SCOPE

Equality for disabled people

The disability price tag

Technical report

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February 2018

Contents

Introduction

In 2018, life is still more expensive if you are disabled.

From the high cost of a powered wheelchair or adaptive clothing; to greater consumption of energy or more costly insurance premiums, disabled people face extra costs related to their impairment or condition across many areas of their lives.

These are costs that non-disabled people don't experience – they represent an unfair financial penalty for disabled people.

Our estimate of extra costs is based on a different methodology than when we last calculated this figure in 2014.[1] It focuses on the financial impact extra costs have on disabled people's lives. It is based on nationally representative data of both disabled and non-disabled people and is the first standard of living and extra costs estimate for working age disabled people.

The analysis has been carried out in collaboration with Dr. Marcello Morciano, whose input and guidance has been critical and gratefully received. The methodology used is based on a paper he published with Ruth Hancock and Stephen Pudney, who together estimated the extra costs faced by older people[2].

This report provides more detail on the methodology, assumptions and analysis carried out. We will be publishing our measure of the extra costs annually. We have published a policy briefing alongside this with a summary of our analysis and our recommendations for tackling the financial penalty
of disability.

1. Our previous estimate was that disabled people spend on average £550 per month on disability-related expenditure; Priced Out, (Scope, 2014).

2. Morciano M., Hancock R. and Pudney S. (2015) 'Disability costs and equivalence scales in the Disability Costs and Equivalence Scales in the Older Population in Great Britain'. Review of Income and Wealth 61 (3), 494-514

Methodology

A Standard of Living approach

Measuring extra costs is not a straight-forward task, with no single established methodological approach[3]. For this analysis we have used a standard of living approach.

This approach measures the financial impact that extra costs have on disabled people's lives. We assume that, after controlling for socio-economic variables, differences in standards of living are due to the extra costs disabled people incur. Disabled people, in our hypothesis, use a portion of their income to fund the additional expenditure, and this results in having less income available to afford a similar standard of living to non-disabled people.

Figure 1 illustrates the relationship between income and standard of living across the population. The two curves represent the standard of living for non-disabled people (D_0) and disabled people (D), which both increase as income increases. Disabled people experience a lower financial standard of living than non-disabled people at all levels of income, as they have less income to afford non-disability related goods and services. This is measured by the distance between points A and B at standard of living level S*, which equals the additional income needed for a disabled person to reach the same standard of living as a non-disabled person.

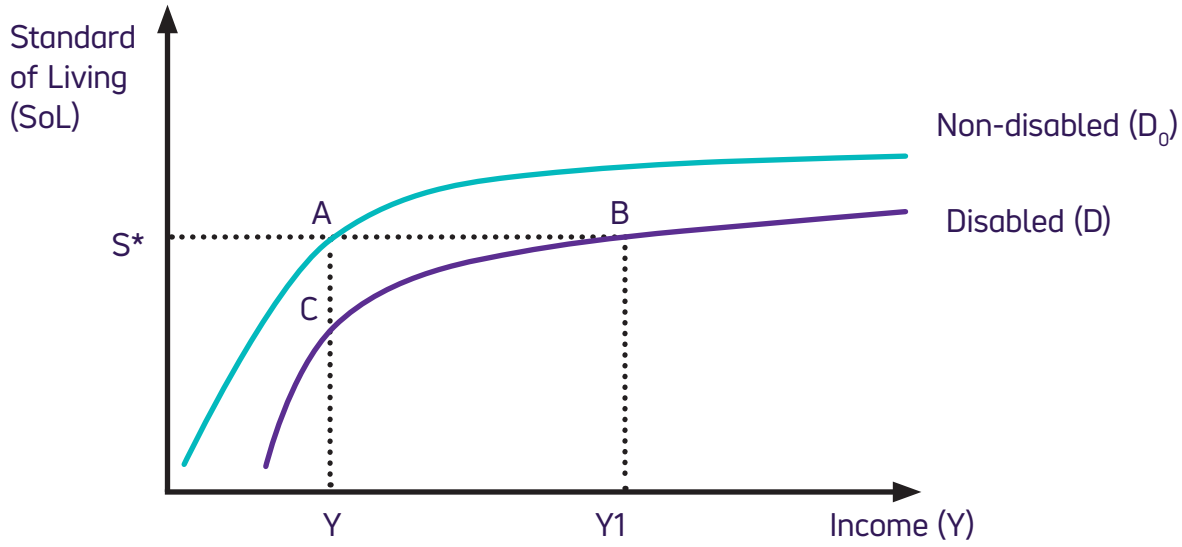


Figure 1: Extra costs and standard of living

3. See Counting the Cost (Demos, 2010) for a more a detailed account of the different methodological approaches.

Structural Equation Model (SEM)

Our analysis is based on a structural equation model. This statistical model allows us to compute three elements to estimate extra costs:

- Standard of living index
- Disability index
- Income associated with levels of standard of living, whilst controlling for socio-economic factors.

The SEM has been used as it allows us to conduct regression-based analysis that includes latent variables: a standard of living index and a disability index.

Family Resource Survey

Our analysis is based on the Family Resource Survey (FRS) 2015/16, a nationally representative dataset used to provide official statistics on social welfare issues. Our analysis is based on the UK working age population with a sample of over 21,000 respondents, including over 4,000 disabled people[4].

The analysis has been computed at a family[5] level, because that is the format provided for the standard of living questions in the FRS. We have therefore computed variables such as income[6], the disability index and relevant socio-economic factors at this level. Where there is more than one adult within a family, we have assumed that income is shared equally between adults. Extra costs estimates are then made for each adult in a family.

Standard of Living Index

Standard of living is a multi-faceted concept. We have constructed an index to measure standards of living based on the 11 adult deprivation questions[7] in the FRS. This creates a latent variable which is unobserved, but revealed by the observed deprivation questions. We measure a family as having a lower standard of living if they want, but cannot afford, certain items. Table 1 shows the deprivation questions and the percentage of families that are unable to afford items for families with at least one disabled adult and families with no disabled adult.

4. This represents around 20% of our sample, which is in line with the weighted estimate of working age disabled population

5. Our analysis is at a benefit unit level (a single adult or a married or cohabiting couple and any dependent children). This report refers to the term “families” for simplicity.

6. Adjusted by the family composition in the benefit unit using the OECD income equivalisation factors.

7. Deprivation questions are asked to each benefit unit

Table 1: Adult social deprivation indicators for disabled and non-disabled families

Deprivation indicators	Families with at least one disabled person (percent)	Families with no disabled people (percent)
Would you (and your family/and your partner) like but cannot afford to...		
keep your home in a decent state of decoration?	28	10
get household contents insurance?	32	12
replace any worn out furniture?	41	18
regularly participate in a hobby or leisure activity?	21	9
have two pairs of properly fitting shoes, including a pair of all-weather shoes, for yourself and your partner?	12	3
replace worn-out clothes with new ones?	26	8
get together with friends or family around for a drink or meal at least once a month?	24	9
replace or repair major electrical goods such as a refrigerator or a washing machine, when broken?	34	12
spare a small amount of money to spend each week on yourself (not on your family)	37	17
have internet access for personal use?	10	3
have a holiday away from home for at least one week a year, whilst not staying with relatives at their home?	53	28

Notes: Statistics computed over a sample of 14,357 families interviewed in the FRS 2015/16

Disability index

We know that extra costs vary due to a person's impairment type,[8] as well as socio-economic barriers. To account for this in our model we went beyond a binary disability definition to incorporate the variation of a person's conditions or impairments, which result in different extra costs.

We constructed a latent disability index based on the 10 areas of long-term and limiting conditions or impairments in the FRS (see below for the questions). We also assume that socio-economic factors also impact long-term and limiting difficulties[9] influence a person's health. This creates a latent disability variable that is continuous for the whole population.

As part of our calculation of extra costs, we established a reference disability level against which comparisons of extra costs are made. The reference point we used was the median person in the population ordered by the disability index, because this seemed the fairest comparison.[10]

Not all respondents in the FRS who had long-term conditions or impairments identified as disabled under the Equality Act definition. To simplify our findings, we only computed the extra costs for those who identified as disabled according to the Equality Act definition.

8. Scope, Extra Cost Commission, Interim technical report, 2015.

9. The factors used are age, gender, living as a couple and region. Income was not included due to endogeneity issues, because the causality between income and a person's impairment or condition is not clear.

10. The median person corresponds as somebody who is not disabled and has reported no health difficulties.

Table 2: Percentage of conditions / impairments by family types

Longstanding conditions/ impairments	Families with no disabled people (percent)	Families with one disabled person (percent)	Families with two disabled people (percent)
Does this (Do these) health problem(s) or disability(ies) mean that you have significant difficulties with any of these areas of your life?			
Difficulty with vision	1	11	21
Difficulty with hearing	1	7	23
Difficulty with mobility	1	44	78
Difficulty with dexterity	1	25	43
Difficulty with learning	0	14	21
Difficulty with memory	1	16	31
Difficulty with mental health	2	35	40
Difficulty with stamina or breathing or fatigue	3	36	59
Difficulty with social interaction	0	7	8
Difficulty with other area of life	3	17	26
Total number of families	10,419	3,547	391

Note: Statistics computed over a sample of 14,357 families using the FRS 2015/16. Disabled people are selected according to the Equality Act definition.

Income

Income is the main factor that influences an individuals standard of living. For our analysis we have used total income from all sources including disability benefits[11]. These benefits have been included because we assume respondents in the FRS would answer the social deprivation questions based on all the income available to them.

Housing costs and direct taxes have been removed as they allow a more accurate reflection of disposable income and allow comparability with established income statistics.

Income has been equivalised to adjust for the family composition, to account for the number of adults and age of children, based on the OECD-modified method.

Socio-economic factors

Beyond income, there are several other socio-economic factors that influence people's standard of living, such as age and employment status. Within the structural equation model these factors are controlled for using regression analysis. This enables like for like comparisons between disabled and non-disabled people to be made, which allows us to isolate the effect that income and disability have on standards of living.

The disability index is one of the most important factors affecting standard of living. This enables us to understand how a person's impairment or condition affects their standard of living, while accounting for a range of socio-economic factors.

11. The disability benefits referred to here are Personal Independence Payments (PIP) and Disability Living Allowance (DLA).

Table 3: Descriptive statistics of the socio-economic factors used in the Standard of Living Index for disabled and non-disabled families

Explanatory factors of Standard of Living	Families with at least one disabled person	Families with no disabled person
Age of respondent (mean)	46	41
Monthly individual income (mean)	1,173	1,664
Female	51%	39%
Married or civil partnership	35%	56%
Postgraduate degree	5%	10%
Social renting	39%	15%
Private renting	19%	19%
Home owner	21%	42%
Children aged 0 to 4	12%	18%
Children aged 5 to 10	14%	20%
Children aged 11 to 15	13%	15%
Children aged 16 to 19	6%	8%
North East	4%	3%
North West	13%	10%
Northern Ireland	11%	10%
East Midlands	7%	6%
East of England	8%	9%
South East	10%	13%
Yorkshire and the Humber	7%	7%
South West	8%	7%
Scotland	13%	13%
Wales	5%	4%
London	14%	18%
In work	48%	82%
Partner in work	21%	43%

Note: Statistics computed over a sample of 14,357 respondents using the FRS 2015/16

Table 3 shows that 39% of families with at least one disabled person live in social housing compared to 15% of families with no disabled people. Similarly, the table shows that in families with at least one disabled person, 21% of partners are in work compared to 43% in families with no disabled people.

Path Diagram: an illustration of the SEM framework

The diagram below illustrates the SEM. Rounded boxes are used to represent latent variables, and square boxes show observed variables. The diagram shows how the 11 observed social deprivation questions are explained by the unobserved standard of living index. The standard of living index is assumed to be influenced by income, socio-economic factors and the disabilty index.

The disabilty index is an unobserved variable, which is explained by ten long term difficulty questions and assumed to vary according to sub-set of socio-economic factors.[12] For each regression (arrows in the diagram) there is an unobserved error term.[13]

The regression outputs from the SEM analysis are used to compute the extra costs. Extra costs estimates are then made for each adult in a family, which enables the final estimates to be made at this level.

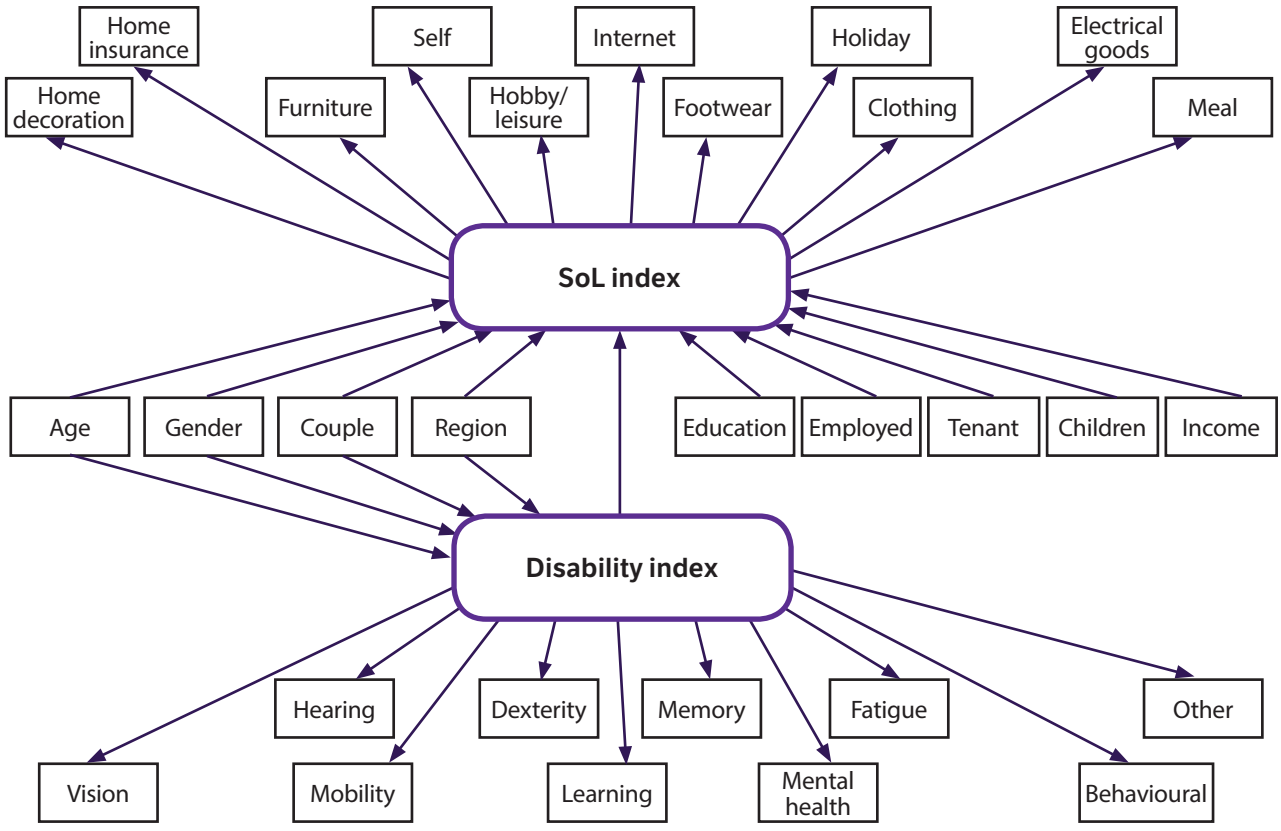


Figure 2: Path diagram: an illustration of the SEM framework

Measured latent variable

Observed variable

Regression/causal effect

12. Income hasn't been added to the disability index explanatory variables to avoid endogeneity problems

13. The error terms are not shown in the diagram below for simplicity

Results – the extra costs disabled people face

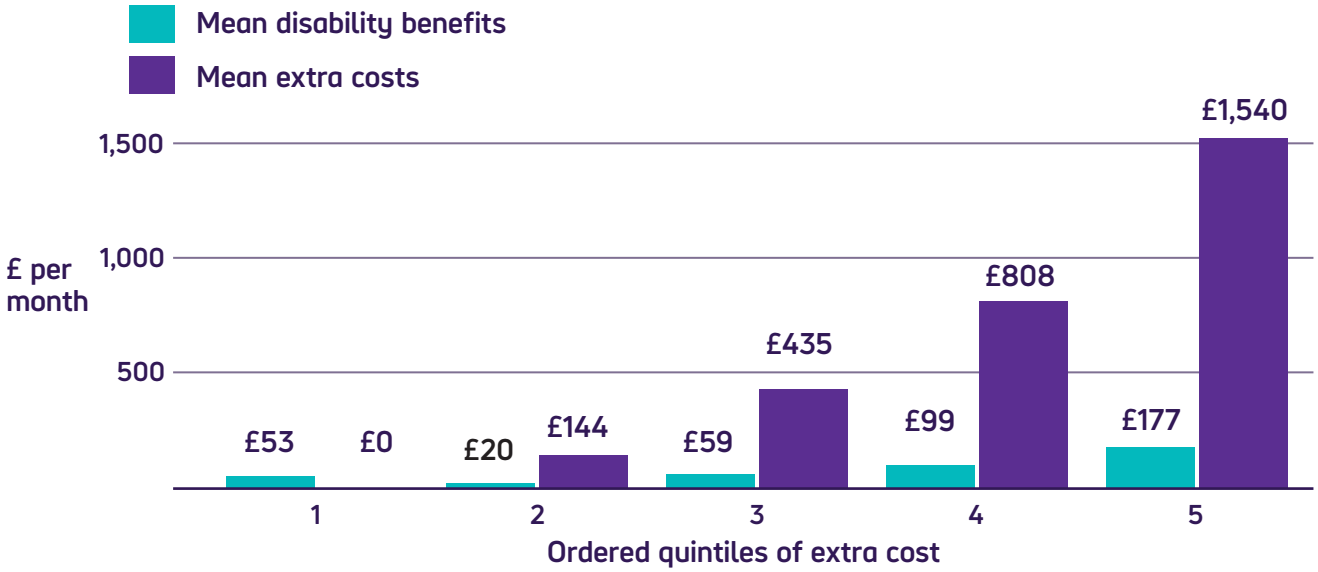
Key findings

- On average, disabled people face extra costs of £570 a month related to their impairment or condition. This is on top of welfare payments designed to help meet these costs.
- For one in five disabled people, extra costs amount to over £1,000 per month.
- After housing costs, disabled people on average spend 49 per cent of their income on disability-related costs.
- Extra costs mean that disabled people's money doesn't go as far: £100 for a non-disabled person is equivalent to just £67 for a disabled person.

Extra costs breakdown

Our findings also show that disability benefits don't compensate the vast majority of disabled people for the financial penalty they face. This is shown in figure 3 below, which shows the average extra costs and disability benefits faced by each person, ranked in order of extra costs and split into five groups (quintiles). One in five disabled people face extra costs of more than £1,000, however they only receive disability benefits on average of £177 per month.

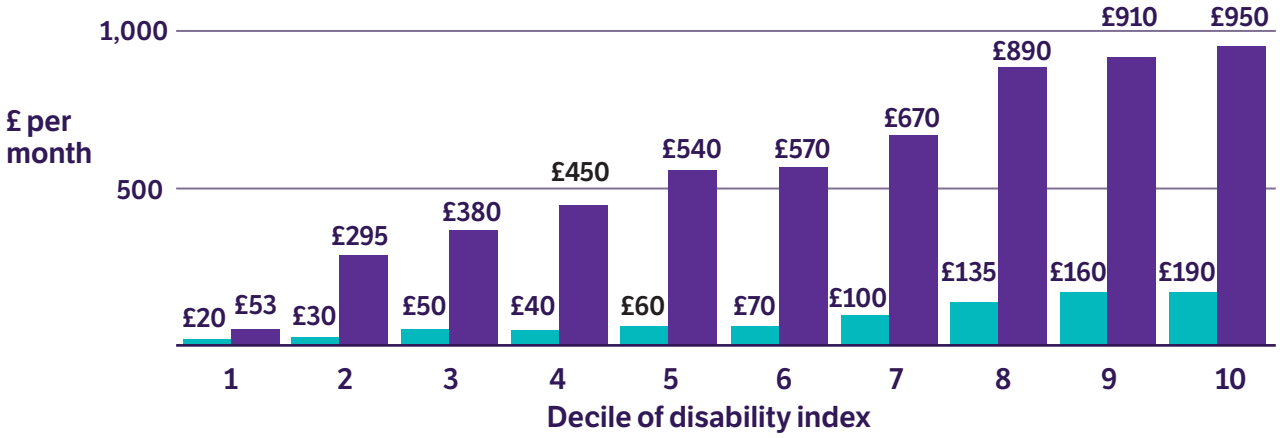
Figure 3: Disabled people's extra costs and disability benefits split in order of extra costs



Disability index breakdown

Our analysis accounts for how different people's impairments or conditions affect the extra costs they face. Figure 4 below show average extra costs and disability benefits ordered by the disability index, split into ten groups (deciles). Our analysis shows how people who experience multiple conditions or impairments face higher extra costs, with the highest decile facing average extra costs of £950 per month.

Figure 4: Disabled people's extra costs in order of disability index



Extra costs and income distribution

Extra costs are experienced across the income distribution for the whole population, however there is a higher incidence of disability and extra costs amongst people on lower incomes. Table 4 shows average extra costs and the proportion of disabled people ranked by income for the whole population, with the first decile being those on the lowest income and the tenth being the highest[14].

Table 4: Extra costs and income distribution

Deciles of total income	Extra Cost per month	Disabled people in decile
1	£178	28%
2	£170	34%
3	£153	27%
4	£144	25%
5	£134	22%
6	£92	17%
7	£64	13%
8	£72	12%
9	£59	10%
10	£66	9%

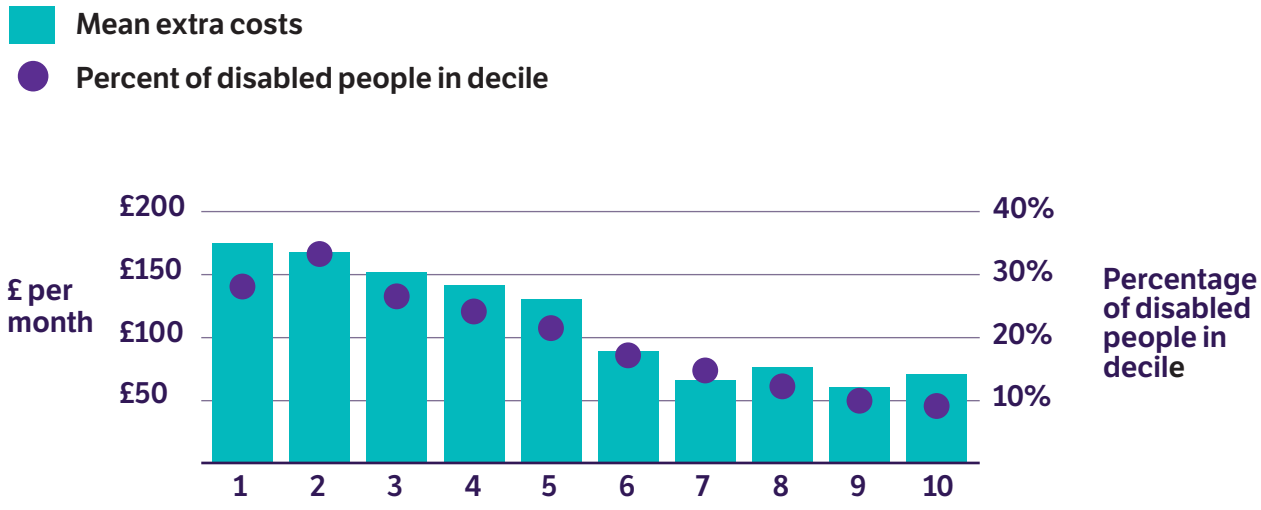


Figure 5: Average monthly extra costs across the income distribution for the whole population

Note: Statistics computed over a sample of 21,700 respondents using the FRS 2015/16.

14. Including disabled and non-disabled people

Regional breakdown

Extra costs are broken down by region below.

We have not solely isolated the effect a region has on extra costs, so our estimates are influenced by the socio-economic factors in each region.

Therefore, the regional distribution of the extra costs will depend on several factors such as the employment (and income) gap between disabled and non-disabled people, the prevalence of disability in each region, cost of living and the availability of formal or informal care.

Figure 7 shows how the employment gap between disabled and non-disabled people is positively correlated with regional extra costs.

Figure 6: UK regional average extra costs per month

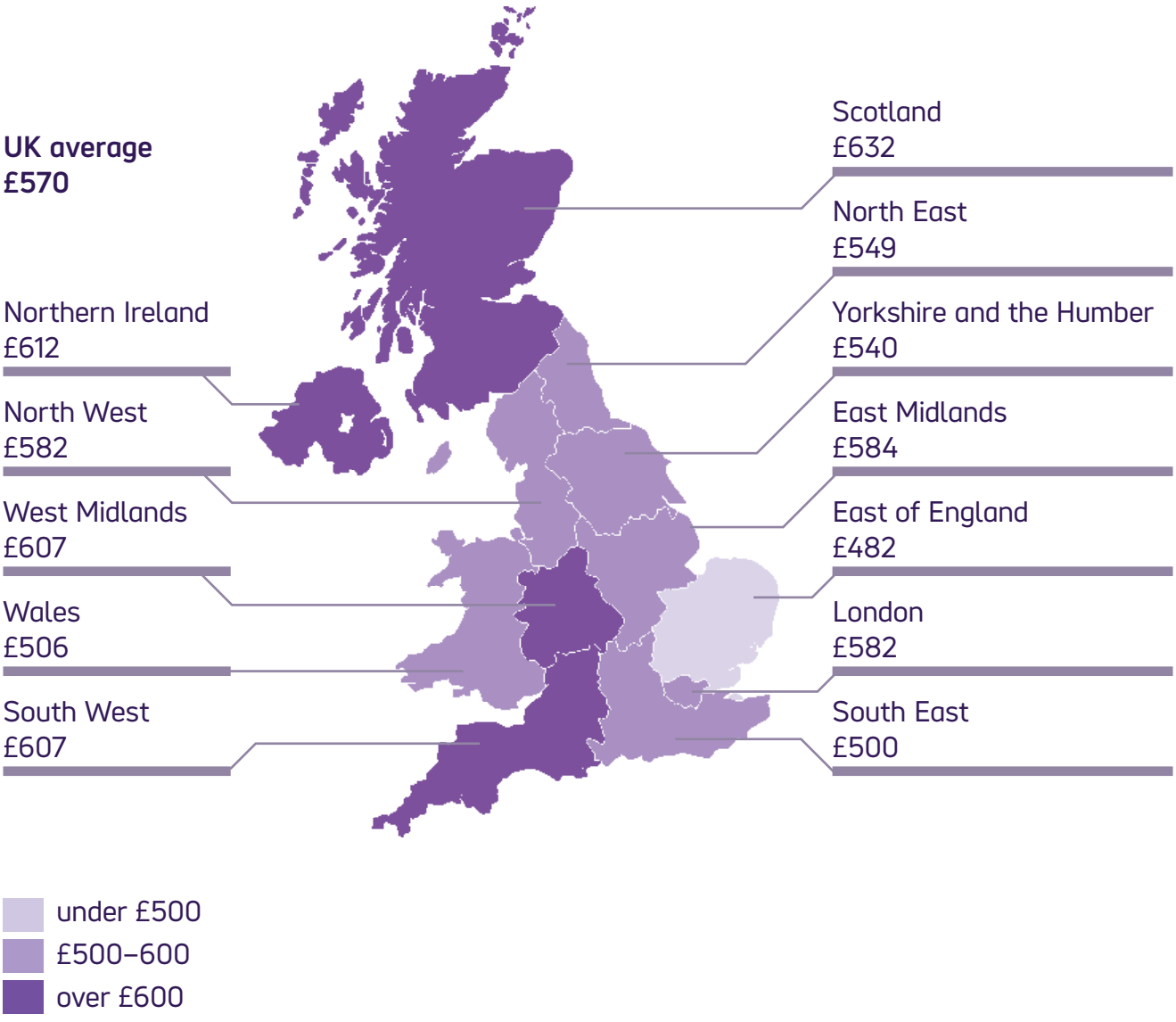
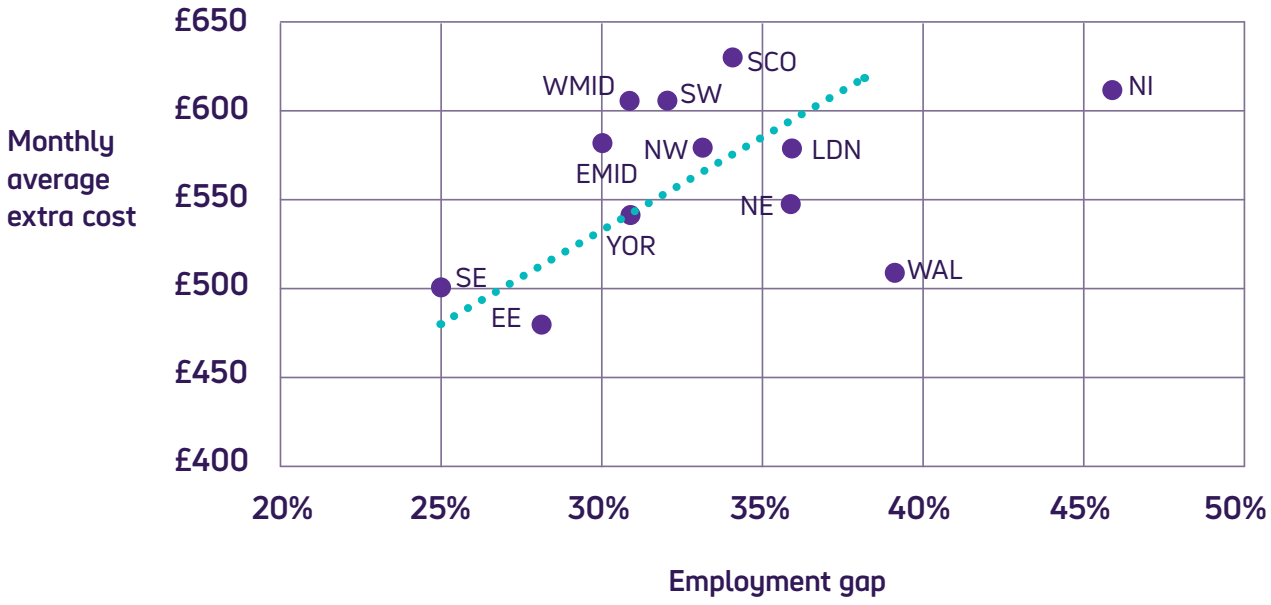


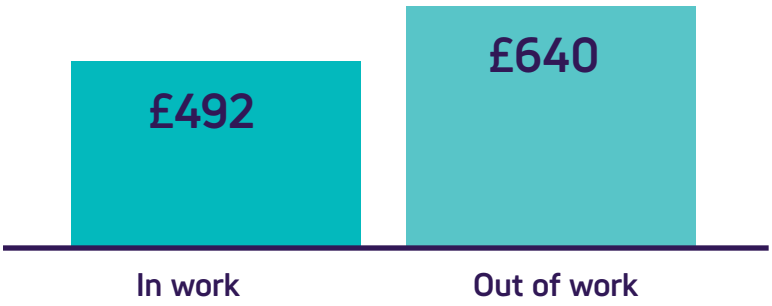
Figure 7: Scatterplot of extra costs and the employment gap for each region



Impact of employment on extra costs

Disabled people in work face 23% lower extra costs than those out of work. This is likely to be because there is a higher proportion of out-of-work disabled people who have multiple impairments or conditions that compound the costs they face.

Figure 8: Average monthly extra costs by employment status



Impact of family composition on extra costs

Couples including a disabled person face significantly lower extra costs than single disabled people. This is likely to be due to a non-disabled person in a couple reducing the impact of the extra costs.

Figure 9: Average month extra costs by singles and couples

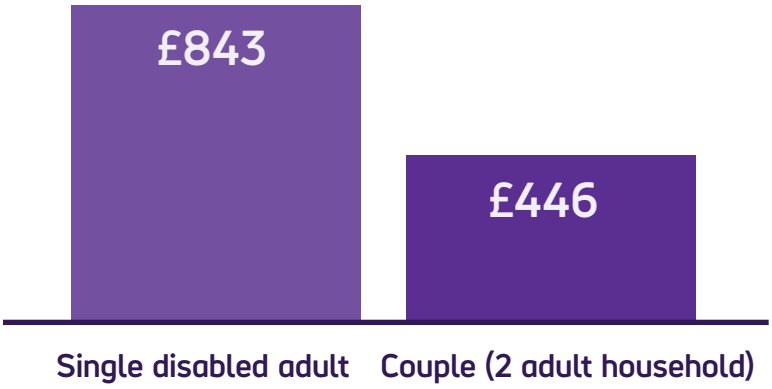
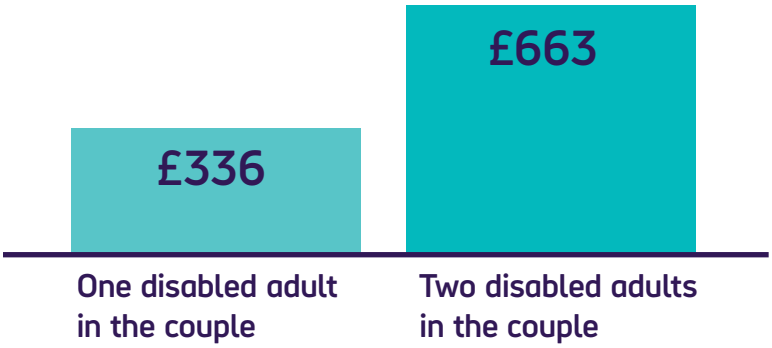


Figure 10: Average monthly extra costs by number of disabled adults in the couple



Extra costs vary significantly depending on the number of disabled adults in the family. The extra costs of a disabled adult living with a non-disabled adult are significantly lower than when a disabled adult lives with another disabled person. This may be explained by the non-disabled partner providing informal care to their disabled partner.

Conclusions and next steps

We hope that our new research will help to raise awareness of the reality of disabled people's experiences of extra costs.

Scope will be reporting annually on the extra costs disabled people face, which will allow us to assess any changes over time. We also plan to carry out further analysis into disability-related costs faced by families with disabled children.

These additional costs make it harder for disabled people to enjoy the same standard of living as non-disabled people. Together we must tackle this problem.

Building upon our new analysis, we will continue to work with Government, businesses and regulators to ensure that there is a tangible impact in tackling the financial penalty experienced by disabled people. Our annual measure of disabled people's extra costs will therefore provide Scope with a way to assess its own progress in delivering social change over the longer term.

Appendix

Table 5: Long term difficulties comparing disabled and non-disabled people

Long term conditions or impairment indicators	Disabled people (percent)	Non-disabled people (percent)
Does this condition (s) or impairment (s) or disability (ies) mean that you have significant difficulties with any of these areas of your life?		
Difficulty with vision	13	2
Difficulty with hearing	10	1
Difficulty with mobility	50	5
Difficulty with dexterity	28	3
Difficulty with learning	16	1
Difficulty with memory	19	2
Difficulty with mental health	36	4
Difficulty with stamina or breathing or fatigue	40	6
Difficulty with social interaction	7	0
Difficulty with other area of life	19	5

Note: Statistics computed over whole population (sample of 21,760) using the FRS 2015/16. Disabled people are selected according to the Equality Act definition.

Structural Equation Model results

Table 6: Confirmatory Factor analysis estimates: Standard of Living index measurement

The results below show how the observed adult deprivation indicators relate to the latent standard of living index in our model. The estimate shows the ability to replace furniture and electrical goods being have the highest correlation with the latent standard of living index. All variables at statistically significant at 1%.

	Factor loading	P value
Enough money to keep your home in a decent state of decoration?	1.376	0.000
Enough money to get household contents insurance?	1.400	0.000
Enough money to replace any worn out furniture?	1.640	0.000
Regularly participate in a hobby or leisure activity?	1.310	0.000
Two pairs of properly fitting shoes, including a pair of all weather shoes, for yourself and your partner?	1.463	0.000
Enough to replace worn-out clothes with new ones?	1.564	0.000
Get together with friends or family around for a drink or meal at least once a month?	1.395	0.000
Enough to replace or repair major electrical goods such as a refrigerator or a washing machine, when broken?	1.752	0.000
A small amount of money to spend each week on yourself (not on your family)	1.510	0.000
Internet access for personal use?	1.051	0.000
A holiday away from home for at least one week a year, whilst not staying with relatives at their home?	1.331	0.000

Table 7: Confirmatory Factor analysis estimates: Disability index measurement

The results below show how the observed adult health indicators relate to the latent disability index in our model. The estimate shows that learning and memory have the highest correlation with the latent disability index. All variables at statistically significant at 1%.

	Factor loading	P value
Difficulty with vision	0.95	0.000
Difficulty with hearing	0.910	0.000
Difficulty with mobility	1.538	0.000
Difficulty with dexterity	1.541	0.000
Difficulty with learning	1.609	0.000
Difficulty with memory	2.010	0.000
Difficulty with mental health	0.853	0.000
Difficulty with stamina or breathing or fatigue	1.123	0.000
Difficulty with social interaction	0.800	0.000
Difficulty with other area of life	0.373	0.000

Table 8: Regression estimates for the SOL index

The results below show how the factors behind the SOL index influence standards of living. The standard of living index is reversed, so a positive estimate represents a factor that increases the probability of decreasing standards of living. The disability index has a statistically significant[15] and negative influence on standards of living. Income positively influences standards of living, but with an increasing marginal impact.

	Coefficients	Standard error	P value
Disability index	0.226	0.013	0.000
Monthly total income (mean)	0.428	0.023	0.000
Squared monthly total income (mean)[19]	-0.079	0.003	0.000
Age of respondent (mean)	0.666	0.053	0.000
Squared age of respondent (mean)	-0.078	0.006	0.000
Gender	0.155	0.018	0.000
Married or civil partnership	0.064	0.027	0.000
Number of years post graduate	-0.255	0.036	0.000
Social renting	0.261	0.022	0.000
Private renting	-0.577	0.029	0.000
Owner	-0.296	0.023	0.000
Children aged 0 to 4	0.261	0.016	0.000
Children aged 5 to 10	0.175	0.014	0.000
Children aged 11 to 15	0.196	0.017	0.000
Children aged 16 to 19	0.196	0.027	0.000
North East	0.053	0.045	0.000
North West	-0.006	0.031	0.000
Northern Ireland	0.014	0.031	0.000
East Midlands	-0.014	0.038	0.000
East of England	-0.073	0.034	0.000
South East	-0.004	0.032	0.000
Yorkshire and the Humber	0.038	0.036	0.000

15 At a 1% significance level.

16 We used the natural log of income for this regression. We also added the natural log of income squared to reflect the relationship between income and standard of living.

South West	0.004	0.036	0.000
Scotland	0.318	0.030	0.000
West Midlands	0.006	0.035	0.000
Wales	-0.022	0.042	0.000
In work	-0.182	0.022	0.000
Partner in work	-0.080	0.028	0.000

Table 9: Regression estimates for the disability index

The results below show how the factors that influence the disability index.

	Coefficients	Standard error	P value
Age of respondent (mean)	0.200	0.068	0.000
Squared age of respondent (mean)	0.009	0.008	0.000
Gender	0.142	0.024	0.000
Married or civil partnership	-0.060	0.025	0.000
North East	0.269	0.063	0.000
North West	0.291	0.043	0.000
Northern Ireland	0.155	0.044	0.000
East Midlands	0.214	0.052	0.000
East of England	0.078	0.048	0.000
South East	0.052	0.044	0.000
Yorkshire and the Humber	0.208	0.050	0.000
South West	0.317	0.050	0.000
Scotland	0.202	0.042	0.000
West Midlands	0.315	0.048	0.000
Wales	0.294	0.061	0.000

We're Scope, the disability equality charity. We won't stop until we achieve a society where all disabled people enjoy equality and fairness. At home. At school. At work. In our communities.

We provide practical advice and emotional support to disabled people and their families whenever they need it most.

We use our collective power to change attitudes and end injustice. And we campaign relentlessly to create a fairer society.

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