded disability measure is used (Appendix 1).*(b) Employment Rates*

Table 2 presents the employment rates of persons without disabilities compared to all persons with disabilities, and compared to persons with single and multiple disabilities. Table 2 gives the disability gap, i.e. the difference between the employment rates of persons without and with disabilities.

In 13 of 15 countries, the employment rate of persons with disabilities is consistently lower than that of persons without disabilities. In nine out 15 countries, there is a statistically significant disability gap showing lower employment rates for persons with disabilities. Table 2 also shows employment rates for persons with single and multiple disabilities compared to persons without disabilities in 12 countries.[12] Persons with single or multiple disabilities have lower employment rates compared to persons without disabilities in eight and nine countries respectively. Persons with multiple disabilities have even lower employment rates than persons with single disabilities. Similar results are reached when the expanded disability measure is used in Appendix 2. Figure 1 gives the employment ratio i.e., the ratio between the employment rate of persons with disabilities and the employment rate of persons without disabilities. This ratio conveys the degree of integration in the labor market for persons with disabilities relative to that for persons without disabilities. A ratio at, above or close to one suggests that working age persons with disabilities access employment to the same degree as persons without disabilities. Except for the Dominican Republic, the ratio is lower for multiple disabilities compared to single disability.

Table 3 represents the employment rates of persons with and without disabilities by gender in the countries under study using the base disability measure. Out of 15 countries, the

employment rates of persons with disabilities are lower than those of persons without disabilities in 13 countries for males, and in nine countries for females. The disability gap is two percentage points or less in four countries for males and in seven countries for females. Except for Brazil and Lao, the magnitude of the disability gap is larger for males compared to females. The disability gap in employment rates is statistically significant in four countries for males and females. Figure 2 gives the disability ratio for males and females separately for each country. The ratio is at 1 or above for six countries for females, and for three countries for males. For males and females, the lowest ratio is in Burkina Faso (0.64 for males, and 0.57 for females), followed by Mauritius (0.71 for males and 0.78 for females). The highest ratio is found in Bangladesh for males (1.02) and in Zimbabwe for females (1.54). Results from Table 3 and Figure 2 suggest that the differences in employment rates across disability status are more pronounced for males compared to females. Similar results are found on employment differences across disability status for males and females when the expanded measure but are not presented here.

Overall, given the results in Tables 2 and 3 and Appendix 2, there is a lot of variation in the disability gap in employment rates across countries. For instance, by gender, the largest gap is found in Burkina Faso at 30.5 percentage points for males and 15 percentage points for females while several countries have a gap close to zero. In addition, two groups of countries seem to emerge. One group consists of countries where the disability gap in employment rates is consistently small and not significantly different from zero. It includes six countries: Ghana, Kenya, Lao, Malawi, Zambia and Zimbabwe. A second group consists of countries where the disability gap in employment rates is significantly different from zero at 5% comparing persons across disability status (i) overall; and/or (ii) by gender; and/or (iii) when disability refers to a single disability and/or (iv) when disability refers to multiple disabilities. This group includes nine countries: Bangladesh, Brazil, Burkina Faso, Dominican Republic,

Mauritius, Mexico, Pakistan, Paraguay, the Philippines. A majority, nine out of 15, of the countries under study shows differences in employment rates to the detriment of persons with disabilities.

(c) Self-employment rates

In most developing countries, a majority of persons with and without disabilities are in the informal sector. This is confirmed by the rates of self-employment among the employed presented in Table 4. It is often argued that persons with disabilities are more likely to be working in the informal sector than persons without disabilities. Results in Table 4 present indeed a higher proportion of workers who are self-employed for persons with disabilities in 14 out of 15 countries, and a significant difference in nine countries.

(d) Logistic Regressions

We run logistic regressions separately for males and females for each country. The independent variables include disability, age, age squared, being married, three education categories for the respondent, location of household (urban-rural), household size, number of children, and three education categories for the household head. The observable characteristics of our subsamples of persons with and without disabilities are not shown here. In all countries, males and females with disabilities are on average older than their nondisabled counterparts. Persons with disabilities are less educated than persons without disabilities in all countries for males, and in most countries for females. In most countries, persons with disabilities are found to more often live in rural areas and to have larger households.

Results of logistic regressions of the probability of being employed are presented in Table 5 separately for males and females and for different disability measures: the base and the expanded disability measures, as well as the different types of disability, which were used to

construct the base and expanded disability measure. For males, disability has a negative and statistically significant coefficient in 12 and in 9 countries respectively for the base and expanded measure for males, and in three countries for both measures for females. For males, the functional limitations that have negative and significant coefficients in most countries are self-care, moving around, learning new tasks and seeing at arm's length. For females, the moving around difficulty is associated with a lower probability of employment, all else equal, in eight countries. Having a severe difficulty with self-care or learning new tasks has a negative and significant coefficient in five countries for females.

Table 6 presents the estimated coefficient of the base disability variables respectively in the logistic regression of employment for each country. Results for other variables are not shown here. For males, the base disability variable has a negative coefficient in all countries. The coefficient is negative *and* statistically significant at 5% level in 12 out of 15 countries, i.e. in all countries but Kenya, Malawi and Zimbabwe. Among the coefficients of the base disability variable significant in the countries under study, the absolute value of significant coefficients ranges from a low of 0.44 in Brazil to a high of 2.18 in Mauritius. By applying the "divide by 4" rule, we obtain 0.11 and 0.53, which are approximate the upper bound of the marginal effect of having a disability on employment. This suggests that, approximately, the employment rates of persons with disabilities are lower than those of persons without disabilities by 11 to 53 percentage points in the 12 countries above. For females, the coefficient is negative and significant in three countries and the employment rates of persons with disabilities are lower than the persons without disabilities approximately by 8 to 18 percentage points. When the expanded disability measure is used (results not shown), the coefficient of the disability variable is negative *and* statistically significant in fewer countries: in nine out of 15 countries, i.e. in all countries but Kenya, Malawi, Zambia, Zimbabwe, Lao

and Dominican Republic.

For females, the base disability variable has a negative coefficient in all but five countries (Kenya, Zambia, Zimbabwe, Philippines, Dominican Republic), but it is negative and statistically different from zero in only three countries (Burkina Faso, Ghana and Mauritius). A similar result is reached for females when the expanded measure of disability is used (results not shown). Interestingly, in Zimbabwe, among women, the coefficient of the disability variable (base or expanded) is statistically different from zero and positive with both the base and the expanded disability measures, suggesting that women with disabilities are more likely to be employed than their non-disabled counterparts.

The determinants of employment were further explored separately for persons with and without disabilities but results are not shown due to brevity concern. The main results of interest are commented upon below. As expected, age has a positive and statistically significant coefficient in all countries, and being married is positively and negatively associated with employment for males and females respectively. Having a primary or a secondary schooling attainment has coefficients of mixed signs across countries. It is important to note that there is some clear heterogeneity in the results in the subsamples of persons with and without disabilities in the size or sign of coefficients of independent variables for several countries[13]. For instance, in Mexico, having a secondary or higher secondary level of education is significantly associated with a higher probability of employment among persons with disabilities, but not for persons without. This may point toward different returns to education across disability status, which requires further research. In Bangladesh, the coefficient of rural residence is negative and significant for both subsamples, but its absolute value is more than twice higher among females with disabilities

compared to females without. In Burkina Faso, living in a rural area is associated with significantly lower employment among males with disabilities, but not among males without. Overall, the results of these regressions suggest that there is some heterogeneity in the determinants of employment across disability status, which justifies a decomposition approach.

(e) Decomposition of the Disability Gap in Employment Rates

In order for us to further assess if some of the gap in the employment rates above can be explained by differences in observable characteristics and by differences in coefficients across disability status, we apply the Fairlie decomposition technique described earlier for countries with a disability gap[14] in employment rates in Table 3 and a negative and significant (at 10% level) coefficient of the disability variable using the base measure in Table 6. Table 7 summarizes the results of the decomposition. For males, the explained employment gap is nill or positive for five countries and negative for five countries. A negative explained gap or an unexplained gap above 100% means that if the nondisabled had the characteristics of the disabled, for instance if the nondisabled were older like the disabled are in most countries (descriptive statistics not shown here), the employment rate of the nondisabled would be higher given that age is positively associated with employment in most countries in the pooled regression; hence the gap in employment rates between persons with and without disabilities would be larger. For instance, in Paraguay it would be larger by five percentage points and would thus reach nine percentage points. For females, the explained gap is positive for Mauritius and negative for Burkina Faso. The unexplained portion of the employment gap in percentage stands at 119.2% in Burkina Faso and 72.9% in Mauritius. Similar results are reached when the expanded disability measure is used in the lower panel of Table 7. We run a robustness check of the decomposition analysis using results from a regression within the subsample of persons without disabilities instead of the coefficient from

a pooled regression as in Table 7. Results are very close to those in Table 7.

5. DISCUSSION

There is considerable variation in the prevalence of disability across the 15 countries included in our study. This variation may result from a variety of factors, a study of which is beyond the scope of this study. In particular, in addition to differences in the true prevalence of limitations, variation could result from differences in age population structures and in survey translations as has been shown to be relevant in the cognitive testing of the Washington Group on Disability Statistics questions in different countries (Miller et al 2010). Although this analysis uses a disability measure that is different from the one used in WHO-World Bank 2011, our country level estimates for adults aged 18 to 60 ranging from 3.2% in Lao to 16.1% in Bangladesh seem overall consistent with those in the WHO-World Bank 2011, whether globally by age group (8.9% for 18-49, 20.6% for 50-59; page 28) or at the country level (pages 271-276).

Employment rates are found to be lower for persons with disabilities compared to persons without disabilities in nine out of 15 countries. This result is somewhat more mixed than in the literature so far. As summarized in Appendix 3, out of studies covering 12 countries, so far it was only in Zimbabwe that no difference in employment rates was found (Eide et al (2003a). Eide et al (2003a; p. 123) note that, in Zimbabwe, there is an extensive system of specialized services for persons with disabilities, including opportunities in sheltered workshops. Like in Eide et al (2003), we find similar employment rates across disability status in Zimbabwe, as well as in four other countries. It should be noted that, in Malawi, we find no significant difference in employment probability across disability status, which is different from Loeb et al (2004) who find a small (four percentage point) but significant disability gap.

The results also suggest that there is a great degree of heterogeneity across countries in the employment of persons with disabilities relative to persons without disabilities with a significant difference in some countries and not in others. For those countries with a significant disability gap, the size of the gap is variable across countries. For males, the employment rates of persons with disabilities are lower than those of persons without disabilities by 11 to 53 percentage points. This heterogeneity in the magnitude of the disability gap can also be found in the literature. As shown in Appendix 3, all countries but Zimbabwe have a disability gap, and for these countries with a gap, it ranges from a low of four percentage points in Malawi to a high of 40 percentage points in Peru.

It is also notable that, in this paper, all the countries that do not have a disability gap are low income countries, while only two of the nine countries with a disability gap (Bangladesh and Burkina Faso) are in the low income category. This is consistent with results on multidimensional poverty in xxxx (2012) using the same disability measures and data as in this paper. The results in this paper suggest that the disability gap is more common in middle income countries compared to low income countries and further research is needed to determine if, as countries develop, people with disabilities face growing barriers to employment.

In addition, the results in this paper point out that employment differences across disability status are more pronounced among males than females. An analysis of the employment rates and of the determinants of the probability of employment suggests that disability may not represent so much of a barrier to employment for women as they do for men. For women, barriers to employment may well be primarily gender related in most of the developing countries under study. In contrast, for men, having a disability is often significantly and

negatively associated with employment, even after controlling for human capital and other observables in most countries. The literature on disability and employment typically does not distinguish employment rates for males and females (e.g. OECD 2009). At least, one can say that the difference in results for males and females found in this paper is consistent with those reached by Loeb and Eide (2004) in Malawi and Mitra and Sambamoorthi (2005) in India.

This paper finds a significantly higher proportion of workers who are self-employed for persons with disabilities in nine countries. Other studies do find a higher share of workers with disabilities in self-employment compared to workers without disabilities in several countries (e.g. Eide et al (2003, 2006, 2009, 2011b), Loeb et al (2004) and Mitra and Sambamoorthi (2006)). Further research is needed on informal/formal employment across disability status in developing countries. If in a given country, persons with disabilities are found to be disproportionately in the informal sector, then it becomes important to find the extent to which they are constrained to the informal sector due to barriers to the formal sector or the extent to which they may choose to be in the informal sector.

The decomposition of the employment gap reveals that the gap is not attributable to differences in demographic, human capital and other observed characteristics. What are the potential explanations then for the substantial disability gap in the employment rates in most developing countries? The unexplained gap seems to result in part from different returns to characteristics. The employment logit model has different coefficients across disability status for some variables (e.g., education, rural residence). In addition, part of the difference may result from the productivity limitations created by the disability itself, which may not be captured in the observables. The only variables that we used as proxies for productivity were education and age. Part of the employment gap may also result from unobservables such as

the time and financial cost of getting to work as well as local/regional employment policies and programs. Finally, discrimination is a possible explanation of the disability gap in employment rates. This result is consistent with the one reached by Mitra and Sambamoorthi (2005, 2008) in rural India. For males in the survey, a decomposition of the disability gap in employment rates was also carried out. In Uttar Pradesh and Tamil Nadu respectively, employment rates among disabled men were 30 and 14 percent lower than those non-disabled men. Decomposition of the factors driving the gap found that most of the employment gap is not attributable to observable differences in demographic, human capital or other characteristics.

6. CONCLUSION

There are six main findings from the analysis of the WHS data. They are listed below and policy implications are drawn. First, there is a disability gap in employment rates in nine of the 15 countries under study. This result suggests that policies that promote access to employment may be particularly important for the economic wellbeing of persons and households with disabilities in many developing countries. Second, there is a great degree of heterogeneity across countries in the employment of persons with disabilities relative to persons without disabilities going from no difference in six countries to moderate and large differences in nine countries. This heterogeneity has important implications for policy and program design, as one employment disability policy is unlikely to fit all. A more in-depth analysis would be needed for each of the countries with a disability gap to develop specific and contextualized policy recommendations with respect to employment. Third, the disability gap in employment rates was found to be more often significant and larger in middle income countries compared to low income countries. Further research is needed to investigate the potential relation between economic development and the disability/non-employment association. Fourth, an analysis of the employment rates and the determinants of the

probability of employment by disability status and gender suggest that women with disabilities tend to have similar employment rates as their nondisabled counterparts in most countries. For men, having a disability is negatively associated with employment, even after controlling for human capital. Disability may not represent as much of a barrier to employment for women as they do for men. For women, barriers to employment may well be primarily gender related. Further research is needed on gender, disability and employment in developing countries. Fifth, this paper finds a higher proportion of workers who are self-employed for persons with disabilities in most countries. Finally, it appears that observable characteristics of males with disabilities do not explain most of their "employment deficit", but rather that other factors are driving their poor employment outcomes.

This study demonstrates the need for policy analysis and research on employment and disability in many developing countries. Regarding policy, it is essential to note that the results presented in this study only provide aggregate level estimates regarding the employment of persons with disabilities in selected developing countries. They are a starting point when it comes to informing policymaking. A detailed situational analysis of employment outcomes, and an identification of the barriers to employment, if appropriate, is necessary to make specific adapted policy recommendations. For instance, in a country with a low employment rate for persons with disabilities compared to that for persons without disabilities, prior to developing a policy or program to enhance employment among persons with disabilities, one needs to find out why the employment rate is low. It could be due to how the underlying health conditions reduce the productivity of persons with disabilities for the types of jobs that are available in the labor market of the country under consideration. It could be due to a lack of access to assistive devices or personal assistance. It could be due to contextual factors, for instance, a physically inaccessible work environment or negative

attitudes with respect to the ability to work of persons with disabilities. Once the main causes for low employment rates for persons with disabilities in a particular country are better understood, it becomes feasible to develop evidence-based programs and policies to promote employment among persons with disabilities. This paper may provide the starting point for such an assessment in selected developing countries.

In addition, there is a need for more research on disability and employment in developing countries in several areas, three of which are briefly introduced below. Research is needed to evaluate interventions that attempt to improve the employment outcomes of persons with disabilities in developing countries. Some interventions, such as community based rehabilitation, have long been in the field, but little is known on what works. More data collection is also needed for further research to be undertaken. Longitudinal data or data with instrumental variables are necessary to assess the causal pathways between disability and non-employment. In developing countries, very rare are the longitudinal household surveys that include disability questions. In addition, there is a need to study employment in developing countries by disability type and by age at onset, and to study employment outcomes that were beyond the scope of this paper such as occupation type or earnings. Finally, further research is needed on the other factors that may influence the disability gap in employment rates that could not be covered in this study such as differences in returns from education and work experience or attitudes among employers and more generally community members.

NOTES

[1] These rights are defined in articles 24, 25, 27 and 28 respectively.

[2] The number of countries that have ratified the convention was found at:

http://www.un.org/disabilities/countries.asp?id=166

[3] Countries with less than the GNI per capita of $3,945 i.e., low income and lower middle income group of the World Bank definition

[4] For a recent review on employment issues related to disability, see Bruyere et al (2011).

[5] Several other studies have been conducted but are not published in peer reviewed journals. A large majority of these studies show that persons with disabilities are less likely to be employed (Eide et al 2003b (Namibia), Eide and Loeb 2006 (Zambia), 2009 (Mozambique); Loeb and Eide (2004) (Malawi), Zambrano 2006 (Peru)). In Zimbabwe though, Eide et al (2003a) find no statistically significant difference between the employment rates of persons with and without disabilities.

[6] The questionnaire's main employment status question in the WHS reads as follows: "*Now, I would like to ask you a few questions about your work status. What is your current job?**1.** Government employee; **2.** Non-government employee; **3.** Self- employed; **4.** Employer; **5.** Not working"*

[7] For the 15 countries under study, data was collected in 2003.

[8] Out of the countries where the WHS was fielded, there were 40 developing countries in Africa, Asia and South America. Out of these countries, we excluded three countries where the WHS data is not nationally representative (Congo, Cote d'Ivoire, Comoros). In three countries (Turkey, Mali, Morocco), key economic indicators were not collected and hence could not be covered. In six countries (China, Malaysia, Myanmar, United Arab Emirates, Uruguay, and Senegal), the sample sizes were deemed too small for the purpose of this study, and in one country (Guatemala) sampling weights were not available. For the rest of the countries, missing data was analyzed. Missing data rates varied across countries from 0% to 25% for selected disability and economic indicator questions. An analysis of missing data was conducted to assess to what extent data on economic indicators was missing randomly across disability status. For each country, non-random bias in missing data was checked in two ways. Firstly, logistic regressions were run of the probability of having missing data on employment. Independent variables included a dummy variable for disability status, age, age squared, marital status, education, and a dummy variable for rural residence. Secondly, a logistic regression of missing data on disability against economic wellbeing (expenditures or assets) and household level controls

(household size, dummies for rural residence, household head's gender and marital status) was run. Two dependent variables were used in turn: having missing data on the base disability measure and the expanded disability measure (see section on disability measures using WHS data). Considering results for the coefficients of relevant variables in these regressions, as well as missing data rates on economic indicators and disability measures, it was assessed that non-random missing data was a concern for 12 countries that were therefore excluded from this study: Chad, Ecuador, Ethiopia, India, Mauritania, Namibia, Nepal, South Africa, Sri Lanka, Swaziland, Tunisia and Vietnam.

[9] In June 2001, the United Nations International Seminar on the Measurement of Disability recommended that principles and standard forms for indicators of disability be developed (United Nations 2010). There was a broad consensus on the need for population-based measures of disability for country use and for international comparisons. The Washington Group on Disability Statistics was formed to address this need. The main purpose of the Washington Group is to promote and coordinate international cooperation in the area of disability measures. Further information on the UN Washington Group on Disability Statistics is available at: http://unstats.un.org/unsd/methods/citygroup/washington.htm

[10] Sample size for individuals with extreme/unable to do difficulty was too small to separate the analysis for those with severe difficulty, on the one hand, and those with extreme/unable to do difficulty, on the other. In addition, this study uses self reports of severe or extreme difficulties only, and not of mild or moderate difficulties. Earlier research has shown that moderate difficulties may not be as reliably self-reported as severe difficulties (Lafortune et al (2007; 17); Miller et al (2010)). In addition, policy implications in terms of vocational rehabilitation are more relevant to the population with severe difficulties.

[11] For details of the derivation of the decomposition techniques, see Mitra and Sambamoorthi (2008).

[12] Results for Ghana, Zambia, and Lao are not presented due to a low number of observations of individuals with multiple disabilities.

[13] It also can be noted that for several countries several variables (e.g., age) have coefficients that are not significantly different from zero among the disabled but are significantly different from zero among the non-disabled. This result may be due to the smaller sample size for the disabled.

[14] We included all countries with a strictly positive employment gap in Table 3, which includes more countries than those where the gap is strictly positive and statistically significant.

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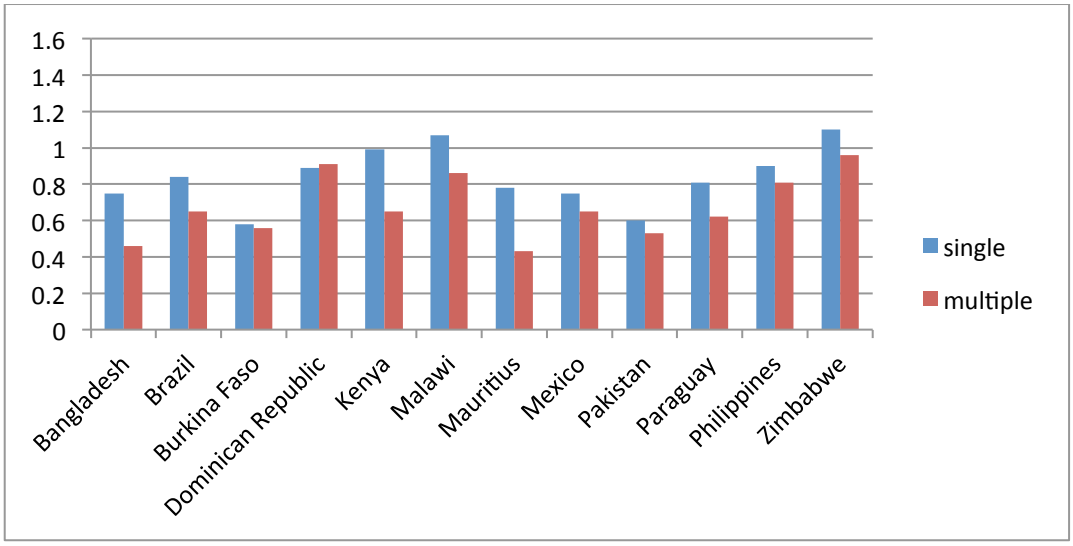
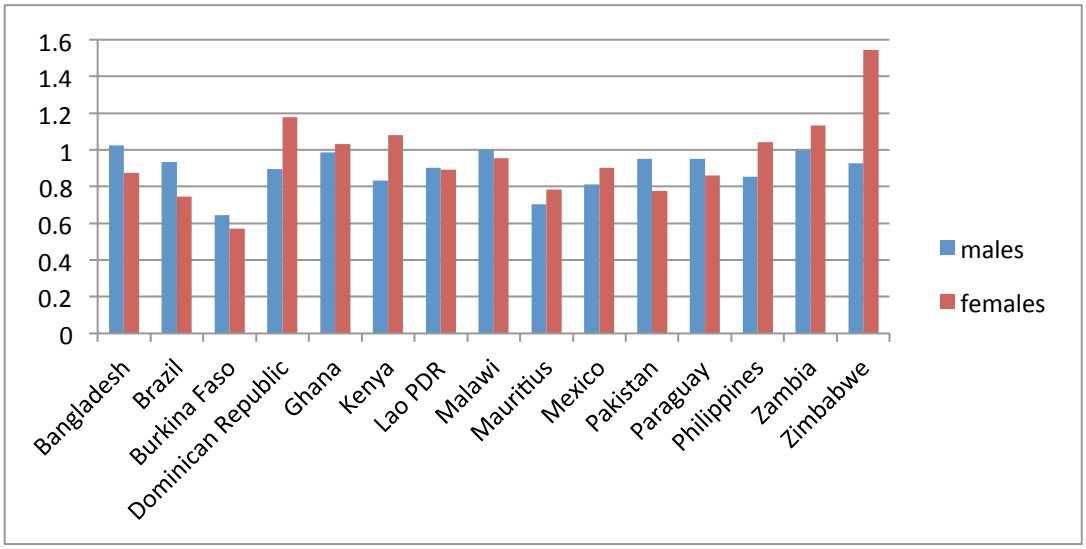
Figure 1: Employment Ratio of Persons with Single or Multiple Disabilities and Persons without Disabilities [a]



[a] The employment ratio is the employment rate of persons with single or multiple disabilities divided by the employment rate of persons without disabilities

Figure 2: Employment Ratio, or Relative Employment Rates of Men and Women with Disabilities Relative to Men and Women without Disabilities[a]



[a] The employment ratio is the employment rate of persons with disabilities divided by the employment rate of persons without disabilities

Table 1: *Prevalence of disability (%) among individuals aged 18 to 60*

	All	Single Disability	Multiple Disabilities	Among Males	Among Females
Sub-Saharan Africa					
Burkina Faso	7.46	5.69	1.77	6.35	8.47
	(0.52)	(0.45)	(0.27)	(0.68)	(0.77)
Ghana	7.59	6.49	1.10	5.85	9.28
	(0.52)	(0.48)	(0.21)	(0.70)	(0.76)
Kenya	5.07	3.96	1.11	3.44	6.63
	(0.57)	(0.51)	(0.24)	(0.68)	(0.89)
Malawi	12.97	9.18	3.79	12.64	13.29
	(0.71)	(0.61)	(0.42)	(1.08)	(0.94)
Mauritius	10.93	7.74	3.19	8.61	13.32
	(0.58)	(0.50)	(0.32)	(0.75)	(0.89)
Zambia	5.33	4.03	1.30	3.43	7.17
	(0.47)	(0.40)	(0.25)	(0.54)	(0.75)
Zimbabwe	10.51	7.39	3.12	8.87	12.09
	(0.67)	(0.55)	(0.41)	(1.03)	(0.86)
Asia					
Bangladesh	15.40	9.81	5.59	9.12	22.10
	(0.61)	(0.49)	(0.39)	(0.72)	(0.97)
Lao PDR	3.24	2.71	0.53	2.93	3.55
	(0.28)	(0.26)	(0.12)	(0.38)	(0.41)
Pakistan	5.92	4.58	1.34	3.17	8.75
	(0.46)	(0.42)	(0.20)	(0.46)	(0.80)
Philippines	8.24	6.80	1.44	7.33	9.15
	(0.34)	(0.31)	(0.14)	(0.47)	(0.49)
Latin America					
Brazil	13.22	10.26	2.96	10.67	16.41
	(0.65)	(0.59)	(0.32)	(0.82)	(1.04)
Dominican Republic	8.92	7.04	1.88	6.15	11.80
	(0.68)	(0.60)	(0.33)	(0.87)	(1.03)
Mexico	5.04	4.17	0.86	3.72	6.27
	(0.17)	(0.16)	(0.07)	(0.24)	(0.25)
Paraguay	6.50	5.17	1.33	3.77	9.24
	(0.42)	(0.37)	(0.20)	(0.45)	(0.69)

Notes: All estimates are weighted. Standard errors are in parentheses. For explanations on the base disability measure, see text. Disability prevalence is not age standardized.
Source: Authors' analysis based on WHS data as described in the text.

Table 2: *Employment rates by disability status* [a]

	Persons without disability	Persons with disability	Gap	Persons with single disability	Gap	Persons with multiple disability	Gap
Sub-Saharan Africa							
Burkina Faso	0.59	0.34	0.25 ***	0.35	0.25 ***	0.33	0.26 ***
	(0.01)	(0.03)		(0.04)		(0.07)	
Ghana	0.77	0.78	-0.01	NA		NA	
	(0.01)	(0.03)					
Kenya	0.63	0.57	0.05	0.62	0.01	0.41	0.22 *
	(0.02)	(0.06)		(0.07)		(0.10)	
Malawi	0.52	0.50	0.01	0.53	-0.01	0.44	0.07
	(0.01)	(0.03)		(0.03)		(0.06)	
Mauritius	0.67	0.45	0.22 ***	0.52	0.15 ***	0.29	0.38 ***
	(0.01)	(0.03)		(0.03)		(0.05)	
Zambia	0.60	0.59	0.00	NA		NA	
	(0.01)	(0.04)					
Zimbabwe	0.33	0.34	-0.02	0.36	-0.03	0.31	0.01
	(0.01)	(0.03)		(0.04)		(0.06)	
Asia							
Bangladesh	0.54	0.35	0.19 ***	0.40	0.13 ***	0.25	0.29 ***
	(0.01)	(0.02)		(0.03)		(0.03)	
Lao	0.81	0.72	0.08 *	NA		NA	
	(0.01)	(0.04)					
Pakistan	0.52	0.30	0.22 ***	0.31	0.21 ***	0.27	0.25 ***
	(0.01)	(0.04)		(0.04)		(0.08)	
Philippines	0.55	0.48	0.06 **	0.49	0.05 *	0.44	0.10 *
	(0.01)	(0.02)		(0.02)		(0.05)	
Latin America							
Brazil	0.61	0.49	0.12 ***	0.51	0.10 **	0.40	0.21 ***
	(0.01)	(0.03)		(0.03)		(0.06)	
Dominican Republic	0.64	0.57	0.07	0.57	0.07	0.58	0.06
	(0.01)	(0.04)		(0.04)		(0.08)	
Mexico	0.56	0.41	0.15 ***	0.42	0.14 ***	0.37	0.20 ***
	(0.00)	(0.02)		(0.02)		(0.04)	
Paraguay	0.65	0.51	0.15 ***	0.53	0.12 ***	0.41	0.25 ***
	(0.01)	(0.03)		(0.04)		(0.08)	

[a] Results by single/multiple disability status are not presented for Ghana, Zambia, and Lao due to a low number of observations of individuals with multiple disabilities. The sample size of persons with single or multiple disabilities was too small in most countries for it to be broken down by gender.
The notes of Table 1 also apply.

Table 3: *Employment rates by gender and disability status*

Country	Males				Females			
	N	With Disability	Without Disability	Gap	*N*	With Disability	Without Disability	Gap
Sub-Saharan Africa								
Burkina Faso	1,972	0.55	0.85	0.30 ***	2,311	0.20	0.36	0.15 ***
		(0.05)	(0.01)			(0.04)	(0.02)	
Ghana	1,488	0.75	0.76	0.01	1,774	0.81	0.78	-0.02
		(0.06)	(0.02)			(0.04)	(0.01)	
Kenya	1,642	0.62	0.75	0.13	2,223	0.55	0.51	-0.04
		(0.11)	(0.02)			(0.07)	(0.02)	
Malawi	1,927	0.67	0.67	0.00	2,617	0.35	0.36	0.02
		(0.04)	(0.02)			(0.04)	(0.01)	
Mauritius	1,627	0.64	0.90	0.27 ***	1,644	0.33	0.42	0.09 *
		(0.04)	(0.01)			(0.03)	(0.01)	
Zambia	1,381	0.72	0.72	0.00	1,633	0.53	0.47	-0.06
		(0.08)	(0.02)			(0.05)	(0.02)	
Zimbabwe	1,245	0.44	0.47	0.03	2,249	0.28	0.18	-0.10 **
		(0.06)	(0.02)			(0.03)	(0.01)	
Asia								
Bangladesh	2,264	0.89	0.87	-0.02	2,689	0.11	0.12	0.02
		(0.03)	(0.01)			(0.01)	(0.01)	
Lao PDR	2,080	0.75	0.83	0.08	2,348	0.70	0.79	0.09
		(0.06)	(0.01)			(0.06)	(0.01)	
Pakistan	3,185	0.83	0.87	0.04	2,542	0.11	0.14	0.03
		(0.04)	(0.01)			(0.03)	(0.01)	
Philippines	4,182	0.62	0.73	0.11 **	4,820	0.37	0.36	-0.02
		(0.03)	(0.01)			(0.03)	(0.01)	
Latin America								
Brazil	1,582	0.72	0.77	0.05	1,403	0.30	0.40	0.10 **
		(0.04)	(0.01)			(0.03)	(0.02)	
Dominican Republic	1,740	0.78	0.87	0.09	2,047	0.46	0.39	-0.07
		(0.07)	(0.01)			(0.05)	(0.02)	
Mexico	13,740	0.70	0.86	0.16 ***	19,093	0.25	0.28	0.03
		(0.03)	(0.00)			(0.02)	(0.00)	
Paraguay	2,010	0.81	0.85	0.04	2,415	0.38	0.44	0.06
		(0.05)	(0.01)			(0.04)	(0.01)	

The notes of Table 1 apply.

Table 4: *Rates of self-employment among the employed by disability status*

	Persons Without Disability	Persons With Disability	Difference	Persons with Single Disability	Difference	Persons with With Multiple Disability	Difference
Sub-Saharan Africa							
Burkina Faso	0.91	0.94	0.02	0.92	0.01	0.96	0.05 *
	(0.01)	(0.02)		(0.03)		(0.02)	
Ghana	0.82	0.83	0.01	NA		NA	
	(0.01)	(0.03)		(0.07)		(0.02)	
Kenya	0.62	0.75	0.13	0.60	-0.01	0.83	0.22 ***
	(0.02)	(0.05)		(0.09)		(0.06)	
Malawi	0.74	0.84	0.10 **	0.80	0.06	0.91	0.17 ***
	(0.01)	(0.03)		(0.04)		(0.04)	
Mauritius	0.20	0.29	0.09 *	0.36	0.16 **	0.20	0.00
	(0.01)	(0.04)		(0.05)			
Zambia	0.81	0.89	0.07 *	NA		NA	
	(0.01)	(0.03)		(0.07)	0.06	(0.02)	
Zimbabwe	0.45	0.68	0.23 ***	0.58		0.78	0.33 ***
	(0.02)	(0.05)		(0.09)		(0.05)	
Asia							
Bangladesh	0.81	0.87	0.06 *	0.88		0.85	0.03 ***
	(0.01)	(0.02)		(0.03)	0.02		
Lao PDR	0.83	0.84	0.01	NA		NA	
	(0.01)	(0.03)		(0.06)		(0.04)	
Pakistan	0.68	0.67	-0.01	0.75	0.06	0.46	-0.23
	(0.01)	(0.07)		(0.08)		(0.13)	
Philippines	0.50	0.60	0.10 ***	0.56	0.06	0.66	0.17 ***
	(0.01)	(0.03)		(0.04)		(0.04)	
Latin America							
Brazil	0.41	0.55	0.14 ***	0.55	0.14 **	0.55	0.14 *
	(0.01)	(0.04)		(0.05)		(0.07)	
Dominican Republic	0.47	0.52	0.06	0.61	0.15	0.43	-0.03
	(0.02)	(0.06)		(0.08)		(0.08)	
Mexico	0.45	0.53	0.08 **	0.58	0.12 ***	0.46	0.00
	(0.01)	(0.03)		(0.04)		(0.04)	
Paraguay	0.52	0.67	0.15 ***	0.72	0.20 ***	0.63	0.11
	(0.01)	(0.04)		(0.06)		(0.06)	

[a] Results by single/multiple disability status are not presented for Ghana, Zambia, and Lao due to a low number of observations.

The sample size of persons with single or multiple disabilities was too small in most countries for it to be broken down by gender.

The self-employment rate is the percentage of the employed who are self employed. The notes of Table 1 apply.

Table 5: *Number of countries where disability variable is negative and significant*

		Male	Female
Base Disability Measure		12	3
Expanded Disability Measure		9	3
	Moving around	10	8
	Selfcare	11	5
	Remembering	7	3
Severe or Extreme	Learning new tasks	10	5
Difficulty in	Personal relationship	5	2
	Dealing with conflict	5	2
	Seeing across the road	6	0
	Seeing at arm's length	8	2

Note: Control variables include three education categories, age, age squared, being married, urban location, household size, number of children and three education categories for the household head.

Table 6: *Coefficient of disability variable in the logistic regression of the probability of being employed*

	Male			Female		
	Coef.	t		Coef.	t	
Sub-Saharan Africa						
Burkina	-1.908	-8.217	***	-0.734	-3.949	***
	(0.232)			(0.186)		
Ghana	-1.202	-3.438	***	-0.527	-2.168	**
	(0.232)			(0.186)		
Kenya	-0.486	-1.775	*	0.024	0.153	
	(0.232)			(0.186)		
Malawi	-0.233	-1.299		-0.198	-1.424	
	(0.232)			(0.186)		
Mauritius	-2.184	-8.434	***	-0.336	-2.073	**
	(0.232)			(0.186)		
Zambia	-0.953	-2.741	***	0.209	1.004	
	(0.232)			(0.186)		
Zimbabwe	-0.297	-1.381		0.526	3.449	***
	(0.232)			(0.186)		
Asia						
Bangladesh	-0.817	-3.086	***	-0.088	-0.618	
	(0.232)			(0.186)		
Lao PDR	-0.620	-2.045	**	-0.369	-1.498	
	(0.232)			(0.186)		
Pakistan	-1.045	-4.054	***	-0.004	-0.018	
	(0.232)			(0.186)		
Philippines	-0.765	-5.379	***	0.082	0.795	
	(0.232)			(0.186)		
Latin America						
Brazil	-0.441	-2.310	**	-0.133	-0.789	
	(0.232)			(0.186)		
Dominican Republic	-0.600	-2.305	**	0.079	0.527	
	(0.232)			(0.186)		
Mexico	-1.040	-8.753	***	-0.077	-1.054	
	(0.232)			(0.186)		
Paraguay	-1.033	-3.230	***	-0.122	-0.811	
	(0.232)			(0.186)		

Notes: The base disability measure is used. Control variables include three education categories, age, age squared, being married, urban location, household size, number of children and three education categories for the household head.

Table 7: *Logistic Decomposition of the Probability of being Employed across Disability Status*

			Explained		Unexplained	
		Gap		%		%
Base Bisability Measure						
Male	Burkina Faso	0.30	-0.01	-4.0%	0.32	104.0%
	Ghana	0.01	-0.09	-978.2%	0.10	1078.2%
	Mauritius	0.27	0.00	-0.8%	0.27	100.8%
	LaoPDR	0.08	0.02	28.1%	0.06	71.9%
	Pakistan	0.04	0.00	-12.0%	0.05	112.0%
	Philippines	0.11	-0.04	-35.1%	0.15	135.1%
	Brazil	0.05	-0.01	-30.5%	0.06	130.5%
	Dominican Republic	0.09	0.02	18.5%	0.07	81.5%
	Mexico	0.16	0.00	-0.9%	0.16	100.9%
	Paraguay	0.04	-0.05	-119.8%	0.09	219.8%
Female	Burkina Faso	0.15	-0.03	-19.2%	0.18	119.2%
	Mauritius	0.09	0.02	27.1%	0.07	72.9%
Expanded Disability Measure						
Male	Burkina Faso	0.19	-0.01	-7.4%	0.21	107.4%
	Mauritius	0.22	-0.01	-4.4%	0.23	104.4%
	Bangladesh	0.01	-0.03	-439.4%	0.04	539.4%
	Pakistan	0.01	-0.01	-106.6%	0.02	206.6%
	Philippines	0.08	-0.03	-41.0%	0.11	141.0%
	Brazil	0.05	-0.02	-38.9%	0.06	138.9%
	Mexico	0.13	-0.01	-4.9%	0.14	104.9%
	Paraguay	0.10	-0.03	-26.1%	0.12	126.1%
Female	Burkina Faso	0.11	-0.02	-15.5%	0.13	115.5%
	Mauritius	0.09	0.02	24.2%	0.07	75.8%

Appendix 1: *Prevalence of Disability (%) (expanded measure) among Individuals aged 18 to 60*

	All	Males	Females	Single Disability	Multiple Disabilities
Sub-Saharan Africa					
Burkina Faso	11.39	9.86	12.79	6.52	4.87
	(0.61)	(0.82)	(0.90)	(0.45)	(0.45)
Ghana	11.84	9.67	13.96	7.87	3.97
	(0.66)	(0.91)	(0.94)	(0.55)	(0.39)
Kenya	8.32	6.11	10.45	5.65	2.67
	(0.70)	(0.87)	(1.07)	(0.58)	(0.39)
Malawi	17.11	16.85	17.37	9.46	7.65
	(0.79)	(1.19)	(1.05)	(0.61)	(0.57)
Mauritius	13.70	10.91	16.58	6.35	7.35
	(0.64)	(0.84)	(0.98)	(0.45)	(0.49)
Zambia	8.46	5.54	11.26	5.66	2.80
	(0.59)	(0.69)	(0.93)	(0.48)	(0.36)
Zimbabwe	13.68	11.37	15.90	8.11	5.57
	(0.75)	(1.16)	(0.97)	(0.59)	(0.51)
Asia					
Bangladesh	18.82	12.55	26.61	9.94	8.88
	(0.72)	(0.86)	(1.15)	(0.54)	(0.52)
Lao PDR	13.20	11.75	14.61	9.88	3.32
	(0.57)	(0.78)	(0.82)	(0.50)	(0.30)
Pakistan	7.56	4.47	10.75	4.39	3.17
	(0.51)	(0.53)	(0.88)	(0.41)	(0.32)
Philippines	11.83	10.53	13.13	7.19	4.64
	(0.41)	(0.56)	(0.58)	(0.32)	(0.27)
Latin America					
Brazil	21.31	17.04	26.68	12.48	8.84
	(0.79)	(1.01)	(1.25)	(0.64)	(0.55)
Dominican Republic	13.20	8.99	17.59	8.11	5.10
	(0.82)	(1.02)	(1.26)	(0.67)	(0.52)
Mexico	7.15	5.27	8.91	4.35	2.80
	(0.20)	(0.27)	(0.30)	(0.16)	(0.13)
Paraguay	10.81	7.36	14.27	6.48	4.33
	(0.53)	(0.65)	(0.83)	(0.42)	(0.35)

Notes: All estimates are weighted. Standard errors are in parentheses. For explanations on the expanded disability measure, see text. Disability prevalence is not age standardized.
Source: Authors' analysis based on WHS data as described in the text.

Appendix 2: *Employment Rate by disability status using the expanded disability measure* [a]

	Persons without disability	Persons with a disability	Gap	Persons with single disability	Gap	Persons with multiple disability	Gap
Sub-Saharan Africa							
Burkina Faso	0.60	0.42	0.18 ***	0.51	0.09 **	0.30	0.30 ***
	(0.01)	(0.03)		(0.04)		(0.04)	
Ghana	0.77	0.78	-0.02	NA		NA	
	(0.01)	(0.03)					
Kenya	0.62	0.63	0.00	0.64	-0.02	0.59	0.04
	(0.02)	(0.04)		(0.05)		(0.07)	
Malawi	0.52	0.51	0.01	0.51	0.01	0.51	0.01
	(0.01)	(0.03)		(0.03)		(0.04)	
Mauritius	0.67	0.47	0.20 ***	0.58	0.09 **	0.38	0.29 ***
	(0.01)	(0.03)		(0.04)		(0.03)	
Zambia	0.60	0.60	0.00	NA		NA	
	(0.01)	(0.04)					
Zimbabwe	0.33	0.34	-0.01	0.34	-0.02	0.34	-0.01
	(0.01)	(0.03)		(0.04)		(0.05)	
Asia							
Bangladesh	0.57	0.39	0.18 ***	0.43	0.14 ***	0.33	0.23 ***
	(0.01)	(0.02)		(0.03)		(0.03)	
Lao	0.80	0.82	-0.02	NA		NA	
	(0.01)	(0.02)					
Pakistan	0.52	0.32	0.21 ***	0.39	0.14 **	0.22	0.30 ***
	(0.01)	(0.03)		(0.05)		(0.04)	
Philippines	0.55	0.49	0.05 **	0.53	0.02	0.44	0.11 ***
	(0.01)	(0.02)		(0.02)		(0.03)	
Latin America							
Brazil	0.62	0.50	0.12 ***	0.52	0.10 ***	0.46	0.16 ***
	(0.01)	(0.02)		(0.03)		(0.03)	
Dominican Republic	0.64	0.55	0.09 **	0.56	0.09	0.54	0.11 *
	(0.01)	(0.03)		(0.04)		(0.05)	
Mexico	0.57	0.42	0.15 ***	0.44	0.13 ***	0.39	0.17 ***
	(0.00)	(0.01)		(0.02)		(0.02)	
Paraguay	0.66	0.50	0.16 ***	0.50	0.16 ***	0.50	0.16 ***
	(0.01)	(0.03)		(0.03)		(0.04)	

[a] Results for Ghana, Zambia, and Lao are not presented due to a low number of observations of Individuals with Multiple Disabilities.
The sample size of persons with single or multiple disabilities was too small in most countries for it to be broken down by gender.
The notes of Table 1 also apply.

Appendix 3*: Other studies' employment rates across disability status in developing countries*

	Persons With disability	Persons Without disability	Gap	Ratio	Year	Source
Sub-Saharan Africa						
Lesotho	0.06	0.19	0.13 *	32%	2011	Kamaleri et al (2011a)
Malawi[1]	0.42	0.46	0.04 *	92%	2004	Loeb et al (2004)
Mozambique[1]	0.11	0.26	0.15 *	42%	2009	Eide et al (2009)
Namibia[1]	0.08	0.21	0.13 *	39%	2003	Eide et al (2003b)
South Africa	0.12	0.41	0.29 *	30%	2002	Mitra (2008)
Swaziland	0.27	0.39	0.13 *	68%	2011	Eide et al (2011b)
Zambia[1]	0.46	0.58	0.13 *	78%	2006	Eide et al (2006)
Zimbabwe[1]	0.21	0.21	0.00	101%	2003	Eide et al (2003a)
Asia						
Afghanistan	0.56	0.78	0.22 *	71%	2005	Trani et al 2010
India	0.38	0.63	0.25 *	60%	2002	World Bank (2009)
Latin America and the Caribbean						
Mexico	0.47	0.6	0.13 NA	78%		OECD (2003)
Peru	0.24	0.64	0.40 *	37%	2003	Zambrano (2006)

Notes: * is for statistical significance of the difference in employment rates between persons with and without disabilities; an estimate with a 1 as superscript is the percentage of persons employed in the formal sector only. NA stands for not available.