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Adjusting Estimates of Poverty for the Cost of Disability

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The Irish Human Rights and Equality Commission was established under statute on 1 November 2014 to protect and promote human rights and equality in Ireland, to promote a culture of respect for human rights, equality and intercultural understanding, to promote understanding and awareness of the importance of human rights and equality, and to work towards the elimination of human rights abuses and discrimination.

The Economic and Social Research Institute (ESRI) is an independent research institute working towards a vision of 'Informed policy for a better Ireland'. The ESRI seeks to support sustainable economic growth and social progress in Ireland by providing a robust knowledge base capable of providing effective solutions to public policy challenges.

Foreword

It is a privilege to introduce this timely paper 'Adjusting Estimates of Poverty for the Cost of Disability'. According to the 2022 Census, one-in-five people in Ireland is disabled. We know that living with a disability comes with a significant financial burden that is often unrecognised by society, and by the State.

Disabled people in Ireland face a double penalty, with both a lower average income, and a higher average expenditure. While current living standards measurements can capture the impact of the former, they often don't reflect the latter. I welcome this new analysis, which sets out to build the evidence-base, through additional analysis of the cost of disability, and the development of an approach to understand the relationship between poverty and disability.

While the findings in this new paper are significant and compelling, they will not come as a surprise to disabled people in Ireland or to their advocates. The cost of disability is estimated to be between 52% and 59% of the income of a household with a disabled person, varying with the extent of disability. Utilising an adjusted approach, the At Risk Of Poverty (AROP) rate for disabled people is estimated to be between 65%-76%. The study finds that the cost of disability is slightly higher than previous estimates, and may be rising.

The significance of this research cannot be overstated. The Commission has repeatedly called on the State to provide better services and supports for disabled people in Ireland. It is now critical that policymakers recognise the cost of disability and invest in services and supports that reflect the lives of disabled people. I wholeheartedly welcome and commend this work as an important step forward.

I wish to extend my thanks to Dr Karina Doorley, Dr Theano Kakoulidou and Dr Agathe Simon for their work undertaking this analysis and delivering this report.

This report is the second report in 2022-2024 IHREC/ESRI Research programme, and marks the twelfth published report since 2017 under the IHREC/ESRI Irish Human Rights and Equality Research Programme Series. These research reports examine

equality and discrimination in Ireland across a wide range of themes and topics including inequality in the labour market, disability, caring and unpaid work, inequality in housing and attitudinal research towards diversity and migration in Ireland.

These detailed studies continue to provide us with a better understanding of equality and discrimination in Ireland, expanding the boundaries of existing knowledge and guiding us towards new horizons of insight. On behalf of the Commission, I would like to acknowledge the ESRI and all of the researchers who worked on these studies and to thank you for your significant contribution to developing knowledge in the area of equality and discrimination in Ireland.

Liam Herrick
Chief Commissioner, Irish Human Rights and Equality Commission

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Abbreviations

AIDS   Almost Ideal Demand System

AROP   At risk of poverty

CPI   Consumer Price Index

CSO   Central Statistics Office

HBS   Household Budget Survey

OECD   Organisation for Economic Co-operation and Development

RMF   Research Microdata File

SHARE   Survey of Health, Ageing, and Retirement in Europe

SILC   Survey of Income and Living Conditions

SoL   Standard of Living method

UNCRPD   United Nations Convention on the Rights of Persons with Disabilities

Executive Summary

This study explores the economic impact of disability on households. Disabled people face a double economic penalty though lower average disposable income and higher average expenditure needs. Conventional measures of living standards do not reflect the latter. We employ two separate methods to estimate a range of disability-adjusted 'at risk of poverty' (AROP) rates for Ireland. We employ first the Standard of Living method (SoL) using the Survey of Income and Living Conditions (SILC) dataset for Ireland. Based on two indicators of SoL – a composite material deprivation indicator and a self-assessed financial difficulty indicator – we update findings on the cost of disability in Ireland and explore the differential impact across household composition and age groups. Secondly, we introduce a novel application of the Almost Ideal Demand System (AIDS) method to directly estimate disability-adjusted equivalence scales, based on the Household Budget Survey (HBS) dataset for Ireland. These two methods allow us to estimate a range of disability-adjusted at risk of poverty (AROP) and poverty gap rates for Ireland. We estimate that the cost of disability is 52-59 per cent of the disposable income of households with disabled members, and that this cost varies with the severity of disability. Deriving a disability-adjusted equivalence scale, we estimate that the weight for a disabled additional adult should be 9 per cent higher than the weight for a non-disabled additional adult. Estimating AROP rates, we find that these increase substantially when the cost of disability is accounted for.

Chapter 1

Introduction

Disability significantly impacts households beyond its effect on their limitations in daily activities and healthcare needs. Households with disabled people face an increased risk of poverty (Elwan, 1999; Banks et al., 2017).[1] In 2022, 29 per cent of people who declared to have some or severe limitations in daily activities because of a health problem were classified at risk of poverty (AROP) in Europe.[2] In Ireland, the AROP rate of disabled people is 21-27 per cent, depending on the severity of disability. This figure has been on the rise in recent years (CSO, 2022a).[3]

Multiple factors contribute to the high poverty risk for households with disabled members. Disabled people tend to have a lower level of education and lower labour market attachment compared to people without disabilities. Ireland has the fifth highest employment gap between people with and without disabilities in Europe, with an employment rate of only 36 per cent for people with disabilities (Kelly and Maître, 2021). Thus, the share of disabled people with low or no earnings is high, increasing their poverty risk. There is also evidence that the labour market participation of family members of people with disabilities is low, potentially due to their role in caring for the disabled person. Disability Allowance in Ireland is means-tested at the household level which may also decrease the financial incentive to work for family members of people with disabilities. On average, household income for households with a disabled

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[1]   In this report, the terms 'people with disabilities' and 'disabled people' are used interchangeably. The term 'disabled people' is recognised by many within the disability rights movement in Ireland to align with the social and human rights model of disability, as it is considered to acknowledge the fact that people with an impairment are disabled by barriers in the environment and society. However, we also recognise that others prefer the term 'persons with disabilities' because of the inherent understanding in the term that they are first and foremost human beings entitled to human rights. This also reflects the language used in the UNCRPD. We recognise that many people with an intellectual disability, people with a mental health difficulty or psycho-social disability prefer person-first language. We also recognise that some people do not identify with either term. For more information see NDA (2022).

[2]   Eurostat, see https://doi.org/10.2908/HLTH_DPE010.

[3]   For more details, see Poverty Indicators by Health Status - Survey on Income and Living Conditions (SILC) 2022 - Central Statistics Office.

member is lower than that of households without a disabled member (Doorley and Regan, 2022).

In addition to this, disabled people tend to face a higher cost of living, notably due to healthcare expenditures but also housing accommodations, transportation etc. This higher cost of living has been well documented in Ireland (Cullinan et al., 2011; 2013; Indecon, 2021) and internationally (Antón et al., 2016; Morris and Zaidi, 2020). Disabled people thus face a 'double penalty' in the sense that they have lower average incomes but face higher average expenditures. Conventional measures of living standards do not always account for these additional costs and thus misrepresent the economic situation of households composed of members with disabilities.

The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) underscores the importance of ensuring an adequate standard of living and social protection for disabled people. It also emphasises the need to collect appropriate statistics to facilitate the formulation and implementation of effective policies (Articles 28 and 31, United Nations, 2006). Collecting relevant data is essential for understanding the additional living costs that disabled people face and for developing strategies to mitigate these financial challenges. With the Irish government currently in the process of developing a UNCRPD Implementation Strategy, the advancement of poverty statistics that incorporate the additional costs of living with a disability can provide evidence to guide such a strategy.

In this paper, we estimate the economic cost of disability in Ireland using two methods and apply the results to estimate disability-adjusted AROP rates. First, we employ the Standard of Living (SoL) approach (Berthoud et al., 1993), which is widely used in this literature. Based on two composite indicators of the standard of living, we estimate of the cost of disability in Ireland using data from the 2022 Survey of Income and Living Conditions (SILC), updating previous estimates from Cullinan et al. (2011; 2013) and Indecon (2021) which use data from 1995-2001, 2001, and 2015-2018 respectively. In addition to estimating an aggregate cost for all households affected by disability, we differentiate the costs by household types, distinguishing between working- and retirement-age households and single and couple households, as economies of scale

may result in lower aggregate costs for couple households, while older households may have wealth available to draw down to meet the cost of disability.

We find that the cost of disability is substantial, representing between 52-59 per cent of the disposable income of affected households. These costs increase with the degree of limitation and vary by household type. Singles and working-age households tend to face a higher cost of disability. These costs are higher than some previously estimated for Ireland by Cullinan (2011) of 20-37 per cent; by Cullinan et al. (2013) of 20-79 per cent for those aged 65 years or older; and by Indecon (2021) of 26-41 per cent. They are more in line with estimates from a cross-country study carried out by Antón et al. (2016), who estimate the cost of disability in Ireland to be 45-55 per cent.

In a second step, we employ a second, novel approach to estimating the cost of disability, which has not been applied in an Irish context. We derive an equivalence scale, which we use to adjust household income, and which directly accounts for the different consumption patterns of households with and without disabled members. To do this, we apply the Almost Ideal Demand System (AIDS) model (Deaton and Muellbauer, 1980), based on observed expenditure from the Household Budget Survey (HBS). This approach allows us to derive alternative 'weights' for household members with a disability and household members without a disability. We find that the appropriate weight for an adult with a disability is 9 per cent higher than the existing adult weights in commonly used equivalence scales.

In a final step, we estimate AROP rates for Ireland which are adjusted to account for the cost of disability using the two methods. In doing so, we provide a more nuanced understanding of the proportion of the population at risk of poverty, based on consumption patterns or self-assessed standard of living. Our findings indicate that poverty rates are higher when using either the SoL or the equivalence scale approach, and especially higher for households with disabled members.

Chapter 2

Related literature

Apart from their lower average incomes, households with disabled members face a lower standard of living than other households, as they tend to have a higher cost of living. These additional costs include specific expenses such as housing, accommodation and healthcare, but also include higher expenditure on items consumed by both disabled and non-disabled people e.g. transportation costs, housing, heating etc. (see Morris et al., 2022; Indecon, 2021; Cullinan et al., 2011; and Mitra et al., 2017 for a review of the literature).

Previous research has attempted to incorporate the extra cost of disability into measures of national living standards. An important index of the standard of living is the AROP rate, defined as:

> *the share of people having an equivalised disposable income after social transfers that is below 60 per cent of the national median equivalised disposable income after social transfers. (CSO, 2022a).*

There are two main ways in which this rate can be adjusted to account for the cost of disability. First, an average additional financial cost-of-living for households affected by disability can be estimated and deducted from the disposable income of these households before the AROP rate is calculated. Alternatively, the scale which is used to equivalise disposable income – which typically accounts for the number of adults and children in the household – can be adjusted to also account for the number of disabled adults in the household.

There are two principal methods of carrying out the first adjustment, i.e. of estimating the 'extra' costs of disability. A direct survey approach, whereby individuals directly report the additional costs of disability, can be used. Or more commonly, disabled people are asked about their needs regarding goods and services that they might require to participate fully in society. Estimates from this approach may suffer from bias however, as disabled people may be unaware of specific goods or services that

could improve their participation in society, potentially leading to an underestimation of the additional costs (Berthoud et al., 1993; Mitra et al., 2017). Conversely, a respondent might overstate the cost of disability when estimating it in an interview (Mitra et al., 2017).

An alternative approach, commonly known as the SoL, was developed by Berthoud et al. (1993) and is based on estimating the extra income necessary to reach a certain standard of living for a household with disabled members. The concept of SoL is related to the concept of material deprivation or material well-being (see Sen, 1987, for more details). The SoL rises with the level of income but, for a household affected by disability, a lower level of SoL might be reached with the same income due to the cost of disability. This means that to reach a certain standard of living, households with disabled members need higher resources than households with no disabled members.

2.1   Accounting for the cost of disability using the sol method

The SoL approach to estimating the cost of disability makes use of a composite indicator of goods and services related to material living conditions, such as the ability to keep the home warm, being able to afford a car, holidays or a social event. As such, the indicator is self-assessed based on the household's perception of how well they can afford certain goods and services. Results can be sensitive to the indicator of SoL used.

Various indicators are used in the literature, although most research makes use of an index of consumable durables (Zaidi and Burchardt, 2005; Cullinan et al., 2011; Loyalka et al., 2014; Palmer et al., 2016), sometimes complemented with the ability to save (Zaidi and Burchardt, 2005), or to afford holidays (Cullinan et al., 2011). More recently, the work of Morris and Zaidi (2020) used a SoL index based on subjective assessment of financial difficulties and a material deprivation indicator. This indicator depends on income but is independent from disability status (see Zaidi and Burchardt, 2005, for more details).

The SoL method has grown in popularity, as shown by the systematic review of Mitra et al. (2017), since it does not require expenditure data and can be applied using more

widely available survey data. Previous research using the SoL approach with panel data for Ireland estimated an overall cost of disability at 18-30 per cent for individuals with a chronic illness who were limited in their daily activities by this illness (Cullinan et al., 2011). Among retirement-age individuals (aged 65 and over), Cullinan et al. (2013) found a cost of 40 per cent for any disability, rising to 79 per cent for severely limited individuals. Indecon (2021) also estimated the cost of disability using the SoL approach and pooled EU-SILC data for 2015-2018. They found a cost of disability of 26 per cent and 41 per cent for households with members with some limitation and severe limitations respectively, based on EU-SILC data. They found relatively smaller costs of disability using the SILC RMF dataset, but confirmed the particularly higher cost for people with severe limitations.

The SoL approach has also been applied internationally. Antón et al. (2016) discover much variance in the cost of disability across European countries, with Nordic and Continental countries (including Anglo-Saxon nations) displaying a higher cost compared to Mediterranean and Eastern countries (up to 155 per cent of disposable income for Sweden, and 40-55 per cent for Ireland). Morris and Zaidi (2020) use the Survey of Health, Ageing, and Retirement in Europe (SHARE) data to estimate the cost of disability for adults aged over 50 years in 15 European countries (excluding Ireland). On aggregate, they find costs of 30-62 per cent of disposable income.

2.2   Adjusting equivalence scales to account for disability

An alternative way to incorporate the cost of disability into estimates of poverty rates is by using an alternate scale to adjust or 'equivalise' income to account for household composition and size. Equivalisation adjusts ('equivalises') the income of households of differing sizes and composition, with common practice being to divide the income of a household by a weight that is a function of the number of adults and children in the household. Commonly used indicators for poverty and inequality are based on the concept of equivalised income. Often, the scales are ad hoc, involving value judgements. However, the derivation of equivalence scales can also be accomplished using consumption data.

The Irish national scale assigns a weight of 1 to the first adult in a household, 0.66 to each additional adult and 0.33 to children under 14 years of age (CSO). Alternative national, European or OECD scales assign different weights for additional adults and children. The choice of equivalence scale has been shown to strongly affect poverty measurements (Regan and Kakoulidou, 2022; Mysíková and Zelinsky, 2019; Aaberge and Melby, 1998; Jenkins and Cowell, 1994). Additionally, recent research by Doorley et al. (2024) suggests that the current Irish scale, which has been in use since the 1980s, may need to be re-evaluated.

Several empirical approaches are employed in the literature to derive equivalence scales using consumption data.[4] In this research, we adopt a demand-system method to estimate equivalence scales, based on consumer demand theory. We utilise the Almost Ideal Demand System (AIDS) model, introduced by Deaton and Muellbauer (1980), which has become a widely accepted approach to estimate households' demand functions, and was recently used by Doorley et al. (2024) to investigate the relevance of the Irish equivalence scale. This method allows us to derive a weight for disabled adults, to be used in place of the standard additional adult weight, when equivalising income for poverty measurement. The extension of equivalence scales to derive a weight for disabled adults is not common (see Jones and O'Donnell (1995) for the UK, in which Engel curves are employed for this purpose), and has not yet been done using an AIDS model.

2.3   Comparing methods for assessing the economic burden of disability

Both the SoL and equivalence scale approaches provide valuable insights into the economic burden of disability. However, there are important reasons for which we might expect them to produce different answers. The SoL approach offers a direct assessment of the additional financial requirements for households with disabled members to maintain a comparable standard of living to households without disabled members. This assessment is based on each household's own assessment of its ability to afford essentials and holidays, and to face unexpected financial expenses. In any

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4   For a review of these, see Doorley et al. (2024).

evaluation of self-assessed responses to survey questions, the researcher must keep in mind that there is likely to be some level of bias in the survey responses. However, if the responses of households with disabled members are not systematically more biased than the responses of households without disabled members, the SoL method provides a direct assessment of the extra financial resources needed by a disabled household in order to reach the same standard of living as a similar non-disabled household. Crucially, the approach accounts for unmet needs by exploiting questions posed to households about their ability to afford certain items.

By contrast, the equivalence scale approach is based on observed expenditure. As such it does not fully account for unmet need so that, if a household with disabilities actually requires extra consumption (on healthcare, transportation, etc.) compared to a household without disabilities in order to achieve the same standard of living, this is not fully captured by the model. Additionally, as noted by Jones and O'Donnell (1995), who employed a similar methodology to measure the cost of disability, if disability directly reduces welfare, equivalence scales derived from observed demand for goods and services will give a conservative bound for the cost of disability.

Chapter 3

Methods

In this section, we describe the methodology we use to measure the cost of disability and adjust how we measure living standards to account for this cost. We provide a detailed description of the SoL and equivalence scale methods and how we apply them in Appendices B.1 and B.2.

3.1   Data

To measure the additional cost of living with a disability, we use SILC 2022 data for the SoL method and HBS 2015/16 data for the equivalence scales method. SILC is the dataset used by the CSO to estimate rates of poverty and income inequality while HBS is an expenditure survey used by CSO to calculate the Consumer Price Index (CPI). Each of these datasets is the latest available wave.[5]

SILC is an annual household survey that provides comprehensive data on household incomes, labour market characteristics, demographics and living conditions, and is commonly used to estimate poverty and inequality indicators. The SILC 2022 wave includes a sample of 4,660 households and 11,393 individuals. For our analysis, the SoL deprivation indicator leverages various deprivation variables from the SILC data to assess economic hardship (see Table 3.1),[6] while the SoL financial indicator uses information on self-reported financial difficulties. So that the models are not unduly influenced by outliers, the income data are trimmed by recoding the bottom and top percentile of income values to the value of the 1st and 99th percentile respectively.

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[5]   The HBS is usually carried out every five years. However, collection was paused during the pandemic so that the latest available wave of HBS dates from 2015/16.

[6]   See Appendix B.1 for a discussion of how these variables are selected.

Table 3.1   Sol Deprivation Variables

Variable
Had to go without heating during the 12 months though lack of money
Deprived of a morning, afternoon or evening out in the last fortnight for their entertainment (something that costs money)
Deprived of possession of two pairs of strong shoes per household member
Deprived of the ability to keep the home adequately warm
Deprived of eating meals with meat, chicken, fish (or vegetarian equivalent) every second day
Deprived of a roast joint of meat (or its equivalent) once a week
Deprived of the ability to be able to afford to replace any worn out furniture
Household unable to afford to buy presents for family or friends at least once a year
Deprived of a (get-together with) family and/or friends (relatives) for a drink or a meal once a month
Unable to afford to be in possession of a warm waterproof coat
Unable to afford to replace worn out clothes with new (not second hand) items
Unable to afford paying for one week annual holiday away from home
Unable to face unexpected financial expenses
Cannot afford a computer
Cannot afford a car

Source: SILC 2022 data.
Note: For a more detailed description of the data, see Table A.1 in Appendix A.

HBS offers detailed insights into household expenditure patterns. In the 2015/16 wave, a nationally representative sample of 6,839 households was monitored for two weeks, during which participants recorded their expenditures. The survey also collects comprehensive demographic information, including age, sex, household size and disability status.

3.2   The definition of adult disability

The concept of disability has undergone changes over time. There has been a notable shift away from the traditional medical perspective towards a more social model. Cullinan et al. (2011) discuss this paradigm shift, emphasising that the old medical model classified disabled people solely based on their impairments, which led to their exclusion from mainstream social activities. On the other hand, the social model of disability highlights that the barriers in society are the primary limiting factors, rather than just the medical diagnosis (Barnes, 1997; 1996; Oliver and Barnes, 2013). In 2001, the World Health Organization (WHO) approved the 'International Classification of Functioning, Disability, and Health', which emphasises the interaction between an individual and their environment. This reaffirms that disability is not solely a physical or medical condition but also a social issue. In addition to physical and medical

conditions, limitations in everyday activities – whether they are social or not – need to be taken into consideration.

Following these considerations, we define disability based on two main questions from both SILC and HBS surveys which are:

1.   Do you have any chronic physical or mental health problem, illness, or disability?
2.   Are you hampered [limited] in your daily activities by this physical or mental health problem, illness, or disability?

These two questions provide us with information about self-reported health and disability conditions. While the HBS data provide only yes/no answers to each question, in SILC individuals respond to Question 2 with the degree of limitation (No; Yes, somewhat limited; Yes, severely limited). We define individuals as disabled if they report having a chronic health problem or disability *and* being limited in their daily activities.[7]

One caveat to our measure of disability is that it does not capture individuals below 16 years old, as they are not asked these questions in the survey. It should therefore be considered an underestimate of the proportion of disabled people in the population as a whole. Among the disabled population reported by Census 2022 (22 per cent), just 2 percentage points relate to children, so the magnitude of the discrepancy is small. However, if children have a systematically higher cost of disability than adults, our estimated cost of disability will also be an underestimate.

3.3   Measuring poverty

We consider the AROP rate and the poverty gap as the primary measures of living standards for this research although our approach could be easily extended to other measures of living standards, such as the Gini coefficient which measures income

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[7]   This differs somewhat to earlier work by Indecon (2021) which considers only those with limitations in their daily activities (with or without a self-declared disability), and by Cullinan et al. (2011) and Cullinan et al. (2013) who included individuals who declared a health problem, illness or disability but with no accompanying limitation.

inequality. The AROP rate is calculated as the number of individuals with disposable income less than 60 per cent of the median disposable income, adjusted (or 'equivalised') to account for household composition. The poverty gap is estimated by evaluating how far, on average, the incomes of the poor are from the poverty line.

We use two separate methods to adjust our estimate of the AROP rate and the poverty gap to account for the cost of disability. First, we estimate the extra cost of living faced by a disabled household using the SoL method (see Appendix B.1 for a full description of this method). We deduct this cost from the income of households with a disabled member before it is equivalised, in order to calculate the poverty threshold and how many households fall below this threshold. Second, we derive an adjusted equivalence scale which applies a different weight to disabled people in a household to reflect their higher consumption needs (see Appendix B.2 for a full description of this method). This is used in place of the national scale to adjust household income before the poverty threshold or AROP rate are calculated.

Chapter 4

Results

4.1   The prevalence of disability

Table 4.1 displays the number of individuals and households by disability status and by severity of the disability using SILC and HBS data. A household is considered 'disabled' when at least one member of the household declares that they have a disability or chronic illness which limits them in their daily activities.

Using HBS data from 2015/16, we estimate that 6 per cent of adults are disabled and 14.5 per cent of households contain a disabled adult. The figures using SILC 2022 data are higher, with 18 per cent of adults reporting disability and 30 per cent of households containing a disabled member. The SILC estimates are closer to the most recent Census figures. Census 2022 found that 22 per cent of the population experience a long-lasting condition or difficulty to any extent (CSO, 2022b). This figure has increased compared to the previous Census, which reported a population disability rate of 13.5 per cent in 2016 (CSO, 2016).

The higher disability rate recorded in SILC 2022 compared to HBS 2015/16 may be attributed to a number of factors. First, the surveys are conducted six years apart and there is a well-documented trend of increasing disability prevalence in Ireland (and elsewhere, see Doorley and Regan, 2022). Indeed the 2016 Census reported a disability rate 8.5 percentage points lower than that recorded in 2022. The difference may also be due to the different nature of the two surveys. According to CSO, the response rate for the HBS is 'lower than other household surveys, reflecting the difficulty in achieving a high response for an intense survey such as the HBS'.[8] Disabled households may simply be systematically less likely to participate in such an intensive survey. Since the scale of the difference is very large and the SILC data are more recent and more in line with the Census figure, we interpret results using HBS with caution.

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[8]   Household Budget Survey 2015-2016 - CSO - Central Statistics Office.

The SILC data also allow us to document the severity of disability that disabled households are faced with. Among households affected by disability in 2022, we estimate that more than one-quarter contain someone with a severe disability.

Table 4.1   Prevalence of disabled people and households in 2015/16 HBS and 2022 SILC

HBS 2015/16	No. adults	% adults	No. households	% households
Non-disabled	17,472	94.1	5,847	85.5
Disabled – some / severe limitation	1,092	5.9	992	14.5
Total	18,564	100.0	6,839	100.0

SILC 2022	No. adults	% adults	No. households	% households
Non-disabled	7,444	81.9	3,233	69.6
Disabled – some limitation	1,232	13.6	1,026	22.1
Disabled – severe limitation	415	4.6	385	8.2
Total	9,091	100.0	4,644	100.0

Source: HBS 2015/16 and SILC 2022 data, authors' estimates.
Notes: Disabled people are those who self-declare to have an illness or disability which limits them in their daily activities.

4.2   Estimating the cost of disability using the SoL method

This section presents our estimates of the cost of disability using the SoL approach and SILC 2022 data. We first define two SoL indicators, which proxy each households' standard of living, and then, following the methodology described in Appendix B.1, we estimate the cost of disability at the household level.

The items used for the primary SoL indicator computation are presented in Table A.1. This SoL indicator is composed of items related to household ownership of certain goods, but also the ability to make ends meet, or go on holiday.[9] We created three levels of SoL which are: (3) very high SoL (no deprivation); (2) high SoL and no deprivation (being deprived of just one item); and (1) low SoL and high deprivation

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[9]   In Appendix Table A.12 we also present results using the Eurostat definition. For an assessment of the current suitability of poverty indicators for social inclusion in Ireland see Sprong and Maître (2023) and Watson et al. (2017).

(being deprived of at least two items). In what follows, we will refer to this indicator as 'SoL Deprivation' and a lower value indicates higher deprivation.

We also study a second SoL indicator based on self-assessment of financial difficulties (as suggested by Morris and Zaidi, 2020); we refer to this indicator as 'SoL Financial'. This indicator takes the value of 0 for households with self-assessed financial difficulties and takes the value of 1 otherwise.[10] Again, a lower value indicates higher deprivation.

Table 4.2 shows the average level of each SoL indicator by individual disability status. There is a clear gradient in the indicators, with severely disabled adults experiencing the lowest SoL and people without disabilities experiencing the highest SoL.

Table 4.2   Average SoL by individual disability status

	SoL Deprivation (1-3)	SoL Financial (0/1)
No disability	2.57	0.66
Disability some limitation	2.28	0.52
Disability severe limitation	1.91	0.34

Source: Authors' estimates using SILC 2022 data.
Notes: The SoL Deprivation indicator is categorised as: (3) very high SoL; (2) high SoL and no deprivation; and (1) low SoL and high deprivation. The SoL Financial indicator is categorised as (0) financial difficulties and (1) no financial difficulties.

The two SoL indicators are modelled as a function of explanatory variables, with disability status at the household level as the main variable of interest. Tables A.2 and A.3 in the Appendix present the descriptive statistics for the variables used in the model and Table 4.3 presents selected parameter estimates for the two SoL indicators. For both indicators we estimated two specifications: one which includes a dummy variable for a disabled household member (irrespective of severity) and the other which includes dummy variables indicating the severity of disability for any disabled household members.[11] Tables 4.3 and 4.4 translate these results to the extra cost of disability.

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[10]   People reporting that they had 'great difficulty', 'difficulty' or 'some difficulty' in making ends meet were scored 0, while the remaining categories have been scored as 1 (corresponding to 'fairly easily' 'easily' and 'very easily').

[11]   Tables A.4 and A.5 in Appendix A provide the estimated coefficient for all the covariates.

Using the SoL Deprivation indicator, we find that households with disabled members have a lower standard of living than those without disabled members (Model 1). In income terms, this equates to a cost of disability of 59 per cent of disposable income (Figure 4.1). Given the average weekly household disposable income in our sample of disabled households of €944,[12] this corresponds to a cost of €555 per week for households affected by disability (or €465 using median rather than mean income).[13]

The estimated lower standard of living for households with disabilities is strongly related to the severity of disability (Model 2), with the cost for those with severe limitations reaching 93 per cent of disposable income.

Turning to the self-assessment of having difficulty in making ends meet (SoL Financial), Model 3 echoes these findings, indicating a higher probability of financial difficulties in households composed of disabled members. This equates to a cost of disability of 52 per cent of disposable income on average, corresponding to a cost of €488 per week for households affected by disability. Using median disposable income, this cost would be €408 per week.

The gradient in the cost of disability by severity is confirmed by Model 4. Converting the coefficients in Figure 4.1, we find the cost of disability ranges from 40-83 per cent of household disposable income depending on the severity of the disability.[14]

Overall, we find a cost of disability of 59 per cent and 52 per cent using the SoL Deprivation and SoL Financial respectively. These costs are higher than some previously estimated for Ireland (Cullinan et al., 2011; Indecon, 2021) but in line with recent estimates by Antón et al. (2016) of the cost of disability for Ireland in a cross-country comparison.[15] Some of the differences between our estimates and previous

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[12]   The average weekly household disposable income for the general population is €1,063.
[13]   We computed the weekly costs based on weekly average earnings for households with disabilities. Indecon (2021) found smaller weekly costs which they estimate at the median (of €150-260 per week) using pooled SILC data for 2015-2018.
[14]   In Tables A.13-A.15 we also present results on the cost of disability by age and relationship status.
[15]   Antón et al. (2016) estimated the cost of disability in Ireland to be 45 per cent using a similar SoL Financial indicator and to be around 55 per cent using a SoL indicator composed of several items related to deprivation for Ireland, using SILC 2007 and 2012.

research may be due to conceptual choices such as how disability is defined, and modelling choices such as the specification for the SoL model and the measure of deprivation employed.[16] Some differences may also be due to the fact that we use more recent data than previous studies and the cost of disability may be on the rise. Future work should investigate this using a harmonised method and data source over time.

Table 4.3   Estimates for SoL indicators

	Model 1	Model 2	Model 3	Model 4
VARIABLES	**SoL Deprivation**	**SoL Deprivation**	**SoL Financial**	**SoL Financial**
Log Income	1.377***	1.369***	1.294***	1.291***
	(0.0873)	(0.0870)	(0.0882)	(0.0880)
Some limitations	-0.633***		-0.527***	
	(0.0866)		(0.0858)	
Severe limitations	-1.277***		-1.078***	
	(0.125)		(0.129)	
Any disability		-0.805***		-0.667***
		(0.0778)		(0.0775)
Observations	4,629	4,629	4,629	4,629

Source: Authors' estimates using SILC 2022 data.

Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The SoL Deprivation indicator is categorised as: (3) very high SoL; (2) high SoL and no deprivation; and (1) low SoL and high deprivation. The SoL Financial indicator is categorised as (0) facing financial difficulties and (1) no financial difficulties.

Figure 4.1   Extra cost of disability as a share of disposable income by disability status
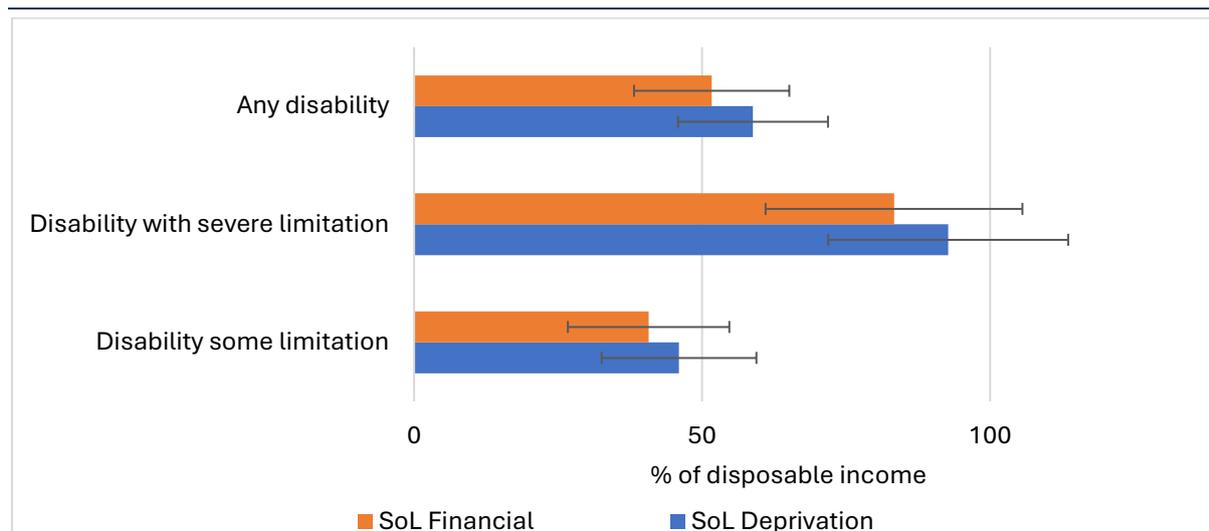
Source: Authors' estimates using SILC 2022 data.

Notes: Confidence intervals at 95 per cent. Estimations based on Equation 2 in Appendix B. The SoL Deprivation indicator is categorised as: (3) very high SoL; (2) high SoL and no deprivation; and (1) low SoL and high deprivation. The SoL Financial

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16   These conceptual and modelling differences are discussed in detail in Appendix B.1.

indicator is categorised as (0) financial difficulties and (1) no financial difficulties. The values of the estimations can also be found in Table A.18 in the Appendix.

It is possible that the cost of disability differs by household type, as having a partner providing care might reduce certain expenditures or result in some income sharing which mitigates the extra expenditure needs. On the other hand, couple households, particularly older ones, might be more likely to contain two disabled people, increasing the cost of disability at the household level.[17] For this reason, we next assess the cost of disability using the SoL method for singles and couples separately.[18] Figure 4.2 depicts the estimated cost of disability by relationship status.

Figure 4.2   Extra cost of disability as a share of disposable income by relationship status
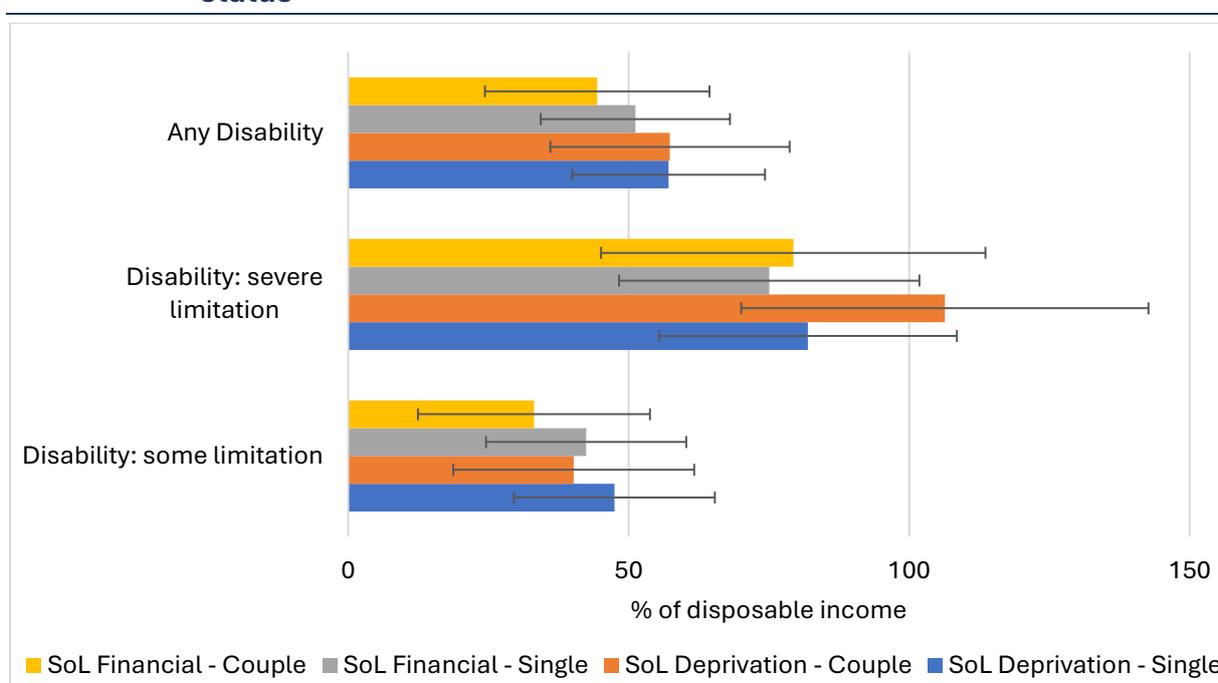
Source: Authors' estimates using SILC 2022 data.
Notes: Confidence intervals at 95 per cent. Estimations based on Equation 2 in Appendix B. The SoL Deprivation indicator is categorised as: (3) very high SoL; (2) high SoL and no deprivation; and (1) low SoL and high deprivation. The SoL Financial indicator is categorised as (0) financial difficulties and (1) no financial difficulties. The values of the estimations can also be found in Table A.19 in Appendix A.

We find that, for any level of disability, singles and couples tend to face similar costs of disability when measured by the SoL Deprivation index, but that singles face higher costs than couples when measured by the SoL Financial index. This suggestive

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[17]   In our sample, 13 per cent of couples include two disabled individuals.
[18]   Both groups contain households with and without dependent children. Tables A.6 and A.7 present the estimated coefficients for the two SoL indicators, for couples and singles separately.

evidence is in line with findings of Mitra et al. (2017) who estimate that costs are particularly high for individuals living in small households as there is limited risk-sharing. However, these differences are not statistically significant, potentially due to the small sample sizes involved.

To delve deeper into this, we examined the effects by both age and relationship status. Tables A.14 and A.15 detail the estimated costs for both singles and couples, split into two groups based on whether the household head is younger or older than 65 years.[19] We find that working-age households face the highest cost of disability, particularly among households with a disabled member with severe limitations. These differences are not statistically significant, but provide suggestive evidence that working-age households have fewer resources (e.g. wealth or through welfare) with which to meet the financial cost of disability.

4.3   Adjusting equivalence scales to account for disability

This section presents the results of the equivalence scales estimation using the AIDS methodology described in Appendix B.2, drawing upon household expenditure data from HBS for 2015/16. We first follow Doorley et al. (2024) in deriving an equivalence scale for all adults and children, to compare with the national scale. This derived scale indicates the relative extra consumption required by each type of household member, based on observed consumption in the HBS data. We then extend the AIDS model to derive a weight for disabled additional adults.

Table 4.4 displays the estimated equivalence scales with and without an extension to additional adults with a disability. Deriving a standard equivalence scale which does not account for disability, we estimate that an additional adult should be assigned a weight of 0.95, which is well above the national scale of 0.66 and the widely used modified OECD scale of 0.6. Doorley et al. (2024) estimate a similarly high weight using the same method, and find that this has grown over time, and was closer to the national and modified OECD scales in the 1980s and 1990s. By contrast, we estimate a child

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[19]   Results based on age and relationship status are also presented for the SoL Deprivation and SoL Financial in Tables A.8-A.11.

weight of 0.18, well below either the national or modified OECD scales (similar to Doorley et al., 2024).

Extending this analysis to account for disability, we find that a 9 per cent higher weight should be accorded to a disabled additional adult (1.02) compared to an additional adult with no disability (0.94). This signifies that disabled adults require 9 per cent extra income compared to non-disabled adults in order to meet the same standard of living. Extrapolating this relativity to derive a weight for a first adult with disabilities, we arrive at a weight of 1.09.[20]

Table 4.4   Estimated equivalence scales by disability status

Equivalence scale	First adult	First adult without disabilities	First adult with disabilities	Additional adult	Additional adult no disabilities	Additional adult with disabilities	Child
National scale	1	1		0.66			0.33
Modified OECD scale	1			0.60			0.30
Derived (using AIDS method)	1			0.95			0.18
Derived + disability (first step)	1				0.94	1.02	0.18
Derived + disability(final)		1	1.085		0.94	1.02	0.18

Source: Authors' calculations using HBS 2015/16 data.
Notes: The national scale is widely used in Ireland while the modified OECD scale is used by Eurostat. The derived scales are estimated using the AIDS model described in Section 3.3. A separate weight for disabled and non-disabled additional adults is estimated using Equation 5 (first step) in Appendix B. The ratio between the disabled and non-disabled additional adult weights is used for the first adult with disabilities in the final step.

4.4   Disability-adjusted poverty rates

We next examine the impact on AROP rates when adjusting income to account for the differences in living costs between households with and without disabled members.[21] We use SILC 2022 for these estimates, and the method is described in Section 3.3.

Figure 4.3 and Table 4.5 present AROP rates for those with and without disabilities. We first show a standard measure in which household disposable income is not adjusted

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[20]   It is derived from the following estimation: (1.02/0.94*1).
[21]   In principle, it is possible to calculate this by severity of disability. However, the sample size becomes very small at this level of disaggregation, so we present results aggregated for any level of disability.

to account for disability and the national equivalence scale is used (column 1 of Table 4.5). We then re-estimate AROP rates for both groups where the cost of disability (as estimated as the average of the two SoL approaches) is deducted from the disposable income of those in a household with a disabled member before it is equivalised using the national scale and used for poverty measurement (columns 2 and 3). Finally, we re-estimate AROP rates using the standard measure of disposable income, and the adjusted equivalence scales estimated using the AIDS method (column 4 without accounting for disability, column 5 including weights for members with a disability).

We find that the AROP rate, measured in the usual way (column 1), is substantially higher for disabled people (24 per cent) than for people with no disability (10 per cent). These estimates are comparable to the latest figures from the CSO (2022a) which put the AROP rate of disabled people between 21-27 per cent, depending on the severity of disability.[22]

Figure 4.3   Adjusted AROP rate by disability status
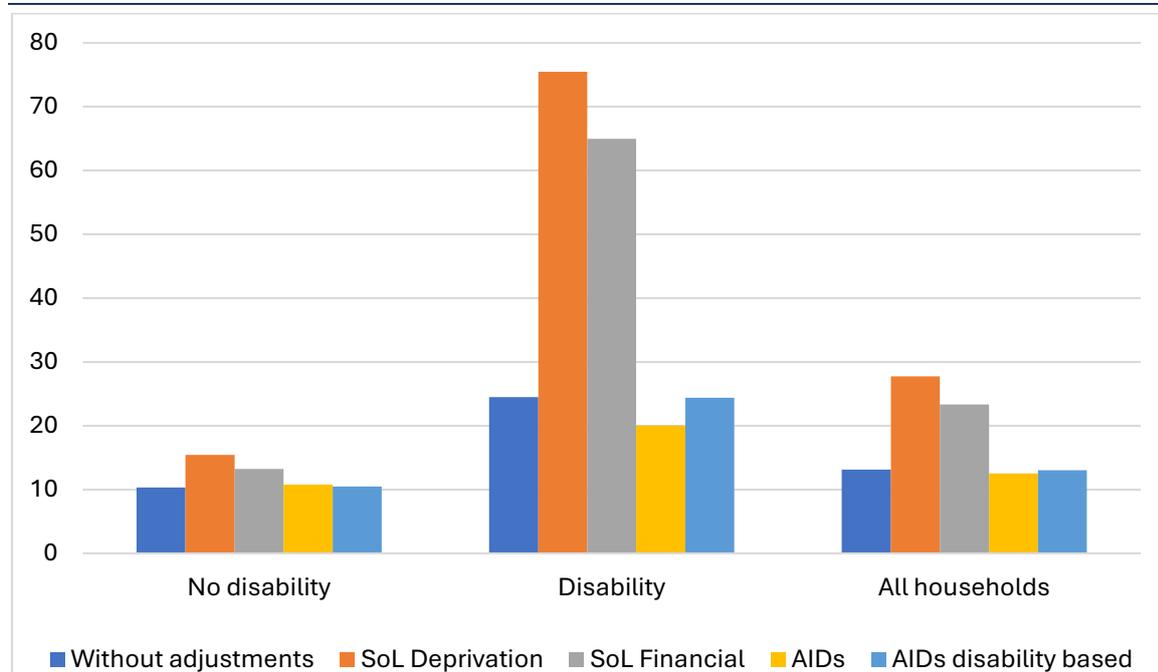
Source: Authors' calculations using SILC 2022.
Note: The AROP rate is an estimate of the share of people whose equivalised disposable income after social transfers is below 60 per cent of the national median equivalised disposable income after social transfers.

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[22]   See CSO Poverty Indicators by Health Status - Survey on Income and Living Conditions (SILC) 2022.

Table 4.5   Adjusted AROP rates by disability status

AROP rate	(1) Standard	(2) SoL Deprivation	(3) SoL Financial	(4) AIDS equivalence scale	(5) AIDS disability based equivalence scale
No disability	10.35	15.45	13.21	10.80	10.50
Disability	24.49	75.46	64.97	20.05	24.41
All households	13.12	27.72	23.35	12.55	13.02

Source: Authors' calculations using SILC 2022.
Note: The AROP rate is an estimate of the share of people whose equivalised disposable income after social transfers is below
         60 per cent of the national median equivalised disposable income after social transfers.

Adjusting the disposable income of people living in households affected by disability using our SoL estimates of the cost of disability, we estimate a much higher AROP rate of 65-75 per cent for disabled people (columns 2 and 3). This corroborates findings of Morris and Zaidi (2020) who estimate disability-adjusted AROP rates for the population aged 50-65 in 15 European countries (excluding Ireland). They estimate extremely high adjusted AROP rates for disabled people, exceeding 70 per cent in most countries and reaching 99 per cent in Sweden.

The estimated AROP rate for people without disabilities also increases in this simulation (to 13-16 per cent) as a substantial minority of them live in households containing a disabled member and are thus subject to higher household living costs. The headline poverty rate increases by 10-14 percentage points once the SoL adjustment is carried out.

Adjusting the equivalence scale to reflect the weights estimated using the AIDS method, we find that the headline poverty rate is slightly lower than the baseline estimates (column 1) when we do not include a separate weight for disabled adults (column 4).[23] This is in line with previous findings of Regan and Kakoulidou (2022) and Doorley et al. (2024) who show that using empirically derived equivalence scales can substantially change the estimate of AROP rates. When we extend the equivalence scale to account for disability, we observe a 4-percentage point increase in the AROP

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[23]   Table A.16 in Appendix A depicts changes in the equivalised disposable income depending on the
       equivalence scale used and whether that household has disabled member.

rate for disabled people and a half percentage point increase in the headline poverty rate (column 5 compared to column 4).

We next calculate the poverty gap adjusted for disability in the same way. The poverty gap indicator measures the intensity of poverty by evaluating how far, on average, the incomes of the poor are from the poverty line. It provides a sense of the depth of poverty and helps in understanding not just the prevalence of poverty, but its severity.

Figure 4.4 and Table A.17 show that the poverty gap for disabled people is 4 per cent, compared to 2.3 per cent for non-disabled people. This means that, in addition to a higher risk of living below the poverty line, disabled people have a disposable income further below the poverty line, on average, than non-disabled people. Adjusting the measurement of the poverty gap using the SoL methods, we observe a significant increase for disabled people. The poverty gap rises to 28.1 per cent when using the SoL Deprivation method and to 27.75 per cent under the SoL Financial method. Using the equivalence scale adjustment, the poverty gap for disabled people increases by nearly a percentage point.

These findings underscore the significance of accounting for the financial burdens associated with disability, as the relevant adjustments to AROP rates and measures of the depth of poverty are potentially large, and affect not only the poverty rate of disabled people, but also the headline AROP rate for the whole population.

Figure 4.4   Adjusted poverty gap by disability status
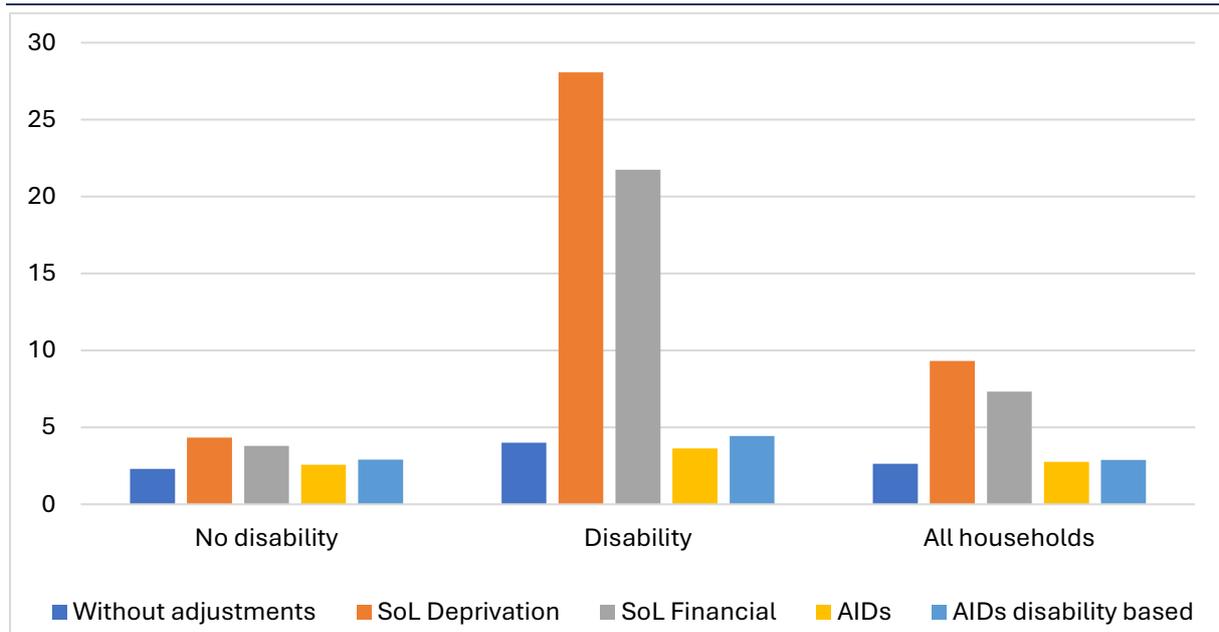
Source: Authors' calculations using SILC 2022.

Notes: Poverty gap is an average estimate of how far away from poverty line – defined as below 60 per cent of the national median equivalised disposable income after social transfers – poor people are. The poverty gaps can also be found in Table A.17 in Appendix A.

Chapter 5

Discussion

This research has tackled the question of living standards of households with disability in Ireland. We have used two different methods to adjust the incomes of households affected by disability to account for the extra costs that they face. These measures capture different aspects of the cost of disability, and we should not expect them to produce similar results. Nevertheless, there is value in estimating each, in order to understand the composition of the cost of disability.

The Standard of Living (SoL) method is widely used in this literature and estimates, based on self-reported deprivation, the extra income that a disabled household requires in order to reach the same standard of living as a similar non-disabled household. The equivalence scale method is much less used in this literature and allows researchers to estimate, based on observed consumption patterns, how the consumption of disabled households differs when compared to the consumption of similar non-disabled households.

Using the SoL method, we estimate that the cost of disability is between 52 per cent and 59 per cent of the disposable income of disabled households. This equates to €488 to €555 per week, on average. Comparing to previous literature which employs an approach similar to our own, we find slightly higher estimates of the cost of disability. This may be due to different methodological choices but may also reflect a rising cost of disability over time, perhaps particularly so during the recent years of the COVID-19 pandemic and cost-of-living crisis. Future work should investigate the cost of disability over time in a harmonised manner in order to understand this.

We find suggestive evidence that the cost of disability depends not only on the severity of the disability but also on the type of household. However, these results are not statistically significant, potentially due to the small sample sizes involved. Learnings on this point from the international literature suggest that single households have a higher cost of disability than couple households, as income sharing between household members may help to absorb some of the cost of disability.

Deducting the average estimated cost of disability from the disposable income of disabled households and calculating the AROP rate, we find that adjusting for the cost of disability increases the AROP rate of disabled people to 65-75 per cent and increases the headline AROP rate for the whole population by 10-14 percentage points. The poverty gap for disabled households, which measures how far below the poverty line they are, increases from 4 per cent to 28 per cent. These findings are in line with the high financial burdens estimated in the international literature for individuals with disabilities. Antón et al. (2016) discover much variance in the cost of disability across European countries, with Nordic and Continental countries (including Anglo-Saxon nations) displaying a higher cost compared to Mediterranean and Eastern European countries (around 150 per cent of disposable income for Sweden and Norway, and around 50 per cent for Ireland). Similarly, Morris and Zaidi (2020) conducted an analysis in which they adjusted AROP rates to account for the cost of disability and found that these adjusted AROP rates exceeded 70 per cent for disabled people in most of the countries they studied.

Using an alternative method to account for the cost of disability, we derive a disability-adjusted equivalence scale. We estimate that the weight assigned to an additional adult with a disability should be 9 per cent higher than the weight assigned to an additional adult with no disability. Using this derived scale to calculate AROP rates, we find that the AROP rate of disabled people increases by 4 percentage points and the overall AROP rate increases by 0.5 percentage points compared to a derived scale that does not assign a different weight to disabled people.

The SoL method is certainly more widely used in the national and international literature relating to the cost of disability. As such, it is straightforward to make international and over-time comparisons between estimates. In addition, as it is not dependent on consumption data, we have been able to make use of relatively recent survey data to estimate the cost of disability. However, its greatest strength lies in the fact that it accounts for unmet needs, which is likely to be particularly acute for households with disabled members who face higher costs of living with lower average income. As such, we are inclined to place more emphasis on the results of this research stemming from the SoL method than the equivalence scale method, which is

relatively untested in the international literature and relies on older data. However, the AROP rates estimated using the equivalence scale method could be considered as a lower bound, as suggested by Jones and O'Donnell (1995).

In addition to these conceptual differences in the two methodologies used in this research, we must also keep in mind that the proportion of disabled people in the HBS survey sample is much lower than that in the SILC survey sample. This may be due to the six-year gap between the survey collection dates, but also to a potential under-representation of disabled households in HBS, reflecting the time-intensive nature of participation in the HBS survey, which requires a consumption diary to be kept for two weeks.

The international and national evidence on disability is clear. Individuals and households affected by disability suffer a double penalty to their living standards as their labour income is lower and consumption needs are higher than non-disabled individuals and households. One way to address the higher rates of income poverty among disabled people is by removing barriers to work that they and their family members face. Achieving this would require significant investment in services such as adult care, childcare, education and training, along with changes in employer policies, such as flexible work arrangements and formalised recruitment practices (Doorley et al., 2022). Income poverty could also be reduced by directly increasing targeted welfare payments or introducing a 'cost of disability' payment, as recommended by the Commission on the Status of People with Disabilities (NDA, 2021).

However, the measurement of the living standards of households with disabilities also deserves attention. Currently, the most commonly used headline measures of living standards, such as poverty and inequality metrics, account only for income, and adjust this income for household size without reference to disability. To accurately capture national and international living standards, accounting for how these differ systematically for disabled households, there should be more reflection of the consumption side of the equation and how this differs by disability status. One possibility includes calculating disability-adjusted AROP rates, as suggested by the results of this research, in conjunction with standard measures.

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Appendix A

Table A.1   Deprivation variables used for the SoL Deprivation indicator

SILC Variable		Mean	SD
Without heating	Had to go without heating during the 12 months though lack of money	0.07	0.26
dep_soc_hh_ref	Deprived of a morning, afternoon or evening out in the last fortnight for their entertainment (something that costs money)	0.06	0.24
dep_shoes_hh	Deprived of possession of two pairs of strong shoes per household member	0.02	0.12
dep_warm_hsehh	Deprived of the ability to keep the home adequately warm	0.05	0.21
dep_meat_meal_hh	Deprived of eating meals with meat, chicken, fish (or vegetarian equivalent) every second day	0.01	0.11
dep_joint_hh	Deprived of a roast joint of meat (or its equivalent) once a week	0.03	0.17
dep_furniture_hh	Deprived of the ability to be able to afford to replace any worn out furniture	0.14	0.35
dep_fam_pres_hh	Household unable to afford to buy presents for family or friends at least once a year	0.03	0.18
dep_fam_mealhh	Deprived of a (get-together with) family and/or friends (relatives) for a drink or a meal once a month	0.06	0.23
dep_coat_hh	Unable to afford to be in possession of a warm waterproof coat	0.01	0.10
dep_clothes_hh	Unable to afford to replace worn out clothes with new (not second hand) items	0.06	0.24
Holiday	Unable to afford paying for one week annual holiday away from home	0.19	0.39
expenses	Unable to face unexpected financial expenses	0.24	0.42
computer	Cannot afford a computer	0.02	0.16
Car	Cannot afford a car	0.04	0.20

Source: Authors' estimates using SILC 2022 data.

Table A.2   Descriptive statistics – household variables

	Mean	Standard deviation
SoL Deprivation	2.46	0.82
SoL Financial	0.60	0.49
Log Income	10.81479	0.719569
Household size	2.44	1.36

Source: Authors' estimates using SILC 2022 data.

Table A.3   Descriptive statistics of the household head

	Proportion (%)
Tenant	15.50
Owner	84.50
Age 18-34	8.13
Age 35-49	27.64
Age 50-64	31.48
Age 65+	32.75
Men	53.45
Women	46.55
Married	52.82
Lone parent	2.73
Northern and Western Ireland	15.48
Southern Ireland	36.97
Eastern and Midland Ireland	47.55

Source: Authors' estimates using SILC 2022 data.

Table A.4   Parameter estimates of the ordered logit model using SoL Deprivation

VARIABLES	Severity of Disability	Any disability
Log Income	1.377***	1.369***
	(0.0873)	(0.0870)
Disability some limitations	-0.633***	
	(0.0866)	
Disability severe limitations	-1.277***	
	(0.125)	
Any disability		-0.805***
		(0.0778)
Household size	-0.398***	-0.403***
	(0.0427)	(0.0426)
Owner	1.147***	1.158***
	(0.0898)	(0.0898)
Age 18-34	-0.843	-0.914
	(0.844)	(0.830)
Age 35-49	-0.541	-0.605
	(0.841)	(0.827)
Age 50-64	-0.245	-0.310
	(0.843)	(0.830)
Age 65+	0.338	0.298
	(0.843)	(0.830)
Women	-0.347***	-0.351***
	(0.0746)	(0.0744)
		Contd.

Table A.4   Contd.

VARIABLES	Severity of Disability	Any disability
Married	0.223**	0.226**
	(0.109)	(0.108)
Separated	-0.753***	-0.748***
	(0.190)	(0.189)
Widowed	0.104	0.106
	(0.139)	(0.138)
Divorced	-0.183	-0.186
	(0.166)	(0.167)
Primary educ.	0.0228	0.0782
	(0.600)	(0.625)
Upper second. educ.	0.438	0.517
	(0.601)	(0.626)
Upper second. general	0.829	0.879
	(0.599)	(0.624)
Upper second. vocational	0.380	0.449
	(0.654)	(0.676)
Post-secondary educ.	0.836	0.895
	(0.602)	(0.627)
Short-cycle tertiary educ.	1.090*	1.167*
	(0.605)	(0.630)
Bachelor educ.	1.473**	1.546**
	(0.600)	(0.625)
Master educ.	1.687***	1.759***
	(0.609)	(0.633)
Doctoral educ.	1.437**	1.535**
	(0.658)	(0.680)
Lone parent	-0.954***	-0.936***
	(0.238)	(0.241)
HoH Unemployed	-0.112	-0.124
	(0.283)	(0.280)
HoH Inactive	0.0199	-0.0458
	(0.119)	(0.118)
Southern Ireland	-0.266**	-0.257**
	(0.106)	(0.105)
Eastern and Midland Ireland	0.0232	0.0276
	(0.107)	(0.106)
/cut1	13.53***	13.44***
	(1.369)	(1.369)
/cut2	14.39***	14.30***
	(1.370)	(1.370)
Observations	4,629	4,629

Source: Authors' calculations using SILC 2022 data.
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.5   Parameter estimates of the logistic regression of SoL Financial

VARIABLES	Severity of disability	Any disability
Log Income	1.294***	1.291***
	(0.0882)	(0.0880)
Disability some limitations	-0.527***	
	(0.0858)	
Disability severe limitations	-1.078***	
	(0.129)	
Any disability		-0.667***
		(0.0775)
Household size	-0.450***	-0.454***
	(0.0400)	(0.0401)
Owner	0.717***	0.730***
	(0.104)	(0.104)
Age 18-34	-0.354	-0.411
	(0.828)	(0.827)
Age 35-49	-0.101	-0.156
	(0.824)	(0.823)
Age 50-64	0.188	0.133
	(0.825)	(0.824)
Age 65+	0.527	0.495
	(0.827)	(0.826)
Women	-0.224***	-0.226***
	(0.0718)	(0.0716)
Married	-0.0856	-0.0816
	(0.108)	(0.108)
Separated	-0.901***	-0.892***
	(0.195)	(0.196)
Widowed	0.0784	0.0846
	(0.139)	(0.138)
Divorced	-0.523***	-0.524***
	(0.175)	(0.174)
Primary educ.	0.141	0.190
	(0.503)	(0.512)
Upper second. educ.	0.407	0.479
	(0.504)	(0.512)
Upper second. general	0.599	0.650
	(0.501)	(0.510)
Upper second. vocational	0.170	0.236
	(0.585)	(0.592)
Post-secondary educ.	0.603	0.659
	(0.503)	(0.512)
Short-cycle tertiary educ.	0.688	0.757
	(0.505)	(0.514)

Cont.

Table A.5   Contd.

VARIABLES	Severity of disability	Any disability
Bachelor educ.	1.103**	1.173**
	(0.500)	(0.509)
Master educ.	1.466***	1.536***
	(0.507)	(0.516)
Doctoral educ.	1.683***	1.771***
	(0.572)	(0.579)
Lone parent	-0.539**	-0.523**
	(0.263)	(0.264)
HoH Unemployed	-0.356	-0.347
	(0.344)	(0.343)
HoH Inactive	0.186	0.134
	(0.122)	(0.121)
Southern Ireland	0.219**	0.224**
	(0.102)	(0.101)
Eastern and Midland Ireland	0.536***	0.538***
	(0.100)	(0.0996)
Constant	-13.96***	
	(1.333)	
		-13.93***
Observations	4,629	(1.335)

Source: Authors' calculations using SILC 2022 data.

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.6   Parameter estimates of the SoL Deprivation by relationship status

VARIABLES	Single Severity of Disability	Single Any Disability	Couple Severity of Disability	Couple Any Disability
Log Income	1.486***	1.483***	1.274***	1.270***
	(0.128)	(0.128)	(0.134)	(0.133)
Disability some limitations	-0.705***		-0.512***	
	(0.124)		(0.127)	
Disability severe limitations	-1.218***		-1.355***	
	(0.173)		(0.188)	
Any disability		-0.847***		-0.729***
		(0.110)		(0.114)
Household size	-0.526***	-0.538***	-0.338***	-0.341***
	(0.0827)	(0.0821)	(0.0546)	(0.0546)
Owner	1.081***	1.098***	1.246***	1.245***
	(0.120)	(0.120)	(0.141)	(0.141)
Age 18-34	-0.995	-1.060		
	(0.858)	(0.848)		
Age 35-49	-0.682	-0.753	0.340	0.347
	(0.863)	(0.853)	(0.247)	(0.250)
Age 50-64	-0.584	-0.655	0.769***	0.779***
	(0.866)	(0.856)	(0.264)	(0.267)
Age 65+	0.0565	0.0122	1.253***	1.288***
	(0.869)	(0.860)	(0.330)	(0.333)
Women	-0.552***	-0.544***	-0.136	-0.156
	(0.109)	(0.109)	(0.107)	(0.106)
Married	0.336	0.369	-0.00872	-0.00902
	(0.477)	(0.478)	(0.195)	(0.194)
Separated	-0.716***	-0.708***	-0.190	-0.316
	(0.201)	(0.200)	(0.811)	(0.894)
Widowed	0.225	0.215	-0.659	-0.417
	(0.159)	(0.157)	(1.121)	(1.126)
Divorced	-0.171	-0.171	0.787	0.665
	(0.175)	(0.176)	(0.556)	(0.587)
Primary educ.	0.292	0.314	-12.61***	-12.42***
	(0.725)	(0.755)	(0.653)	(0.908)
Upper second. educ.	0.840	0.886	-12.37***	-12.16***
	(0.728)	(0.758)	(0.661)	(0.909)
Upper second. general	1.296*	1.338*	-11.93***	-11.80***
	(0.725)	(0.755)	(0.648)	(0.900)
Upper second. vocational	1.053	1.080	-12.55***	-12.35***
	(0.868)	(0.888)	(0.712)	(0.948)
Post-secondary educ.	1.084	1.117	-11.75***	-11.58***
	(0.730)	(0.760)	(0.652)	(0.910)
Short-cycle tertiary educ.	1.450**	1.496*	-11.59***	-11.40***
	(0.736)	(0.766)	(0.664)	(0.909)

Contd.

Table A.6   Contd.

VARIABLES	Single Severity of Disability	Single Any Disability	Couple Severity of Disability	Couple Any Disability
Bachelor educ.	1.705**	1.736**	-11.12***	-10.92***
	(0.727)	(0.757)	(0.651)	(0.906)
Master educ.	2.031***	2.068***	-10.97***	-10.79***
	(0.748)	(0.777)	(0.659)	(0.909)
Doctoral educ.	1.076	1.146	-10.77***	-10.57***
	(0.830)	(0.859)	(0.760)	(0.980)
Lone parent	-0.826***	-0.804***		
	(0.267)	(0.269)		
HoH Unemployed	0.0236	0.00908	-0.318	-0.294
	(0.357)	(0.359)	(0.472)	(0.453)
HoH Inactive	-0.0177	-0.0614	0.111	0.00842
	(0.151)	(0.150)	(0.205)	(0.202)
Southern Ireland	-0.580***	-0.563***	0.0805	0.0769
	(0.148)	(0.147)	(0.148)	(0.147)
Eastern and Midland Ireland	-0.226	-0.210	0.300**	0.279*
	(0.151)	(0.151)	(0.148)	(0.147)
/cut1	14.16***	14.10***	1.095	1.206
	(1.692)	(1.700)	(1.596)	(1.687)
/cut2	15.01***	14.95***	1.982	2.085
	(1.695)	(1.702)	(1.597)	(1.691)
Observations	2,023	2,023	2,606	2,606

Source: Authors' calculations using SILC 2022 data.

Notes: Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A.7   Estimates of the logit regression of SoL Financial by relationship status

VARIABLES	Single — Severity of Disability	Single — Any Disability	Couple — Severity of Disability	Couple — Any Disability
Log Income	-1.539***	-1.538***	-1.206***	-1.208***
	(0.131)	(0.131)	(0.126)	(0.127)
Disability some limitations	0.653***		0.399***	
	(0.129)		(0.119)	
Disability severe limitations	1.155***		0.957***	
	(0.189)		(0.182)	
Any disability		0.787***		0.536***
		(0.116)		(0.108)
Household size	0.699***	0.709***	0.386***	0.389***
	(0.0813)	(0.0817)	(0.0483)	(0.0484)
Owner	-0.664***	-0.683***	-0.803***	-0.808***
	(0.137)	(0.136)	(0.168)	(0.168)
aggp3	-0.197**	-0.200**	-0.329***	-0.337***
	(0.0838)	(0.0835)	(0.0891)	(0.0894)
Women	0.292***	0.286**	0.150	0.160*
	(0.111)	(0.111)	(0.0964)	(0.0961)
Married	0.0386	0.0182	0.345*	0.348*
	(0.426)	(0.427)	(0.208)	(0.208)
Separated	0.893***	0.883***	0.440	0.497
	(0.210)	(0.210)	(0.814)	(0.863)
Widowed	-0.107	-0.108		
	(0.159)	(0.158)		
Divorced	0.482***	0.482***	0.894	0.950
	(0.187)	(0.186)	(0.647)	(0.623)
Primary educ.	-0.0575	-0.0810	-0.454	-0.631
	(0.548)	(0.568)	(1.327)	(1.214)
Upper second. educ.	-0.419	-0.463	-0.529	-0.721
	(0.548)	(0.567)	(1.326)	(1.212)
Upper second. general	-0.737	-0.779	-0.671	-0.823
	(0.548)	(0.568)	(1.321)	(1.208)
Upper second. vocational	-0.405	-0.432	-0.145	-0.336
	(0.745)	(0.753)	(1.373)	(1.265)
Post-secondary educ.	-0.409	-0.440	-0.884	-1.053
	(0.552)	(0.571)	(1.323)	(1.211)
Short-cycle tertiary educ.	-0.590	-0.636	-0.898	-1.081
	(0.556)	(0.575)	(1.324)	(1.211)
Bachelor educ.	-0.999*	-1.035*	-1.320	-1.509
	(0.548)	(0.567)	(1.320)	(1.207)
Master educ.	-1.067*	-1.108*	-1.782	-1.966
	(0.566)	(0.584)	(1.324)	(1.211)

Contd.

Table A.7   Contd.

VARIABLES	Single Severity of Disability	Single Any Disability	Couple Severity of Disability	Couple Any Disability
Doctoral educ.	-1.602**	-1.677**	-1.898	-2.095*
	(0.723)	(0.737)	(1.361)	(1.251)
Lone parent	0.322	0.303		
	(0.268)	(0.270)		
HoH Unemployed	-0.0840	-0.0826	0.953	0.918
	(0.387)	(0.387)	(0.652)	(0.654)
HoH Inactive	-0.386**	-0.355**	-0.128	-0.0795
	(0.151)	(0.149)	(0.166)	(0.165)
Southern Ireland	-0.0589	-0.0724	-0.370***	-0.367***
	(0.151)	(0.150)	(0.139)	(0.139)
Eastern and Midland Ireland	-0.540***	-0.554***	-0.538***	-0.528***
	(0.150)	(0.149)	(0.135)	(0.134)
Constant	16.57***	16.61***	14.44***	14.64***
	(1.456)	(1.459)	(1.905)	(1.829)
Observations	2,023	2,023	2,603	2,603

Source: Authors' calculations using SILC 2022 data.
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.8   Estimates by age groups using the SoL Deprivation indicator

VARIABLES	65+ Severity of Disability	65+ Any Disability	Working age Severity of Disability	Working age Any Disability
Log Income	1.406***	1.411***	1.372***	1.357***
	(0.191)	(0.190)	(0.0981)	(0.0973)
Disability some limitations	-0.612***		-0.611***	
	(0.139)		(0.110)	
Disability severe limitations	-1.105***		-1.412***	
	(0.178)		(0.180)	
Any disability		-0.764***		-0.800***
		(0.125)		(0.0996)
Household size	-0.509***	-0.531***	-0.453***	-0.458***
	(0.180)	(0.175)	(0.0421)	(0.0418)
Owner	1.061***	1.078***	1.277***	1.287***
	(0.181)	(0.181)	(0.104)	(0.104)
Women	-0.228*	-0.234*	-0.422***	-0.423***
	(0.128)	(0.127)	(0.0920)	(0.0918)
Married	0.341	0.337	0.399***	0.418***
	(0.251)	(0.248)	(0.114)	(0.113)
Separated	-0.779**	-0.788**	-0.560**	-0.552**
	(0.311)	(0.308)	(0.242)	(0.241)
Widowed	0.0781	0.0658	0.377	0.370
	(0.193)	(0.191)	(0.287)	(0.281)
Divorced	-0.00625	-0.0234	-0.0329	-0.0258
	(0.298)	(0.300)	(0.197)	(0.197)
Primary educ.	-0.380	-0.382	14.10	13.95***
	(0.707)	(0.758)		(0.198)
Upper second. educ.	0.0539	0.0646	14.39	14.31
	(0.712)	(0.762)		
Upper second. general	0.625	0.607	14.65	14.54
	(0.715)	(0.765)		
Upper second. vocational	0.526	0.557	14.02	13.91***
	(0.898)	(0.940)		(0.296)
Post-secondary educ.	0.249	0.242	14.86	14.75***
	(0.721)	(0.771)		(0.161)
Short-cycle tertiary educ.	0.546	0.551	15.08	15.00***
	(0.724)	(0.774)		(0.148)
Bachelor educ.	1.172	1.184	15.35	15.25
	(0.725)	(0.774)		
Master educ.	0.519	0.512	15.70	15.61
	(0.755)	(0.801)		
Doctoral educ.	1.389	1.443	15.32	15.25***
	(0.980)	(1.015)		(0.252)

Contd.

Table A.8   Contd.

VARIABLES	65+ Severity of Disability	65+ Any Disability	Working age Severity of Disability	Working age Any Disability
HoH Unemployed	-0.640	-0.567	-0.0514	-0.0852
	(0.831)	(0.868)	(0.307)	(0.304)
HoH Inactive	-0.128	-0.162	0.122	0.0369
	(0.256)	(0.256)	(0.140)	(0.137)
Southern Ireland	-0.324*	-0.304*	-0.234*	-0.235*
	(0.171)	(0.170)	(0.135)	(0.134)
Eastern and Midland Ireland	-0.0496	-0.0344	0.0468	0.0402
	(0.176)	(0.175)	(0.136)	(0.135)
/cut1	12.82***	12.83***	27.90	27.63***
	(2.058)	(2.065)		(0.894)
/cut2	13.65***	13.66***	28.77***	28.50***
	(2.057)	(2.064)	(0.149)	(0.893)
Lone parent			-0.998***	-0.968***
			(0.245)	(0.247)
Observations	1,517	1,517	3,112	3,112

Source: Authors' calculations using SILC 2022 data.
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.9   Estimates by age groups using SoL Financial indicator

VARIABLES	65+ Severity of Disability	65+ Any Disability	Working age Severity of Disability	Working age Any Disability
Log Income	-1.463***	-1.467***	-1.263***	-1.256***
	(0.174)	(0.175)	(0.101)	(0.100)
Disability some limitations	0.468***		0.511***	
	(0.138)		(0.110)	
Disability severe limitations	0.891***		1.192***	
	(0.175)		(0.192)	
Any disability		0.595***		0.661***
		(0.123)		(0.0998)
Household size	0.631***	0.646***	0.503***	0.508***
	(0.184)	(0.190)	(0.0407)	(0.0407)
Owner	-0.367*	-0.392*	-0.940***	-0.949***
	(0.207)	(0.205)	(0.119)	(0.119)
Women	0.161	0.164	0.259***	0.258***
	(0.124)	(0.123)	(0.0893)	(0.0890)

Contd.

Table A.9   Contd.

VARIABLES	65+ Severity of Disability	65+ Any Disability	Working age Severity of Disability	Working age Any Disability
Married	0.105	0.111	-0.142	-0.158
	(0.249)	(0.252)	(0.111)	(0.111)
Separated	0.875***	0.883***	0.837***	0.820***
	(0.320)	(0.320)	(0.246)	(0.248)
Widowed	-0.0296	-0.0213	-0.108	-0.110
	(0.196)	(0.195)	(0.267)	(0.267)
Divorced	0.439	0.460	0.379*	0.370*
	(0.316)	(0.314)	(0.205)	(0.204)
Primary educ.	0.0375	0.0265	1.193***	1.259***
	(0.561)	(0.582)	(0.414)	(0.412)
Upper second. educ.	-0.321	-0.348	1.180***	1.191***
	(0.567)	(0.587)	(0.341)	(0.340)
Upper second. general	-0.400	-0.405	0.952***	0.988***
	(0.567)	(0.588)	(0.312)	(0.310)
Upper second. vocational	-0.673	-0.711	1.854***	1.880***
	(0.776)	(0.794)	(0.506)	(0.503)
Post-secondary educ.	-0.306	-0.320	0.867***	0.897***
	(0.576)	(0.597)	(0.319)	(0.318)
Short-cycle tertiary educ.	-0.632	-0.651	0.937***	0.951***
	(0.578)	(0.597)	(0.323)	(0.322)
Bachelor educ.	-1.041*	-1.067*	0.520*	0.537*
	(0.575)	(0.595)	(0.300)	(0.299)
Master educ.	-0.675	-0.691	0.0347	0.0480
	(0.600)	(0.619)	(0.309)	(0.308)
Doctoral educ.	-2.412*	-2.467*		
	(1.249)	(1.264)		
HoH Unemployed	0.334	0.257	0.349	0.350
	(0.952)	(0.979)	(0.370)	(0.367)
HoH Inactive	-0.103	-0.0786	-0.316**	-0.243*
	(0.230)	(0.230)	(0.150)	(0.146)
Southern Ireland	-0.234	-0.245	-0.209	-0.208
	(0.170)	(0.170)	(0.127)	(0.127)
Eastern and Midland Ireland	-0.520***	-0.529***	-0.544***	-0.541***
	(0.171)	(0.170)	(0.124)	(0.123)
Lone parent			0.505*	0.480*
			(0.265)	(0.266)
Constant	14.39***	14.44***	12.21***	12.11***
	(1.856)	(1.863)	(1.096)	(1.091)
Observations	1,517	1,517	3,109	3,109

Source: Authors' calculations using SILC 2022 data.
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.10 **Parameter estimates SoL Deprivation indicator by age and relationship status**

VARIABLES	Single 65+	Single working age	Couple 65+	Couple working age
Log Income	1.600***	1.525***	1.236***	1.354***
	(0.235)	(0.158)	(0.345)	(0.146)
Disability some limitations	-0.744***	-0.676***	-0.379*	-0.519***
	(0.190)	(0.166)	(0.218)	(0.154)
Disability severe limitations	-1.025***	-1.281***	-1.096***	-1.590***
	(0.248)	(0.247)	(0.258)	(0.283)
Household Size	-0.885***	-0.580***	-0.0427	-0.387***
	(0.208)	(0.0809)	(0.246)	(0.0511)
Owner	1.149***	1.155***	1.047**	1.433***
	(0.199)	(0.149)	(0.421)	(0.146)
Women	-0.302*	-0.628***	-0.00195	-0.211*
	(0.165)	(0.138)	(0.196)	(0.127)
Primary educ.	-0.196	13.23***	-12.53***	
	(0.847)	(0.956)	(0.759)	
Upper second. educ.	0.274	13.72***	-12.22***	0.0219
	(0.857)	(0.938)	(0.770)	(0.523)
Upper second. general	0.890	14.02***	-11.57***	0.375
	(0.863)	(0.932)	(0.766)	(0.494)
Upper second. vocational	2.105	13.17***	-12.45***	-0.173
	(1.342)	(1.131)	(0.952)	(0.595)
Post-secondary educ.	0.341	13.99***	-11.88***	0.710
	(0.875)	(0.935)	(0.771)	(0.507)
Short-cycle tertiary educ.	0.690	14.43***	-11.61***	0.755
	(0.869)	(0.947)	(0.791)	(0.507)
Bachelor educ.	1.025	14.52***	-10.56***	1.124**
	(0.868)	(0.934)	(0.806)	(0.491)
Master educ.	0.582	15.03***	-11.52***	1.371***
	(0.956)	(0.951)	(0.818)	(0.504)
Doctoral educ.	1.740	13.48***	-11.24***	1.647**
	(1.265)	(1.048)	(1.285)	(0.645)
lone_parent		-0.879***		
		(0.260)		
HoH Unemployed	-0.000	0.0657	-0.899	-0.0974
	(1.244)	(0.383)	(0.896)	(0.531)
HoH Inactive	0.122	0.00519	-0.318	0.574**
	(0.342)	(0.167)	(0.409)	(0.278)
Southern Ireland	-0.283	-0.697***	-0.226	0.190
	(0.224)	(0.196)	(0.273)	(0.177)
Eastern and Midland Ireland	-0.00843	-0.360*	-0.0113	0.395**
	(0.230)	(0.202)	(0.281)	(0.174)
/cut1	14.84***	27.96***	-0.517	13.88***
	(2.514)	(1.730)	(3.783)	(1.592)
/cut2	15.64***	28.85***	0.382	14.76***
	(2.516)	(1.738)	(3.778)	(1.594)
Observations	773	1,250	744	1,862

Source: Authors' calculations using SILC 2022 data.

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.11   Parameter estimates SoL Financial indicator by age and relationship status

VARIABLES	Single 65+	Single working age	Couple 65+	Couple working age
Log Income	-1.683***	-1.512***	-1.366***	-1.189***
	(0.228)	(0.164)	(0.280)	(0.139)
Disability some limitations	0.470**	0.728***	0.432**	0.310**
	(0.194)	(0.173)	(0.198)	(0.147)
Disability severe limitations	0.876***	1.241***	0.854***	1.109***
	(0.260)	(0.267)	(0.249)	(0.282)
Household size	1.448***	0.712***	0.175	0.430***
	(0.282)	(0.0828)	(0.227)	(0.0478)
Owner	-0.360	-0.909***	-1.124**	-0.907***
	(0.223)	(0.169)	(0.555)	(0.171)
Women	0.0793	0.394***	0.170	0.158
	(0.173)	(0.144)	(0.177)	(0.115)
Primary educ.	0.310	0.990*	-0.488	
	(0.644)	(0.592)	(1.261)	
Upper second. educ.	-0.0301	0.835*	-0.611	0.364
	(0.652)	(0.506)	(1.267)	(0.547)
Upper second. general	-0.311	0.464	-0.557	0.126
	(0.663)	(0.479)	(1.259)	(0.511)
Upper second. vocational	-0.520	1.115	-0.980	1.232*
	(1.015)	(0.883)	(1.445)	(0.701)
Post-secondary educ.	0.0503	0.759	-0.664	-0.167
	(0.673)	(0.488)	(1.266)	(0.517)
Short-cycle tertiary educ.	-0.206	0.621	-1.055	0.0702
	(0.668)	(0.499)	(1.274)	(0.523)
Bachelor educ.	-0.718	0.253	-1.368	-0.401
	(0.676)	(0.459)	(1.263)	(0.504)
Master educ.	0.298	-0.0896	-1.390	-0.908*
	(0.719)	(0.476)	(1.291)	(0.513)
Doctoral educ.			-1.810	-1.012*
			(1.632)	(0.605)
Lone parent		0.396		
		(0.274)		
HoH Unemployed	-0.542	-0.132	1.026	0.968
	(1.133)	(0.417)	(1.379)	(0.710)
HoH Inactive	-0.355	-0.303	0.0134	-0.595**
	(0.326)	(0.190)	(0.340)	(0.275)
Southern Ireland	-0.154	-0.0869	-0.487*	-0.292*
	(0.227)	(0.201)	(0.262)	(0.164)
Eastern and Midland Ireland	-0.571**	-0.566***	-0.531**	-0.531***
	(0.233)	(0.196)	(0.255)	(0.158)
Constant	15.79***	14.70***	15.50***	12.51***
	(2.373)	(1.757)	(3.318)	(1.528)
Observations	763	1,247	744	1,862

Source: Authors' calculations using SILC 2022 data. *Note:* Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.12 **Parameter estimates of the ordered logit model using Eurostat material deprivation indicator**

VARIABLES	Severity of Disability
Log Income	1.556***
	(0.0894)
Disability some limitations	-0.602***
	(0.0895)
Disability severe limitations	-1.295***
	(0.128)
Household size	-0.472***
	(0.0448)
Owner	1.170***
	(0.0924)
Age 18-34	-0.803
	(0.850)
Age 35-49	-0.528
	(0.846)
Age 50-64	-0.221
	(0.849)
Age 65+	0.324
	(0.850)
Women	-0.433***
	(0.0768)
Married	0.185
	(0.114)
Separated	-0.885***
	(0.193)
Widowed	0.116
	(0.145)
Divorced	-0.276*
	(0.165)
Primary educ.	-0.0757
	(0.527)
Upper second. educ.	0.366
	(0.528)
Upper second. general	0.776
	(0.524)
Upper second. vocational	0.801
	(0.599)
Post-secondary educ.	0.763
	(0.528)
Short-cycle tertiary educ.	0.988*
	(0.531)
Bachelor educ.	1.383***
	(0.526)

Contd.

Table A.12   Contd.

VARIABLES	Severity of Disability
Master educ.	1.671***
	(0.536)
Doctoral educ.	1.478**
	(0.612)
Lone parent	-0.987***
	(0.238)
HoH Unemployed	-0.246
	(0.280)
HoH Inactive	0.115
	(0.121)
Southern Ireland	-0.305***
	(0.108)
Eastern and Midland Ireland	0.0343
	(0.110)
/cut1	15.13***
	(1.347)
/cut2	15.95***
	(1.348)
Observations	4,629

Source: Authors' calculations using SILC 2022 data.
Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.13   Cost of disability by age status divided into SoL Deprivation and SoL Financial categories

	SoL Deprivation	SoL Deprivation	SoL Financial	SoL Financial
	HoH <65 years old	HoH >=65 years old	HoH <65 years old	HoH >=65 years old
Disability with limitation	44.55 [27.74; 61.35]	43.53 [20.74; 66.32]	40.46 [22.44; 58.48]	32.00 [11.72; 52.28]
Disability with severe limitation	102.83 [74.07; 131.65]	78.57 [45.73; 111.41]	94.41 [61.81; 127.02]	60.90 [33.00; 88.81]
Any disability	58.94 [42.77; 75.11]	54.16 [31.47; 76.86]	52.62 [35.36; 69.88]	40.57 [21.82; 59.87]

Source: Authors' calculations using SILC 2022 data.
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.14   Cost of disability by age and relationship status: SoL Deprivation

	HoH less than 65 years old	HoH less than 65 years old	HoH over 65 years old	HoH over 65 years old
	Single	Couple	Single	Couple
Disability with limitation	44.33 [21.36; 67.31]	38.34 [14.45; 62.22]	46.50 [20.73; 72.27]	30.67 [-0.09; 70.34] NS
Disability with severe limitation	84.00 [48.10; 119.94]	117.41 [70.51; 164.31]	64.06 [29.16; 98.95]	88.70 [27.76; 155.58]

Source: Authors' calculations using SILC 2022 data.
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. NS: Not significant.

Table A.15   Cost of disability by age and relationship status: SoL Financial

	HoH less than 65 years old	HoH less than 65 years old	HoH over 65 years old	HoH over 65 years old
	Single	Couple	Single	Couple
Disability with limitation	48.11 [23.36; 72.86]	26.08 [1.19; 50.98]	27.95 [04.45; 51.46]	31.64 [-0.01; 64.19] NS
Disability with severe limitation	82.21 [43.62; 120.55]	93.26 [42.11; 144.41]	52.07 [19.06; 85.07]	61.54 [16.53; 108.47]

Source: Authors' calculations using SILC 2022 data.
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. NS: Not significant.

Table A.16   Adjusted equivalised disposable income by disability status

Equivalised disposable income	National equivalence scale	AIDS equivalence scale	Disability-adjusted equivalence scale
No disability	38,890.89	35,512.71	35,823.09
At least one member with disability	30,752.16	26,748.56	25,608.51

Source: Authors' calculations using SILC 2022 data.
Note: *** p<0.01, ** p<0.05, * p<0.1.

Table A.17   Adjusted poverty gap by disability status

		SoL adjustment	SoL adjustment	Equivalence scale adjustment	Equivalence scale adjustment
	(1)	(2)	(3)	(4)	(5)
Poverty gap	Standard	SoL Deprivation	SoL Financial	AIDS equivalence scale	AIDS disability based equivalence scale
No disability	2.30	4.34	3.79	2.77	2.88
Disability	4.00	28.08	21.75	3.64	4.44
All households	2.64	9.32	7.33	2.57	2.91

Source: Authors' calculations using SILC 2022 data.
Note: *** p<0.01, ** p<0.05, * p<0.1.

Table A.18   Extra cost of disability as a share of disposable income by disability status

	SoL Deprivation(%)	SoL Financial (%)
Disability some limitation	46.00 [32.55; 59.43]	40.71 [29.70; 54.73]
Disability with severe limitation	92.72 [71.90; 112.55]	83.32 [61.02; 105.61]
Any disability	**58.84 [45.81; 71.86]**	**51.66 [38.18; 65.14]**
N	4,629	4,629

Source: Authors' estimates using SILC 2022 data.

Notes: Confidence intervals at 95 per cent. Estimations based on Equation 2 in Appendix B. The SoL Deprivation indicator is categorised as: (3) very high SoL; (2) high SoL and no deprivation; and (1) low SoL and high deprivation. The SoL Financial indicator is categorised as (0) financial difficulties and (1) no financial difficulties.

Table A.19   Extra cost of disability as a share of disposable income by relationship status

	SoL Deprivation (%)	SoL Deprivation (%)	SoL Financial (%)	SoL Financial (%)
	Single	Couple	Single	Couple
Disability: some limitation	47.46 [29.56; 65.36]	40.20 [18.73; 61.68]	42.41 [24.59; 30.20]	33.11 [12.43; 53.79]
Disability: severe limitation	81.96 [13.55; 55.40]	106.36 [70.10; 142.67]	75.05 [48.28; 101.82]	79.34 [45.10; 113.60]
Any disability	**57.12 [39.94; 74.30]**	**57.36 [36.03; 78.70]**	**51.19 [34.32; 68.05]**	**44.38 [24.37; 64.39]**
N	2,023	2,606	2,023	2,606

Source: Authors' estimates using SILC 2022 data.

Notes: Confidence intervals at 95 per cent are presented within brackets. Estimations based on Equation 2 in Appendix B. The SoL Deprivation indicator is categorised as: (3) very high SoL; (2) high SoL and no deprivation; and (1) low SoL and high deprivation. The SoL Financial indicator is categorised as (0) financial difficulties and (1) no financial difficulties.

Appendix B

B.1   The cost of disability: The Standard of Living method

The Standard of Living Approach (SoL) was developed by Berthoud et al. (1993) and is based on estimating the extra income necessary to reach a certain standard of living for a household with disabled members. The SoL indicator is expressed as a linear function of household income and disability status. Thus, the coefficient associated with disability status directly gives the additional cost of disability.

Following Cullinan et al. (2011),[24] the deterministic relationship between the SoL of a household, h, and disability can be expressed as:

$$SoL_h = \alpha + \beta Y_h + \delta D_h + \gamma X_h \qquad (1)$$

Where Y is the log household disposable income, D is a binary variable indicating disability and X represents household characteristics. The additional cost associated with disability for a certain standard of living can be computed as:

$$\frac{dY}{dD} = -\frac{\delta}{\beta} \qquad (2)$$

This represents the additional cost as a percentage of disposable income.

We apply the SoL method using SILC data. SILC collects information on the income and living conditions of households in Ireland with a focus on poverty, deprivation and social exclusion. Regarding the precise SoL indicator to use, several indicators have been used in the literature, such as an index of consumable durables, or information related to material deprivation (Zaidi and Burchardt, 2005; Cullinan et al., 2011; Loyalka et al., 2014; Palmer et al., 2016), or assessment of financial difficulties (Morris and

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[24]   Recent papers estimated a SoL equation using a two latent factor structural equation approach (SEM) (Morciano et al., 2015). For this work we estimate a reduced-form, and follow the work of Cullinan et al. (2011), allowing us to provide updated estimates of the cost of disability for Ireland.

Zaidi, 2020). In this research, we tested a wide range of items related to material deprivation and social exclusion, and selected those that were found to be elastic to income (as suggest by Zaidi and Burchardt, 2005).[25] The items used are presented in Table A.1 in Appendix A. Following previous studies which use the SoL method, we opt for an ordered logit model.

The items used for the primary SoL indicator computation are presented in Table A.1. This SoL indicator is composed of items related to household ownership of certain goods, but also the ability to make ends meet, or go on holiday.[26] Following Indecon (2021) and others, we created three levels of SoL which are: (3) very high SoL (no deprivation); (2) high SoL and no deprivation (being deprived of just one item); and (1) low SoL and high deprivation (being deprived of at least two items). In what follows, we will refer to this indicator as 'SoL Deprivation'.

We also study a second SoL indicator based on self-assessment of financial difficulties (as suggested by Morris and Zaidi, 2020); we refer to this indicator as 'SoL Financial'. This indicator takes the value of 0 for households with self-assessed financial difficulties and 1 otherwise.[27]

Although our approach is similar to that of previous research for Ireland carried out by Cullinan et al. (2011) and Indecon (2021) in terms of data type and methodology employed, there are important differences. Firstly, our study is conducted for the year 2022, a post-COVID year. We expect that, due to recent economic developments, households may have experienced an average fall in their standard of living. For example, Roantree and Doorley (2023) report an increase in material deprivation from

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[25]   We estimated the link between each item and household disposable income using a logistic regression and selected items showing a statistically significant relationship.
[26]   In Appendix Table A.12 we also present results using the Eurostat definition. This results in an estimated cost of disability of 39-83 per cent depending on the severity of disability. For the current suitability of the poverty indicators for social inclusion in Ireland see Sprong and Maître (2023) and Watson et al. (2017).
[27]   People reporting that they had 'great difficulty', 'difficulty' or 'some difficulty' in making ends meet were scored 0, while the remaining categories have been scored as 1 (corresponding to 'fairly easily' 'easily' and 'very easily').

13.3 per cent to 16.6 per cent in 2022, highlighting the impact of the pandemic and rising inflation.

In addition, we use a slightly different definition to identify disabled members (see Section 3.1). We base our identification of a disabled individual on two variables: having a chronic illness/disability and being limited in daily activity. In contrast, Indecon (2021) only focuses on the second variable, resulting in a less restrictive definition, as it can include people feeling limited in their daily activity but who do not have a chronic illness or disability. Cullinan et al. (2011) focus on those with a chronic illness/disability, including those who do not have a limitation in their daily activity.

Another difference between the studies is the definition of the SoL indicator. Our SoL deprivation indicator (see Section 3.2 for more details) includes more items related to heating affordability and social life.[28] As we have a slightly broader definition of the SoL indicator, this might increase the chances of people with a disability experiencing it. Specifically, the ability to afford an afternoon or evening for entertainment might be more difficult to access for people with disabilities, not only due to their economic situation but also because their limitations in daily activities might prevent them from participating in certain social activities without incurring additional expense compared to a non-disabled person.

Finally, our econometric specification differs slightly from that of Indecon (2021). The model of Indecon (2021) does not control for the age and education of the head of the household and uses a polynomial of log income. Our model controls for the age and education of the household head as both may be related to the resources (such as wealth) available to households to meet living costs. We use a log specification for income, in line with both Cullinan et al. (2011) and more recent international literature (Morris and Zaidi, 2020).

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[28] We include all variables that are found to be significantly related to disposable income, as suggested in Cullinan et al. (2011). The additional items include: if someone had to go without heating the house in the last 12 months due to inability to afford it; being able to afford buying gift for family members; and being able to afford an afternoon or evening dedicated to entertainment.

B.2 Adjusting equivalence scales to account for disability: The Almost Ideal Demand System (AIDS)

In addition to the SoL approach which allows us to derive a cost of disability and adjust household disposable income accordingly, we make use of a second methodology based on household expenditures. This consists of constructing an equivalence scale which accounts for the different consumption patterns of people with and without disabilities and using it to adjust household incomes.

To derive an equivalence scale that accounts for disability, we estimate the Almost Ideal Demand System (AIDS) of Deaton and Muellbauer (1980).

The budget share equation for the ith good of the standard AIDS model is:

$$w_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \beta_i \ln \left(\frac{y}{P}\right)$$

(3)

With p_j for the price of the jth good, y is total expenditure and P for the translog price index.

$$\ln P = \alpha_0 + \sum_{i=1}^{n} \alpha_i \ln p_i + \frac{1}{2} \sum_{i=1}^{n} \sum_{j=1}^{n} \gamma_{ij} \ln p_i \ln p_j$$

(4)

To incorporate demographic variables into the AIDS model, we use the specification of Ray (1983):

$$w_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \left(\beta_i + \boldsymbol{\eta}_i^T \boldsymbol{z}\right) \ln \left(\frac{y}{\overline{m}_0(\boldsymbol{z})P}\right)$$

(5)

where z is a vector of demographic variables and $\overline{m}_0(\boldsymbol{z}) = 1 + \boldsymbol{\rho}^T \boldsymbol{z}$; the ρ and η vectors are parameters to be estimated. In our model, demographic variables include the number of children in the household, the number of non-disabled additional adults

and the number of disabled adults in the household (excluding the household head).[29] Following Ray, the parameters are interpreted as follows: we estimate three parameters ρ_1, ρ_2, ρ_3, being the equivalence scales for non-disabled adult, disabled adult and children, and the $\boldsymbol{\eta}$ parameters are estimates of the sensitivity of the scales to the prices of our seven commodities (food, tobacco, alcohol, clothing, transportation, health, and other miscellaneous commodities).

The data on household expenditures and demographics come from the Irish HBS Research Microdata File (RMF) for 2015/16.[30] The survey follows a nationally representative sample of 6,000 to 7,000 households for two weeks and asks them to record their expenditures. It also collects rich demographic information such as age, sex and household size. The price series for each commodity were taken from the subindices of the Consumer Price Index published by the CSO.[31]

One complication in estimating equivalence scales extended to account for disability is the treatment of single adult households in which the adult is disabled. The AIDS method implicitly assigns a weight of one to the first adult in the household. It is not straightforward to derive a different weight for the first adult if they are disabled. Our approach is to directly derive a weight only for 'additional' adults who are disabled. For cases in which the first adult is disabled, we propose to extrapolate the estimated weight for additional adults based on the relativity between the estimated additional adult scale and the additional disabled adult scale.[32]

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[29]   As in Michelini (2001, p. 386), we subtract 1 from the adult variable to obtain the appropriate reference household.
[30]   HBS 2015/16 is the latest wave for which the RMF is available.
[31]   Available at https://data.cso.ie/table/CPM03.
[32]   There are 392 households in which the first adult is disabled, amounting to 40 per cent of all disabled households.