



*Citation for published version:*

Clausen, J & Barrantes, N 2020, 'Implementing a Group-Specific Multidimensional Poverty Measure: The Case of Persons with Disabilities in Peru', *Journal of Human Development and Capabilities*, pp. 1-34.  
<https://doi.org/10.1080/19452829.2020.1828316>

*DOI:*

[10.1080/19452829.2020.1828316](https://doi.org/10.1080/19452829.2020.1828316)

*Publication date:*

2020

*Document Version*

Peer reviewed version

[Link to publication](#)

This is an Accepted Manuscript of an article published by Taylor & Francis in *Journal of Human Development and Capabilities* on 06/10/2020, available online: <http://www.tandfonline.com/10.1080/19452829.2020.1828316>

**University of Bath**

**Alternative formats**

If you require this document in an alternative format, please contact:  
[openaccess@bath.ac.uk](mailto:openaccess@bath.ac.uk)

**General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

**Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



### Implementing a group-specific multidimensional poverty measure: the case of persons with disabilities in Peru

Journal:	<i>Journal of Human Development and Capabilities</i>
Manuscript ID	CJHD-2019-0047.R3
Manuscript Type:	Original Article
Keywords:	Capabilities, Disability, Multidimensional poverty, Group-specific measures, Peru
Abstract:	<p>We contribute to the literature on multidimensional poverty and people with disabilities by developing a group-specific, comprehensive, and policy-relevant measure of multidimensional poverty adapted to exploring deprivations within the group of persons with disabilities in Peru. Based on the Alkire and Foster (2011) method, we calculated multidimensional poverty estimates using data from the first Specialised National Survey on Disability in Peru collected in 2012. Our measure included eight dimensions, four of which were operationalised using disability-specific indicators, of which, in turn, three involved deprivation criteria specific to different categories of disability. Our results showed that 41.1% of the population with disabilities in Peru suffer deprivations in at least three out of the eight dimensions, whereas rural populations, women, indigenous peoples, persons with severe disabilities, and persons with communication disabilities face the highest levels of poverty. Additionally, we identified rural indigenous women as the poorest subgroup within the overall group of persons with disabilities in Peru with a poverty incidence of 88.1%. Our results suggested that eradicating multidimensional poverty among persons with disabilities in Peru will involve implementing reasonable accommodations to existing policies and creating new disability-specific policies focused on the poorest subgroups within this population.</p>

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



## Implementing a group-specific multidimensional poverty measure: the case of persons with disabilities in Peru

**Word Count:** 7963

We contribute to the literature on multidimensional poverty and people with disabilities by developing a group-specific, comprehensive, and policy-relevant measure of multidimensional poverty adapted to exploring deprivations within the group of persons with disabilities in Peru. Based on the Alkire and Foster (2011) method, we calculated multidimensional poverty estimates using data from the first Specialised National Survey on Disability in Peru collected in 2012. Our measure included eight dimensions, four of which were operationalised using disability-specific indicators, of which, in turn, three involved deprivation criteria specific to different categories of disability. Our results showed that 41.1% of the population with disabilities in Peru suffer deprivations in at least three out of the eight dimensions, whereas rural populations, women, indigenous peoples, persons with severe disabilities, and persons with communication disabilities face the highest levels of poverty. Additionally, we identified rural indigenous women as the poorest subgroup within the overall group of persons with disabilities in Peru with a poverty incidence of 88.1%. Our results suggested that eradicating multidimensional poverty among persons with disabilities in Peru will involve implementing reasonable accommodations to existing policies and creating new disability-specific policies focused on the poorest subgroups within this population.

**Keywords:** capabilities; disability; multidimensional poverty; group-specific measures; Peru

## Introduction

The Sustainable Development Goals (SDGs) have contributed to increasing the visibility of historically marginalised groups of the world population. Under the “leaving no one behind” framework, the SDG narrative advocates designing and implementing policies to improve the living conditions of women, rural populations, indigenous peoples, older persons, and persons with disabilities, among others (UNDP 2016).

The SDG agenda has also helped broaden how poverty is understood and measured. This new perspective has been inspired, in part, by the capability approach (Robeyns 2017) and recognises different “forms” of poverty that include several non-income multidimensional deprivations. This has been made explicit in SDG target 1.2: “reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions” (UN 2015, 17).

The emphasis on excluded groups and multidimensional poverty has prompted research on the living conditions of various disadvantaged populations from a multidimensional perspective. Such is the case of the literature on multidimensional poverty among persons with disabilities in low- and middle-income countries (LMICs), where these groups account for between 14% and 16.4% of the population (WHO-World Bank 2011).

Much of this literature has been influenced by the capability approach. Following Sen’s (1980) criticisms of utility as a relevant “space” for the evaluation of human advantage, studies have broadened the spectrum of domains factored into empirical poverty analysis with a focus on persons with disabilities. Thus, studies have included dimensions of poverty related to human functioning and capabilities instead of solely income information. Additionally, to measure multidimensional poverty among people with disabilities, most studies have applied the Alkire and Foster (2011) (AF) method, which itself was inspired by the capability approach (Alkire and Foster 2011). This approach has also inspired theoretical developments such as the

1  
2  
3 “Human Development Model of Disability, Health and Wellbeing”, which, in turn, has  
4 informed the empirical analysis of multidimensional poverty in a group of LMICs (Mitra  
5 2018).  
6  
7  
8  
9

10 This literature has found a positive association between having a disability and being  
11 multidimensionally poor (Mitra, Posarac, and Vick 2013; Trani and Canings 2013; Trani,  
12 Biggeri, and Mauro 2013; Trani et al. 2015; Trani et al. 2016; Igei 2017; Mitra 2018).  
13 Additionally, some studies have found a positive association between living in a household in  
14 which a member has a disability and experiencing multidimensional poverty (Pinilla-  
15 Roncancio and Alkire 2020; Pinilla-Roncancio 2018).  
16  
17  
18  
19  
20  
21  
22  
23

24 As a response to the high prevalence of poverty among persons with disabilities, some  
25 LMICs, such as Bangladesh, Brazil, India, and South Africa, now implement social policies  
26 targeted at these groups (WHO 2011). This is also the case of Peru, a “newcomer” to the group  
27 of middle-income countries, which in 2015 created a cash transfer programme targeted at  
28 persons with severe disabilities living in extreme income poverty (El Peruano 2015).  
29  
30  
31  
32  
33  
34

35 Most of the aforementioned studies utilise measures that enable comparisons of persons  
36 with and without disabilities. However, persons with disabilities might be exposed to certain  
37 group-specific deprivations that are not captured by general measures of multidimensional  
38 poverty. This study argues that the literature on poverty and disability can be complemented  
39 by other analyses that, instead of comparing deprivations between persons with and without  
40 disabilities, focus specifically on multidimensional poverty within the group of persons with  
41 disabilities by using certain disability-specific indicators and deprivation criteria specific to  
42 different categories of disabilities.  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53

54 This study aimed to develop a group-specific, comprehensive, and policy-relevant  
55 measure of multidimensional poverty adapted to exploring deprivations within the group of  
56 persons with disabilities in Peru. Based on the AF method, we calculated multidimensional  
57  
58  
59  
60

1  
2  
3 poverty estimates using data from Peru's first Specialised National Survey on Disability  
4 (Encuesta Especializada sobre Discapacidad, ENEDIS), conducted by the Peruvian National  
5  
6 Institute of Statistics (Instituto Nacional de Estadística e Informática, INEI) in 2012. To the  
7  
8 best of our knowledge, this is the first study to propose a disability-specific multidimensional  
9  
10 poverty measure for an LMIC.  
11  
12  
13

14  
15 There are at least three reasons to justify this empirical exercise. First, not having to  
16  
17 maintain comparability between persons with and without disabilities allows us to better reflect  
18  
19 a broader set of deprivations, including disability-specific indicators relevant to the group of  
20  
21 persons with disabilities. This approach is similar to that of the multidimensional child poverty  
22  
23 literature, which proposes group-specific measures of deprivation tailored to reflect  
24  
25 disadvantages at this lifestage (De Neubourg et al. 2012; OPHI 2019). Second, making poverty  
26  
27 comparisons within the group of persons with disabilities can elucidate patterns of  
28  
29 intersectional disadvantage that affect subgroups of this population, such as women, rural  
30  
31 populations, indigenous peoples, persons with different levels of disability severity, and  
32  
33 persons in specific categories of disability. Third, identifying the poorest subgroups within this  
34  
35 population is policy-relevant since most LMIC governments implement social policies targeted  
36  
37 at the poorest individuals within groups that are particularly exposed to vulnerability.  
38  
39  
40  
41

42  
43 We contribute to the literature on multidimensional poverty and persons with  
44  
45 disabilities in three ways: (i) proposing a group-specific measure of multidimensional poverty  
46  
47 that includes a broader set of dimensions particularly relevant for persons living with different  
48  
49 disabilities; (ii) including, where applicable, indicators and deprivation criteria specific to  
50  
51 different disability categories; and (iii) exploring patterns of intersectional disadvantage to  
52  
53 identify the poorest subgroups within the group of persons with disabilities.  
54  
55  
56  
57  
58  
59  
60

## **Background literature on persons with disabilities and multidimensional poverty in LMICs**

While there is extensive literature on poverty based on income or expenditures and persons with disabilities, research on multidimensional poverty among the population with disabilities in LMICs remains relatively scarce (Banks, Kuper, and Polack 2017). Most such studies have the following aspects in common: (i) a focus on multidimensional poverty comparisons between persons with and without disabilities; (ii) exploration of the association between having a disability and being multidimensionally poor; (iii) recognition of the importance of broadening the relevant dimensions included in the analysis of multidimensional poverty among persons with disabilities; and (iv) estimation of multidimensional poverty using the AF method.

Some of these studies explore multidimensional poverty using large internationally comparable datasets, such as the Demographic and Health Surveys, World Health Survey, or a subgroup of the Living Standards Measurement Study panel datasets. These studies have consistently found a positive association between being a person with disabilities or living in a household in which a member has a disability, and being multidimensionally poor (Mitra, Posarac, and Vick 2013; Pinilla-Roncancio and Alkire 2020; Pinilla-Roncancio 2018; Mitra 2018).

Another group of studies has sought to identify the relationship between disability and multidimensional poverty in countries such as Afghanistan (Trani et al. 2016), Morocco, and Tunisia (Trani et al. 2015) using specific surveys covering a wider range of dimensions and indicators. This literature has also found a positive association between having disabilities and suffering multiple deprivations. Moreover, research focusing specifically on disability and multidimensional child poverty using broad sets of dimensions and age-specific indicators has obtained similar results (Trani and Cannings 2013, Trani, Biggeri, and Mauro 2013).



1  
2  
3 The reviewed literature has consistently shown that persons with disabilities are  
4 multidimensionally poorer than those without disabilities and that having a disability is directly  
5 associated with a range of simultaneous deprivations across different dimensions. This  
6 coincides with the findings reviewed in the first United Nations Disability and Development  
7 Report (2018). We complement this literature by conducting a multidimensional poverty  
8 analysis within the group of persons with disabilities, using a group-specific measure of  
9 multidimensional poverty. This kind of analysis does not involve comparisons with persons  
10 without disabilities. This further allows us not only to consider a broader set of relevant  
11 dimensions but also to propose a multidimensional poverty measure composed of both general  
12 indicators of deprivation—such as access to water—and other group-specific indicators for  
13 persons with different disabilities.  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31

### 32 **Data source and definition of disability**

33  
34 We used data from the first ENEDIS conducted by INEI in 2012. This survey was designed to  
35 obtain statistical information on the size of the population with disabilities in Peru, the types  
36 of impairments that affect them, and their sociodemographic and economic characteristics  
37 (INEI 2014).  
38  
39  
40  
41  
42  
43

44 INEI used the 2007 Peruvian National Census as a sampling frame for ENEDIS. The  
45 sampling design was probabilistic, stratified, and had two stages. First, 1,858 clusters were  
46 selected using a probability proportional to the size sampling method. Second, several  
47 dwellings were randomly selected within each cluster, resulting in the registration of more than  
48 222,000 dwellings throughout Peru. The data collection process involved the application of  
49 two different questionnaires. The first collected basic information on households and the  
50 prevalence of disabilities among their members, and was applied across all registered  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 dwellings. The second, covering disability-specific information, was applied only to household  
4  
5 members with disabilities across a sample of more than 22,000 households—selected from the  
6  
7 222,000 dwellings initially registered—in which at least one member had a disability. The  
8  
9 ENEDIS dataset was designed to be statistically representative at the national (urban and rural)  
10  
11 and sub-national levels, encompassing Peru’s 25 administrative regions (INEI 2014). These  
12  
13 data have been used by INEI to make comparisons between different subgroups within the  
14  
15 population with disabilities, including comparisons between groups of people with different  
16  
17 categories of disabilities (INEI 2014).  
18  
19  
20

21  
22 ENEDIS included seven questions to identify the prevalence of different kinds of  
23  
24 functional and activity limitations (Table 1). These questions were adapted from the  
25  
26 Washington Group (WG) Short Set of Questions on Disability<sup>1</sup>, which has been tested in  
27  
28 several LMICs (Miller et al.2011; Altman 2016). ENEDIS also included a 4-item scale of  
29  
30 severity for each question on functional and activity limitations: mild, moderate, severe, and  
31  
32 complete.  
33  
34  
35  
36  
37

38 *[Table 1 near here]*  
39  
40  
41

42  
43 We followed the International Classification of Functioning, Disability and Health  
44  
45 (ICF), which understands disability as an “umbrella term for impairments, activity limitations  
46  
47 and participation restrictions. It denotes the negative aspects of the interaction between an  
48  
49 individual (with a health condition) and that individual’s contextual factors (environmental and  
50  
51 personal factors)” (WHO 2001, 213). We took this decision because ENEDIS questions on  
52  
53 function and activity limitations are based on the WG Short Set of Questions on Disability,  
54  
55 which is conceptually consistent with the ICF definition of disability<sup>2</sup>. Hence, we identified a  
56  
57 person as living with a disability if she answered “yes” to any of the first five questions on  
58  
59  
60

1  
2  
3 functional and activity limitations included in ENEDIS and shown in the first column of Table  
4  
5  
6 1. These questions also allowed us to identify five subgroups within the population with  
7  
8 disabilities according to different categories of disabilities: mobility, vision, hearing,  
9  
10 communication, and cognitive. We identified a person with a mobility disability if she  
11  
12 answered “yes” to the question on mobility limitations in ENEDIS (see the first question in the  
13  
14 first column of Table 1). We followed the same criteria for the other four categories of  
15  
16 disability. The total population we analysed corresponds to persons aged six years and over  
17  
18 who answered that they experienced at least one of the five abovementioned functional and  
19  
20 activity limitations. This group represents 5.5% of the entire Peruvian population within that  
21  
22 age range.  
23  
24  
25

26 Table 2 presents demographic information on persons with disabilities aged six years  
27  
28 and over. ENEDIS data show that most persons with disabilities live in urban areas (77.4%),  
29  
30 while women (52.7%) represent a higher proportion of this population than men (47.3%).  
31  
32 Additionally, indigenous peoples account for a large proportion of the total (31.8%). We  
33  
34 considered a person as indigenous if her mother tongue is *Quechua*, *Aymara*, or *Ashaninka*, or  
35  
36 if she self-identifies as belonging to an indigenous community (such as *Quechua*, *Aymara*,  
37  
38 *Ashaninka*, *Aguaruna*, *Shipibo-Conibo*, or another indigenous community). The average age  
39  
40 of the population with disabilities is 59.7, and they live in households with an average of 4.2  
41  
42 people. The most prevalent disability category is mobility limitations (60.7%).  
43  
44  
45  
46  
47  
48  
49

50 [Table 2 near here]  
51  
52  
53

54 To account for different levels of disability severity, we followed Mitra (2018) and  
55  
56 used a functional score and a trichotomical categorisation. The functional score ranged from 0  
57  
58 to 1 and corresponded to a normalised sum of the answers regarding the severity level of each  
59  
60

1  
2  
3 disability category. Using this score, we divided the population with disabilities into three  
4  
5 groups, Group 1 corresponding to persons with the lowest values (lower severity) and Group  
6  
7 3 to persons with the highest values (higher severity). The alternative trichotomical  
8  
9 categorisation also established three groups: persons with only “mild” limitations, persons with  
10  
11 at least one “moderate” limitation but without severe or complete limitations, and persons with  
12  
13 at least one “severe” or “complete” limitation. Table 2 shows the share of the population with  
14  
15 disabilities that each of these six subgroups represents.  
16  
17  
18  
19  
20  
21  
22

### 23 **Alkire – Foster (AF) method**

24  
25 The group-specific measure proposed is based on the AF method. We chose this from the  
26  
27 various methods available for the following reasons. First, the AF method has been applied  
28  
29 extensively to inform social policies in LMICs (Zavaleta, Moreno, and Santos 2018)<sup>3</sup>. Second,  
30  
31 the AF method allows us to discuss and contrast our results with the specialised literature on  
32  
33 the topic, which relies exclusively on applications of AF poverty measures. Third, the AF  
34  
35 method has been explicitly developed on the basis of the capability approach (Alkire and Foster  
36  
37 2011), which, in turn, has been one of the most influential frameworks for broadening the  
38  
39 “space” for evaluating poverty (Robeyns 2017). Fourth, poverty measures based on the AF  
40  
41 method exhibit a range of properties that make them particularly suitable for the kind of  
42  
43 analysis we conduct, such as dimensional breakdown and population subgroup  
44  
45 decomposability (Alkire et al. 2015), allowing us to evaluate each subgroup’s contribution to  
46  
47 overall multidimensional poverty.  
48  
49  
50  
51  
52

53 The first relevant measure for this study is the multidimensional poverty headcount  
54  
55 ratio ( $H$ ), which is the proportion of persons who are multidimensionally poor. The AF method  
56  
57 also allows us to calculate the intensity of poverty ( $A$ ) as the average share of weighted  
58  
59  
60

1  
2  
3 indicators in which poor persons are deprived. The last relevant measure is the adjusted  
4  
5 headcount ratio,  $M_0 = H \times A$ , which satisfies dimensional monotonicity by jointly reflecting  
6  
7 the incidence and intensity of multidimensional poverty. We utilise subgroup decomposability  
8  
9 for urban/rural, male/female, indigenous/non-indigenous, and sub-national level poverty  
10  
11 comparisons within the group of persons with disabilities. We also disaggregate our results by  
12  
13 both severity and disability categories. Following the literature on small-area poverty  
14  
15 estimations (Seitz 2019) and precision requirements for household surveys (Eurostat 2013), we  
16  
17 presented the coefficient of variation (Haldane 1955) of the AF deprivation score for each  
18  
19 subgroup to provide additional information on the reliability of our poverty estimates. The  
20  
21 coefficients of variation are less than 5% for all the subgroup estimations presented. Finally,  
22  
23 we used the property of dimensional breakdown to explore the contribution of each dimension  
24  
25 of poverty to the  $M_0$  measure both for all persons with disabilities and each aforementioned  
26  
27 subgroup.  
28  
29  
30  
31  
32  
33  
34  
35  
36

### 37 **Design of the measure**

38  
39  
40 There is no consensus on how to design a multidimensional poverty measure, either for the  
41  
42 general field of multidimensional poverty or for the specialised literature on multidimensional  
43  
44 poverty and persons with disabilities. Selecting poverty dimensions represents a challenging  
45  
46 endeavour that can rely on a plurality of sources of justification (Alkire 2002). In many cases,  
47  
48 the dimensions are selected based, variously, on the following: literature reviews (Igei 2017);  
49  
50 focus groups featuring participants with disabilities and “experts” (Trani et al. 2015); data  
51  
52 availability (Mitra, Posarac, and Vick 2013); or taking as guidance the set of domains  
53  
54 developed by Stiglitz, Sen, and Fitoussi (2009) following international consultative processes  
55  
56  
57  
58  
59  
60

1  
2  
3 (Mitra 2018). A different approach is taken by Mitra et al. (2013), who implemented a mixed  
4 method and participatory exercise to select dimensions and weights.  
5  
6

7  
8 Drawing on Alkire et al. (2015), we used three criteria for choosing the dimensions,  
9 indicators, and deprivation criteria: (i) a theoretical list of dimensions, (ii) enduring consensus,  
10 and (iii) information from participatory processes. We chose Nussbaum's (2011) list of central  
11 human capabilities to provide theoretical justification for our selection. Nussbaum stated that  
12 her dimensions are elements of a theory of basic social justice rooted in the notion of human  
13 dignity. However, this list was not designed to reflect the circumstances of persons with  
14 disabilities comprehensively. Therefore, following the "principle of multiple realizability", we  
15 specified and complemented the list's domains using information from the UN Convention on  
16 the Rights of Persons with Disabilities (CRPD) (UN 2006) and the Peruvian Law on Persons  
17 with Disabilities (PLPD) (El Peruano 2012), which reflect an enduring consensus on the basic  
18 rights of this population and the reasonable accommodation required to fulfil such rights.  
19 Finally, to inform our selection, we relied on the findings of Vargas and Azorza's (2020)  
20 qualitative participatory study on wellbeing and persons with disabilities in Peru. These authors  
21 conducted focus groups, including persons with disabilities, their caregivers, and public  
22 servants in three regions in Peru, to explore and discuss the meaning these persons give to the  
23 terms "wellbeing" and "good life". Their results allowed us to identify certain aspects that are  
24 not always included in the literature on persons with disabilities and multidimensional poverty  
25 but are particularly important for this group in Peru. Examples include access to not only  
26 healthcare but also specialised medical attention for persons with disabilities, freedom from  
27 discrimination, and certificates of disability conferring preferential access to certain public  
28 services guaranteed under Peruvian law.  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54

55  
56 We selected eight dimensions and operationalised them using 20 indicators: "general  
57 healthcare" (two indicators), "disability-related healthcare" (two indicators), "education,  
58  
59  
60

1  
2  
3 employment and pension” (two indicators), “housing” (three indicators), “basic facilities” (four  
4 indicators), “information and communication” (two indicators), “social connectedness” (three  
5 indicators), and “basic daily activities” (two indicators). We operationalised dimensions of  
6 particular relevance for persons with disabilities, such as “disability-related healthcare”,  
7 “education, work and retirement”, “basic daily activities”, and “social connectedness” using  
8 disability-specific indicators. The first three of these four dimensions also include certain  
9 indicators with deprivation criteria specific to different disability categories. In establishing the  
10 deprivation criteria for each indicator, we took as a reference the three abovementioned sources  
11 of justification and the international expert consensus for cases such as indicators of access to  
12 water and sanitation (WHO and UNICEF 2017).  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

26 The person with disabilities is both the unit of identification and analysis in all the  
27 indicators of our measure. However, in dimensions such as “housing” and “basic facilities”,  
28 the person with disabilities is identified to be deprived from using information of the  
29 characteristics of the dwelling in which she lives. Since the ENEDIS does not have information  
30 on whether all the people who live in a particular dwelling have the same level of access to the  
31 services available there, this might be a limitation that could involve overlooking patterns of  
32 intra-household inequality that might affect people with disabilities.  
33  
34  
35  
36  
37  
38  
39  
40  
41

42 Table 3 presents the set of dimensions, indicators, and dimensional weights; and a  
43 detailed explanation of the deprivation criteria used for each indicator in our measure. Since  
44 there is no available information on how persons with disabilities in Peru rank different  
45 dimensions of wellbeing, we followed the literature reviewed previously in assigning equal  
46 weights to all dimensions. Moreover, as there is no consensus on how to set a multidimensional  
47 poverty cut-off ( $k$ ), we presented our main results for the following range of three values:  $k$   
48  $= 2/8$ ,  $k = 3/8$ , and  $k = 4/8$ . We justified the lower bound of this range by taking as a  
49 reference the proposed Multidimensional Poverty Indicator for Latin America (Santos and  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 Villatoro 2018) with  $k = 25\%$ , whereas we set an extremely conservative upper bound of  $k$   
4  
5 = 50%, higher than most of the multidimensional poverty literature based on the AF method.  
6  
7  
8  
9

10 *[Table 3 near here]*  
11  
12  
13  
14

15 The first dimension, “general healthcare”, was operationalised using two indicators:  
16  
17 “medical attention not related to disability” and “health insurance”. This dimension reflects the  
18 capabilities of “life” and “bodily health” in Nussbaum’s list. Life and health are considered  
19 fundamental rights under Articles 10 and 25 of the CRPD, whereas Articles 7, 26, 27, and 28  
20 of the PLPD guarantee access to the public health insurance system and promote non-  
21 discriminatory access to private health insurance. Additionally, health was cited as a central  
22 aspect of wellbeing by nearly all focus groups in Vargas and Azorza (2019). We included  
23 “health insurance” in this dimension rather than as a dimension of “social protection” given  
24 that the main policy tool for universal health insurance provision in Peru, “Integral Health  
25 Insurance” (Seguro Integral de Salud, SIS), is a basic insurance scheme targeted mainly at  
26 persons in poverty and/or informal employment but not a true component of a social protection  
27 system, and it does not “exhibit the characteristics of standard insurance” (Cetrángolo et al.  
28 2013, 73).  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43

44 The second dimension, “disability-related healthcare”, includes two indicators:  
45  
46 “disability-related medical attention” and “disability-related treatment”. Though this might  
47 reflect similar information to the previous dimension, we kept it separate given normative and  
48 policy considerations. Specifically, as Vargas and Azorza’s (2019) respondents mentioned, in  
49 an LMIC like Peru, it is not unusual for persons with disabilities to have access only to basic  
50 healthcare centres whose medical staff are not trained to deal with the specific requirements of  
51 persons with disabilities and which do not provide adequate medical treatment or therapy for  
52  
53  
54  
55  
56  
57  
58  
59  
60



1  
2  
3 different disability categories. Moreover, the importance of access to adapted healthcare is  
4 explicitly recognised by Articles 25 and 26 of the CRPD, which call for the provision of  
5 specific health services adapted to persons with disabilities and their impairments, and Articles  
6 26, 27, and 31 of the PLPD, which acknowledge the right of persons with disabilities to access  
7 rehabilitation services if they need them.  
8  
9

10  
11  
12  
13  
14  
15 “Education, work and retirement” is a broad dimension that covers specific aspects  
16 relevant to different age groups. This dimension has two indicators: “educational attendance,  
17 delay and attainment” reflects the intrinsic importance of education, while “adapted education,  
18 employment and pensions” captures elements of the “study, work, retire” cycle. We justified  
19 this dimension with reference to Nussbaum’s capabilities of “senses, imagination, and thought”  
20 and “control over one’s [material] environment”. We also relied on the public consensus  
21 reflected in Article 24 of the CRPD and Articles 35, 36, and 38 of the PLPD, which stress the  
22 right to accessible education; and in Article 27 of the CRPD and Articles 45 and 50 of the  
23 PLPD, which guarantee the right to work by encouraging the adoption of reasonable  
24 accommodation measures. Furthermore, Article 28 of the CRPD and Article 60 of the PLPD  
25 support access to retirement benefits. Having access to education and being able to work and  
26 contribute to the household economy was another dimension cited by respondents in Vargas  
27 and Azorza’s (2019) study.  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43

44 The fourth dimension, “housing”, has three indicators: “housing materials”,  
45 “overcrowding”, and “housing tenure”. We included this dimension and indicators given their  
46 contribution to Nussbaum’s capabilities of “bodily health” and “control over one’s [material]  
47 environment”. We also justified this dimension relying on public consensus reflected in the  
48 right to adequate housing included in Article 28 of the CRPD and Article 18 of the PLPD.  
49 Moreover, the ability to provide oneself with decent housing was a dimension identified by  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 Vargas and Azorza (2019) as an important component of wellbeing for persons with disabilities  
4  
5 in Peru.  
6

7  
8 “Basic facilities”, the fifth dimension selected, used four indicators: “water source”,  
9  
10 “sanitation”, “cooking fuel”, and “lighting”. We included it because of its contribution to the  
11  
12 capability of “bodily health” and following Article 22 of the CRPD, which emphasises the  
13  
14 importance of equal access to drinking water and other adequate services. We also justified  
15  
16 this, given the findings of Vargas and Azorza (2019).  
17

18  
19 The sixth dimension, “information and communication”, has two indicators:  
20  
21 “information technology” and “communication technology”. This dimension is linked to  
22  
23 Nussbaum’s capabilities of “senses, imagination, and thought” and “affiliation”, and is justified  
24  
25 with reference to Articles 4, 9, and 21 of the CRPD, and Articles 22 and 23 of the PLPD, which  
26  
27 stress the importance of access to information and media, and developing new forms of  
28  
29 disability-adapted ICT, respectively. This is the only dimension in our measure that was not  
30  
31 mentioned by respondents in Vargas and Azorza’s (2019) research.  
32  
33

34  
35 “Social connectedness”, the seventh dimension, echoes Nussbaum’s central capabilities  
36  
37 of “affiliation” and “emotions”. We justified this dimension with reference to Article 19 of the  
38  
39 CRPD and Article 11 of the PLPD, which recognise the rights of persons with disabilities to  
40  
41 be included in the community, Article 23 of the CRPD, which advocates eliminating all kinds  
42  
43 of discrimination from personal and affective relationships, and Article 5 of the PLDP, which  
44  
45 stresses the role of the family in including persons with disabilities in social life. This  
46  
47 dimension also includes the principle of non-discrimination, mentioned in Article 5 of the  
48  
49 CRPD and Article 8 of the PLPD. Moreover, affect, support, and non-discrimination are also  
50  
51 considered by participants with disabilities in Vargas and Azorza’s (2019) study as important  
52  
53 components of wellbeing. “Social connectedness” is an overarching dimension that reflects an  
54  
55 individual’s capability of sustaining enriching social relationships across three spheres of  
56  
57  
58  
59  
60

1  
2  
3 interaction: family, community, and government. Therefore, we chose to operationalise this  
4  
5 dimension through three indicators: “support”, to reflect the connection between persons with  
6  
7 disabilities and their immediate social environment (such as family, caregivers, and close  
8  
9 friends); “discrimination”, a broader indicator to reflect information on the quality of social  
10  
11 relationships with the immediate environment and the community in general; and “certification  
12  
13 of disability”, referring to connections with public institutions and the government. We include  
14  
15 this indicator because, in Peru, holding a Ministry of Health-issued certificate of disability is a  
16  
17 requirement for access to a set of social protection provisions, such as the “Contigo” cash  
18  
19 transfer programme targeted at income-poor people with disabilities (Article 59 of the PLPD),  
20  
21 preferential access to government housing programmes (Article 18 of the PLPD) and public  
22  
23 and private universities (Article 38 of the PLPD), and preferential employment quotas within  
24  
25 the public sector and private companies (Articles 48 and 49 of the PLPD).  
26  
27  
28  
29

30  
31 Finally, our eighth dimension, “basic daily activities” has two indicators: “mobility”  
32  
33 and “leisure”. This dimension is linked to Nussbaum’s capabilities of “physical integrity” and  
34  
35 “play”. We also justified our selection based on Articles 9, 18, and 20 of the CRPD and Articles  
36  
37 15, 16, 17, 18, and 20 of the PLPD, which guarantee the right to free movement and right to  
38  
39 access to mobility aids, transportation, and adapted buildings such as schools, housing,  
40  
41 workplaces, and public places, among others; and Article 30 of the CRPD and Articles 40, 41,  
42  
43 and 44, which ensure access to recreational, cultural, and sports activities. Access to mobility  
44  
45 devices and moving safely and freely were also highlighted as important dimensions by Vargas  
46  
47 and Azorza’s (2019) respondents.  
48  
49  
50

51  
52 It is worth noting that although some indicators, such as “mobility” or “adapted  
53  
54 education, employment and pensions”, might seem relevant only for persons with certain  
55  
56 categories of disabilities, the specific questions used to operationalise them include broad  
57  
58 deprivation criteria that can also be relevant for persons with seeing, hearing, or  
59  
60

1  
2  
3 communication disabilities, and other cognitive disabilities. Appendix 1 shows that the  
4 incidence of deprivation by disability category is never below 50% for “mobility” or 45% for  
5  
6 “adapted education, employment and pensions”.  
7  
8  
9

10 To test for redundancy between indicators, we estimated both Cramér’s V correlation  
11 coefficients and the measure of overlap of deprivations  $R^0$  proposed by Alkire et al. (2015).  
12 While most of Cramér’s V coefficients are not higher than 0.25, suggesting a low association  
13 between dimensions (see Appendix 2), some  $R^0$  estimates show a high overlap between certain  
14 dimensions (see Appendix 3). This is the case of “certification of disability”, which has  $R^0$   
15 values higher than 0.9. However, this result is to be expected given that the uncensored  
16 headcount ratio of this indicator is 93.1%. Other indicators such as “disability-related  
17 treatment” and “educational attendance, delay and attainment” presented a similar pattern.  
18 Despite this, we have opted to keep these indicators for the abovementioned normative  
19 considerations and because we cannot necessarily infer their behaviour based on the  
20 information on the rest of the indicators of our measure since they show low association.  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39

## 40 Results

41 Figures 1 and 2 present  $H$  and  $M_0$  for all persons with disabilities aged six years or over and  
42 for the eight subgroups. Depending on the poverty cut-off, the proportion of persons with  
43 disabilities living in multidimensional poverty varies from 71.3% ( $k = 2/8$ ) to 41.1% ( $k = 3/8$   
44 ) and 17.8% ( $k = 4/8$ ). Meanwhile,  $M_0$  values are 0.297, 0.204, and 0.104 for these three cut-  
45 offs, respectively. We also observed patterns of disadvantage for the subgroups of female and  
46 indigenous persons with disabilities, compared to their male and non-indigenous counterparts.  
47 These results are statistically significant at conventional levels. Furthermore, the subgroup of  
48 rural indigenous women with disabilities shows significantly higher values of  $H$  and  $M_0$  than  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 the remaining persons with disabilities (Appendix 4 includes statistical significance of gaps  
4 between subgroups based on t-tests, standard errors, number of observations, and coefficients  
5 of variation).  
6  
7  
8  
9

10  
11  
12 *[Figure 1 near here]*  
13

14  
15  
16  
17 *[Figure 2 near here]*  
18  
19

20  
21 We presented the results disaggregated by disability severity, disability categories, and  
22 sub-national regions; and data on the subgroup contribution to poverty, uncensored headcounts,  
23 and dimensional breakdown by subgroups using a referential cut-off of  $k = 3/8$ . This cut-off  
24 corresponds to an intermediate position in the aforementioned range of cut-offs. Table 4 shows  
25 that persons with severe disabilities experience higher poverty levels than persons with less  
26 severe disabilities. This association is clearer when we approximate disability severity using a  
27 trichotomical categorisation instead of establishing severity subgroups using a functional score.  
28 Persons with communication disabilities faced higher levels of multidimensional poverty  
29 (53.9%) than persons with other disabilities.  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44

45 *[Table 4 near here]*  
46  
47  
48

49 Table 5 shows the contributions of all the above mentioned subgroups to overall  
50 multidimensional poverty among the population with disabilities. The contribution of rural  
51 populations, indigenous peoples, rural indigenous women with disabilities, and persons with  
52 severe disabilities to  $M_0$  is significantly larger than their population shares. These findings  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 revealed that these subgroups were overrepresented among persons with disabilities living in  
4  
5 multidimensional poverty.  
6  
7  
8  
9

10 *[Table 5 near here]*  
11  
12  
13

14 We ranked the 25 regions in Peru according to the incidence of multidimensional  
15 poverty experienced by persons with disabilities. These results revealed a spatial distribution  
16 of poverty whereby Andean and Amazonian regions faced higher deprivation than the coastal  
17 regions closer to the capital city, Lima (01) (see Figure 3). Moreover, the estimates indicated a  
18 highly unequal distribution of disadvantage across regions; for instance, the difference between  
19 the multidimensional poverty incidence in Cajamarca (06) and Callao (07) exceeds 65  
20 percentage points (Appendix 5 includes standard errors, number of observations, and  
21 coefficients of variation).  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34

35 *[Figure 3 near here]*  
36  
37  
38  
39

40 Figure 4 presents the censored headcount ratios for different subgroups. The incidence  
41 of deprivation is particularly high among disability-specific indicators, such as “certification  
42 of disability” (39.6%), “disability-related treatment” (37.8%), “educational attendance, delay  
43 and attainment” (37.7%), and “mobility” (33.8%). These four indicators are also among the  
44 most prevalent deprivations for each subgroup under analysis. Despite this, important contrasts  
45 emerge from the comparison of the uncensored headcount levels of deprivation among  
46 different subgroups (see Appendices 6 and 7). Persons living in rural areas faced higher  
47 deprivation than those in urban areas across all 20 indicators; women experienced higher  
48 deprivation than men in 17 out of the 20 indicators; indigenous peoples suffered higher  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 incidence of deprivation than the subgroups of non-indigenous peoples in all the 20 indicators,  
4  
5 whereas the rural indigenous women with disabilities also faced higher censored headcounts  
6  
7 than the rest of the population with disabilities in all these indicators (Appendix 6 includes  
8  
9 statistical significance of gaps between subgroups based on t-tests and standard errors).  
10  
11 Subgroups of persons with more severe disabilities—grouped using the functional score or the  
12  
13 trichotomical categorisation—faced higher censored headcount ratios in most indicators (see  
14  
15 Appendix 7). Subgroups of persons with communication disabilities experienced higher  
16  
17 uncensored headcount ratios than persons with other disabilities in 16 out of the 20 indicators  
18  
19 (see Appendix 7).  
20  
21  
22  
23  
24  
25

26 *[Figure 4 near here]*  
27  
28  
29

30  
31 Table 6 presents data on the contribution of each dimension to multidimensional  
32  
33 poverty. For all persons with disabilities, dimensions that include disability-specific indicators,  
34  
35 such as “education, work and retirement” (19.5%), “disability-related healthcare” (13.9%), and  
36  
37 “basic daily activities” (13.5%), contributed the most to multidimensional poverty. This  
38  
39 pattern varied when we analysed dimensional contribution to poverty for different subgroups  
40  
41 within the population with disabilities. This is the case of rural populations with disabilities,  
42  
43 for which the dimensions that contribute the most to poverty are “education, work and  
44  
45 retirement” (17.2%), “basic facilities” (15.3%), and “information and communication”  
46  
47 (12.6%), whereas for persons with disabilities in urban areas, these are “education, work and  
48  
49 retirement” (21.8%), “disability-related healthcare” (15.5%), and “basic daily activities”  
50  
51 (14.9%).  
52  
53  
54  
55  
56  
57

58 *[Table 6 near here]*  
59  
60

1  
2  
3  
4  
5  
6 Our results on multidimensional poverty comparisons (using  $H$  and  $M_0$ ) are robust if  
7  
8 we restrict our analysis only to persons with disabilities aged 15 or older. This holds true for  
9  
10 subgroups based on area, gender, and/or ethnicity (see Appendix 8); and for subgroups of  
11  
12 severity and disability categories (see Appendix 9). Similarly, poverty comparisons by area,  
13  
14 gender, and/or ethnicity are robust to an alternative structure that gives equal weight to each  
15  
16 indicator instead of using nested weights and changes the poverty cut-off to  $k = 7/20 = 35\%$   
17  
18 (see Appendix 10); and for comparisons between different disability categories and severity  
19  
20 (see Appendix 11).  
21  
22

23  
24 Following Santos and Villatoro (2018), we also explored the ranking robustness and  
25  
26 identification robustness. The ranking based on our original specification (Set 1) is robust to  
27  
28 several alternative specifications that involve different changes such as giving equal weight to  
29  
30 an indicator instead of using nested weights (Set 2), combining both indicators of medical  
31  
32 attention into one union indicator and creating a new overarching health dimension with three  
33  
34 indicators (“medical attention”, “health insurance”, and “disability-related treatment”) (Set 3),  
35  
36 and eliminating “certification of disability” (Set 4). Appendix 12 shows that ties-adjusted  
37  
38 Spearman rank correlation coefficients among these rankings are never below 0.97 for  $H$ , and  
39  
40 0.95 for  $M_0$ . This regional poverty ranking is also robust compared to the abovementioned  
41  
42 specification that simultaneously changes the structure of weights and poverty cut-off (see  
43  
44 Appendix 13). To check identification robustness, we calculated the percentage of persons with  
45  
46 disabilities who were identified as poor simultaneously by Sets 1, 2, 3, and 4 (“consistently  
47  
48 poor”). We also calculated the percentage of persons with disabilities identified as poor only  
49  
50 by one, two, or three Sets but not by the four Sets simultaneously (“inconsistently poor”). The  
51  
52 proportion of “inconsistently poor” is 13% at the national level and not higher than 20% at the  
53  
54 regional level, showing robustness to different specifications (see Appendix 14).  
55  
56  
57  
58  
59  
60



## Discussion

We situate the contribution of this study to the literature on multidimensional poverty, persons with disabilities, and the capability approach in three areas. To our knowledge, this is the first group-specific measure of multidimensional poverty that included a broad set of dimensions particularly relevant for persons living in different disability categories in an LMIC. Our results showed that 41.1% of persons with disabilities in Peru experienced deprivations in at least three out of the eight dimensions included. The deprivations that contributed the most to multidimensional poverty corresponded to dimensions that include disability-specific indicators that are not normally included in most poverty analysis focused on this population. From the capability approach perspective, this is a desirable characteristic of our measure because it allows us to better reflect human diversity in poverty measurement and focus on evaluating aspects that point towards the actual ability of persons with disabilities to achieve a set of valuable basic functionings. This represents a powerful argument that justifies the use of group-specific multidimensional poverty measures that complement the information that general multidimensional poverty measures provide, by making visible deprivations that are particularly relevant to persons with disabilities.

Second, our measure included, where applicable, indicators and deprivation criteria specific to different disability categories. This characteristic allows us to make comparisons between subgroups of people living with different disabilities, and between different subgroups according to their degree of disability severity. We found that persons with severe disabilities faced higher poverty levels than persons with mild or moderate disabilities. This result is consistent with the findings of Pinilla-Roncancio and Alkire (2020) for Uganda, and Mitra (2018) for Ethiopia, Malawi, Tanzania, and Uganda. Persons with communication disabilities were poorer than those with other disabilities. This contrasts with Mitra's (2018) finding that

1  
2  
3 living with a communication disability is not associated with a higher probability of living in  
4 multidimensional poverty. Exploring multidimensional poverty heterogeneity between Latin  
5 American and African populations with disabilities requires further research. Overall, these  
6 results revealed that the category of disability and the degree of disability severity are variables  
7 that should be considered by policymakers as part of the SDG efforts oriented to avoid “leaving  
8 behind” particular subgroups of persons with disabilities that face higher multidimensional  
9 poverty levels. More specifically, these findings might be useful to justify extending the  
10 coverage of the current Peruvian cash transfer programme targeted to persons with severe  
11 disabilities living in extreme monetary poverty to also include persons with severe disabilities  
12 living in multidimensional non-monetary poverty.  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

26 Third, our analysis focused on exploring multidimensional poverty within the group of  
27 persons with disabilities, allowing us to identify patterns of intersectional disadvantage that  
28 affected certain subgroups of people with disabilities in addition to their disability category  
29 and severity. Our results showed that female, rural and indigenous subgroups are consistently  
30 in a worse state of poverty than male, urban and non-indigenous population subgroups. We  
31 found the subgroup of rural indigenous women to be the poorest with a multidimensional  
32 poverty headcount of 88%. Additionally, we found a pattern of spatial distribution of poverty  
33 among persons with disabilities, since Andean and Amazonian regions have higher levels of  
34 multidimensional poverty than coastal regions closer to the capital city. These results showed  
35 that some patterns of multidimensional poverty that affected the general population in Peru  
36 (Clausen and Flor 2017) were also valid for the population with disabilities in this country.  
37 From a public policy perspective, these findings suggested that multidimensional poverty  
38 eradication strategies should set priorities after considering the geographical and sociocultural  
39 characteristics of the population with disabilities alongside information on disability severity  
40 and categories of disability.  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 Our research has the following limitations. The WG Short Set of Questions on Disability  
4 was originally developed for adults, whereas ENEDIS was applied to both adults and children.  
5  
6 Moreover, ENEDIS does not include questions that reflect all relevant aspects of child  
7 disability. Further, ENEDIS does not provide information on mental health disabilities. Thus,  
8 our results are restricted only to the subgroup of persons with disabilities that the questions in  
9 ENEDIS allow us to identify, and do not necessarily extend to all persons with disabilities in  
10 Peru. Additionally, although we included a broad set of dimensions in our measure, we could  
11 not include disability-specific indicators in all of them due to data restrictions in ENEDIS.  
12 Finally, the ENEDIS dataset was collected in 2012, and we do not have more up-to-date  
13 information to determine whether the situation of persons with disabilities in Peru has  
14 significantly changed over the last years. More research and policy efforts are necessary to  
15 advocate national institutes of statistics in LMICs to produce specialised data on persons with  
16 disabilities every certain number of years. Recognising these limitations can provide insights  
17 for future specialised surveys to ensure that they are better suited to provide high-quality data  
18 on the different deprivations that this group experiences.  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40

## 41 **Conclusion**

42  
43  
44 Advancing the SDGs' "leaving no one behind" agenda involves a particular policy focus on  
45 the groups that experience clustered deprivations and different "forms" of poverty. Since  
46 persons with disabilities might face forms of disadvantage that are not normally suffered by  
47 the rest of the population, using disability-specific measures of multidimensional poverty can  
48 complement the analyses based on other general poverty measures by showing deprivations  
49 that particularly affect populations with disabilities. Moreover, this helps to identify patterns  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 of intersectional disadvantages that affect persons with disabilities who simultaneously belong  
4 to several subgroups, particularly exposed to disadvantages.  
5  
6

7  
8 Based on our proposal of a comprehensive and group-specific multidimensional poverty  
9 measure applied to persons with disabilities in Peru, we found that dimensions with disability-  
10 specific indicators contribute the most to multidimensional poverty within this population.  
11  
12 Furthermore, within the group of persons with disabilities, rural populations, women,  
13 indigenous peoples, persons with severe disabilities, and persons with communication  
14 disabilities face higher levels of multidimensional poverty than the rest. Additionally, rural  
15 indigenous women with disabilities were identified as the poorest subgroup within the group  
16 of persons with disabilities in Peru. Our findings suggest that eradicating multidimensional  
17 poverty across different subgroups of persons with disabilities will entail not only  
18 implementing reasonable accommodations to existing policies. It also necessitates creating  
19 new disability-specific social protection policies focused on the poorest subgroups among this  
20 population.  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37

### 38 **Disclosure statement**

39  
40 No potential conflict of interest was reported by the author  
41  
42  
43

### 44 **Notes**

45  
46 [47 http://www.washingtongroup-disability.com/washington-group-question-sets/short-set-of-disability-questions/](http://www.washingtongroup-disability.com/washington-group-question-sets/short-set-of-disability-questions/)  
48

49  
50 [2 http://www.washingtongroup-disability.com/methodology-and-research/conceptual-framework/](http://www.washingtongroup-disability.com/methodology-and-research/conceptual-framework/)  
51

52  
53 [3 See also https://www.mppn.org/participants/countries-en/](https://www.mppn.org/participants/countries-en/)  
54  
55  
56  
57  
58  
59  
60

## References

- Alkire, S., and J. Foster. 2011. "Counting and Multidimensional Poverty Measurement." *Journal of Public Economics* 95 (7–8): 476–487.  
<https://doi.org/10.1016/j.jpubeco.2010.11.006>.
- Alkire, S., J. Foster, S. Seth, M. E. Santos, J. M. Roche, and P. Ballón. 2015. *Multidimensional Poverty Measurement and Analysis*. Oxford: Oxford University Press.
- Banks, L. M., H. Kuper, and S. Polack. 2017. "Poverty and Disability in Low-and middle-Income Countries: A Systematic Review." *PLOS ONE* 12 (12):  
<https://doi.org/10.1371/journal.pone.0189996>.
- Cetrángolo, O., F. Bertranou, L. Casanova, and P. Casalí. 2013. *El sistema de salud del Perú: situación actual y estrategias para orientar la extensión de la cobertura contributiva*. Lima: ILO.
- Clausen, J. and J. Flor. 2017. "Sobre la naturaleza multidimensional de la pobreza humana: propuesta conceptual e implementación empírica para el caso peruano." In *Exclusión e inclusión social en el Perú. Logros y desafíos para el desarrollo*, edited by J. Rodríguez and P. Francke, 45–135. Lima: Pontificia Universidad Católica del Perú.
- De Neubourg, C., J. Chai, M. De Milliano, I. Plavgo, and Z. Wei. 2012. "Cross-Country MODA Study. Multiple Overlapping Deprivation Analysis (MODA). Technical Note." Office of Research Working Paper 2012-05, UNICEF.
- El Peruano. 2012. "Ley General de la Persona con Discapacidad." Congreso de la República del Perú website. Published on the 24<sup>th</sup> of December 2012.  
<http://www.leyes.congreso.gob.pe/Documentos/Leyes/29973.pdf>.
- El Peruano. 2015. "Decreto Supremo que crea el Programa de pensión por discapacidad severa." Ministerio de la Mujer y Poblaciones Vulnerables website. Published on the

- 1  
2  
3 11<sup>th</sup> of August 2015. [https://www.mimp.gob.pe/files/transparencia/organigrama/Org-](https://www.mimp.gob.pe/files/transparencia/organigrama/Org-mod-DS004-2015-mimp.pdf)  
4 [mod-DS004-2015-mimp.pdf](https://www.mimp.gob.pe/files/transparencia/organigrama/Org-mod-DS004-2015-mimp.pdf)  
5  
6  
7  
8 Eurostat. 2013. *Handbook on Precision Requirements and Variance Estimation for ESS*  
9  
10 *Households Surveys*. Luxembourg: Publications Office of the European Union.  
11  
12 Haldane, J. B. S. 1955. "The Measurement of Variation." *Evolution* 9(4): 484–484.  
13  
14 <https://doi.org/10.1111/j.1558-5646.1955.tb01559.x>.  
15  
16  
17 Igei, K. 2017. *Untangling Disability and Poverty: A Matching Approach Using Large-scale*  
18  
19 *Data in South Africa.* Working Paper No. 142, JICA Research Institute.  
20  
21 Instituto Nacional de Estadística e Informática (INEI). 2014. *Primera Encuesta Nacional*  
22  
23 *Especializada sobre Discapacidad 2012*. Lima: INEI.  
24  
25  
26 Miller, K., D. Mont, A. Maitland, B. Altman, and J. Madans. 2011. "Results of a Cross-national  
27  
28 Structured Cognitive Interviewing Protocol to Test Measures of Disability." *Quality &*  
29  
30 *Quantity* 45 (4): 801–815. <https://doi.org/10.1007/s11135-010-9370-4>.  
31  
32  
33 Mitra, S. 2018. *Disability, Health and Human Development*. New York: Palgrave MacMillan.  
34  
35  
36 Mitra, S., A. Posarac, and B. Vick. 2013. "Disability and Poverty in Developing Countries: A  
37  
38 Multidimensional Study." *World Development* 41 (C): 1–18.  
39  
40 <http://dx.doi.org/10.1016/j.worlddev.2012.05.024>.  
41  
42  
43 Mitra, S., K. Jones, B. Vick, D. Brown, E. McGinn, and M. J. Alexander. 2013. "Implementing  
44  
45 a Multidimensional Poverty Measure Using Mixed Methods and a Participatory  
46  
47 Framework." *Social Indicators Research* 110 (3): 1061–1081.  
48  
49 <https://doi.org/10.1007/s11205-011-9972-9>.  
50  
51  
52 Nussbaum, M. C. 2011. *Creating Capabilities: The Human Development Approach*.  
53  
54 Cambridge: Harvard University Press.  
55  
56 OPHI (Oxford Poverty and Human Development Initiative). 2019. *Child Multidimensional*  
57  
58 *Poverty in Thailand*. [https://ophi.org.uk/wp-content/uploads/NESDC\\_UNICEF-](https://ophi.org.uk/wp-content/uploads/NESDC_UNICEF-)  
59  
60

1  
2  
3 [Thailand\\_2019\\_Child\\_MDP\\_in\\_Thailand.pdf?fbclid=IwAR2poSFusLIYFK2YKvpM](https://doi.org/10.1016/j.dhjo.2017.12.007)  
4  
5 [87F3soiFy0a\\_Md3I\\_nSytD0MNJ451wO2JXzJ3G0.](https://doi.org/10.1016/j.dhjo.2017.12.007)  
6  
7

8 Pinilla-Roncancio, M. 2018. “The Reality of Disability: Multidimensional Poverty of People  
9 with Disability and their Families in Latin America.” *Disability and Health Journal* 11  
10 (3): 398–404. <https://doi.org/10.1016/j.dhjo.2017.12.007>.  
11  
12

13  
14 Pinilla-Roncancio, M. & Alkire, S. 2020. “How Poor are People with Disabilities? Evidence  
15 based on the Global Multidimensional Poverty Index.” *Journal of Disability Policy*  
16 *Studies*. <https://doi.org/10.1177/1044207320919942>  
17  
18

19 Robeyns, I. 2017. *Wellbeing, Freedom and Social Justice: The Capability Approach Re-*  
20 *examined*. Cambridge: Open Book Publishers.  
21  
22

23 Santos, M. E., and P. Villatoro. 2018. “A Multidimensional Poverty Index for Latin  
24 America.” *Review of Income and Wealth* 64(1): 52–82.  
25  
26 <https://doi.org/10.1111/roiw.12275>  
27  
28

29 Seitz, W. 2019. “*Where They Live: District-Level Measures of Poverty, Average Consumption,*  
30 *and the Middle Class in Central Asia.*” Policy Research Working Paper No. 8940, The  
31 World Bank. <https://doi.org/doi:10.1596/1813-9450-8940>.  
32  
33

34 Sen, A. 1980. “Equality of What?” In *Tanner Lectures on Human Values Vol. 1*, edited by S.  
35 McMurrin, 97–220. Cambridge: Cambridge University Press.  
36  
37

38 Specialized National Survey on People with Disabilities (ENEDIS by its Spanish acronym;  
39 conducted by Peruvian National Institute of Statistics in 2012; accessed on the 29<sup>th</sup> of  
40 January 2019). [https://webinei.inei.gob.pe/anda\\_inei/index.php/catalog/495](https://webinei.inei.gob.pe/anda_inei/index.php/catalog/495).  
41  
42

43 Stiglitz, J. E., A. K. Sen, and J. P. Fitoussi. 2009. *Report by the Commission on the*  
44 *Measurement of Economic Performance and Social Progress*. Paris: Commission on  
45 the Measurement of Economic Performance and Social Progress.  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



- 1  
2  
3 Trani, J. F., and T. I. Canings. 2013. "Child Poverty in an Emergency and Conflict Context: A  
4  
5 Multidimensional Profile and an Identification of the Poorest Children in Western  
6  
7 Darfur." *World Development* 48: 48–70.  
8  
9 <https://doi.org/10.1016/j.worlddev.2013.03.005>.
- 10  
11  
12 Trani, J. F., M. Biggeri, and V. Mauro. 2013. "The Multidimensionality of Child Poverty:  
13  
14 Evidence from Afghanistan." *Social Indicators Research* 112 (2): 391–416.  
15  
16 <https://doi.org/10.1007/s11205-013-0253-7>.
- 17  
18  
19 Trani, J. F., J. Kuhlberg, T. Cannings, and D. Chakkal. 2016. "Multidimensional Poverty in  
20  
21 Afghanistan: Who are the Poorest of the Poor?" *Oxford Development Studies* 42 (2):  
22  
23 220–245. <https://doi.org/10.1080/13600818.2016.1160042>.
- 24  
25  
26 Trani, J. F., P. Bakhshi, S. Myers Tlapek, D. Lopez, and F. Gall. 2015. "Disability and Poverty  
27  
28 in Morocco and Tunisia: A Multidimensional Approach." *Journal of Human*  
29  
30 *Development and Capabilities* 16 (4): 518–548.  
31  
32 <https://doi.org/10.1080/19452829.2015.1091808>.
- 33  
34  
35 UN (United Nations). 2006. *Convention on the Rights of Persons with Disabilities*.  
36  
37 <http://www.un.org/disabilities/documents/convention/convoptprot-e.pdf>.
- 38  
39  
40 UN (United Nations). 2015. *Transforming our world: The 2030 agenda for sustainable*  
41  
42 *development*.  
43  
44 [https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20f](https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf)  
45  
46 [or%20Sustainable%20Development%20web.pdf](https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf).
- 47  
48  
49 UN (United Nations). 2018. *Disability and Development Report. Realizing the Sustainable*  
50  
51 *Development Goals by, for and with persons with disabilities*." New York: UN.
- 52  
53  
54 UNDP (United Nations Development Programme). 2016. *Human Development Report 2016:*  
55  
56 *Human Development for Everyone*. New York: UNDP.  
57  
58  
59  
60



1  
2  
3 WHO (World Health Organization). 2001. *International Classification of Functioning,*  
4  
5 *Disability and Health.* Geneva: WHO.

6  
7  
8 WHO and UNICEF (World Health Organization and the United Nations Children’s Fund).  
9  
10 2017. *Progress on Drinking Water, Sanitation and Hygiene: 2017 Update and SDG*  
11  
12 *Baselines.* Geneva: WHO and UNICEF.

13  
14  
15 WHO (World Health Organization)-World Bank. 2011. *World Report on Disability.* Geneva:  
16  
17 WHO Press.

18  
19 Vargas, S. and A. Azorza. 2020. “De la vulnerabilidad a la ampliación de capacidades  
20  
21 humanas: análisis interseccional de la incidencia de pobreza multidimensional en  
22  
23 personas con discapacidad en el Perú. Análisis cualitativo de las dimensiones de  
24  
25 vulnerabilidad.” Manuscript in preparation.

26  
27  
28 Zavaleta, D., C. Moreno, and M. E. Santos. 2018. “La medición de la pobreza multidimensional  
29  
30 en América Latina.” In *Introducción al enfoque de las capacidades: aportes para el*  
31  
32 *desarrollo humano en América Latina*, edited by S. Deneulin, J. Clausen, and A.  
33  
34 Valencia, 253–274. Buenos Aires: Ediciones Manantial and Pontificia Universidad  
35  
36 Católica del Perú.  
37  
38

## 39 40 41 42 43 44 **Appendices**

45  
46 *[Appendix 1 near here]*

47  
48 *[Appendix 2 near here]*

49  
50 *[Appendix 3 near here]*

51  
52 *[Appendix 4 near here]*

53  
54 *[Appendix 5 near here]*

55  
56 *[Appendix 6 near here]*

57  
58 *[Appendix 7 near here]*  
59  
60

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

*[Appendix 8 near here]*

*[Appendix 9 near here]*

*[Appendix 10 near here]*

*[Appendix 11 near here]*

*[Appendix 12 near here]*

*[Appendix 13 near here]*

*[Appendix 14 near here]*

For Peer Review Only

**Table 1.** ENEDIS and WG questions on functional and activity limitations

ENEDIS set of questions	Washington Group Short Set of Questions
(i) Do you have permanent limitations on moving or walking, or on using your arms or legs?	Do you have difficulty walking or climbing steps?
(ii) Do you have permanent limitations on seeing, even when using glasses?	Do you have difficulty seeing, even if wearing glasses?
(iii) Do you have permanent limitations on speaking or communicating, even when using sign language or other [non-verbal forms of communication]?	Using your usual (customary) language, do you have difficulty communicating, for example understanding or being understood?
(iv) Do you have permanent limitations on hearing, even when using a hearing aid?	Do you have difficulty hearing, even if using a hearing aid?
(v) Do you have permanent limitations on understanding or learning (concentrating and remembering)?	Do you have difficulty remembering or concentrating?
(vi) Do you have permanent limitations on interacting with other persons because of your thoughts, feelings, emotions or behaviour?	
(vii) Do you suffer from any chronic illness that permanently limits your daily activities?	
	Do you have difficulty (with self-care such as) washing all over or dressing?

Sources: Author’s elaboration based on 2012 ENEDIS and Washington Group Short Set of Questions on Disability.

**Table 2.** Characteristics of persons with disabilities aged six years and over in Peru

<b>Area</b>	<b>Urban</b>	77.4% (0.04%)	
	<b>Rural</b>	22.6% (0.04%)	
<b>Gender</b>	<b>Men</b>	47.3% (0.04%)	
	<b>Women</b>	52.7% (0.04%)	
<b>Ethnicity</b>	<b>Non-indigenous</b>	68.2% (0.04%)	
	<b>Indigenous</b>	31.8% (0.04%)	
<b>Average age</b>		59.7 years (0.019)	
<b>Average household size</b>		4.2 members (0.002)	
<b>Severity</b>	<b>Functional score</b>	<b>Group 1</b>	88.4% (0.03%)
		<b>Group 2</b>	10.8% (0.03%)
		<b>Group 3</b>	0.8% (0.01%)
	<b>Trichotomy</b>	<b>Mild</b>	11.0% (0.03%)
		<b>Moderate</b>	51.5% (0.04%)
		<b>Severe</b>	37.5% (0.04%)
<b>Categories of disability</b>	<b>Mobility</b>	60.7% (0.04%)	
	<b>Vision</b>	52.4% (0.04%)	
	<b>Hearing</b>	34.9% (0.04%)	
	<b>Communication</b>	15.5% (0.03%)	
	<b>Cognitive</b>	32.1% (0.04%)	

Notes: Since a person can live with more than one category of disability – these are not mutually exclusive groups – the sum of the proportions of persons with different categories of disabilities do not total 100%. Standard errors in parentheses.  
Source: Authors' calculations based on 2012 ENEDIS.

Table 3. Dimensions, indicators, weights, and deprivation criteria

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

Dimension	Indicator	Disability-specific	Weight	Deprived if...
General healthcare	Medical attention not related to disability		1/16	The person has suffered a symptom, illness or accident over the past six months that is not related to her disability, and she has not received medical attention for reasons that reflect exclusion or lack of opportunities (i).
	Health insurance		1/16	The person is not covered by any kind of health insurance.
Disability-related healthcare	Disability-related medical attention	X	1/16	The person has suffered a symptom, illness or accident related to her disability over the last six months, and she has not received medical attention for reasons that reflect exclusion or lack of opportunities.
	Disability-related treatment	X	1/16	The person states that she needs specialised therapy for her specific category of disability (such as physical therapy, psychological treatment, psychiatric treatment or language therapy) and she does not have access to it.
Education, work and retirement	Educational attendance, delay and attainment	X	1/16	- For a school-aged person: she does not attend an education centre and has not completed any of the two basic educational paths (ii) or she is behind the age-appropriate school grade (iii). - For a person above school-age: she has not completed either of the two basic educational paths.
	Adapted education, employment and pension	X	1/16	- For a person aged six to 20: there are no specialised teachers at her education centre and the centre is not adapted to her specific category of disability (iv), or she does not attend an education centre and has not completed either of the basic educational paths. - For a person aged 14 to 64: she is unemployed (v), is time-related underemployed, (vi) or is a discouraged worker (vii). - For a person aged 65 or over: she does not have access either to a retirement pension (contributory or non- contributory) or a widows'/widowers' pension.
Housing	Housing materials		1/24	The person lives in a dwelling with inadequate walls (adobe; mud mixed with cane; stone with mud; wood; straw and other unidentified makeshift materials), floor (dirt or other unidentified makeshift materials) or roof (cane mixed with mud; straw; palm leaves; and other unidentified makeshift materials); or she lives in a makeshift house or a building that was not designed to provide shelter for human beings (such as a stable).
	Overcrowding		1/24	The person lives in a dwelling with three or more people per room, considering only the rooms used for sleeping.
	Housing tenure		1/24	The person lives in a dwelling that has been illegally occupied or transferred, or the dwelling has been occupied under another unspecified form of tenancy.
Basic facilities	Water source		1/32	The person lives in a dwelling unconnected to the public water system.
	Sanitation		1/32	The person lives in a dwelling with no toilet or septic tank, or the toilet is not connected to the public sewer system.
	Cooking fuel		1/32	The person lives in a dwelling in which the fuel used for cooking is coal, charcoal, wood, dung or yareta (an Andean plant).
	Lighting		1/32	The person lives in a dwelling with no electric lighting.
Information and communication	Information technology		1/16	The person does not have access to either radio, television, newsletters or magazines.
	Communication technology		1/16	The person does not have access to either a landline phone, mobile phone or the internet.
Social connectedness	Support	X	1/24	No one helps the person to overcome the limitations she suffers because of her impairment.
	Discrimination	X	1/24	- The person has been treated 'differently' (she has been overprotected, neglected, ignored, physically or verbally abused, or she claims that people get nervous when dealing with her) because of her disability; - or she is or was in a partner relationship that her family or her partner's family were against or got angry about (viii).
	Certification of disability	X	1/24	The person does not have a certificate of disability issued by the Ministry of Health.
Basic daily activities	Mobility	X	1/16	- The person has a mobility or visual impairment and needs some kind of aid to move but does not have access to it, or she has such an aid, but finds it inadequate; - or the person has difficulties using every kind of transportation service available in the area where she lives, or there are no such services available in the area where she lives (excluding taxis, air transportation and other non-identified private services); - or the person has limitations on her mobility at home, at her education centre or workplace, or is unable to get around anywhere.

Leisure		1/16	The person dedicates all of her time to caring for another person with disabilities or she does not engage in any kind of recreational activity in her spare time (ix).
---------	--	------	---

## Notes:

(i) Reasons that reflect exclusion or lack of opportunities are: there was no medicine at the health centre; she did not have money; there was no medical centre nearby; there was no doctor in the area; there was no medical staff at the medical centre; she did not trust the medical service; she did not have health insurance; she self-medicated; she did not have time to go to a health centre; she thought the medical staff mistreated patients; her impairment prevented her from getting to the health centre; or she did not understand the doctor.

(ii) In Peru, PWD can follow two basic educational paths: regular basic education (which starts at six years of age and covers six years of primary education and five years of secondary education) or special basic education (which is targeted at persons with severe disabilities up to the age of 20 and comprises only six years of primary education).

(iii) We consider a person following the regular education path to be deprived if she is more than two years behind her age-appropriate school grade. A person who follows the special education path is deprived if the number of years by which she is behind will prevent her from completing this six-year path by the age of 20, the legal age limit for attending this kind of education centres. For example, a person aged 16 or older who is attending the first year of the special education path is deprived in this indicator because she will not be able to finish the six years of this path by the age of 20.

(iv) We consider a centre to be adapted to persons with mobility disability if it has at least one of the following: ramp, handrails, lift, or accessible toilets. A centre is adapted to persons with visual disability if there is at least one of the following: JAWS screen reader, audio player, Braille embosser, Braille books, or audio books. Finally, a centre is adapted to persons with communication or hearing disabilities if the school utilises sign language or fingerspelling.

(v) A person is unemployed if she is not working but is looking for a job and is available to work.

(vi) A person is time-related underemployed if she regularly works less than 35 hours per week, but wants to work more hours and is available to do so.

(vii) A person is considered a discouraged worker if she is not working, wants to work and is available to do so, but is not looking for a job.

(viii) Deprivation criterion related to partner relationships applies only for persons with disabilities aged 14 years of age or over.

(ix) Recreational activities involve watching tv, listening to the radio or to music, reading, surfing the internet, chatting or emailing, visiting friends, making crafts, doing sports, attending recreational facilities, attending prayer meetings, resting or any other unspecified leisure activity.

**Table 4.** Incidence ( $H$ ), intensity ( $A$ ), and adjusted headcount ratio ( $M_0$ ) by severity and disability categories,  $k = 3/8$  poverty cut-off

			<b>H</b>	<b>A</b>	<b>M0</b>	<b>Number of observations</b>	<b>Coefficient of variation</b>
<b>Severity</b>	<b>Functional score</b>	<b>Group 1</b>	38.4% (0.04%)	48.9% (0.01%)	0.188 (0.0002)	28,567	0.04%
		<b>Group 2</b>	61.5% (0.13%)	52.2% (0.04%)	0.321 (0.0007)	3,590	0.09%
		<b>Group 3</b>	64.4% (0.46%)	53.0% (0.13%)	0.341 (0.0026)	255	0.32%
	<b>Trichotomy</b>	<b>Mild</b>	20.4% (0.10%)	46.6% (0.05%)	0.095 (0.0005)	2,905	0.12%
		<b>Moderate</b>	36.1% (0.06%)	48.6% (0.02%)	0.175 (0.0003)	17,131	0.05%
		<b>Severe</b>	54.0% (0.07%)	50.7% (0.02%)	0.274 (0.0004)	13,022	0.05%
<b>Categories of disability</b>	<b>Mobility</b>	43.2% (0.05%)	49.9% (0.02%)	0.215 (0.0003)	20,186	0.05%	
	<b>Vision</b>	41.3% (0.06%)	49.9% (0.02%)	0.206 (0.0003)	17,589	0.05%	
	<b>Hearing</b>	44.7% (0.07%)	50.7% (0.02%)	0.226 (0.0004)	11,375	0.06%	
	<b>Communication</b>	53.9% (0.11%)	50.5% (0.03%)	0.272 (0.0006)	5,279	0.08%	
	<b>Cognitive</b>	46.8% (0.08%)	49.8% (0.02%)	0.233 (0.0004)	10,202	0.06%	

Note: Standard errors in parentheses.

Source: Authors' calculations based on 2012 ENEDIS.

**Table 5.** Subgroup contribution to adjusted headcount ratio ( $M_0$ ) by area, gender, ethnicity, severity, and disability categories,  $k = 3/8$  poverty cut-off

		Share of the population	Subgroup contribution to $M_0$	
Area	Urban	77.4%	49.2%	
	Rural	22.6%	50.8%	
Gender	Men	47.3%	44.7%	
	Women	52.7%	55.3%	
Ethnicity	Non-indigenous	68.2%	55.7%	
	Indigenous	31.8%	44.3%	
Area, gender and ethnicity	RIWD	6.6%	15.5%	
	Rest of PWD	93.4%	84.5%	
Severity	Functional score	Group 1	88.4%	81.5%
		Group 2	10.8%	17.0%
		Group 3	0.8%	1.4%
	Trichotomy	Mild	11.0%	5.1%
		Moderate	51.5%	44.3%
		Severe	37.5%	50.4%
Categories of disability	Mobility	60.7%	64.2%	
	Vision	52.4%	53.0%	
	Hearing	34.9%	38.8%	
	Communication	15.5%	20.7%	
	Cognitive	32.1%	36.8%	

Note: RIWD, rural, indigenous, women with disabilities; PWD, persons with disabilities.

Source: Authors' calculations based on 2012 ENEDIS.



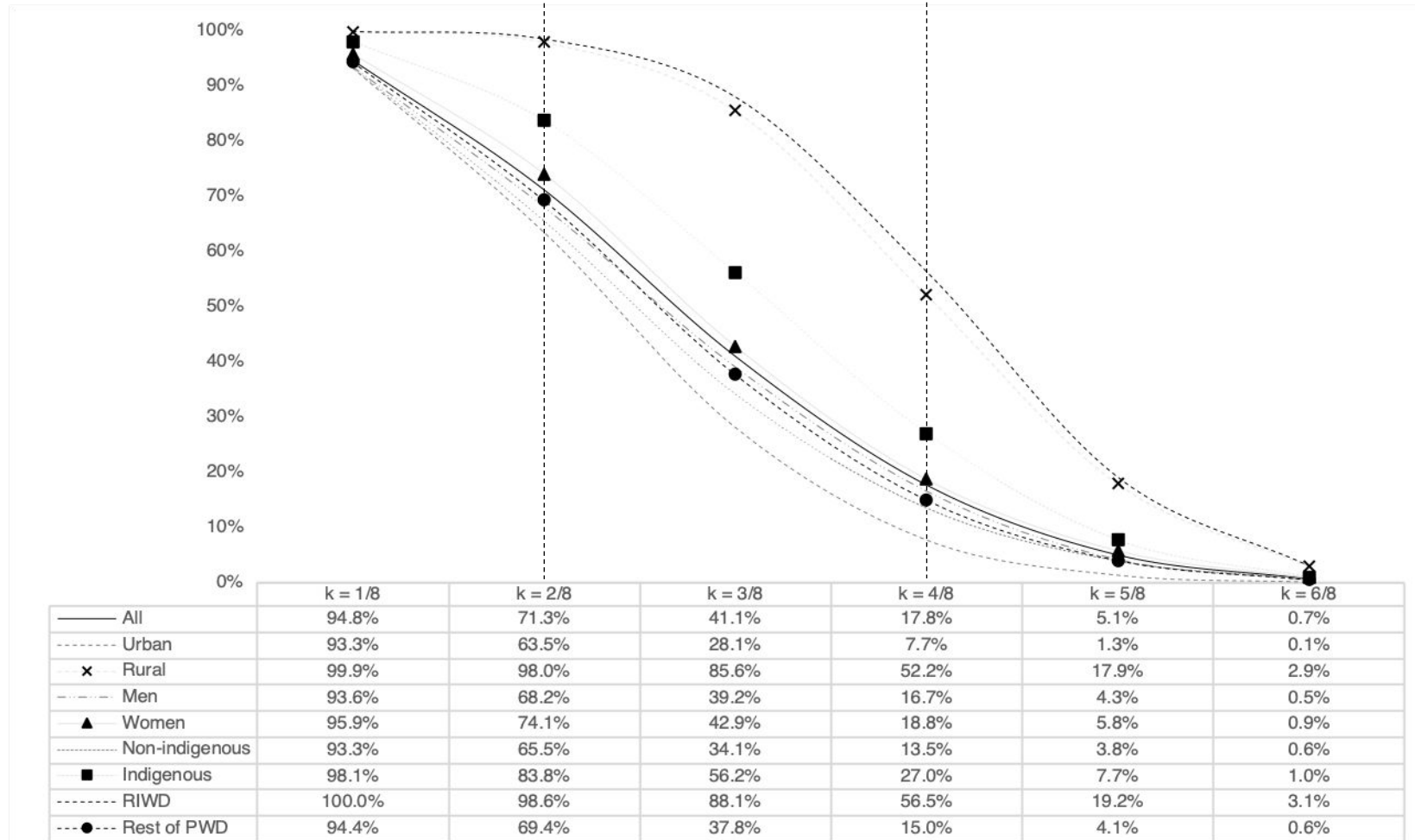
**Table 6.** Contribution of dimensions to adjusted headcount ratio ( $M_0$ ) by area, gender, ethnicity, severity, and disability categories,  $k = 3/8$  poverty cut-off

Dimensions		General health	Disability-related health	Education, work and retirement	Housing	Basic facilities	Information and communication	Social connectedness	Basic daily activities	
All		9.4%	13.9%	19.5%	11.2%	9.9%	10.4%	12.3%	13.5%	
Area	Urban	11.8%	15.5%	21.8%	10.3%	4.3%	8.2%	13.2%	14.9%	
	Rural	7.1%	12.3%	17.2%	12.0%	15.3%	12.6%	11.4%	12.2%	
Gender	Men	9.4%	13.9%	19.1%	11.5%	10.7%	9.9%	12.4%	13.1%	
	Women	9.4%	13.9%	19.8%	10.9%	9.2%	10.8%	12.2%	13.8%	
Ethnicity	Non-indigenous	10.5%	14.4%	19.9%	11.0%	8.8%	9.6%	12.5%	13.3%	
	Indigenous	8.0%	13.3%	18.9%	11.4%	11.2%	11.4%	12.0%	13.8%	
Area, gender and ethnicity	RIWD	5.9%	12.3%	17.2%	11.6%	15.0%	13.7%	11.3%	13.0%	
	Rest of PWD	10.0%	14.2%	19.9%	11.1%	8.9%	9.8%	12.5%	13.6%	
Severity	Functional score	Group 1	9.5%	14.0%	19.4%	11.5%	10.2%	9.8%	12.4%	13.1%
		Group 2	8.5%	13.3%	19.6%	9.8%	8.7%	13.2%	12.0%	14.8%
		Group 3	8.6%	13.2%	20.3%	7.9%	5.4%	13.9%	11.4%	19.4%
	Trichotomy	Mild	10.5%	14.7%	20.4%	11.8%	9.8%	7.2%	12.8%	12.6%
		Moderate	9.9%	14.0%	19.9%	11.4%	9.8%	9.9%	12.1%	13.0%
		Severe	8.8%	13.7%	19.0%	10.9%	9.9%	11.2%	12.4%	14.0%
Categories of disability	Mobility	9.1%	14.6%	19.7%	10.5%	8.9%	10.1%	12.0%	15.0%	
	Vision	9.3%	13.6%	20.3%	10.5%	9.0%	10.7%	11.7%	14.9%	
	Hearing	8.9%	13.1%	20.3%	10.4%	9.8%	12.3%	11.9%	13.3%	
	Communication	9.0%	13.4%	18.8%	11.3%	10.1%	12.1%	13.1%	12.3%	
	Cognitive	9.7%	14.0%	19.9%	10.4%	8.2%	11.5%	12.9%	13.4%	

Note: RIWD, rural, indigenous, women with disabilities; PWD, persons with disabilities.

Source: Authors' calculations based on 2012 ENEDIS.

Figure 1. Incidence ( $H$ ) for subgroups of persons with disabilities by area, gender, and ethnicity



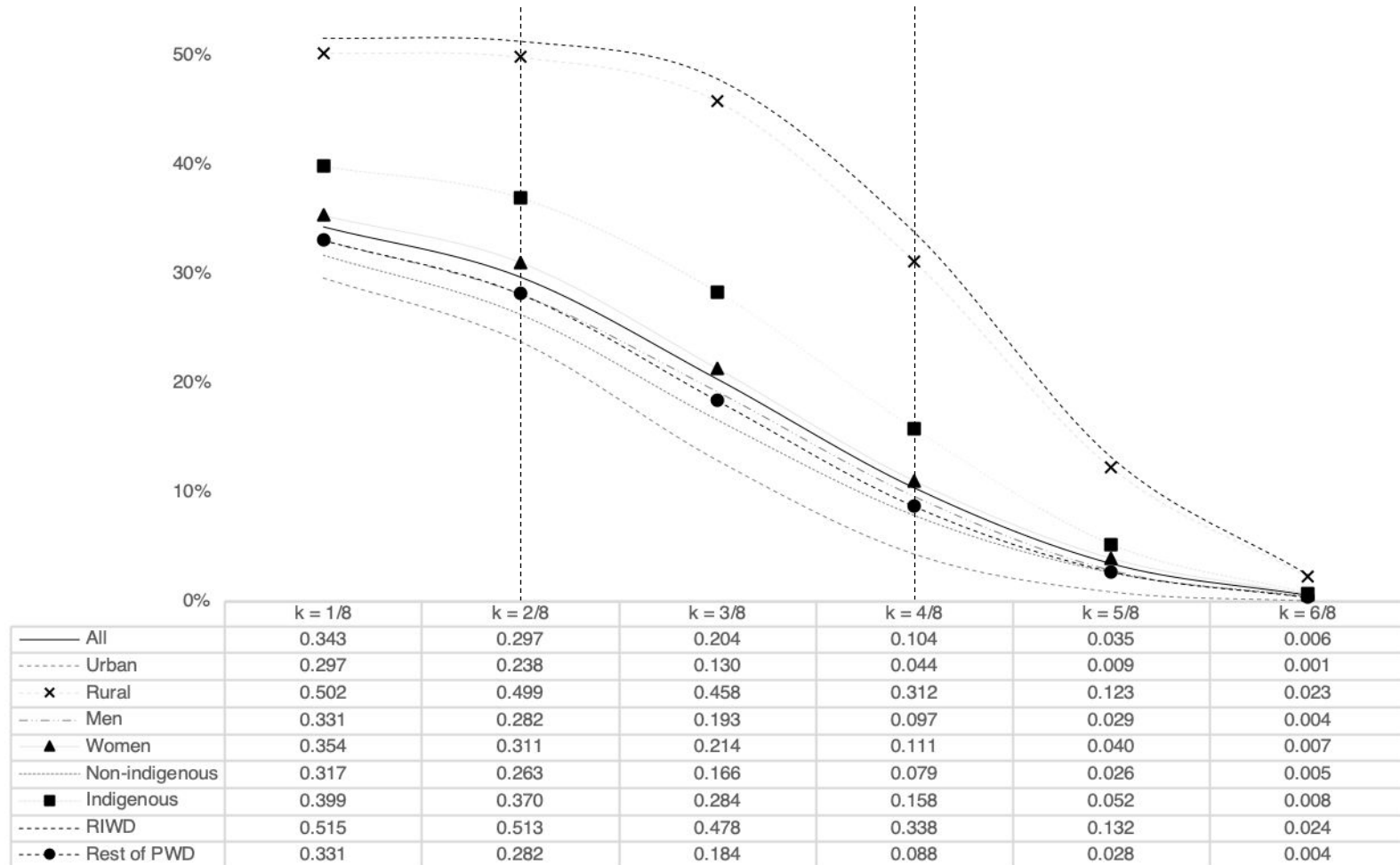
Note: RIWD, rural, indigenous, women with disabilities; PWD, persons with disabilities.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

Source: Authors' calculations based on 2012 ENEDIS.

For Peer Review Only

**Figure 2.** Adjusted headcount ratio ( $M_0$ ) for subgroups of persons with disabilities by area, gender, and ethnicity



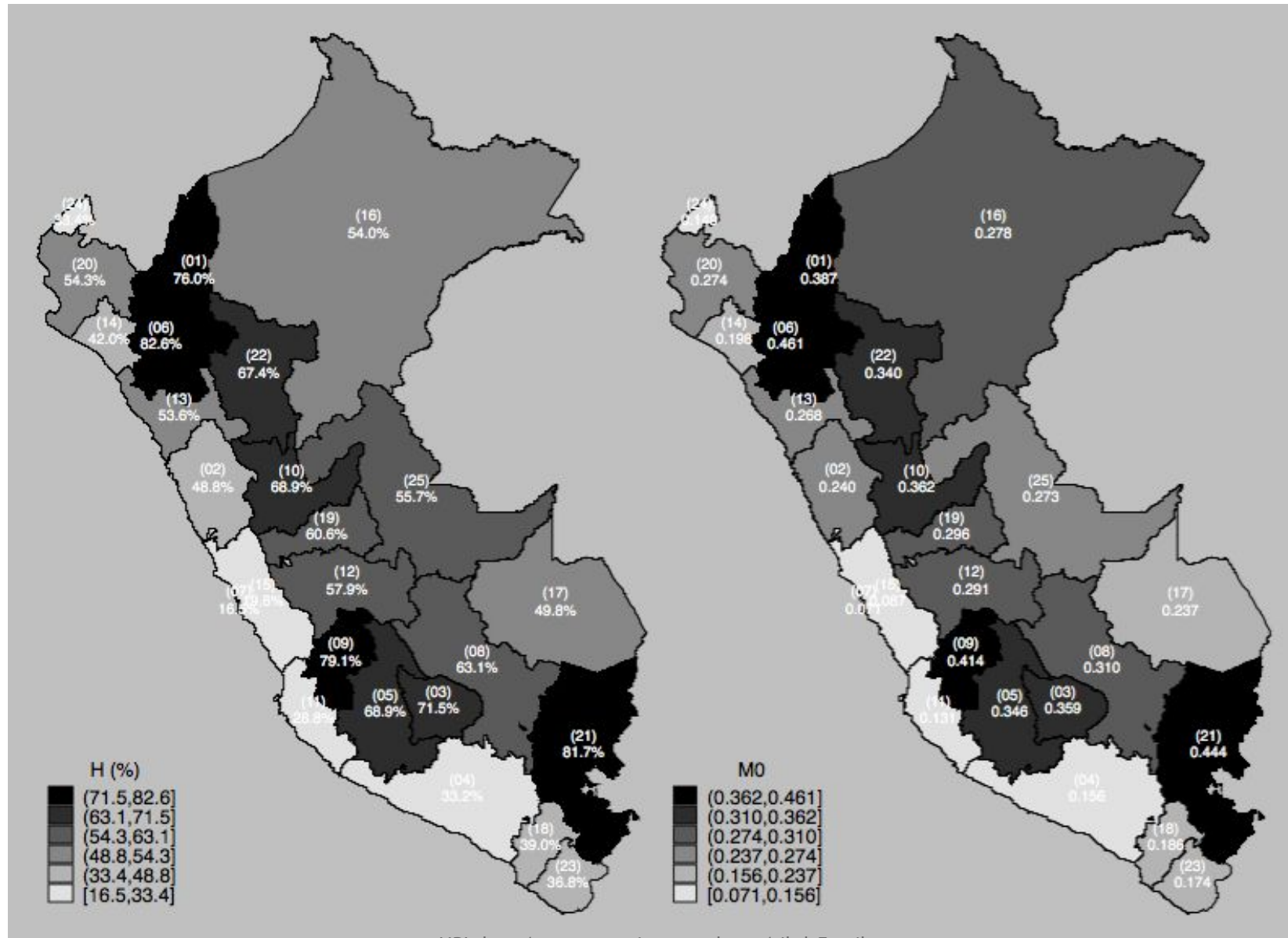
Note: RIWD, rural, indigenous, women with disabilities; PWD, persons with disabilities.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

Source: Authors' calculations based on 2012 ENEDIS.

For Peer Review Only

**Figure 3.** Incidence ( $H$ ) and adjusted headcount ratio ( $M_0$ ) by region,  $k = 3/8$  poverty cut-off

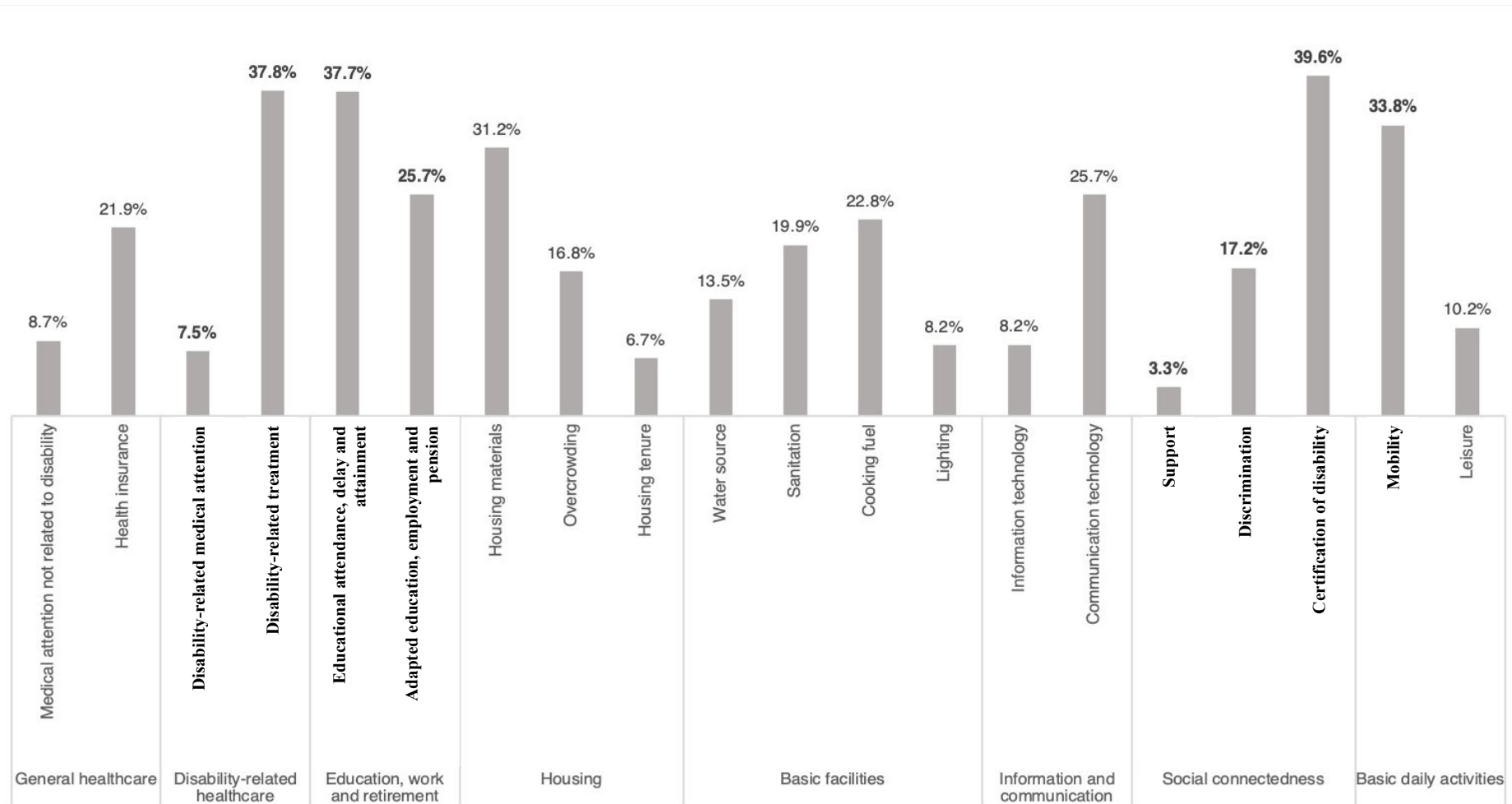


1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

Source: Authors' calculations based on 2012 ENEDIS.

For Peer Review Only

**Figure 4.** Censored headcount ratios by indicator for all persons with disabilities,  $k = 3/8$  poverty cut-off



Note: Disability-specific indicators are shown in bold letters.



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

Source: Authors' calculations based on 2012 ENEDIS.

For Peer Review Only

**Appendix 1.** Incidence of deprivation in indicators where deprivation criteria are specific to different disability categories

Indicator	Categories of disability				
	Mobility	Vision	Hearing	Communication	Cognitive
Adapted education, employment and pensions	47.3% (0.05%)	49.4% (0.06%)	51.9% (0.07%)	46.7% (0.10%)	49.6% (0.07%)
Mobility	84.6% (0.04%)	83.4% (0.04%)	69.1% (0.06%)	59.9% (0.10%)	66.7% (0.07%)

Note: Standard errors in parentheses.

Source: Authors' calculations based on 2012 ENEDIS.

Appendix 2. Cramér’s V coefficient between indicators of deprivation

Dimension	Indicator	General healthcare		Disability-related healthcare		Education, work and retirement		Housing		
		Medical attention not related to disability	Health insurance	Disability-related medical attention	Disability-related treatment	Educational attendance, delay and attainment	Adapted education, employment and pension	Housing materials	Overcrowding	Housing tenure
General healthcare	Medical attention not related to disability									
	Health insurance	0.119								
Disability-related healthcare	Disability-related medical attention	0.258	0.116							
	Disability-related treatment	0.057	0.031	0.051						
Education, work and retirement	Educational attendance, delay and attainment	0.076	0.078	0.036	0.083					
	Adapted education, employment and pension	0.043	0.145	0.017	0.032	0.216				
Housing	Housing materials	0.126	0.046	0.115	0.122	0.249	0.065			
	Overcrowding	0.083	0.056	0.078	0.053	0.085	0.014	0.294		
	Housing tenure	0.016	0.031	0.042	0.010	-0.015	0.011	0.057	0.096	
Basic facilities	Water source	0.088	0.044	0.071	0.076	0.155	0.036	0.412	0.216	0.028
	Sanitation	0.097	0.047	0.091	0.095	0.208	0.048	0.541	0.257	0.010
	Cooking fuel	0.113	0.013	0.093	0.117	0.259	0.063	0.616	0.266	-0.019
	Lighting	0.067	0.062	0.038	0.045	0.134	0.025	0.328	0.192	0.020
Information and communication	Information technology	0.067	0.034	0.049	0.059	0.172	0.059	0.270	0.121	-0.003
	Communication technology	0.096	0.056	0.069	0.106	0.296	0.127	0.372	0.157	0.012
Social connectedness	Support	0.022	0.012	0.043	-0.076	0.016	-0.009	0.053	0.038	0.006
	Discrimination	0.066	0.042	0.066	0.138	0.004	-0.003	0.108	0.103	0.053
	Certification of disability	0.019	0.052	0.005	-0.048	0.077	0.063	0.052	-0.006	-0.054
Basic daily activities	Mobility	0.037	-0.032	0.059	0.113	0.093	0.047	0.056	-0.009	-0.013

Leisure	0.018	0.032	0.000	0.045	0.113	0.047	0.111	0.053	-0.011
---------	-------	-------	-------	-------	-------	-------	-------	-------	--------

## Appendix 2. Continued

Dimension	Indicator	Basic facilities				Information and communication		Social connectedness			Basic daily activities	
		Water source	Sanitation	Cooking fuel	Lighting	Information technology	Communication technology	Support	Discrimination	Certification of disability	Mobility	Leisure
General healthcare	Medical attention not related to disability											
	Health insurance											
Disability-related healthcare	<b>Disability-related medical attention</b>											
	<b>Disability-related treatment</b>											
Education, work and retirement	<b>Educational attendance, delay and attainment</b>											
	<b>Adapted education, employment and pension</b>											
Housing	Housing materials											
	Overcrowding											
	Housing tenure											
Basic facilities	Water source											
	Sanitation	0.607										
	Cooking fuel	0.467	0.623									
	Lighting	0.445	0.440	0.412								
Information and communication	Information technology	0.235	0.310	0.345	0.295							
	Communication technology	0.297	0.370	0.432	0.271	0.413						
Social connectedness	<b>Support</b>	0.046	0.058	0.048	0.050	0.070	0.046					
	<b>Discrimination</b>	0.065	0.089	0.092	0.046	0.039	0.112	-0.031				
	<b>Certification of disability</b>	0.045	0.067	0.058	0.034	0.041	0.035	0.022	-0.166			
Basic daily activities	<b>Mobility</b>	0.041	0.036	0.045	0.013	0.065	0.071	-0.029	0.009	0.015		

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

---

Leisure	0.095	0.121	0.132	0.098	0.187	0.169	0.029	0.022	0.026	0.076	
---------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--

Note: Disability-specific indicators are shown in bold letters.

Source: Authors' calculations based on 2012 ENEDIS.

For Peer Review Only

**Appendix 3.  $R_0$  measure of overlap between indicators of deprivation**

Dimension	Indicator	General healthcare		Disability-related healthcare		Education, work and retirement		Housing		
		Medical attention not related to disability	Health insurance	Disability-related medical attention	Disability-related treatment	Educational attendance, delay and attainment	Adapted education, employment and pension	Housing materials	Overcrowding	Housing tenure
General healthcare	Medical attention not related to disability									
	Health insurance	0.549								
Disability-related healthcare	Disability-related medical attention	0.363	0.560							
	Disability-related treatment	0.875	0.828	0.875						
Education, work and retirement	Educational attendance, delay and attainment	0.793	0.739	0.745	0.834					
	Adapted education, employment and pension	0.519	0.550	0.484	0.827	0.805				
Housing	Housing materials	0.600	0.454	0.598	0.868	0.829	0.497			
	Overcrowding	0.342	0.433	0.344	0.849	0.763	0.471	0.682		
	Housing tenure	0.136	0.425	0.163	0.823	0.675	0.472	0.503	0.354	
Basic facilities	Water source	0.240	0.437	0.230	0.884	0.863	0.502	0.905	0.461	0.178
	Sanitation	0.339	0.428	0.342	0.882	0.872	0.503	0.917	0.447	0.235
	Cooking fuel	0.404	0.396	0.390	0.889	0.894	0.511	0.929	0.472	0.243
	Lighting	0.182	0.484	0.133	0.870	0.896	0.499	0.951	0.511	0.143
Information and communication	Information technology	0.182	0.440	0.144	0.891	0.957	0.555	0.867	0.413	0.118
	Communication technology	0.442	0.425	0.415	0.874	0.894	0.551	0.693	0.446	0.333
Social connectedness	Support	0.140	0.408	0.147	0.693	0.722	0.441	0.530	0.308	0.129
	Discrimination	0.378	0.417	0.385	0.897	0.696	0.456	0.509	0.376	0.356
	Certification of disability	0.944	0.947	0.934	0.925	0.944	0.948	0.947	0.928	0.893
Basic daily activities	Mobility	0.757	0.693	0.794	0.842	0.740	0.736	0.741	0.704	0.695

	Leisure	0.161	0.423	0.143	0.857	0.822	0.515	0.559	0.297	0.132
--	---------	-------	-------	-------	-------	-------	-------	-------	-------	-------

Appendix 3. Continued

Dimension	Indicator	Basic facilities				Information and communication		Social connectedness			Basic daily activities	
		Water source	Sanitation	Cooking fuel	Lighting	Information technology	Communication technology	Support	Discrimination	Certification of disability	Mobility	Leisure
General healthcare	Medical attention not related to disability											
	Health insurance											
Disability-related healthcare	<b>Disability-related medical attention</b>											
	<b>Disability-related treatment</b>											
Education, work and retirement	<b>Educational attendance, delay and attainment</b>											
	<b>Adapted education, employment and pension</b>											
Housing	Housing materials											
	Overcrowding											
	Housing tenure											
Basic facilities	Water source											
	Sanitation	0.825										
	Cooking fuel	0.753	0.774									
	Lighting	0.671	0.823	0.856								
Information and communication	Information technology	0.430	0.655	0.770	0.360							
	Communication technology	0.645	0.636	0.652	0.728	0.953						
Social connectedness	<b>Support</b>	0.217	0.322	0.350	0.143	0.161	0.401					
	<b>Discrimination</b>	0.363	0.368	0.363	0.361	0.350	0.398	0.237				
	<b>Certification of disability</b>	0.958	0.962	0.955	0.959	0.965	0.943	0.951	0.865			
Basic daily activities	<b>Mobility</b>	0.755	0.741	0.746	0.731	0.808	0.758	0.656	0.717	0.933		

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

---

Leisure	0.235	0.349	0.407	0.255	0.360	0.510	0.182	0.318	0.947	0.796	
---------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--

Note: Disability-specific indicators are shown in bold letters.

Source: Authors' calculations based on 2012 ENEDIS.

For Peer Review Only



Appendix 4. Incidence (H), intensity (A), and adjusted headcount ratio (M0) by area, gender, and ethnicity

k	All			Area								
	H	A	M0	H			A			M0		
	All			Urban	Rural	Difference (Urban-Rural)	Urban	Rural	Difference (Urban-Rural)	Urban	Rural	Difference (Urban-Rural)
1/8	94.8% (0.02%)	36.2% (0.01%)	0.343 (0.0001)	93.3% (0.02%)	99.9% (0.00%)	-6.6***	31.8% (0.01%)	50.3% (0.02%)	-18.5***	0.297 (0.0001)	0.502 (0.0002)	-0.206***
2/8	71.3% (0.04%)	41.7% (0.01%)	0.297 (0.0002)	63.5% (0.05%)	98.0% (0.02%)	-34.5***	37.5% (0.01%)	50.9% (0.02%)	-13.3***	0.238 (0.0002)	0.499 (0.0002)	-0.260***
3/8	41.1% (0.04%)	49.5% (0.01%)	0.204 (0.0002)	28.1% (0.04%)	85.6% (0.06%)	-57.5***	46.0% (0.01%)	53.5% (0.02%)	-7.5***	0.130 (0.0002)	0.458 (0.0004)	-0.329***
4/8	17.8% (0.03%)	58.6% (0.02%)	0.104 (0.0002)	7.7% (0.03%)	52.2% (0.09%)	-44.5***	56.4% (0.02%)	59.7% (0.02%)	-3.4***	0.044 (0.0001)	0.312 (0.0005)	-0.268***
5/8	5.1% (0.02%)	68.3% (0.02%)	0.035 (0.0001)	1.3% (0.01%)	17.9% (0.07%)	-16.6***	67.0% (0.04%)	68.7% (0.02%)	-1.7***	0.009 (0.0001)	0.123 (0.0005)	-0.114***
6/8	0.7% (0.01%)	79.0% (0.04%)	0.006 (0.0001)	0.1% (0.00%)	2.9% (0.03%)	-2.8***	79.0% (0.14%)	79.0% (0.05%)	0.0	0.001 (0.0000)	0.023 (0.0002)	-0.022***
7/8	0.0% (0.00%)	91.0% (0.14%)	0.000 (0.0000)	0.0% (0.00%)	0.2% (0.01%)	-0.2***	88.8% (0.12%)	91.2% (0.15%)	-2.5***	0.000 (0.0000)	0.002 (0.0001)	-0.001***
8/8	0.0% -	- -	- -	0.0% -	0.0% -	-	- -	- -	-	- -	- -	-
Number of observations All = 33,275				Number of observations Urban = 25,120 Rural = 8,155								

Coefficient of variation All = 0.04%	Coefficient of variation Urban = 0.04% Rural = 0.04%
---	--

## Appendix 4. Continued

k	Gender								
	H			A			M0		
	Men	Women	Difference (Men- Women)	Men	Women	Difference (Men- Women)	Men	Women	Difference (Men- Women)
1/8	93.6% (0.03%)	95.9% (0.02%)	-2.3***	35.4% (0.02%)	36.9% (0.02%)	-1.5***	0.331 (0.0002)	0.354 (0.0002)	-0.023***
2/8	68.2% (0.06%)	74.1% (0.05%)	-5.9***	41.4% (0.02%)	41.9% (0.02%)	-0.6***	0.282 (0.0003)	0.311 (0.0002)	-0.029***
3/8	39.2% (0.06%)	42.9% (0.06%)	-3.7***	49.2% (0.02%)	49.9% (0.02%)	-0.7***	0.193 (0.0003)	0.214 (0.0003)	-0.021***
4/8	16.7% (0.05%)	18.8% (0.05%)	-2.1***	58.0% (0.02%)	59.1% (0.02%)	-1.0***	0.097 (0.0003)	0.111 (0.0003)	-0.014***
5/8	4.3% (0.03%)	5.8% (0.03%)	-1.5***	67.9% (0.03%)	68.6% (0.03%)	-0.7***	0.029 (0.0002)	0.040 (0.0002)	-0.011***
6/8	0.5% (0.01%)	0.9% (0.01%)	-0.3***	77.9% (0.05%)	79.5% (0.06%)	-1.6***	0.004 (0.0001)	0.007 (0.0001)	-0.003***
7/8	0.0% (0.00%)	0.1% (0.00%)	-0.1***	87.5% -	91.1% (0.14%)	-	0.000 (0.0000)	0.001 (0.0000)	-0.001***

8/8	0.0%	0.0%	-	-	-	-	-	-	-
	-	-		-	-		-	-	
<b>Number of observations</b> <b>Men = 15,813</b> <b>Women = 17,462</b>									
<b>Coefficient of variation</b> <b>Men = 0.06%</b> <b>Women = 0.05%</b>									

Appendix 4. Continued

		Ethnicity								
		H			A			M0		
k		Non-indigenous	Indigenous	Difference (Non-indigenous-indigenous)	Non-indigenous	Indigenous	Difference (Non-indigenous-indigenous)	Non-indigenous	Indigenous	Difference (Non-indigenous-indigenous)
1/8		93.3% (0.03%)	98.1% (0.02%)	-4.8***	34.0% (0.01%)	40.7% (0.02%)	-6.7***	0.317 (0.0002)	0.399 (0.0002)	-0.082***
2/8		65.5% (0.05%)	83.8% (0.06%)	-18.3***	40.2% (0.01%)	44.2% (0.02%)	-4.0***	0.263 (0.0002)	0.370 (0.0003)	-0.107***
3/8		34.1% (0.05%)	56.2% (0.08%)	-22.1***	48.8% (0.02%)	50.5% (0.02%)	-1.8***	0.166 (0.0002)	0.284 (0.0004)	-0.118***
4/8		13.5% (0.04%)	27.0% (0.07%)	-13.5***	58.6% (0.02%)	58.6% (0.02%)	-0.1***	0.079 (0.0002)	0.158 (0.0004)	-0.079***
5/8		3.8% (0.02%)	7.7% (0.04%)	-3.9***	68.5% (0.03%)	68.1% (0.03%)	0.4***	0.026 (0.0001)	0.052 (0.0003)	-0.026***

6/8	0.6% (0.01%)	1.0% (0.02%)	-0.4***	79.1% (0.06%)	78.8% (0.06%)	0.2***	0.005 (0.0001)	0.008 (0.0001)	-0.003***
7/8	0.0% (0.00%)	0.0% (0.00%)	0.0***	91.2% (0.18%)	90.2% (0.16%)	1.1***	0.000 (0.0000)	0.000 (0.0000)	0.000***
8/8	0.0% -	0.0% -	-	- -	- -	-	- -	- -	-
<b>Number of observations</b> <b>Non-indigenous = 21,794</b> <b>Indigenous = 11,481</b>									
<b>Coefficient of variation</b> <b>Non-indigenous = 0.05%</b> <b>Indigenous = 0.06%</b>									

#### Appendix 4. Continued

Area, gender and ethnicity									
k	H			A			M0		
	RIWD	Rest of PWD	Difference (RIWD-Rest of PWD)	RIWD	Rest of PWD	Difference (RIWD-Rest of PWD)	RIWD	Rest of PWD	Difference (RIWD-Rest of PWD)
1/8	100.0% (0.01%)	94.4% (0.02%)	5.6***	51.6% (0.04%)	35.1% (0.01%)	16.5***	0.515 (0.0004)	0.331 (0.0001)	0.184***
2/8	98.6% (0.04%)	69.4% (0.04%)	29.2***	52.0% (0.04%)	40.6% (0.01%)	11.3***	0.513 (0.0004)	0.282 (0.0002)	0.231***
3/8	88.1% (0.11%)	37.8% (0.04%)	50.3***	54.3% (0.04%)	48.8% (0.01%)	5.5***	0.478 (0.0007)	0.184 (0.0002)	0.294***

4/8	56.5% (0.16%)	15.0% (0.03%)	41.4***	59.8% (0.03%)	58.3% (0.02%)	1.6***	0.338 (0.0010)	0.088 (0.0002)	0.250***
5/8	19.2% (0.13%)	4.1% (0.02%)	15.1***	68.9% (0.04%)	68.2% (0.02%)	0.7***	0.132 (0.0009)	0.028 (0.0001)	0.104***
6/8	3.1% (0.06%)	0.6% (0.01%)	2-5***	79.5% (0.09%)	78.7% (0.05%)	0.8***	0.024 (0.0005)	0.004 (0.0001)	0.020***
7/8	0.2% (0.01%)	0.0% (0.00%)	0.1***	90.3% (0.17%)	91.2% (0.18%)	-0.9***	0.001 (0.0001)	0.000 (0.0000)	0.001***
8/8	0.0% -	0.0% -	-	- -	- -	-	- -	- -	-
<b>Number of observations</b> <b>RIWD = 2,311</b> <b>Rest of PWD = 30,964</b>									
<b>Coefficient of variation</b> <b>RIWD = 0.08%</b> <b>Rest of PWD = 0.04%</b>									

Notes: \*\*\* difference significant at 99%, \*\* difference significant at 95%, \* difference significant at 90%. Standard errors in parentheses.  
 RIWD, rural, indigenous, women with disabilities; PWD, persons with disabilities.  
 Source: Authors' calculations based on 2012 ENEDIS.

**Appendix 5.** Incidence ( $H$ ) and adjusted headcount ratio ( $M_0$ ) by region,  $k = 3/8$  poverty cut-off

ID	Subnational region	H	M0	Number of observations	Coefficient of variation
01	Amazonas	76.0% (0.38%)	0.387 (0.0021)	825	0.25%
02	Ancash	48.8% (0.25%)	0.240 (0.0013)	1,167	0.19%
03	Apurimac	71.5% (0.32%)	0.359 (0.0017)	1,094	0.21%
04	Arequipa	33.2% (0.17%)	0.156 (0.0008)	1,836	0.16%
05	Ayacucho	68.9% (0.28%)	0.346 (0.0015)	1,127	0.19%
06	Cajamarca	82.6% (0.16%)	0.461 (0.0010)	1,060	0.12%
07	Callao	16.5% (0.16%)	0.071 (0.0007)	1,617	0.18%
08	Cusco	63.1% (0.24%)	0.310 (0.0012)	1,092	0.16%
09	Huancavelica	79.1% (0.28%)	0.414 (0.0016)	985	0.18%
10	Huanuco	68.9% (0.24%)	0.362 (0.0013)	1,337	0.18%
11	Ica	28.8% (0.24%)	0.131 (0.0011)	1,296	0.22%
12	Junin	57.9% (0.24%)	0.291 (0.0013)	1,051	0.18%
13	La Libertad	53.6% (0.19%)	0.268 (0.0010)	1,294	0.15%
14	Lambayeque	42.0% (0.25%)	0.198 (0.0012)	1,220	0.19%
15	Lima	19.6% (0.05%)	0.087 (0.0002)	4,841	0.06%
16	Loreto	54.0% (0.29%)	0.278 (0.0016)	1,139	0.23%
17	Madre de Dios	49.8% (0.81%)	0.237 (0.0040)	554	0.56%
18	Moquegua	39.0% (0.48%)	0.186 (0.0023)	1,014	0.38%
19	Pasco	60.6% (0.43%)	0.296 (0.0022)	771	0.28%
20	Piura	54.3% (0.19%)	0.274 (0.0010)	1,647	0.14%
21	Puno	81.7% (0.15%)	0.444 (0.0009)	1,057	0.11%
22	San Martin	67.4% (0.28%)	0.340 (0.0015)	1,233	0.18%
23	Tacna	36.8% (0.36%)	0.174 (0.0017)	1,014	0.29%
24	Tumbes	33.4%	0.149	1,750	0.30%

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

		(0.43%)	(0.0020)		
25	Ucayali	55.7%	0.273	1,254	0.26%
		(0.37%)	(0.0019)		

Note: Standard errors in parentheses.  
Source: Authors' calculations based on 2012 ENEDIS.

For Peer Review Only

**Appendix 6.** Censored headcounts by area, gender, and ethnicity,  $k = 3/8$  poverty cut-off

Dimension	Indicator	All	Area			Gender		
			Urban	Rural	Difference (Urban-Rural)	Men	Women	Difference (Men-Women)
General healthcare	Medical attention not related to disability	8.7% (0.02%)	6.8% (0.02%)	15.1% (0.06%)	-8.3***	7.8% (0.03%)	9.5% (0.03%)	-1.7***
	Health insurance	21.9% (0.04%)	17.5% (0.04%)	37.0% (0.09%)	-19.5***	21.1% (0.05%)	22.6% (0.05%)	-1.5***
Disability-related healthcare	<b>Disability-related medical attention</b>	7.5% (0.02%)	6.1% (0.02%)	12.5% (0.06%)	-6.4***	6.8% (0.03%)	8.1% (0.03%)	-1.4***
	<b>Disability-related treatment</b>	37.8% (0.04%)	26.1% (0.04%)	78.0% (0.07%)	-51.8***	35.9% (0.06%)	39.5% (0.06%)	-3.6***
Education, work and retirement	<b>Educational attendance, delay and attainment</b>	37.7% (0.04%)	25.5% (0.04%)	79.7% (0.07%)	-54.2***	34.7% (0.06%)	40.4% (0.06%)	-5.6***
	<b>Adapted education, employment and pension</b>	25.7% (0.04%)	19.8% (0.04%)	46.1% (0.09%)	-26.3***	24.1% (0.05%)	27.2% (0.05%)	-3.0***
Housing	Housing materials	31.2% (0.04%)	16.0% (0.04%)	83.2% (0.07%)	-67.1***	30.6% (0.06%)	31.7% (0.05%)	-1.1***
	Overcrowding	16.8% (0.03%)	10.1% (0.03%)	39.7% (0.09%)	-29.6***	16.4% (0.05%)	17.1% (0.04%)	-0.7***
	Housing tenure	6.7% (0.02%)	5.9% (0.02%)	9.2% (0.05%)	-3.3***	6.4% (0.03%)	6.9% (0.03%)	-0.5***
Basic facilities	Water source	13.5% (0.03%)	3.9% (0.02%)	46.3% (0.09%)	-42.3***	14.2% (0.04%)	12.8% (0.04%)	1.4***



	Sanitation	19.9% (0.03%)	5.7% (0.02%)	68.3% (0.08%)	-62.6***	20.2% (0.05%)	19.5% (0.05%)	0.7***
	Cooking fuel	22.8% (0.04%)	6.8% (0.02%)	77.9% (0.07%)	-71.1***	22.7% (0.05%)	23.0% (0.05%)	-0.3***
	Lighting	8.2% (0.02%)	1.3% (0.01%)	31.6% (0.08%)	-30.2***	8.7% (0.03%)	7.7% (0.03%)	1.0***
Information and communication	Information technology	8.2% (0.02%)	2.7% (0.02%)	27.3% (0.08%)	-24.6***	6.7% (0.03%)	9.7% (0.03%)	-3.0***
	Communication technology	25.7% (0.04%)	14.3% (0.03%)	65.0% (0.09%)	-50.7***	24.0% (0.05%)	27.3% (0.05%)	-3.3***
Social connectedness	<b>Support</b>	3.3% (0.02%)	1.9% (0.01%)	8.0% (0.05%)	-6.1***	3.1% (0.02%)	3.4% (0.02%)	-0.4***
	<b>Discrimination</b>	17.2% (0.03%)	12.3% (0.03%)	34.1% (0.09%)	-21.8***	16.9% (0.05%)	17.4% (0.04%)	-0.5***
	<b>Certification of disability</b>	39.6% (0.04%)	26.9% (0.04%)	83.0% (0.07%)	-56.1***	37.4% (0.06%)	41.6% (0.06%)	-4.2***
Basic daily activities	<b>Mobility</b>	33.8% (0.04%)	24.2% (0.04%)	66.9% (0.08%)	-42.7***	30.8% (0.06%)	36.5% (0.06%)	-5.6***
	Leisure	10.2% (0.03%)	6.7% (0.02%)	22.3% (0.07%)	-15.6***	9.5% (0.04%)	10.8% (0.04%)	-1.3***

Appendix 6. Continued

Dimension	Indicator	Ethnicity			Area, gender and ethnicity		
-----------	-----------	-----------	--	--	----------------------------	--	--

		<b>Non-indigenous</b>	<b>Indigenous</b>	<b>Difference (Non-indigenous-Indigenous)</b>	<b>RIWD</b>	<b>Rest of PWD</b>	<b>Difference (RIWD-Rest of PWD)</b>
General healthcare	Medical attention not related to disability	7.7% (0.03%)	11.0% (0.05%)	-3.3***	14.4% (0.12%)	8.3% (0.02%)	6.1***
	Health insurance	20.4% (0.04%)	25.2% (0.07%)	-4.8***	31.0% (0.15%)	21.3% (0.04%)	9.7***
Disability-related healthcare	<b>Disability-related medical attention</b>	6.5% (0.03%)	9.6% (0.04%)	-3.1***	13.8% (0.11%)	7.1% (0.02%)	6.8***
	<b>Disability-related treatment</b>	31.7% (0.05%)	50.9% (0.08%)	-19.2***	80.2% (0.13%)	34.8% (0.04%)	45.4***
Education, work and retirement	<b>Educational attendance, delay and attainment</b>	30.6% (0.05%)	52.8% (0.08%)	-22.2***	85.3% (0.12%)	34.3% (0.04%)	50.9***
	<b>Adapted education, employment and pension</b>	22.4% (0.04%)	32.8% (0.07%)	-10.4***	46.4% (0.17%)	24.3% (0.04%)	22.1***
Housing	Housing materials	24.0% (0.04%)	46.5% (0.08%)	-22.4***	86.2% (0.11%)	27.3% (0.04%)	58.9***
	Overcrowding	13.9% (0.04%)	22.9% (0.06%)	-9.0***	38.0% (0.16%)	15.3% (0.03%)	22.7***
	Housing tenure	6.1% (0.02%)	8.0% (0.04%)	-1.9***	8.9% (0.09%)	6.5% (0.02%)	2.4***
Basic facilities	Water source	9.4% (0.03%)	22.3% (0.06%)	-12.9***	49.8% (0.17%)	10.9% (0.03%)	38.8***
	Sanitation	14.7% (0.04%)	31.0% (0.07%)	-16.4***	68.9% (0.15%)	16.4% (0.03%)	52.5***
	Cooking fuel	16.3%	36.8%	-20.5***	81.4%	18.7%	62.8***

		(0.04%)	(0.07%)		(0.13%)	(0.03%)	
	Lighting	6.4%	12.0%	-5.6***	29.3%	6.7%	22.6***
		(0.03%)	(0.05%)		(0.15%)	(0.02%)	
Information and communication	Information technology	5.5%	14.1%	-8.5***	35.1%	6.3%	28.8***
		(0.02%)	(0.05%)		(0.16%)	(0.02%)	
	Communication technology	20.1%	37.8%	-17.7***	69.8%	22.6%	47.2***
		(0.04%)	(0.07%)		(0.15%)	(0.04%)	
Social connectedness	<b>Support</b>	2.1%	5.7%	-3.5***	9.3%	2.8%	6.5***
		(0.01%)	(0.03%)		(0.10%)	(0.01%)	
	<b>Discrimination</b>	15.1%	21.8%	-6.7***	33.3%	16.1%	17.3***
		(0.04%)	(0.06%)		(0.16%)	(0.03%)	
	<b>Certification of disability</b>	32.6%	54.5%	-21.8***	86.7%	36.3%	50.5***
		(0.05%)	(0.08%)		(0.11%)	(0.04%)	
Basic daily activities	<b>Mobility</b>	27.4%	47.5%	-20.1***	74.1%	31.0%	43.2***
		(0.05%)	(0.08%)		(0.15%)	(0.04%)	
	Leisure	7.9%	15.2%	-7.3***	25.5%	9.1%	16.3***
		(0.03%)	(0.05%)		(0.14%)	(0.03%)	

Notes: \*\*\* difference significant at 99%, \*\* difference significant at 95%, \* difference significant at 90%. Standard errors in parentheses. RIWD, rural, indigenous, women with disabilities; PWD, persons with disabilities. Disability-specific indicators are shown in bold letters. Source: Authors' calculations based on 2012 ENEDIS.

**Appendix 7.** Censored headcounts by severity and disability categories,  $k = 3/8$  poverty cut-off

Dimension	Indicator	Severity						Categories of disability				
		Functional score			Trichotomy			Mobility	Vision	Hearing	Communication	Cognitive
		Group 1	Group 2	Group 3	Mild	Moderate	Severe					
General healthcare	Medical attention not related to disability	8.0% (0.02%)	13.2% (0.09%)	13.0% (0.32%)	3.8% (0.05%)	7.9% (0.03%)	11.1% (0.04%)	9.4% (0.03%)	9.2% (0.03%)	9.4% (0.04%)	10.4% (0.07%)	10.6% (0.05%)
	Health insurance	20.7% (0.04%)	30.6% (0.12%)	34.1% (0.45%)	12.2% (0.08%)	19.8% (0.05%)	27.6% (0.06%)	22.2% (0.05%)	21.3% (0.05%)	22.8% (0.06%)	28.9% (0.10%)	25.5% (0.07%)
Disability-related healthcare	<b>Disability-related medical attention</b>	7.3% (0.02%)	8.9% (0.08%)	7.8% (0.25%)	3.7% (0.05%)	7.0% (0.03%)	9.2% (0.04%)	8.8% (0.03%)	8.2% (0.03%)	7.1% (0.04%)	5.8% (0.05%)	7.7% (0.04%)
	<b>Disability-related treatment</b>	34.9% (0.04%)	59.4% (0.13%)	64.1% (0.46%)	18.7% (0.10%)	32.3% (0.06%)	51.0% (0.07%)	41.7% (0.05%)	36.8% (0.06%)	40.4% (0.07%)	52.7% (0.11%)	44.8% (0.07%)
Education, work and retirement	<b>Educational attendance, delay and attainment</b>	34.8% (0.04%)	59.5% (0.13%)	61.5% (0.46%)	18.4% (0.10%)	32.8% (0.06%)	50.0% (0.07%)	39.9% (0.05%)	38.8% (0.06%)	42.7% (0.07%)	49.6% (0.11%)	43.6% (0.07%)
	<b>Adapted education, employment and pension</b>	23.5% (0.04%)	41.4% (0.13%)	49.2% (0.48%)	12.6% (0.09%)	23.0% (0.05%)	33.3% (0.07%)	28.1% (0.05%)	28.0% (0.05%)	30.9% (0.07%)	32.2% (0.10%)	30.7% (0.07%)
Housing	Housing materials	29.8% (0.04%)	43.1% (0.13%)	31.6% (0.44%)	14.6% (0.09%)	27.5% (0.05%)	41.0% (0.07%)	31.4% (0.05%)	30.1% (0.05%)	33.4% (0.07%)	39.7% (0.11%)	31.9% (0.07%)
	Overcrowding	15.9% (0.03%)	23.5% (0.11%)	21.9% (0.39%)	8.7% (0.07%)	14.7% (0.04%)	22.0% (0.06%)	16.3% (0.04%)	15.3% (0.04%)	16.7% (0.05%)	24.6% (0.09%)	18.6% (0.06%)
	Housing tenure	6.3% (0.02%)	8.9% (0.07%)	11.0% (0.30%)	3.7% (0.05%)	5.9% (0.03%)	8.4% (0.04%)	6.8% (0.03%)	6.5% (0.03%)	6.4% (0.04%)	9.2% (0.06%)	7.6% (0.04%)
Basic facilities	Water source	13.0% (0.03%)	17.6% (0.10%)	10.4% (0.29%)	6.7% (0.06%)	11.2% (0.04%)	18.5% (0.05%)	12.7% (0.04%)	12.6% (0.04%)	14.4% (0.05%)	17.6% (0.08%)	12.5% (0.05%)
	Sanitation	18.9% (0.02%)	27.6% (0.07%)	18.2% (0.30%)	9.1% (0.05%)	17.1% (0.03%)	26.7% (0.04%)	19.1% (0.03%)	18.4% (0.03%)	21.8% (0.04%)	27.1% (0.06%)	19.3% (0.04%)

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

		(0.04%)	(0.12%)	(0.37%)	(0.07%)	(0.04%)	(0.06%)	(0.04%)	(0.05%)	(0.06%)	(0.10%)	(0.06%)
	Cooking fuel	21.7%	32.3%	22.2%	10.0%	19.9%	30.5%	22.2%	21.5%	25.5%	31.2%	22.5%
		(0.04%)	(0.12%)	(0.39%)	(0.08%)	(0.05%)	(0.06%)	(0.05%)	(0.05%)	(0.06%)	(0.10%)	(0.06%)
	Lighting	7.8%	11.7%	8.2%	4.0%	7.0%	11.1%	7.3%	7.2%	9.4%	11.6%	7.2%
		(0.02%)	(0.08%)	(0.26%)	(0.05%)	(0.03%)	(0.04%)	(0.03%)	(0.03%)	(0.04%)	(0.07%)	(0.04%)
Information and communication	Information technology	6.7%	20.0%	24.4%	2.1%	6.2%	12.8%	8.6%	9.1%	12.2%	13.4%	10.3%
		(0.02%)	(0.11%)	(0.41%)	(0.04%)	(0.03%)	(0.05%)	(0.03%)	(0.03%)	(0.05%)	(0.07%)	(0.05%)
	Communication technology	22.7%	48.1%	51.4%	8.8%	21.4%	36.5%	26.2%	26.2%	32.3%	39.3%	32.7%
		(0.04%)	(0.13%)	(0.48%)	(0.07%)	(0.05%)	(0.07%)	(0.05%)	(0.05%)	(0.07%)	(0.11%)	(0.07%)
Social connectedness	<b>Support</b>	3.3%	3.3%	1.5%	2.3%	3.3%	3.6%	3.1%	3.5%	3.9%	2.4%	2.8%
		(0.02%)	(0.05%)	(0.12%)	(0.04%)	(0.02%)	(0.03%)	(0.02%)	(0.02%)	(0.03%)	(0.03%)	(0.02%)
	<b>Discrimination</b>	15.5%	30.9%	35.2%	6.8%	12.4%	26.9%	17.4%	14.4%	17.0%	33.1%	24.8%
		(0.03%)	(0.12%)	(0.45%)	(0.07%)	(0.04%)	(0.06%)	(0.04%)	(0.04%)	(0.05%)	(0.10%)	(0.06%)
	<b>Certification of disability</b>	37.1%	58.2%	56.8%	20.1%	35.2%	51.3%	41.5%	40.3%	43.6%	49.7%	44.6%
		(0.04%)	(0.13%)	(0.47%)	(0.10%)	(0.06%)	(0.07%)	(0.05%)	(0.06%)	(0.07%)	(0.11%)	(0.07%)
Basic daily activities	<b>Mobility</b>	30.9%	54.9%	64.4%	15.0%	29.4%	45.3%	41.0%	38.7%	36.0%	36.0%	36.7%
		(0.04%)	(0.13%)	(0.46%)	(0.09%)	(0.05%)	(0.07%)	(0.05%)	(0.06%)	(0.07%)	(0.10%)	(0.07%)
	Leisure	8.5%	21.4%	41.5%	4.2%	7.1%	16.1%	10.7%	10.3%	12.0%	17.5%	13.3%
		(0.03%)	(0.11%)	(0.47%)	(0.05%)	(0.03%)	(0.05%)	(0.03%)	(0.04%)	(0.05%)	(0.08%)	(0.05%)

Notes: Standard errors in parentheses. RIWD, rural, indigenous, women with disabilities; PWD, persons with disabilities. Disability-specific indicators are shown in bold letters.

Source: Authors' calculations based on 2012 ENEDIS.

**Appendix 8.** Incidence ( $H$ ), intensity ( $A$ ), and adjusted headcount ratio ( $M_0$ ) by area, gender, and ethnicity for persons with disabilities aged 15 and over,  $k = 3/8$  poverty cut-off

	All	Area			Gender			Ethnicity			Area, gender and ethnicity		
		Urban	Rural	Difference (Urban-Rural)	Men	Women	Difference (Men-Women)	Non-indigenous	Indigenous	Difference (Non-indigenous-Indigenous)	RIWD	Rest of PWD	Difference (RIWD-Rest of PWD)
<b>H</b>	40.4% (0.04%)	27.7% (0.04%)	85.5% (0.07%)	-57.8***	38.2% (0.06%)	42.3% (0.06%)	-4.2***	32.9% (0.05%)	55.7% (0.08%)	-22.9***	87.9% (0.11%)	36.9% (0.04%)	50.9***
<b>A</b>	49.5% (0.01%)	46.0% (0.01%)	53.6% (0.02%)	-7.6***	49.2% (0.02%)	49.7% (0.02%)	-0.5***	48.6% (0.02%)	50.5% (0.02%)	-1.9***	54.2% (0.04%)	48.7% (0.01%)	5.6***
<b>M0</b>	20.0% (0.0002)	12.7% (0.0002)	45.8% (0.0004)	-0.330***	18.8% (0.0003)	21.0% (0.0003)	-0.023***	16.0% (0.0003)	28.2% (0.0004)	-0.122***	47.7% (0.0007)	18.0% (0.0002)	-0.297***
<b>Number of observations</b>	31,313	23,837	7,476	-	14,692	16,621	-	20,097	11,216	-	2,238	29,075	-
<b>Coefficient of variation</b>	0.04%	0.04%	0.05%	-	0.06%	0.05%	-	0.05%	0.06%	-	0.08%	0.04%	-

Notes: \*\*\* difference significant at 99%, \*\* difference significant at 95%, \* difference significant at 90%. Standard errors in parentheses. RIWD, rural, indigenous, women with disabilities; PWD, persons with disabilities.

Source: Authors' calculations based on 2012 ENEDIS.

**Appendix 9.** Incidence ( $H$ ), intensity ( $A$ ), and adjusted headcount ratio ( $M_0$ ) by severity and disability categories for persons with disabilities aged 15 and over,  $k = 3/8$  poverty cut-off

			<b>H</b>	<b>A</b>	<b>M0</b>	<b>Number of observations</b>	<b>Coefficient of variation</b>
<b>Severity</b>	<b>Functional score</b>	<b>Group 1</b>	37.65% (0.05%)	48.90% (0.01%)	0.184 (0.0002)	26,957	0.04%
		<b>Group 2</b>	61.09% (0.13%)	52.09% (0.04%)	0.318 (0.0007)	3,323	0.10%
		<b>Group 3</b>	63.35% (0.49%)	52.85% (0.15%)	0.335 (0.0027)	222	0.36%
	<b>Trichotomy</b>	<b>Mild</b>	20.05% (0.11%)	46.54% (0.05%)	0.093 (0.0005)	2,758	0.12%
		<b>Moderate</b>	35.48% (0.06%)	48.62% (0.02%)	0.173 (0.0003)	16,242	0.05%
		<b>Severe</b>	53.29% (0.07%)	50.59% (0.02%)	0.270 (0.0004)	12,113	0.06%
<b>Categories of disability</b>	<b>Mobility</b>	42.72% (0.06%)	49.82% (0.02%)	0.213 (0.0003)	19,479	0.05%	
	<b>Vision</b>	41.05% (0.06%)	49.86% (0.02%)	0.205 (0.0003)	17,169	0.05%	
	<b>Hearing</b>	44.41% (0.07%)	50.71% (0.02%)	0.225 (0.0004)	11,034	0.06%	
	<b>Communication</b>	52.75% (0.12%)	50.32% (0.03%)	0.265 (0.0006)	4,242	0.09%	
	<b>Cognitive</b>	45.77% (0.08%)	49.79% (0.02%)	0.228 (0.0004)	9,112	0.06%	

Note: Standard errors in parentheses.

Source: Authors' calculations based on 2012 ENEDIS.

**Appendix 10.** Incidence ( $H$ ), intensity ( $A$ ), and adjusted headcount ratio ( $M_0$ ) by area, gender, and ethnicity, equal weights by indicator,  $k = 7/20$  poverty cut-off

k	All			Area								
	H	A	M0	H			A			M0		
	All			Urban	Rural	Difference (Urban-Rural)	Urban	Rural	Difference (Urban-Rural)	Urban	Rural	Difference (Urban-Rural)
1/20	100.0% (0.00%)	33.1% (0.01%)	0.331 (0.0001)	100.0% (0.00%)	100.0% (0.00%)	-	27.9% (0.01%)	51.1% (0.02%)	-23.3***	0.279 (0.0001)	0.511 (0.0002)	-0.233***
2/20	99.1% (0.01%)	33.4% (0.01%)	0.331 (0.0001)	98.9% (0.01%)	100.0% (0.00%)	-1.1***	28.1% (0.01%)	51.1% (0.02%)	-23.0***	0.278 (0.0001)	0.511 (0.0002)	-0.233***
3/20	94.2% (0.02%)	34.6% (0.01%)	0.326 (0.0001)	92.6% (0.03%)	99.9% (0.00%)	-7.4***	29.4% (0.01%)	51.2% (0.02%)	-21.8***	0.272 (0.0001)	0.511 (0.0002)	-0.240***
4/20	85.1% (0.03%)	36.7% (0.01%)	0.312 (0.0002)	80.8% (0.04%)	99.6% (0.01%)	-18.8***	31.4% (0.01%)	51.3% (0.02%)	-19.9***	0.254 (0.0001)	0.511 (0.0002)	-0.257***
5/20	71.7% (0.04%)	39.8% (0.01%)	0.285 (0.0002)	63.8% (0.05%)	98.7% (0.02%)	-35.0***	34.5% (0.01%)	51.6% (0.02%)	-17.1***	0.220 (0.0002)	0.509 (0.0002)	-0.289***
6/20	57.9% (0.04%)	43.3% (0.01%)	0.251 (0.0002)	46.4% (0.05%)	97.2% (0.03%)	-50.8***	38.0% (0.01%)	52.0% (0.02%)	-13.9***	0.177 (0.0002)	0.505 (0.0003)	-0.329***
7/20	45.0% (0.04%)	47.1% (0.01%)	0.212 (0.0002)	30.9% (0.04%)	93.4% (0.04%)	-62.5***	42.1% (0.01%)	52.9% (0.02%)	-10.8***	0.130 (0.0002)	0.494 (0.0003)	-0.364***
8/20	34.6% (0.04%)	50.8% (0.01%)	0.176 (0.0002)	19.4% (0.04%)	86.9% (0.06%)	-67.5***	46.3% (0.02%)	54.2% (0.02%)	-7.9***	0.090 (0.0002)	0.471 (0.0004)	-0.381***
9/20	26.1% (0.04%)	54.3% (0.01%)	0.142 (0.0002)	11.4% (0.04%)	76.7% (0.06%)	-65.3***	50.7% (0.02%)	56.1% (0.02%)	-5.4***	0.058 (0.0002)	0.430 (0.0004)	-0.373***



	(0.04%)	(0.01%)	(0.0002)	(0.03%)	(0.08%)		(0.02%)	(0.02%)		(0.0002)	(0.0004)	
10/20	18.9%	57.8%	0.110	6.5%	61.8%	-55.3***	55.0%	58.8%	-3.7***	0.036	0.363	-0.328***
	(0.03%)	(0.01%)	(0.0002)	(0.02%)	(0.09%)		(0.02%)	(0.02%)		(0.0001)	(0.0005)	
11/20	13.1%	61.3%	0.080	3.5%	45.8%	-42.3***	59.3%	61.8%	-2.6***	0.021	0.283	-0.262***
	(0.03%)	(0.02%)	(0.0002)	(0.02%)	(0.09%)		(0.03%)	(0.02%)		(0.0001)	(0.0006)	
12/20	8.2%	65.0%	0.054	1.8%	30.5%	-28.7***	63.5%	65.3%	-1.7***	0.011	0.199	-0.188***
	(0.02%)	(0.02%)	(0.0002)	(0.01%)	(0.08%)		(0.03%)	(0.02%)		(0.0001)	(0.0005)	
13/20	4.7%	68.9%	0.032	0.8%	17.9%	-17.1***	67.8%	69.0%	-1.2***	0.005	0.123	-0.118***
	(0.02%)	(0.02%)	(0.0001)	(0.01%)	(0.07%)		(0.04%)	(0.02%)		(0.0001)	(0.0005)	
14/20	2.2%	73.0%	0.016	0.3%	8.8%	-8.5***	71.7%	73.2%	-1.4***	0.002	0.064	-0.062***
	(0.01%)	(0.02%)	(0.0001)	(0.01%)	(0.05%)		(0.06%)	(0.03%)		(0.0000)	(0.0004)	
15/20	0.9%	77.2%	0.007	0.1%	3.9%	-3.9***	78.2%	77.2%	1.0***	0.001	0.030	-0.030***
	(0.01%)	(0.03%)	(0.0001)	(0.00%)	(0.03%)		(0.15%)	(0.03%)		(0.0000)	(0.0003)	
16/20	0.3%	81.9%	0.002	0.0%	1.2%	-1.2***	81.9%	81.9%	0.0	0.000	0.010	-0.010***
	(0.00%)	(0.06%)	(0.0000)	(0.00%)	(0.02%)		(0.18%)	(0.06%)		(0.0000)	(0.0002)	
17/20	0.1%	87.1%	0.001	0.0%	0.3%	-0.3***	86.9%	87.1%	-0.2	0.000	0.003	-0.003***
	(0.00%)	(0.11%)	(0.0000)	(0.00%)	(0.01%)		(0.25%)	(0.12%)		(0.0000)	(0.0001)	
18/20	0.0%	92.8%	0.000	0.0%	0.1%	-0.1***	90.0%	93.2%	-	0.000	0.001	-0.001***
	(0.00%)	(0.15%)	(0.0000)	(0.00%)	(0.01%)		-	(0.15%)		(0.0000)	(0.0000)	
19/20	0.0%	95.0%	0.000	0.0%	0.1%	-	-	95.0%	-	-	0.001	-
	(0.00%)	-	(0.0000)	-	(0.00%)		-	-		-	(0.0000)	
20/20	0.0%	-	-	0.0%	0.0%	-	-	-	-	-	-	-
	-	-	-	-	-		-	-		-	-	
	<b>Number of observations</b> All = 33,275			<b>Number of observations</b> Urban = 25,120 Rural = 8,155								

Coefficient of variation All = 0.04%	Coefficient of variation Urban = 0.04% Rural = 0.04%
---	--

## Appendix 10. Continued

k	Gender								
	H			A			M0		
	Men	Women	Difference (Men- Women)	Men	Women	Difference (Men- Women)	Men	Women	Difference (Men- Women)
1/20	100.0% (0.00%)	100.0% (0.00%)	-0.0***	32.3% (0.02%)	33.8% (0.02%)	-1.5***	0.323 (0.0002)	0.338 (0.0002)	-0.015***
2/20	98.7% (0.01%)	99.5% (0.01%)	-0.7***	32.7% (0.02%)	34.0% (0.02%)	-1.3***	0.322 (0.0002)	0.338 (0.0002)	-0.016***
3/20	92.7% (0.03%)	95.6% (0.02%)	-2.9***	34.1% (0.02%)	35.0% (0.02%)	-0.8***	0.316 (0.0002)	0.334 (0.0002)	-0.018***
4/20	82.5% (0.05%)	87.4% (0.04%)	-4.9***	36.5% (0.02%)	36.8% (0.02%)	-0.3***	0.301 (0.0002)	0.322 (0.0002)	-0.021***
5/20	68.7% (0.06%)	74.3% (0.05%)	-5.6***	39.8% (0.02%)	39.8% (0.02%)	0.0	0.274 (0.0003)	0.296 (0.0002)	-0.022***
6/20	55.5% (0.06%)	60.1% (0.06%)	-4.6***	43.3% (0.02%)	43.3% (0.02%)	0.0	0.241 (0.0003)	0.260 (0.0003)	-0.020***
7/20	43.4% (0.06%)	46.5% (0.06%)	-3.1***	47.1% (0.02%)	47.2% (0.02%)	-0.1***	0.204 (0.0003)	0.220 (0.0003)	-0.015***

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

8/20	33.6% (0.06%)	35.5% (0.06%)	-1.9***	50.6% (0.02%)	50.9% (0.02%)	-0.4***	0.170 (0.0003)	0.181 (0.0003)	-0.011***
9/20	25.4% (0.05%)	26.7% (0.05%)	-1.3***	54.0% (0.02%)	54.5% (0.02%)	-0.6***	0.137 (0.0003)	0.146 (0.0003)	-0.009***
10/20	18.5% (0.05%)	19.4% (0.05%)	-0.9***	57.4% (0.02%)	58.2% (0.02%)	-0.8***	0.106 (0.0003)	0.113 (0.0003)	-0.007***
11/20	12.5% (0.04%)	13.6% (0.04%)	-1.1***	60.9% (0.02%)	61.7% (0.02%)	-0.8***	0.076 (0.0003)	0.084 (0.0002)	-0.008***
12/20	7.6% (0.03%)	8.9% (0.03%)	-1.3***	64.7% (0.02%)	65.2% (0.02%)	-0.5***	0.049 (0.0002)	0.058 (0.0002)	-0.009***
13/20	4.2% (0.02%)	5.1% (0.03%)	-0.9***	68.5% (0.03%)	69.1% (0.03%)	-0.7***	0.029 (0.0002)	0.035 (0.0002)	-0.006***
14/20	2.0% (0.02%)	2.5% (0.02%)	-0.5***	72.4% (0.03%)	73.5% (0.04%)	-1.1***	0.014 (0.0001)	0.018 (0.0001)	-0.004***
15/20	0.8% (0.01%)	1.1% (0.01%)	-0.3***	76.3% (0.04%)	77.8% (0.05%)	-1.5***	0.006 (0.0001)	0.009 (0.0001)	-0.003***
16/20	0.2% (0.01%)	0.4% (0.01%)	-0.3***	80.7% (0.05%)	82.3% (0.07%)	-1.6***	0.001 (0.0000)	0.003 (0.0001)	-0.002***
17/20	0.0% (0.00%)	0.1% (0.00%)	-0.1***	85.0% (0.00%)	87.4% (0.13%)	-	0.000 (0.0000)	0.001 (0.0000)	-0.001***
18/20	0.0% -	0.0% (0.00%)	-	- -	92.8% (0.15%)	-	- -	0.000 (0.0000)	-
19/20	0.0% -	0.0% (0.00%)	-	- -	95.0% -	-	- -	0.000 (0.0000)	-
20/20	0.0%	0.0%	-	-	-	-	-	-	-

-	-	-	-	-	-	-	-
<b>Number of observations</b> <b>Men = 15,813</b> <b>Women = 17,462</b>							
<b>Coefficient of variation</b> <b>Men = 0.06%</b> <b>Women = 0.05%</b>							

## Appendix 10. Continued

k	Ethnicity								
	H			A			M0		
	Non-indigenous	Indigenous	Difference (Non-indigenous-indigenous)	Non-indigenous	Indigenous	Difference (Non-indigenous-indigenous)	Non-indigenous	Indigenous	Difference (Non-indigenous-indigenous)
1/20	100.0% (0.00%)	100.0% (0.00%)	-0.0***	30.5% (0.02%)	38.8% (0.02%)	-8.3***	0.305 (0.0002)	0.388 (0.0002)	-0.083***
2/20	98.9% (0.01%)	99.7% (0.01%)	-0.8***	30.8% (0.02%)	38.9% (0.02%)	-8.1***	0.304 (0.0002)	0.388 (0.0002)	-0.084***
3/20	92.6% (0.03%)	97.8% (0.02%)	-5.3***	32.2% (0.01%)	39.4% (0.02%)	-7.3***	0.298 (0.0002)	0.386 (0.0002)	-0.088***
4/20	81.3% (0.04%)	93.0% (0.04%)	-11.7***	34.5% (0.02%)	40.7% (0.02%)	-6.2***	0.281 (0.0002)	0.379 (0.0003)	-0.098***
5/20	65.8% (0.05%)	84.3% (0.06%)	-18.5***	38.0% (0.02%)	42.8% (0.02%)	-4.9***	0.250 (0.0002)	0.361 (0.0003)	-0.111***
6/20	50.9%	73.0%	-22.1***	41.8%	45.6%	-3.8***	0.213	0.333	-0.120***

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

	(0.05%)	(0.07%)		(0.02%)	(0.02%)		(0.0002)	(0.0003)	
7/20	37.3%	61.7%	-24.4***	46.1%	48.5%	-2.4***	0.172	0.299	-0.127***
	(0.05%)	(0.07%)		(0.02%)	(0.02%)		(0.0002)	(0.0004)	
8/20	27.3%	50.3%	-22.9***	50.1%	51.5%	-1.4***	0.137	0.259	-0.122***
	(0.05%)	(0.08%)		(0.02%)	(0.02%)		(0.0002)	(0.0004)	
9/20	19.8%	39.7%	-19.9***	54.0%	54.6%	-0.6***	0.107	0.217	-0.110***
	(0.04%)	(0.07%)		(0.02%)	(0.02%)		(0.0002)	(0.0004)	
10/20	14.0%	29.6%	-15.7***	57.7%	57.9%	-0.2***	0.081	0.171	-0.091***
	(0.04%)	(0.07%)		(0.02%)	(0.02%)		(0.0002)	(0.0004)	
11/20	9.3%	21.1%	-11.8***	61.6%	61.1%	0.5***	0.057	0.129	-0.071***
	(0.03%)	(0.06%)		(0.02%)	(0.02%)		(0.0002)	(0.0004)	
12/20	6.0%	13.2%	-7.2***	65.3%	64.7%	0.6***	0.039	0.085	-0.046***
	(0.02%)	(0.05%)		(0.03%)	(0.02%)		(0.0002)	(0.0003)	
13/20	3.5%	7.1%	-3.6***	69.0%	68.7%	0.3***	0.024	0.049	-0.025***
	(0.02%)	(0.04%)		(0.03%)	(0.03%)		(0.0001)	(0.0003)	
14/20	1.7%	3.4%	-1.7***	73.2%	72.8%	0.4***	0.013	0.025	-0.012***
	(0.01%)	(0.03%)		(0.04%)	(0.03%)		(0.0001)	(0.0002)	
15/20	0.8%	1.3%	-0.6***	77.2%	77.2%	-0.0	0.006	0.010	-0.004***
	(0.01%)	(0.02%)		(0.05%)	(0.05%)		(0.0001)	(0.0001)	
16/20	0.2%	0.4%	-0.2***	82.1%	81.6%	0.4***	0.002	0.004	-0.002***
	(0.01%)	0.01%		(0.09%)	(0.06%)		(0.0000)	(0.0001)	
17/20	0.1%	0.1%	-0.1***	88.3%	85.8%	2.5***	0.001	0.001	-0.001***
	(0.00%)	0.01%		(0.19%)	(0.08%)		(0.0000)	(0.0000)	
18/20	0.0%	0.0%	0.0	94.1%	90.0%	-	0.000	0.000	0.000
	(0.00%)	(0.00%)		(0.14%)	-		(0.0000)	(0.0000)	
19/20	0.0%	0.0%	-	95.0%	-	-	0.000	-	-

	(0.00%)	-		-	-		(0.0000)	-	
20/20	0.0%	0.0%	-	-	-	-	-	-	-
	-	-		-	-		-	-	
<b>Number of observations</b> <b>Non-indigenous = 21,794</b> <b>Indigenous = 11,481</b>									
<b>Coefficient of variation</b> <b>Non-indigenous = 0.05%</b> <b>Indigenous = 0.06%</b>									

### Appendix 10. Continued

k	Area, gender and ethnicity								
	H			A			M0		
	RIWD	Rest of PWD	Difference (RIWD-Rest of PWD)	RIWD	Rest of PWD	Difference (RIWD-Rest of PWD)	RIWD	Rest of PWD	Difference (RIWD-Rest of PWD)
1/20	100.0% (0.00%)	100.0% (0.00%)	-	52.2% (0.04%)	31.8% (0.01%)	20.4***	0.522 (0.0004)	0.318 (0.0001)	0.204***
2/20	100.0% (0.00%)	99.1% (0.01%)	-	52.2% (0.04%)	32.0% (0.01%)	20.2***	0.522 (0.0004)	0.317 (0.0001)	0.205***
3/20	100.0% (0.01%)	93.8% (0.02%)	6.1***	52.2% (0.04%)	33.2% (0.01%)	19.0***	0.522 (0.0004)	0.312 (0.0001)	0.210***
4/20	99.8% (0.01%)	84.0% (0.03%)	15.8***	52.3% (0.04%)	35.4% (0.01%)	16.9***	0.522 (0.0004)	0.297 (0.0002)	0.225***
5/20	99.2%	69.7%	29.5***	52.5%	38.5%	13.9***	0.521	0.269	0.252***

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

	(0.03%)	(0.04%)		(0.04%)	(0.01%)		(0.0004)	(0.0002)	
6/20	98.2%	55.1%	43.1***	52.8%	42.1%	10.6***	0.518	0.232	0.286***
	(0.04%)	(0.04%)		(0.04%)	(0.01%)		(0.0004)	(0.0002)	
7/20	95.1%	41.5%	53.5***	53.5%	46.1%	7.4***	0.509	0.191	0.317***
	(0.07%)	(0.04%)		(0.04%)	(0.01%)		(0.0005)	(0.0002)	
8/20	88.6%	30.8%	57.7***	54.9%	50.0%	4.9***	0.486	0.154	0.332***
	(0.11%)	(0.04%)		(0.03%)	(0.02%)		(0.0007)	(0.0002)	
9/20	80.3%	22.3%	58.0***	56.4%	53.7%	2.7***	0.453	0.120	0.333***
	(0.13%)	(0.04%)		(0.03%)	(0.02%)		(0.0008)	(0.0002)	
10/20	65.9%	15.6%	50.2***	58.9%	57.5%	1.4***	0.388	0.090	0.298***
	(0.16%)	(0.03%)		(0.03%)	(0.02%)		(0.0010)	(0.0002)	
11/20	49.6%	10.5%	39.2***	61.8%	61.1%	0.6***	0.307	0.064	0.243***
	(0.17%)	(0.03%)		(0.03%)	(0.02%)		(0.0010)	(0.0002)	
12/20	32.8%	6.5%	26.3***	65.3%	64.9%	0.4***	0.214	0.042	0.172***
	(0.16%)	(0.02%)		(0.04%)	(0.02%)		(0.0010)	(0.0001)	
13/20	18.9%	3.6%	15.2***	69.2%	68.8%	0.4***	0.131	0.025	0.106***
	(0.13%)	(0.02%)		(0.04%)	(0.02%)		(0.0009)	(0.0001)	
14/20	9.3%	1.7%	7.6***	73.5%	72.9%	0.6***	0.069	0.013	0.056***
	(0.10%)	(0.01%)		(0.05%)	(0.03%)		(0.0007)	(0.0001)	
15/20	4.2%	0.7%	3.5***	77.8%	77.0%	0.8***	0.033	0.005	0.027***
	(0.07%)	(0.01%)		(0.06%)	(0.04%)		(0.0005)	(0.0001)	
16/20	1.7%	0.2%	1.5***	82.0%	81.8%	0.1	0.014	0.002	0.012***
	(0.04%)	(0.00%)		(0.08%)	(0.08%)		(0.0003)	(0.0000)	
17/20	0.5%	0.0%	0.5***	85.9%	88.0%	-2.1***	0.005	0.000	0.004***
	(0.02%)	(0.00%)		(0.09%)	(0.18%)		(0.0002)	(0.0000)	
18/20	0.1%	0.0%	0.1***	90.0%	94.1%	-	0.001	0.000	0.001***

	(0.01%)	(0.00%)		-	(0.14%)		(0.0001)	(0.0000)	
19/20	0.0%	0.0%	-	-	95.0%	-	-	0.000	-
	-	(0.00%)		-	-		-	(0.0000)	
20/20	0.0%	0.0%	-	-	-	-	-	-	-
	-	-		-	-		-	-	
<b>Number of observations</b>									
RIWD = 2,311									
Rest of PWD = 30,964									
<b>Coefficient of variation</b>									
RIWD = 0.08%									
Rest of PWD = 0.04%									

Notes: \*\*\* difference significant at 99%, \*\* difference significant at 95%, \* difference significant at 90%. Standard errors in parentheses.

RIWD, rural, indigenous, women with disabilities; PWD, persons with disabilities.

Source: Authors' calculations based on 2012 ENEDIS.



**Appendix 11.** Incidence ( $H$ ), intensity ( $A$ ), and adjusted headcount ratio ( $M_0$ ) by severity and disability categories, equal weights by indicator,  $k = 7/20$  poverty cut-off

			<b>H</b>	<b>A</b>	<b>M0</b>	<b>Number of observations</b>	<b>Coefficient of variation</b>
<b>Severity</b>	<b>Functional score</b>	<b>Group 1</b>	42.5% (0.05%)	46.7% (0.01%)	0.198 (0.0002)	28,567	0.04%
		<b>Group 2</b>	63.8% (0.13%)	49.5% (0.04%)	0.316 (0.0007)	3,590	0.10%
		<b>Group 3</b>	66.9% (0.45%)	48.3% (0.14%)	0.324 (0.0024)	255	0.36%
	<b>Trichotomy</b>	<b>Mild</b>	23.5% (0.11%)	44.2% (0.05%)	0.104 (0.0005)	2,905	0.13%
		<b>Moderate</b>	40.3% (0.06%)	46.1% (0.02%)	0.186 (0.0003)	17,131	0.06%
		<b>Severe</b>	57.8% (0.07%)	48.4% (0.02%)	0.280 (0.0004)	13,022	0.06%
<b>Categories of disability</b>	<b>Mobility</b>	46.4% (0.05%)	47.1% (0.02%)	0.218 (0.0003)	20,186	0.05%	
	<b>Vision</b>	44.5% (0.06%)	47.1% (0.02%)	0.210 (0.0003)	17,589	0.05%	
	<b>Hearing</b>	48.1% (0.07%)	48.1% (0.02%)	0.232 (0.0004)	11,375	0.07%	
	<b>Communication</b>	58.1% (0.11%)	48.5% (0.03%)	0.281 (0.0006)	5,279	0.09%	
	<b>Cognitive</b>	49.8% (0.08%)	47.1% (0.02%)	0.234 (0.0004)	10,202	0.07%	

Note: Standard errors in parentheses.

Source: Authors' calculations based on 2012 ENEDIS.

**Appendix 12.** Regional ranking robustness across Sets 1, 2, 3, and 4 using ties-adjusted Spearman rank correlation coefficients for incidence ( $H$ ) and adjusted headcount ratio ( $M_0$ )

$H$	Set 1	Set 2	Set 3	Set 4	$M_0$	Set 1	Set 2	Set 3	Set 4
Set 1	1				Set 1	1			
Set 2	0.9927	1			Set 2	0.9963	1		
Set 3	0.9931	0.9875	1		Set 3	0.9950	0.995	1	
Set 4	0.9842	0.9888	0.9792	1	Set 4	0.9913	0.9881	0.9917	1

Source: Authors' calculations based on 2012 ENEDIS.

**Appendix 13.** Incidence ( $H$ ) and adjusted headcount ratio ( $M_0$ ) by region, equal weights by indicator,  $k = 7/20$  poverty cut-off

ID	Subnational region	H	M0	Number of observations	Coefficient of variation
01	Amazonas	84.1% (0.33%)	0.422 (0.0018)	825	0.25%
02	Ancash	56.8% (0.25%)	0.260 (0.0012)	1,167	0.20%
03	Apurimac	81.3% (0.28%)	0.398 (0.0015)	1,094	0.21%
04	Arequipa	37.7% (0.18%)	0.168 (0.0008)	1,836	0.16%
05	Ayacucho	78.6% (0.24%)	0.376 (0.0013)	1,127	0.19%
06	Cajamarca	87.3% (0.14%)	0.477 (0.0009)	1,060	0.13%
07	Callao	18.4% (0.17%)	0.071 (0.0007)	1,617	0.18%
08	Cusco	69.8% (0.23%)	0.326 (0.0011)	1,092	0.17%
09	Huancavelica	87.4% (0.23%)	0.441 (0.0013)	985	0.18%
10	Huanuco	75.3% (0.22%)	0.392 (0.0013)	1,337	0.19%
11	Ica	33.9% (0.25%)	0.142 (0.0011)	1,296	0.23%
12	Junin	64.2% (0.23%)	0.306 (0.0012)	1,051	0.18%
13	La Libertad	58.1% (0.19%)	0.274 (0.0010)	1,294	0.16%
14	Lambayeque	46.7% (0.26%)	0.207 (0.0012)	1,220	0.21%
15	Lima	20.9% (0.06%)	0.084 (0.0002)	4,841	0.06%
16	Loreto	59.8% (0.29%)	0.302 (0.0016)	1,139	0.25%
17	Madre de Dios	57.1% (0.81%)	0.257 (0.0038)	554	0.61%
18	Moquegua	44.6% (0.49%)	0.194 (0.0022)	1,014	0.40%
19	Pasco	71.8% (0.40%)	0.335 (0.0020)	771	0.29%
20	Piura	58.6% (0.18%)	0.278 (0.0009)	1,647	0.15%
21	Puno	86.7% (0.13%)	0.465 (0.0008)	1,057	0.11%
22	San Martin	74.9% (0.26%)	0.364 (0.0014)	1,233	0.20%
23	Tacna	38.7% (0.36%)	0.167 (0.0016)	1,014	0.30%
24	Tumbes	40.5% (0.45%)	0.166 (0.0019)	1,750	0.32%
25	Ucayali	62.5%	0.287	1,254	0.28%

	(0.36%)	(0.0018)	
<b>Spearman rank correlation coefficient between the original specification presented in Appendix 3 (nested weights, <math>k = 3/8 = 37.5\%</math>) and an alternative specification (equal weights by indicator <math>k = 7/20</math>) for <math>H</math>: 0.993</b>			
<b>Spearman rank correlation coefficient between the original specification presented in Appendix 3 (nested weights, <math>k = 3/8 = 37.5\%</math>) and an alternative specification (equal weights by indicator <math>k = 7/20</math>) for <math>M_0</math>: 0.994</b>			

Note: Standard errors in parentheses.

Source: Authors' calculations based on 2012 ENEDIS.

For Peer Review Only

**Appendix 14.** Robustness of the original measure (Set 1) to the group of persons with disabilities identified as multidimensionally poor under alternative specifications (Sets 2, 3, and 4)

	Incidence ( $H$ ) using Set 1 (i)	Consistently Poor (ii)	Inconsistently Poor (iii)
All	41.1%	31.4%	13.0%
Amazonas	76.0%	65.5%	14.3%
Ancash	48.8%	39.1%	14.3%
Apurimac	71.5%	61.7%	14.7%
Arequipa	33.2%	22.7%	13.8%
Ayacucho	68.9%	58.0%	16.9%
Cajamarca	82.6%	75.0%	10.1%
Callao	16.5%	7.2%	11.3%
Cusco	63.1%	50.7%	15.5%
Huancavelica	79.1%	71.6%	13.2%
Huanico	68.9%	60.3%	12.2%
Ica	28.8%	19.0%	13.3%
Junin	57.9%	48.3%	13.1%
La Libertad	53.6%	42.2%	15.4%
Lambayeque	42.0%	28.4%	16.2%
Lima	19.6%	10.3%	12.1%
Loreto	54.0%	44.6%	13.0%
Madre de Dios	49.8%	37.1%	14.4%
Moquegua	39.0%	28.2%	14.7%
Pasco	60.6%	46.2%	19.0%
Piura	54.3%	43.2%	14.5%
Puno	81.7%	76.7%	7.8%
San Martín	67.4%	56.4%	15.3%
Tacna	36.8%	24.4%	16.0%
Tumbes	33.4%	20.2%	17.7%
Ucayali	55.7%	41.1%	18.6%

Notes: (i) Set 1: nested weights and  $k = 3/8$ ; (ii) proportion of persons with disabilities identified as multidimensionally poor using Sets 1, 2, 3 and 4 simultaneously; (iii) proportion of persons with disabilities identified as poor only by one, two or three Sets but not by the four Sets at the same time.

Source: Authors' calculations based on 2012 ENEDIS.

# CERTIFICATE OF ENGLISH EDITING

This document certifies that the paper listed below has been edited to ensure that the language is clear and free of errors. The edit was performed by professional editors at Editage, a division of Cactus Communications, in cooperation with Taylor & Francis Group. The intent of the author's message was not altered in any way during the editing process. The quality of the edit has been guaranteed, with the assumption that our suggested changes have been accepted and have not been further altered without the knowledge of our editors.

## Title

Implementing a group-specific multidimensional poverty measure: the case of persons with disabilities in Peru

## Authors

## Order No.

**EDITINGSERVICES**  
Supporting Taylor & Francis authors

Signature

Vikas Narang

Vikas Narang,  
Chief Operating Officer,  
Editage

Date of Issue  
**August 12, 2020**

