Abstract This chapter estimates the prevalence of disability measured through functional difficulties. In Ethiopia, Malawi, Tanzania, and Uganda, the prevalence of functional difficulties ranges from 10.8 to 15.1%. In the four countries, the prevalence of functional difficulties at the household level ranges from one in five to one in three households. Functional difficulties disproportionately affect older individuals and women. Seeing and walking limitations are the most prevalent limitations in the four countries. A majority of individuals do not take any measure to reduce their functional difficulties, suggesting there may be scope for prevention. There is a strong socioeconomic gradient in prevalence. Prevalence is two to four times higher in households in the poorest quintile compared to the richest quintile.

Keywords Disability · Prevalence · Poverty · Gender · Aging · Africa

JEL I1 · I3 · O15
Policymakers in LMICs currently have very little guidance from statistics regarding the magnitude or nature of functional difficulties. Until recently, data was often not collected, or of poor quality and not comparable across countries. The Washington Group questions allow us to present nationally representative and comparable prevalence estimates.

The main goal of this chapter is to present nationally representative estimates of the prevalence of functional difficulties among adults in Ethiopia, Malawi, Tanzania, and Uganda. Finding out about prevalence is important for several reasons. It helps policymakers, analysts, and researchers understand functional status in their countries. It also helps with the design of interventions in order to prevent functional difficulties and to improve the wellbeing of persons who experience such difficulties, including health, economic, and social wellbeing.

This chapter uses data for Ethiopia, Malawi, Tanzania, and Uganda to answer several questions: how prevalent are functional difficulties? What types of functional difficulties can be found? Do people take any measure to curb their difficulties? Are functional difficulties consistently experienced overtime? What are their correlates? In the context of the human development model, this chapter measures the prevalence of one type of health deprivation (functional difficulties) and investigates its correlates with personal factors (age, sex), resources (mother’s education), and structural factors (rural/urban, distance to healthcare services).

4.1 Literature on Disability Prevalence in LMICs

As of June 2016, there are a number of estimates of disability prevalence in LMICs from both country and global-level data collection efforts. Let us take the example of Ethiopia. What do we know so far about disability prevalence in this populous country of the horn of Africa? In Ethiopia, in 2007, the Census came up with a national disability prevalence of 1% (CSA 2007). This is not unusual in LMICs (WHO-World Bank 2011, Appendix 1). Like many low-income or African countries, prevalence was found to be low compared to prevalence estimates in HICs often between 15 and 20%. Is there underreporting of disability in LICs? Is there excessive mortality associated with disability? Does it reflect a very different population pyramid? Are disability measures radically different from those used in HICs? There is of course a combination of factors, but clearly measurement plays an important role in explaining the vast range of estimates across country groups. Ethiopia’s 2007 Census used
a single question asking if the person has ‘a problem of seeing, hearing, speaking and/or standing/walking/seating, body parts movement, functioning of hands/legs or mental retardation or mental problem or mental/physical damages?’ A single question asking directly about ‘disability’ or about impairments (e.g., mental retardation), or about a mix of impairments and functional difficulties as in the case of Ethiopia, tends to capture very extreme and permanent disabilities only and lead to very low prevalence rates (Mont 2007). Estimates using such questions are thus not comparable to those usually much higher found in HICs using several questions on functional difficulties (e.g., difficulty seeing) and activity limitations (e.g., selfcare difficulty).

Some global data initiatives have also provided estimates of prevalence for countries in LMICs. As part of the Global Burden of Disease (GBD) study (Murray and Lopez 1996), disability prevalence is inferred from data on health conditions and impairments alone using assumptions on distributions of limitations that may result from health conditions and impairments. According to the GBD study, disability prevalence in Ethiopia stands at 11.3% (WHO 2008).

Another global effort to estimate disability prevalence in LMICs (and globally) is in the World Report on Disability (WHO–World Bank 2011). It uses a score that aggregates answers to 15 questions in the World Health Survey (WHS) on difficulties experienced in eight domains (vision, mobility, cognition, selfcare, pain, interpersonal relationships, sleep and energy, affect) (WHO–World Bank 2011). According to the World Report on Disability, disability prevalence in Ethiopia stands at 17.6% among adults using a standardized population structure. Using also the WHS dataset, Mitra and Sambamoorthi (2014) measure disability as having at least one severe or extreme difficulty with bodily functions (seeing) and basic activities (concentrating, moving around, selfcare). For Ethiopia, Mitra and Sambamoorthi (2014) find a disability prevalence among adults of 14.2% using a standardized population structure, and 12.7% for its actual population structure.

This range of estimates for Ethiopia from 1 to 17.6% is potentially confusing and not helpful for policy and may curb policy and research initiatives with respect to disability. They illustrate that considerable uncertainty remains on disability prevalence, especially in LICs and in Africa in particular, where very few surveys have been conducted. To our knowledge, very few country estimates are available in Africa using the internationally comparable and tested Washington Group questions.
except for a few countries where estimates have become available in recent years (South Africa (Statistics South Africa 2014 and NDSD 2015); Zambia (Eide and Loeb 2006); Tanzania (NBS 2008); and Uganda (UBOS 2016). This chapter attempts to fill part of this gap for Ethiopia, Malawi, Tanzania, and Uganda using recent datasets with the Washington Group short set of questions.

4.2 Methodology

This chapter uses cross-sectional samples that are nationally representative for Malawi, Tanzania, and Uganda and representative of rural areas and small towns for Ethiopia. For Malawi and Tanzania, in each case, the only wave with the Washington Group questions is used: for Malawi, the 2010/2011 Third Integrated Household Survey and for Tanzania, the 2010/2011 National Panel Survey, respectively. For Ethiopia and Uganda, I use the initial wave of the panel dataset in which the Washington Group questions are used: the 2011/2012 wave of the Ethiopia Rural Socioeconomic Survey and the 2009/2010 wave of the Uganda National Panel Survey.

The questions on functional difficulties are as explained earlier in Chapter 3. Basic proportions are used to calculate prevalence in each country, and adjustments are made for complex sampling (clustering, strata, and weights). Although one of the objectives of this book is to make cross-country comparisons of prevalence rates, the estimates are not age and sex standardized. As seen in Chapter 3, the population structures of the four countries are somewhat similar. The objective is to present prevalence estimates for the current population structure in each country and their implications for policy, and thus the age/sex standardization is not necessary.

4.3 Prevalence at the Individual Level

Table 4.1 presents results on prevalence overall among adults and by sex and age group. Prevalence is presented for the entire adult population defined as ages 15 and over and for four age groups, overall and by sex. The prevalence of moderate and severe functional difficulties (at least some difficulty in one domain) stands at 12.85% in Ethiopia, 10.78% in Malawi, 15.05% in Tanzania, and 15.36% in Uganda. Prevalence rates for severe difficulties (at least a lot of difficulty in one domain) are as
### Table 4.1  Prevalence of functional difficulties by sex and age group (%)

|                  | Ethiopia | Malawi | Tanzania | Uganda |
|------------------|----------|--------|----------|--------|
|                  | Severe   | Moderate & Severe | Severe   | Moderate & Severe | Severe   | Moderate & Severe | Severe   | Moderate & Severe |
| All aged 15+     | 3.46     | 12.85  | 1.39     | 10.78  | 3.88     | 15.05    | 3.76     | 15.36    |
| Women aged 15+   | 3.58     | 13.24  | 1.55     | 12.50  | 4.32     | 15.65    | 3.96     | 17.16    |
| Men aged 15+     | 3.34     | 12.44  | 1.22     | 8.98   | 3.36     | 14.33    | 3.54     | 13.45    |
| All aged 15-39   | 1.36     | 5.84   | 0.60     | 5.26   | 1.01     | 6.10     | 1.49     | 7.39     |
| Women aged 15–39 | 1.25     | 6.2    | 0.54     | 5.86   | 0.99     | 6.42     | 1.31     | 7.63     |
| Men aged 15-39   | 1.47     | 5.45   | 0.67     | 4.63   | 1.02     | 5.68     | 1.68     | 7.13     |
| All aged 40-49   | 3.02     | 16.0   | 0.92     | 11.60  | 3.20     | 16.55    | 2.60     | 18.55    |
| Women aged 40-49 | 3.77     | 15.58  | 1.21     | 15.31  | 3.85     | 17.57    | 2.57     | 21.90    |
| Men aged 40-49   | 2.3      | 16.4   | 0.66     | 8.15   | 2.46     | 15.36    | 2.64     | 15.16    |
| All aged 50-64   | 6.82     | 28.89  | 2.59     | 22.58  | 5.61     | 26.76    | 8.73     | 36.20    |
| Women aged 50-64 | 9.11     | 33.71  | 3.29     | 26.54  | 5.81     | 27.67    | 8.03     | 39.89    |
| Men aged 50-64   | 4.41     | 23.85  | 1.85     | 18.37  | 5.39     | 25.82    | 9.60     | 31.60    |
| All aged 65+     | 19.44    | 48.68  | 8.75     | 46.93  | 20.69    | 55.09    | 23.24    | 62.70    |
| Women aged 65+   | 20.81    | 53.26  | 8.94     | 50.21  | 24.14    | 55.09    | 27.24    | 67.59    |
| Men aged 65+     | 18.53    | 45.61  | 7.40     | 42.88  | 16.36    | 48.75    | 18.36    | 56.71    |

**Sources**: Author’s calculations using Ethiopia Rural Socioeconomic Survey (2011/12), Malawi Integrated Household Survey (2010/11), Tanzania National Panel Survey (2010/11), Uganda National Panel Survey (2009/10)

**Notes**: Each number is the share of the population in a given age group who reports experiencing a certain level of difficulty for one of the six domains of the Washington Group short set of questions. A severe difficulty includes reporting "a lot of difficulty" or "being unable to do" for at least one domain. Moderate and Severe difficulty includes reporting at least "some difficulty" in at least one domain. Estimates are weighted.
follows: 3.46% in Ethiopia, 1.39% in Malawi, 3.88% in Tanzania, and 3.76% in Uganda. While Malawi seems to be somewhat of an outlier with lower prevalence rates, the other countries have rates that are relatively close to each other.

Overall, these prevalence estimates are consistent with the results of recent studies using the Washington Group questions in LMICs: for severe difficulties, 9.6% in Maldives (age 5+) (Loeb 2016), 8.5% in Zambia (all ages) (Eide and Loeb 2006), and 3.3% in South Africa (5 years and older) (Statistics South Africa 2015). For moderate and severe difficulties, 13.6% in Uganda (all ages) (UBOS 2016) and 9.1% in Bangladesh (as reported in Loeb 2016). In the 2008 Tanzania Disability Survey with a threshold of at least one severe difficulty or two moderate difficulties, prevalence stands at 7.8% (NBS 2008) for persons age seven and older, which is in between the prevalence rates found in this study for severe disability (3.88%) and severe/moderate difficulties (15.05%). The prevalence of severe difficulties found in this study for four LICs are lower than those found in two HICs that have used the Washington Group questions: Israel (14.8% for persons 20 years or older) and in the USA (9.5% for persons 18 years or older) (Loeb 2016).

4.3.1 Age

As expected, the prevalence of difficulties, whatever the severity, is higher for older age groups. For instance, in Ethiopia, 1.36% of adults age 15–39 have severe difficulties compared to 19.44% among people age 65 and older. This is further illustrated in Fig. 4.1 where the mean functional difficulty score is plotted by age for each country. In all four countries, functional difficulties tend to increase with age among adults, especially from mid to late 40s. This result is consistent with much evidence worldwide that functional difficulties become more common with age (WHO–World Bank 2011; Mitra and Sambamoorthi 2014). There is also country evidence showing that prevalence increases with age in the four countries under study for functional difficulties (Wandera et al. (2014) and for other disability measures (CSA 2007; Payne et al. 2013). This finding contributes to fill the considerable gap on the functional status of older adults in LICs (Chatterji et al. 2015).
4.3.2  **Sex**

In Table 4.1, prevalence for all adults is higher among women than men in the four countries. The gender gap in prevalence is the largest in Malawi where the prevalence of moderate/severe difficulties is 3.5 percentage points higher among women (12.5 for women vs. 8.98 for men). The gender gap is not consistently found in all age groups for all countries. In fact, it is among adults age 50 and older that there is a gender gap in all countries. It is as large as 10 percentage points for moderate/severe difficulties in Ethiopia (aged 50–64) and Uganda (aged 65+). Based on the results for all four countries, women overall, but especially in older age groups are found to have higher prevalence than men. This result is consistent with findings on gender differences in disability from recent international studies among adults (e.g. Mitra and Sambamoorthi 2014; OECD 2003; WHO–World Bank 2011) and among older adults in high-income countries (Crimmings et al. 2011), while results of country level surveys and censuses are more mixed. For instance, for Uganda, the 2014 Census has a higher prevalence for women compared to men (14.5% vs 10%, respectively), while for Tanzania, the 2008 Disability Survey found a rate of 7.8% for both men and women (NBS 2008).

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**Fig. 4.1**  Mean functional score by age. *Note* The upper limit of age is at 75 due to small sample sizes beyond that age.

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**Ethiopia**

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**Malawi**

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**Tanzania**

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**Uganda**

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More research is needed on the extent of a gender gap in prevalence, on gender differences in the determinants as well as the consequences of functional difficulties. Several gender-related factors may be at play in the higher prevalence among women including maternal care, access to healthcare, domestic violence, HIV/AIDS, and intra-household distribution of resources.

### 4.3.3 Type of Functional Difficulty

Figure 4.2 provides the distribution of difficulties by type of functional difficulty among persons with severe difficulties. Seeing and walking difficulties are the most common types of difficulties among persons with severe difficulties in all four countries. Hearing and cognitive difficulties are the third or fourth most common types of difficulties in the four countries. Communication difficulties are the least prevalent difficulties. A similar breakdown can be found within persons with moderate difficulties in Appendix A1 and persons with moderate and severe difficulties in Appendix A2. Comparing Fig. 4.2 and Appendix A1, seeing difficulties are more common among persons with moderate difficulties than severe difficulties.

![Fig. 4.2](image-url)  Types of functional difficulties among persons with severe difficulties
These results above on difficulty types are consistent with results from several other studies in the four countries, although such studies do not all use the Washington Group short set of questions (e.g., Groce et al. 2014; Loeb and Eide 2004; NBS 2008; Wandera et al. 2014).

### 4.3.4 Age at Onset

In Tanzania and Uganda, respondents were asked about their age at the onset of the difficulty. Age at onset is important as it could be a determinant of wellbeing. An onset during childhood may impact education due to barriers to schools, which would affect school outcomes and in turn economic wellbeing later in life. An age of onset in the 50s would not impact individual educational outcomes but could still affect economic wellbeing, for instance, if the person does not retain her job. Figure 4.3 shows the distribution of age at onset in three age groups: birth to age 14, age 15–49, and age 50 and over. In both countries, about half of onsets took place at age 50 or over. Only 16% and 25% of persons with severe difficulties had an onset during childhood in Tanzania and Uganda, respectively. Information on age at onset is rarely available in surveys so far, so there is little to compare these results to. For Tanzania, this is overall consistent with results from the 2008 Disability Survey (NBS 2008) showing that functional difficulties arise at various ages.

![Diagram](image_url)

**Fig. 4.3** Age of onset among persons with severe difficulties
4.3.5 Mother’s Educational Attainment

Table 4.2 shows that the prevalence of functional difficulties and the functional score are significantly higher for persons whose mother had no schooling. For instance, in Ethiopia, 3.38% of persons whose mother had no schooling have a severe functional difficulty compared to only 0.89% for other individuals. This result has been found in at least one other study (Mont et al. 2014).

### Table 4.2 Prevalence of functional difficulties by mother’s educational attainment

|                          | Ethiopia | Malawi | Tanzania |
|--------------------------|----------|--------|----------|
| **Prevalence of severe difficulty** |          |        |          |
| Mother had no schooling  | 3.38%*** | 1.61%*** | 5.56%**  |
| Mother had some schooling| 0.89%    | 0.74%  | 1.39%    |
| **Prevalence of moderate and severe difficulty** |          |        |          |
| Mother had no schooling  | 12.03%***| 12.44%***| 20.77%** |
| Mother had some schooling| 3.90%    | 9.60%  | 8.73%    |
| **Functional limitation score** |          |        |          |
| Mother had no schooling  | 0.01***  | 0.01*** | 0.03**   |
|                         | (0.00)   | (0.00) | (0.00)   |
| Mother had some schooling| 0.00     | 0.01   | 0.03     |
|                         | (0.00)   | (0.00) | (0.00)   |

*Sources* Author’s calculations based on data described in the text and in Table 4.1 except for Ethiopia based on Ethiopia Rural Socioeconomic Survey 2013/2014. *Notes* For Uganda (both waves) and Ethiopia (wave 1), data on mother’s education was largely missing. No result can be presented for Uganda. Estimates are weighted. ***indicates significance at 1% level of the difference compared to persons whose mother had some schooling. Statistical significance is tested with Pearson’s Chi square test for prevalence and t-test for the functional score. For Tanzania, the category with ‘no school’ in fact refers to individuals with mothers with less than primary education. Standard errors are in parentheses.

4.3.6 Healthcare or Rehabilitation Measures Taken

In Malawi, Tanzania, and Uganda, persons who reported at least one functional difficulty were asked if they took any measure to improve performance such as using assistive devices (e.g., glasses, braces, hearing aid), medication, surgical operation, spiritual/traditional means. Figure 4.4 shows the answers of respondents with at least one severe difficulty. More than 50% of people with severe difficulties do not take any measure to curb their difficulties. While more than a quarter of
individuals have used medication, a very small share has used assistive devices (e.g., glasses, wheelchairs). This could be due to a variety of reasons including the lack of availability of assistive devices or services, or their lack of affordability.

More broadly, results in Fig. 4.4 suggest that rehabilitation needs are large in Africa and are rarely fulfilled in a healthcare setting (Mulumba et al. 2014). No significant gender difference is found in the extent to which individuals took any measure to curb functional difficulties, which is different from results in May-Teerink (1999) for Uganda.

This result is consistent with earlier research in Africa and in low-income settings in general. The potential to prevent functional difficulties
such as seeing and hearing has been noted globally, in LMICs and in Africa in particular. This result points toward the need for secondary prevention in the form of assistive technology, rehabilitation services in low-income settings that can help curb functional difficulties. The prevention of functional difficulties through assistive technology, rehabilitation or healthcare needs to receive more attention and resources in human development whether from individual countries or international stakeholders.

The results above are also consistent with a small literature on disparities in access to care across disability status in LMICs. WHO–World Bank (2011) shows that persons with disabilities face barriers in accessing care. World Bank (2009) and Trani et al. (2011) show that individuals with disabilities have a reduced access to healthcare in India and urban Sierra Leone, respectively.

### 4.3.7 Transitions Over Time

Disability is often characterized or assumed to be a static phenomenon but do functional difficulties change over time? This could have implications for the identification of the group of persons with disabilities and for policies aimed at improving wellbeing for this group. Table 4.3 gives additional prevalence estimates for Ethiopia and Uganda, where

|                | Ethiopia | Uganda |
|----------------|----------|--------|
|                | Severe   | Moderate & severe | Severe | Moderate & severe |
| Any wave       | 5.54     | 21.16   | 6.07   | 19.53          |
| Wave 1         | 3.39     | 13.34   | 4.15   | 12.84          |
| Wave 2         | 3.17     | 11.50   | 3.74   | 11.2           |
| Both waves     | 1.17     | 5.58    | 1.82   | 4.51           |
| Wave 2 only    | 2.07     | 6.82    | 1.92   | 6.69           |
| (increase in difficulty) |         |         |        |                |
| Wave 1 only    | 2.30     | 8.76    | 2.34   | 8.32           |
| (reduction in difficulty) |       |         |        |                |

*Source* Author’s calculations using a balanced panel from Ethiopia Rural Socioeconomic Survey (2011/2012, 2013/2014) and Uganda NPS (2009/2010, 2010/2011). *Notes* The sample sizes are 7913 for Ethiopia and 5990 for Uganda respectively. These are longitudinal samples. Other notes from Table 4.1 apply. Estimates are weighted
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Functional difficulty questions were asked in two waves. Prevalence estimates are close in both waves: for instance, for severe functional difficulties in Uganda, they stand at 4.15 for wave 1 (2009/2010) and 3.74 in wave 2 (2010). However, these prevalence rates for both waves capture in part different people. Indeed, only 1.82% of individuals report a severe difficulty in both waves in Uganda. There is thus some transitioning in and out of severe difficulties. These transitions may be due to actual changes in the severity of functional difficulties over time or to changes in reporting behavior. Perhaps some individuals may get used to experiencing functional difficulties, especially in the context of aging, and may stop reporting them. Changes between waves could also reflect some measurement error, as noted by Altman (2001).

This churning is consistent with transitions in disability status found in the literature in the context of HICs (Burchardt 2000; Burchardt 2003; Burkhauser and Daly 1996; Drum 2014; Gannon and Nolan 2007; Jenkins and Rigg 2003) and in relation to aging (Grundy and Glaser 2000; Maddox et al. 1994). This literature has shown that transitions into or out of disability status are not rare. A small but growing literature on disability transitions can also be found in middle-income countries such as China (e.g., Liang et al. 2001) and Mexico (Diaz-Venegas et al. 2016a, b). In Malawi, Payne et al. (2013) find a relatively high number of transitions between disability states (none, moderate, severe) using an SF12 measure of functional status.10

4.3.8 Descriptive Statistics

Table 4.4 shows descriptive characteristics for individuals across functional status. First, it shows the share of respondents who answered for themselves instead of via a proxy. In Ethiopia, all individuals responded for themselves while in other countries, the share varies between about half to 90%. In Malawi, Tanzania, and Uganda, persons with functional difficulties are more likely to have responded to questions themselves perhaps suggesting different reporting behavior for functional difficulties between self reports and proxy reports.

Table 4.4 indicates that moderate and severe functional difficulties are associated with a somewhat different profile. In terms of personal factors, persons with functional difficulties are significantly older and more often female. With respect to resources, persons with functional difficulties are more likely to have a mother with no schooling in Ethiopia and Malawi.
### Table 4.4  Descriptive Statistics of sample of individuals

|                  | Ethiopia | Malawi | Tanzania | Uganda |
|------------------|----------|--------|----------|--------|
|                  | Severe   | Moderate | None    | Severe | Moderate | None    | Severe | Moderate | None    |
| **Self respondent** |          |         |          |        |          |         |        |          |         |
|                   | 1.00     | 1.00    | 1.00     | 0.60   | 0.69     | 0.47    | 0.78***| 0.91***  | 0.84    |
| **Personal factors:** |          |         |          |        |          |         |        |          |         |
| Age 15-39         | 0.27***  | 0.32*** | 0.73     | 0.31***| 0.35***  | 0.75    | 0.16***| 0.27***  | 0.67    |
| Age 40-49         | 0.12***  | 0.20*** | 0.14     | 0.08***| 0.14***  | 0.12    | 0.13***| 0.20***  | 0.16    |
| Age 50-64         | 0.22***  | 0.27*** | 0.09     | 0.19***| 0.22***  | 0.09    | 0.20***| 0.26***  | 0.12    |
| Age 65+           | 0.39***  | 0.21*** | 0.04     | 0.42***| 0.29***  | 0.04    | 0.51***| 0.28***  | 0.05    |
| Male              | 0.48     | 0.48*   | 0.50     | 0.43*  | 0.40***  | 0.50    | 0.39** | 0.45*    | 0.46    |
| **Resources:**    |          |         |          |        |          |         |        |          |         |
| Mother no schooling |         |         |          | 0.98** | 0.99***  | 0.93    | 0.97***| 0.94***  | 0.94    |
| **Structural factors:** |        |         |          |        |          |         |        |          |         |
| Household:        |          |         |          |        |          |         |        |          |         |
| Married           | 0.58***  | 0.71*** | 0.63     | 0.50** | 0.61     | 0.62    | 0.36***| 0.53**   | 0.47    |
| Head              | 0.60***  | 0.53*** | 0.35     | 0.56** | 0.57**   | 0.40    | 0.53***| 0.59***  | 0.40    |
| hh size           | 4.25***  | 5.42*** | 5.88     | 3.43** | 3.37***  | 3.87    | 3.45   | 3.39***  | 3.53    |
|                  | (0.16)   | (0.11)  | (0.34)   | (0.13) | (0.05)   | (0.02)  | (0.12) | (0.06)   | (0.03)  |
|                  |          |         |          |        |          |         |        |          |         |
|                  |          |         |          |        |          |         |        |          |         |
|                  |          |         |          |        |          |         |        |          |         |
|                  |          |         |          |        |          |         |        |          |         |
|                  |          |         |          |        |          |         |        |          |         |
|                  |          |         |          |        |          |         |        |          |         |
|                  |          |         |          |        |          |         |        |          |         |

(continued)
Table 4.4  (continued)

| Community: | Ethiopia | Malawi | Tanzania | Uganda |
|------------|----------|--------|----------|--------|
|            | Severe   | Moderate | None | Severe | Moderate | None | Severe | Moderate | None | Severe | Moderate | None |
| Distance to healthcare services | 15.85 (1.12) | 14.74 (0.60) | 15.34 (0.23) | 29.21 (13.58) | 23.73 (4.63) | 22.33 (13.58) | 6.11 (0.79) | 5.10 (0.33) | 5.79 (0.79) | 30.14*** (2.97) | 26.12 (1.30) | 24.85 (0.58) |
| Rural     | NA       | NA     | NA      | 0.93*** | 0.87*** | 0.83 | 0.78*** | 0.71 | 0.69 | 0.87*** | 0.83*** | 0.76 |
| N         | 345      | 897    | 8,323   | 406     | 2,698    | 26,056 | 349 | 1,028 | 8,275 | 330 | 936 | 5,318 |

Notes: Notes of Table 4.1 apply. hh stands for household. Table includes sample means and standard errors (between brackets). ***, **, * indicate significance at 1%, 5% and 10% levels respectively of the difference compared to persons with no difficulty. Statistical significance is tested with t-test for continuous variable, Pearson’s Chi square test for binary variables and the Wilcoxon-Mann-Whitney test for ordinal variables (age group). Distance to healthcare services refers to the distance to the nearest facility in kilometers (health clinic or post or hospital).
1. For Tanzania, this shows the share of individuals with mothers with less than primary education.
and with less than primary schooling in Tanzania.\textsuperscript{11} Regarding structural factors, persons with functional difficulties tend to live in smaller households are more often household heads and less often married. No consistent difference is found with respect to healthcare services. Persons with severe functional difficulties on average live further away from a health clinic but the difference is statistically significant only in Uganda.

### 4.4 Prevalence at the Household Level

Prevalence estimates at the household level are shown in Table 4.5. When the focus is on severe difficulties, prevalence estimates stand at 8.06% in rural Ethiopia, 3.35% in Malawi, 8.85% in Tanzania, and 10.01% in Uganda. Like at the individual level, Malawi is an outlier with

|                  | Ethiopia | Malawi | Tanzania | Uganda |
|------------------|----------|--------|----------|--------|
| **Severe difficulty** |          |        |          |        |
| Overall          |          |        |          |        |
| – current wave   | NA       | 3.35   | 8.85     | 10.01  |
| – current or later wave | NA | NA | NA | 14.41 |
| Rural            |          |        |          |        |
| – current wave   | 8.06     | 3.68   | 5.64     | 11.05  |
| – current or later wave | 12.60 | NA | NA | 15.28 |
| Urban            |          |        |          |        |
| – current wave   | NA       | 1.5    | 10.74    | 5.72   |
| – current or later wave | NA | NA | NA | 10.85 |
| **Moderate and severe difficulty** |          |        |          |        |
| Overall          |          |        |          |        |
| – current wave   | NA       | 21.96  | 29.80    | 37.18  |
| – current or later wave | NA | NA | NA | 44.76 |
| Rural            |          |        |          |        |
| – current wave   | 26.42    | 22.64  | 25.60    | 36.87  |
| – current or later wave | 38.51 | NA | NA | 47.42 |
| Urban            |          |        |          |        |
| – current wave   | NA       | 18.07  | 32.35    | 24.38  |
| – current or later wave | NA | NA | NA | 33.83 |

**Notes** NA indicates not available. For each country the current wave refers to the one listed in Table 4.1. For Ethiopia, the later wave is Ethiopia Rural Socioeconomic Survey (2013/2014). For Uganda, the later wave is Uganda National Panel Survey (2010/2011). For Ethiopia, the current wave covers rural areas only, while the later wave also covers small towns. Hence, estimates for urban areas are not available for Ethiopia. Estimates are weighted.
a lower household prevalence estimate compared to the other three countries where one in 10–12 households has at least one severe functional difficulty. Functional difficulties of any degree affect between one in five households in Malawi (21.80%) to more than one in three households in Uganda (34.4%). Functional difficulties of any degree thus seem relatively common among households. There is no consistent pattern across rural and urban areas. Prevalence is higher in rural areas in Malawi and Uganda but the opposite is true in Tanzania.

For Ethiopia and Uganda, where longitudinal data on functional difficulties is available, Table 4.5 also presents prevalence estimates for functional difficulties in any wave, leading as expected to higher rates: for instance, 12.60% and 14.41% of households have an adult with a severe difficulty in at least one wave in rural Ethiopia and in Uganda, respectively, with thus an increase in the prevalence rates of 4 percentage points.

Table 4.6 provides prevalence rates by household economic status. The Malawi, Tanzania, and Uganda datasets have information on

|                         | Malawi | Tanzania | Uganda |
|-------------------------|--------|----------|--------|
| **Severe difficulty**   |        |          |        |
| Below $1.90 poverty line|        |          |        |
| – current wave          | 4.06***| 15.80*** | 12.03**|
| – current wave or later wave| NA | NA | 15.98 |
| At or above $1.90 poverty line|    |    |          |
| – current wave          | 2.58   | 8.64     | 8.1    |
| – current wave or later wave| NA | NA | 12.94 |
| **Moderate and severe difficulty** |        |          |        |
| Below $1.90 poverty line|        |          |        |
| – current wave          | 22.26  | 36.59*** | 36.3   |
| – current wave or later wave| NA | NA | 46.67 |
| At or above $1.90 poverty line|    |    |          |
| – current wave          | 21.54  | 30.9     | 32.65  |
| – current wave or later wave| NA | NA | 42.96 |

*Notes* No result is available for Ethiopia due to a lack of data on consumption expenditures. For each country the current wave refers to the one listed in Table 1 (Notes). For Uganda, the later wave is Uganda National Panel Survey (2010/2011). Estimates are weighted. Per capita expenditures is total household expenditures divided by adult equivalent. ***,** indicate significance at 1% and 5% levels respectively of the difference in prevalence between households below the $1.90 poverty line compared to households at or above the $1.90 poverty line. Statistical significance is tested with Pearson’s Chi square test.
household consumption expenditures, which makes it possible to calculate the poverty headcount using the international poverty line of $1.90. Severe functional difficulties are more common for households below the poverty line. For instance, in Uganda, 12.03% of households below the $1.90 poverty line have an adult with a severe functional difficulty, compared to 8.1% for households beyond the poverty line. The share of households in poverty with an adult with a severe difficulty goes up to almost 15.98% in Uganda if one includes reports of functional difficulties in the current or following wave.

By quintile, whether by asset index or per capita consumption expenditure, there is not always a linear gradient of prevalence rates, but prevalence is consistently higher in the bottom quintile compared to the top one. This is shown in Fig. 4.5 where the mean household functional score of each quintile of asset index is plotted for each quintile in each country.

Comparing the poorest and richest quintiles, there is a consistent contrast between the poorest and the richest quintiles in Fig. 4.5.

This is consistent with results in Fig. 4.6, which shows the prevalence of severe functional difficulties in the poorest and richest quintiles. The difference is striking in the four countries with a prevalence two to four
Fig. 4.6 Prevalence of severe functional difficulties for the poorest and richest quintiles (%)

times higher in the bottom quintile compared to the top quintile. For instance, in Tanzania, 14% of households in the bottom asset index quintile have a severe functional limitation, compared to 5% in the top quintile. As noted by Grech (2015), there is a common guess-estimate that one in five of the poorest people have a disability. Defining the poorest
as those in the bottom quintile, prevalence estimates in Fig. 4.6 are below this guess-estimate for severe functional difficulties but above in Appendix A3 for moderate or severe difficulties. For Tanzania, for example, one in seven of the poorest have a severe functional difficulty and one in three have a severe or moderate difficulty. Other countries’ estimates are close to the Tanzania estimates (Fig. 4.6 and Appendix A3).\footnote{12}

This result is consistent with results from Hosseinpoor et al. (2013) using an asset quintile, a disability measure similar to that in WHO–World Bank (2011) and 2002–2004 World Health Survey data for 49 countries, including Ethiopia and Malawi.

Table 4.7 gives descriptive statistics of households across functional status. It shows that households with functional difficulties have different characteristics in terms of structural factors. Households with functional difficulties have heads who tend to be older and less often female or married. They are significantly smaller households and tend to have more older or female members. They are also more likely to be in rural areas. For these characteristics, significant differences are found between households with severe or moderate functional difficulties, on the one hand, and households with no difficulty, on the other. However, the differences are larger for households with severe vs. moderate functional difficulties.

\subsection*{4.5 Conclusion: Summary and Implications}

This chapter has several noteworthy results on disability prevalence for Ethiopia, Malawi, Tanzania, and Uganda.

1. The prevalence of moderate and severe functional difficulties among adults ranges from 10.8 to 15.1%, while the prevalence of severe difficulties alone spans 1.4–3.9%.
2. In the four countries, prevalence of functional difficulties at the household level ranges from one in five to one in three households.

Overall, this chapter shows that functional difficulties affect sizeable shares of individuals and households in Ethiopia, Malawi, Tanzania, and Uganda and thus require policy and research attention.

3. Persons with functional difficulties are a diverse group in terms of demographics (age, sex) but also with respect to age at onset, type of functional difficulty, and severity.
Table 4.7  Household descriptive statistics

|                      | Ethiopia | Malawi  | Tanzania | Uganda  |
|----------------------|----------|---------|----------|---------|
|                      | Severe   | Moderate| None     | Severe  | Moderate| None     | Severe  | Moderate| None     | Severe  | Moderate| None     |
| Structural factors:  |          |         |          |         |         |          |         |         |          |         |         |          |
| Household:           |          |         |          |         |         |          |         |         |          |         |         |          |
| Age of head          | 57.39*** | 51.48***| 43.37    | 58.06***| 52.89***| 39.39    | 60.11***| 53.32***| 42.32    | 60.67***| 51.01***| 40.13    |
| (1.48)               | (0.76)   | (0.36)  | (1.31)   | (0.48)  | (0.19)  | (1.27)   | (0.79)  | (0.44)  | (1.13)   | (0.77)  | (0.78)  |
| Head is married      | 0.68***  | 0.77*** | 0.83     | 0.58*** | 0.64*** | 0.75     | 0.45     | 0.54*** | 0.49     | 0.54*** | 0.63*** | 0.78     |
| Head is male         | 0.71***  | 0.77*** | 0.82     | 0.63*** | 0.68*** | 0.78     | 0.51**   | 0.72*** | 0.76     | 0.62     | 0.63     | 0.77     |
| Head has no formal   | 0.24***  | 0.34*** | 0.44     | 0.44*** | 0.27*** | 0.22     | 0.41***  | 0.28**  | 0.20     | 0.75***  | 0.62***  | 0.73     |
| education            |          |         |          |         |         |          |         |         |          |         |         |          |
| hh size              | 4.34***  | 5.38    | 5.24     | 4.31    | 4.25**  | 4.47     | 3.37***  | 3.22*** | 2.74     | 7.00***  | 6.42***  | 5.78     |
| (0.18)               | (0.12)   | (0.05)  | (0.16)   | (0.06)  | (0.03)  | (0.15)   | (0.08)  | (0.05)  | (0.51)   | (0.19)  | (0.09)  |
| Share of hh members  | 0.30***  | 0.40*** | 0.44     | 0.27*** | 0.32*** | 0.40     | 0.23**   | 0.25*** | 0.30     | 0.35***  | 0.37***  | 0.43     |
| under age 15         | (0.02)   | (0.01)  | (0.01)   | (0.02)  | (0.01)  | (0.02)   | (0.01)  | (0.01)  | (0.01)   | (0.01)  | (0.01)  |
| Share of hh members  | 0.24***  | 0.13*** | 0.07     | 0.28*** | 0.22*** | 0.06     | 0.29***  | 0.18*** | 0.06     | 0.25***  | 0.15***  | 0.06     |
| over age 60          | (0.02)   | (0.01)  | (0.00)   | (0.02)  | (0.10)  | (0.00)   | (0.03)  | (0.02)  | (0.01)   | (0.02)  | (0.01)  | (0.00)   |

(continued)
Table 4.7 (continued)

|                | Ethiopia | Malawi | Tanzania | Uganda |
|----------------|----------|--------|----------|--------|
|                | Severe   | Moderate | None    | Severe | Moderate | None    | Severe | Moderate | None    | Severe | Moderate | None    |
| Share of male hh members | 0.47***  | 0.49*** | 0.50    | 0.43*** | 0.45*** | 0.50    | 0.45*** | 0.51     | 0.48*** | 0.50*** | 0.48*   | 0.50    |
|                | (0.02)   | (0.01)  | (0.01)  | (0.02) | (0.01)  | (0.00)  | (0.02) | (0.01)  | (0.01)  | (0.02)  | (0.01)  | (0.01)  |
| Community:     |          |         |         |        |          |         |        |          |         |          |         |        |
| Distance to healthcare services | 15.64    | 15.40   | 15.86   | 20.71  | 26.95    | 21.30   | 6.08   | 4.54     | 5.54    | 29.90    | 27.95   | 25.48   |
|                | (1.16)   | (0.73)  | (0.44)  | (10.64)| (5.97)   | (2.53)  | (0.66) | (0.35)   | (0.32)  | (3.52)   | (1.73)  | (1.17)  |
| Rural area    | 0.99     | 0.99    | 1.00    | 0.94   | 0.87***  | 0.84    | 0.77***| 0.68***  | 0.65    | 0.882**  | 0.85*** | 0.77    |

Notes: Table includes sample means and standard errors (between brackets). hh stands for household. ***, **, * indicate significance at 1%, 5% and 10% levels respectively of the difference compared to persons with no difficulty. Statistical significance is tested with t-test for continuous variable and Pearson’s Chi square test for binary variables. Distance to healthcare services refers to the distance to the nearest facility in kilometers (health clinic or post or hospital).
4. There are also some patterns. They tend to affect older individuals more, as well as women more often than men. Seeing and walking limitations are the most prevalent limitations in the four countries. A majority of individuals do not take any measure to reduce their functional difficulties, suggesting there may be scope for prevention.

5. There is a strong socioeconomic gradient in prevalence. In fact, comparing the poorest and richest quintiles based on an asset index, prevalence is two to four times higher in the poorest quintile.

More research on gender is needed given the higher prevalence found among women in this study and in other studies. Functional difficulties are significantly associated with aging in the four countries. More research is also needed on older adults in less-resourced settings, for whom, little is known on health and wellbeing. These results overall suggest that functional status needs to be considered and included as part of aging, gender, public health, and broadly as part of human development policy and research.

The estimates in this book are of course not the final word on disability prevalence in Ethiopia, Malawi, Tanzania, and Uganda. They likely offer a lower bound estimate of prevalence given that only six functional difficulties are measured. More data collection efforts are needed to inform policy further. For instance, data using the extended set of questions of the Washington Group would offer information on mental health related functional difficulties (e.g., Loeb 2016). Surveys that can collect detailed information on the environment would provide information to help understand the determinants of functional difficulties. Because functional difficulties affect sizeable shares of individuals and households in the four countries under study, a study of the association and causal links between such difficulties and wellbeing inequalities is thus warranted and is conducted in the rest of this book.

Notes

1. Each answer is on a scale of 1–5: (1) no difficulty; (2) mild difficulty; (3) moderate difficulty; (4) severe difficulty; (5) extreme difficulty/unable to do. The disability score aggregates all answers, including mild and moderate and ranges from zero to 100. An Item Response Theory approach using a Rasch model was applied to construct the disability score. It is
compared to a threshold so as to identify who experiences a significant disability. This threshold was set at 40, which is the average of the disability scores of people who report at least one extreme limitation on any of the items and/or a chronic health condition (e.g., asthma, arthritis, diabetes, depression) explaining that ‘such chronic diseases are associated with disability, it is justifiable to use them as indicator conditions for estimating the average levels of functioning across all the chronic conditions that were assessed in the WHS, in order to set a meaningful threshold.’ (WHO–World Bank 2011).

2. Disability prevalence estimates that are not standardized are available in the working paper version of Mitra and Sambamoorthi (2014) available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2329676.

3. Ethiopia is not unique in the vast range of disability estimates it receives. Another example among the countries under study is Malawi: 3.8% using the 2008 Census (NSO 2010); 4.2% as per Loeb and Eide (2004); 14% in WHO–World Bank (2011).

4. It should be noted that prevalence estimates had very low standard errors producing very narrow confidence intervals, which are not presented.

5. The median is zero and is therefore not used.

6. A number of other studies in LMICs also find a higher prevalence among women compared to men (Mexico: Diaz-Venegas et al. 2016a; Bangladesh: Moniruzzaman et al. 2016).

7. Sex-disaggregated results are not reported here.

8. See for instance, Borg et al. (2011), Eide and Øderud (2009), May-Teerink (1999), Magnusson et al. (2013), Harniss et al. (2015), McPherson (2014), WHO (2011).

9. Global Burden of Disease collaborators Study 2016; Kulua et al. (2011), Muller et al. (2011), Lewallen and Courtright (2001).

10. SF12 is a twelve-item functional health measure. More information can be found in Burdine et al. (2000).

11. This information is not available in Uganda.

12. This result also holds using per capita expenditures, with for instance in Malawi 5.17% with severe functional limitations in the lowest quintile and 2.78% in the highest quintile (this result is not shown in Tables/graphs).

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