

# SCOPE

— Equality for  
— disabled people



## The Disability Price Tag 2019

Technical report

Anel Touchet  
and Dr Marcello Morciano

February 2019

# Contents

<b>Introduction</b>	<b>3</b>
Extra costs for families	4
<b>Methodology</b>	<b>5</b>
A standard of living approach	5
Structural Equation Model (SEM)	6
Family Resource Survey	6
Standard of living index	7
Disability indices for adults and children	8
Path diagram: an illustration of the SEM framework	10
Income	11
Socio-economic factors	11
Extra costs computation	13
Technical considerations and notes on updated methodology	14
<b>Results: the extra costs for families with disabled children</b>	<b>15</b>
Key findings	15
Extra costs breakdown	15
Drivers of extra costs for families with disabled children	17
<b>Results: the extra costs disabled adults face</b>	<b>18</b>
Key Findings	18
Extra costs breakdown	18
Extra costs and income distribution	20
Disability index breakdown	21
Extra costs by employment status	21
Extra costs by family composition	<b>22</b>
<b>Next steps</b>	<b>23</b>
Appendix A: Descriptive statistics	24
Appendix B: Extra costs by disability within the family	28
Appendix C: Extra costs equation	29
Appendix D: Structural Equation Model results	30
Appendix E: Child deprivation	33

# Introduction

In 2019 disabled adults and families with disabled children continue to face a financial penalty.

Last year, we measured the size of this financial penalty [1]. Our ground-breaking extra costs measure calculated the average additional monthly income which a disabled person would need in order to achieve the same standard of living as a non-disabled person.

What we uncovered was startling inequality, driven by the excessive payments that disabled people end up making for essential goods and services. Extra costs can also take the form of unmet needs. We know that not every disabled person and their family would be able to meet their extra costs but could face choices and trade-offs at the expense of their quality of life. The pressure of trying to meet these extra costs hinders disabled people's ability to move into work. It makes it harder to build savings and plan for the future. In short, it makes it harder for disabled people to participate fully in society.

This new report provides updated calculations of the extra costs faced by disabled people. Our new model also includes, for the first time, a breakdown of the extra costs faced by families with disabled children.

Government and businesses need to do more to ensure disabled people have fair and affordable access to the goods and services needed to enjoy an equal standard of living. It is inequality, rather than disability, that makes life more expensive if you are disabled – this is unacceptable.

Since our last publication, there have been some positive steps aimed at reducing this inequality. The government has made small but important changes to Personal Independence Payment [2], and has also introduced an energy price cap [3]. But the extra costs remain, and their damaging impacts continue.

More than ever, we need an approach which involves all groups playing their part, from government and regulators to businesses and disability organisations such as Scope.

This report sets out how we can redouble our efforts to tackle extra costs, with a focus on how government policy can help address the issue. As we enter a period of significant welfare reform involving the full roll-out of Universal Credit, it's vital that disabled people receive the support they need, and do not end up worse off.

It is time, once and for all, to end the financial inequality experienced by disabled people.

---

1. Scope (2018). The Disability Price Tag – Policy report.

2. Department for Work and Pensions and Sarah Newton MP. Government to end unnecessary PIP reviews for people with most severe health conditions [press release].

3. Ofgem. Energy price caps [web page].

The following analysis has been carried out in collaboration with Dr. Marcello Morciano, whose further input and guidance has been critical and gratefully received. The basis of this analysis originates from his publication estimating the extra costs faced by older people [4] and builds on our research work on extra costs from 2018 [5].

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

## Extra costs for families with disabled children

This year we applied our extra costs research to another key theme of Scope's strategy [6]: ensuring the best start in life for disabled children and their families.

To meet this objective, we have developed a better understanding of financial impact of extra costs on families with disabled members, including children. More specifically, we have measured this impact in relation to the deprivation level of the whole family.

We revised the methodology used to calculate extra costs for disabled adults in our 2018 Disability Price Tag report in order to account for the disability of children within families in the UK. This report focuses on calculating and understanding the extra costs families face when parenting children with disabilities, as well as recalculating the extra costs for adults with disabilities.

---

4. 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), 494-51.4

5. Scope (2018). *The Disability Price Tag – Technical report*.

6. Scope (2017). *Everyday Equality – Scope's Strategy 2017-2022*

# Methodology

## A standard of living approach

Measuring extra costs is not a straightforward task, with no single established methodological approach. For this analysis we have used a ‘standard of living’ approach.

This approach measures the financial impact extra costs have on disabled peoples’ lives. After controlling for socio-economic variables, we assume differences in standards of living are due to the extra costs disabled people incur. Disabled people, according to our model, 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.

The methodology used to work out the extra costs for families with disabled children is similar to the one previously used for working age adults. It is a standard of living approach: it involves comparing the standard of living of families with disabled children to that of families with non-disabled children. The extra cost is defined as the average additional monthly income that a family

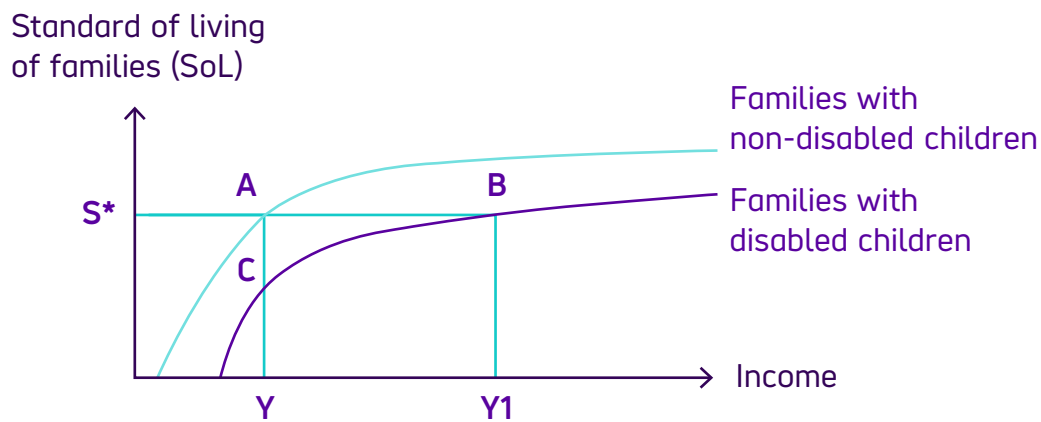
with disabled children [7] would need in order to enjoy the same quality of life as an equivalent family with non-disabled children.

A key feature of our approach is the addition of child health indicators to the model, which allow for the child’s disability to be considered in the calculation of standard of living, alongside that of the adults in the family.

Figure one illustrates the relationship between income and standard of living across the population. The two curves represent the standard of living of families with non-disabled children and families with disabled children both of which increase as income increases. Families with disabled children experience a lower standard of living than families with non-disabled children at all levels of income, as they have less income to afford everyday 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 families with disabled children to reach the same standard of living as those with non-disabled children.

---

7. Our analysis is at a benefit unit level (a single adult or a married/cohabiting couple and any dependent children). This report uses the term “families” for simplicity. When we refer to “families with disabled children” we refer to non-disabled parents with at least one disabled child in the family. It should be noted that a very small number of families analysed include parents who are disabled. See Appendix B for more details.

**Figure one:** Extra costs and standard of living of families

## Structural equation model

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

- **standard of living index**
- **adult disability index**
- **children 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 two disability indices. Latent variables refer to unobserved variables that can be revealed by a set of observed indicators. Latent variables play a key role in our analysis as they allow us to compare families' standard of living while isolating the role of income and disability in determining a certain level of standard of living.

## Family Resource Survey

Our analysis is based on the Family Resource Survey (FRS) 2016/17, a nationally representative dataset used to provide official statistics on social welfare issues. Our sample is taken from the FRS 2016/17 and is made of over 21,000 individuals, including over 4,000 disabled people.

The analysis has been computed at a family level, because that is the format provided for the standard of living questions in the FRS. We have therefore computed variables such as income, the disability indices and relevant socio-economic factors at this level. We have assumed that income is shared equally between members of the family. Extra costs estimates are made at family level and equivalised to an adult level to allow comparison against the whole population.

## Standard of living index

**Figure two:** Adult deprivation indicators by family types  
Would you (and your family or partner) like to, but **cannot** afford to:

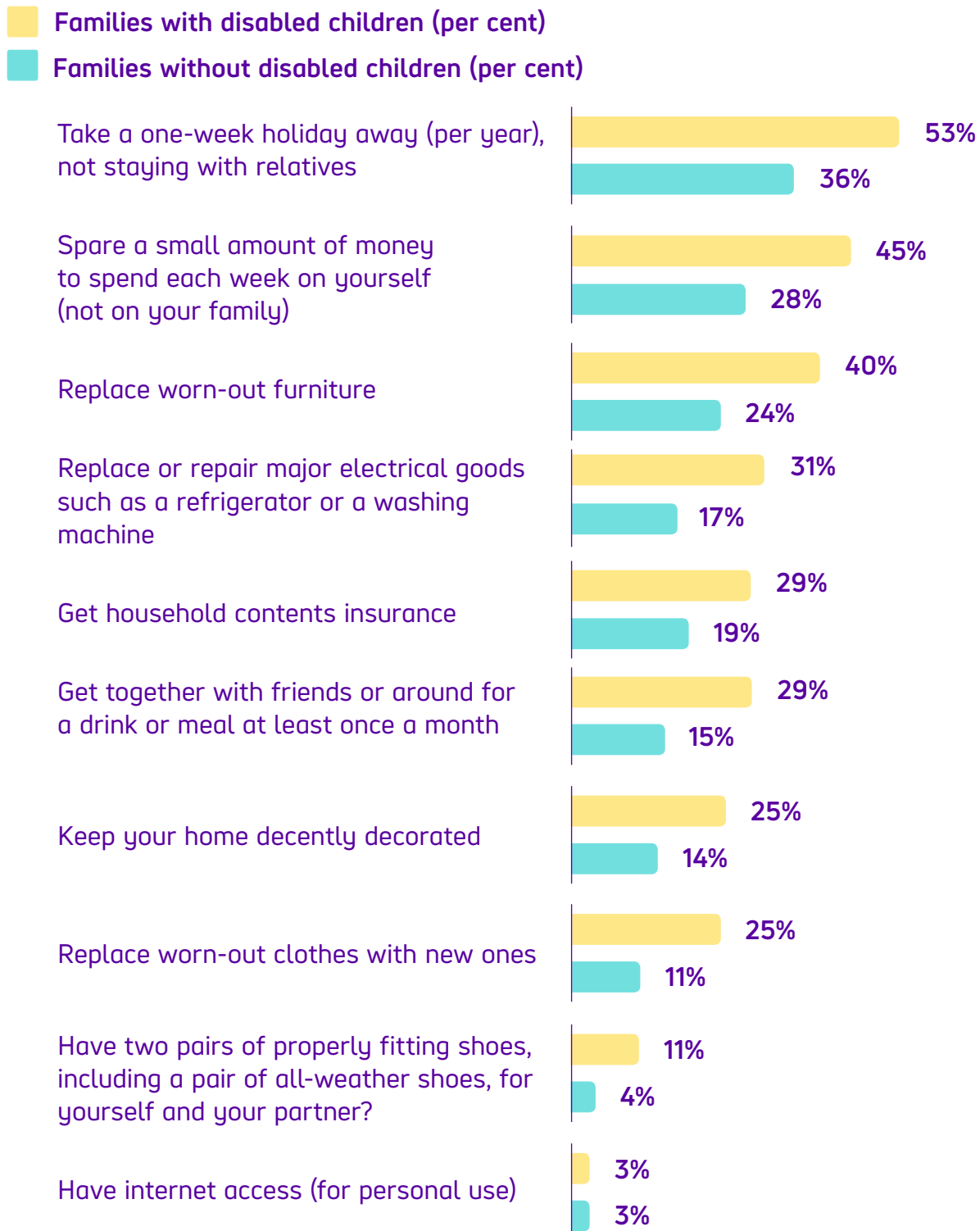


Figure two clearly shows that families with at least one disabled child experience greater deprivation on average than families with non-disabled children. Extra costs mean that families with disabled children are less likely to be able to afford an equal quality of life. Figure two also reveals that parents with disabled children are significantly less likely to be able to spend small amounts of money on themselves. This indicates how the burden of extra costs is spread across the whole family.

## Disability indices for adults and children

We know that the extra costs for disabled people can vary due to person's condition or impairment. To account for this in our model, we went beyond a binary definition of disability, to incorporate the variation in family members' conditions or impairments and capture any difference in extra costs.

We constructed a latent disability index based on the ten areas of long-term and limiting conditions or impairments assessed within the FRS for each adult in the family (see below for the questions). The latent disability index enabled us to capture the underlying disability, not just what is observed in the survey.

This approach also allowed us to create a latent disability variable that is continuous for the whole population. We also recognise the role of socio-economic factors in long-term and limiting difficulties affecting a person's health.

We also established a reference disability level against which comparisons of extra costs are made. The reference point we used was the 75th percentile in the population ordered by the disability index. This decision was based on the distribution of the disability index.

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

In addition to the adult disability index described above, for this analysis, child health indicators were added to form a separate disability index: the children disability index. This is an important feature of this approach, as it allows us to distinguish between the impact of adult and child disability on the standard of living of a family. It is this approach that allows us to isolate the extra costs of parenting a disabled child from the extra costs experienced by disabled adults.



**Table one:** Adult health indicators. Longstanding conditions or impairments of children by family types (in per cent).

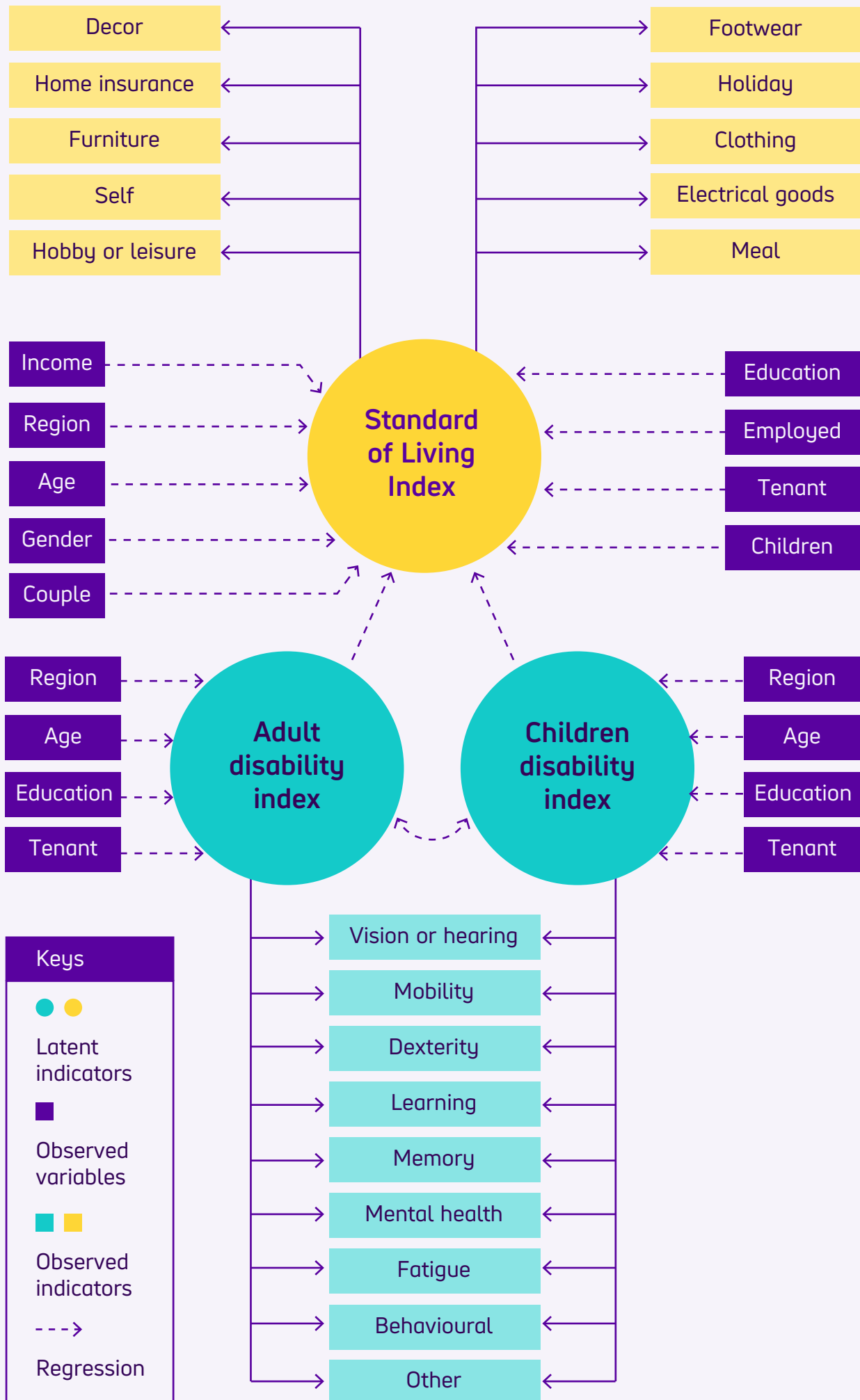
Does this (do these) health problem(s) or disability(ies) mean that you have significant difficulties with any of these areas of your life?	Families <b>with</b> disabled children (per cent)	Families <b>without</b> disabled children (per cent)
Difficulty with vision and hearing	7	4
Difficulty with mobility	20	9
Difficulty with dexterity	12	5
Difficulty with learning	7	3
Difficulty with memory	10	4
Difficulty with mental health	22	9
Difficulty with stamina or breathing fatigue	20	10
Difficulty with socially or behaviourally	3	1
Difficulty with any other areas of life	14	6

**Table two:** Children health indicators. Longstanding conditions or impairments of children by family types (in per cent).

Does this (do these) health problem(s) or disability(ies) mean that you have significant difficulties with any of these areas of your life?	Families <b>with</b> disabled children (per cent)	Families <b>without</b> disabled children (per cent)
Difficulty with vision and hearing	15	1
Difficulty with mobility	23	0
Difficulty with dexterity	11	0
Difficulty with learning	39	1
Difficulty with memory	12	0
Difficulty with mental health	24	0
Difficulty with stamina or breathing fatigue	28	2
Difficulty socially or behaviourally	45	0
Difficulty with any other areas of life	20	1

Table two lists the health indicators used to establish the children disability index. It reports the percentage of long-term health indicators of children in families with and without disabled children. As explained above, the extra cost of parenting disabled children is estimated for Equality Act disabled children.

**Figure three:** Path diagram: an illustration of the SEM framework



## Path diagram: an illustration of the SEM framework

Figure three is an illustration of our SEM model once we added the children and their long-term health indicators to our sample. It also indicates that we have allowed for the possibility of any correlation between the two disability indices.

**Rounded boxes represent latent variables, and square boxes indicate observed variables.** The diagram shows how the observed social deprivation indicators (for both adults and children) are explained by the unobserved standard of living index. The standard of living index is assumed to be determined by income, socio-economic factors and the disability indices.

Similarly, **the diagram shows both the adults and children disability indices as revealed by the long-term difficulty and limiting indicators asked for both adults and children within the FRS** (as described above). They are assumed to vary according to sub-set of socio-economic factors. For each regression (arrows in the diagram) there is an unobserved error term.

The regression outputs from the SEM analysis are used to establish the extra costs estimation and are calculated as described above.

## Income

Income is the main factor that influences a family's standard of living. For our analysis we have used total

income from all sources, including disability benefits. Income from benefits have been included because we assume respondents in the FRS would answer the deprivation questions based on all the income that is available to their family.

Housing costs and direct taxes have been removed as this allows a more accurate reflection of disposable income, as well as providing comparability with established income statistics.

Income has been equivalised to adjust for the family composition, to account for the number and age of adults and children within the family based on the OECD-modified method [8].

## Socio-economic factors

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

The disability index is one of the most important factors affecting standard of living. This enables us to understand how the impairment or condition of a family member can affect the standard of living of the family, while also accounting for a range of socio-economic factors.

8. The equivalisation method used is the standard OECD (Organisation for Economic Co-operation and Development)-modified method.

Table three [9] shows the differential income and socio-economic factors between families with, and without, a disabled child, which are captured in the model. Income and employment

outcomes are typically worse for families with a disabled child, which will partially account for some of the differentials in standards of living.

**Table three:** Descriptive statistics of the socio-economic factors determining the standard of living of families with children.

	Families <b>with</b> disabled children	Families <b>without</b> disabled children
Age of respondent (mean)	41	40
Monthly individual income (mean)	£1,202	£1,475
Social renting	33%	16%
Private renting	19%	34%
Home owner	48%	50%
Children aged 0 to 4	29%	24%
Children aged 5 to 10	61%	46%
Children aged 11 to 15	50%	35%
Children aged 16 to 19	27%	18%
North East	4%	3%
North West	10%	10%
Northern Ireland	8%	11%
East Midlands	9%	6%
West Midlands	11%	8%
East of England	8%	8%
South East	11%	12%
Yorkshire and the Humber	8%	7%
South West	10%	7%
Scotland	11%	13%
Wales	4%	4%
London	7%	10%
In work	73%	88%
Partners in work	44%	64%

9. The table is calculated using the FRS, which includes missing values. An education variable was used in the analysis, however due to the high proportion of missing values, we have not displayed the averages in the table.

## Extra costs computation

The path model illustrates the SEM used to compute both the extra cost for disabled adults and families with disabled children. Our new model has been designed to allow us to account for disability at both the adult and child level. The long-term health indicators only account for disabled people (adults or children) as defined by the Equality Act definition. This means that for families with non-disabled children, the children long-term health indicators, and therefore the children disability index are categorised as 'zero'. This also applies to non-disabled adults.

Therefore the extra cost for families with disabled children is computed as the comparison between the standard of living of parents with disabled children, to parents with no disabled children, with similar income and socio-economic characteristics. Similarly, the extra cost for disabled adults is computed by comparing disabled adult's standard of living, with the standard of living of non-disabled adults. The extra costs of all family compositions, with respect to disability, are presented in Appendix B.

The extra cost calculation [10] is based on the coefficients for income, disability index from the SEM model. This is displayed in Appendix C.

---

10. As described in 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.

## Technical considerations and notes on updated methodology

Following on from last year’s extra costs analysis, we have revised the model to reflect our new area of investigation, families with disabled children. The existing model used to compute extra costs for working age adults did not account for whether or not a child is disabled, and the extra costs associated with this.

This new approach represents an attempt to move beyond our initial model. However, adding child disability to our model substantially increased the number of data points. This created difficulties running the model due to the increased complexity, which prevented the calculation of estimates in the model. In order to make the model converge [11] we proceeded with the following adjustments:

**One:** Substitution of the maximum likelihood (ML) estimation with weighted least squares means and variance adjusted (WLSMV) estimation for the SEM. The higher number of latent variables has little influence on the computations for weighted least squares. In contrast, maximum likelihood is at a disadvantage with a large number of latent variables because this leads to a large number of numerical integrations, which is both time and storage (memory) consuming.

**Two:** Merging of adults and children’s health indicators: “difficulty with vision” and “difficulty with hearing”.

Given the relatively low responses rate on these indicators, we anticipate that the merge had a limited effect on the model’s final calculation.

**Three:** All health indicators (adults and children) have been turned into binary variables. This means that we only measure the presence of health difficulties in a family (being either 1 or 0). This means we do not compute a measure of severity of disability, as we did last year.

**Four:** The adult deprivation indicator titled “ability to afford internet” and the control variable “partner level of education” not been added to the list of SOL deprivation indicators as they were creating convergence issues.

Similar to last year, we have used the adult deprivation indicators to create the SOL index for families. In further iterations of our extra costs measure, we will also consider incorporating children deprivation indicators available within the FRS dataset, as we believe these could enhance the standard of living index. However, we intend to fully explore the relationship these indicators have with the family deprivation measures before any future introduction into our extra costs model.

**It should be noted that due to these changes to the model, extra cost estimates presented in this report are not directly comparable to last year’s estimates. This means that any change from last year cannot be attributed to an increase or decrease of extra costs, but rather to the new methodology used.**

11. That is, to calculate individual components, draw them together, and make them operate effectively as a whole equation.

# Results: the extra costs for families with disabled children

## Key findings

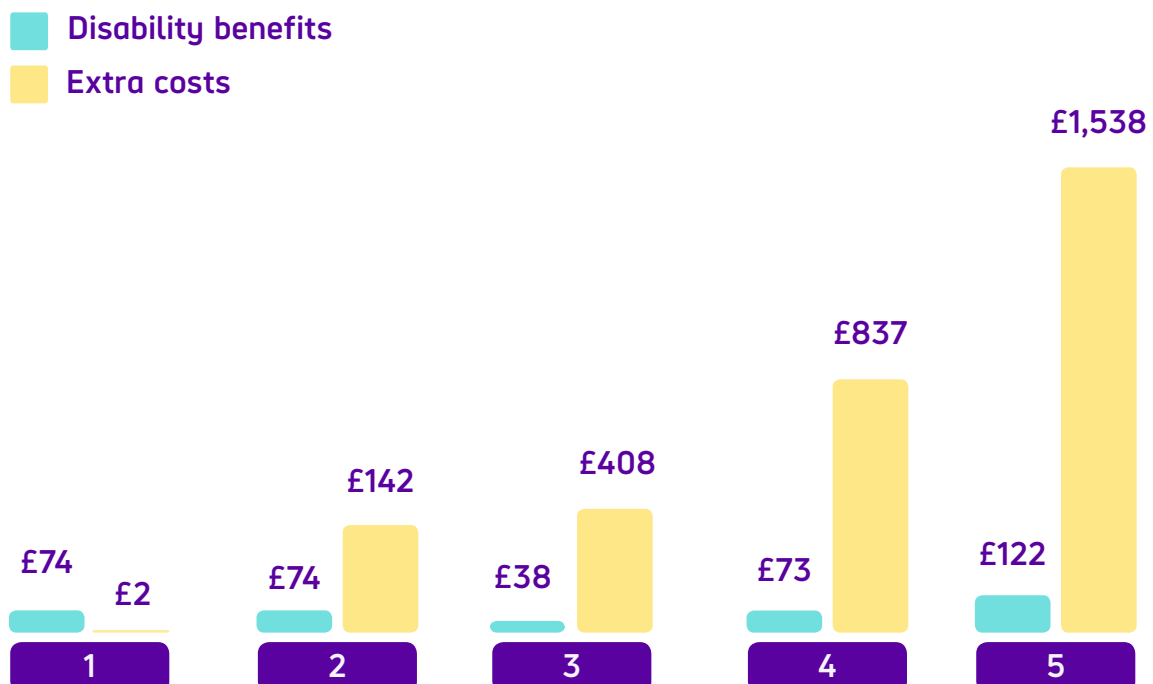
- On average, parents with disabled children face extra costs of £581 a month.
- For almost a quarter of parents with disabled children (24 per cent), these costs amount to over £1,000 a month. This is after taking into account welfare payments designed to help meet these costs.
- On average, parents with disabled children face extra costs equivalent to almost half of their income (47 per cent).

## Extra costs breakdown

### Distribution of extra costs and income

Figure four shows the average extra costs faced by families with disabled children compared to the disability benefits they receive, ranked in order of extra costs and split into five groups (quintiles). Our findings show that disability benefits don't compensate for the majority of the extra costs faced by families with disabled children. The top 20 per cent of the distribution face an average of more than £1,500 however they only receive disability benefits on average of £122 per month.

**Figure four:** Extra costs faced by families with disabled children in relation to disability benefits received, split in order of extra costs (per month)



**Figure five:** Monthly average extra cost by employment situation of families with



Figure five shows that extra costs for families with disabled children are lower when at least one of the adults in the family is working. Families in which both parents are out of work have significantly lower incomes than families with at least one adult in work (£814 per month against £1576 per month).

**Figure six:** Monthly average extra cost for families by the number of disabled children

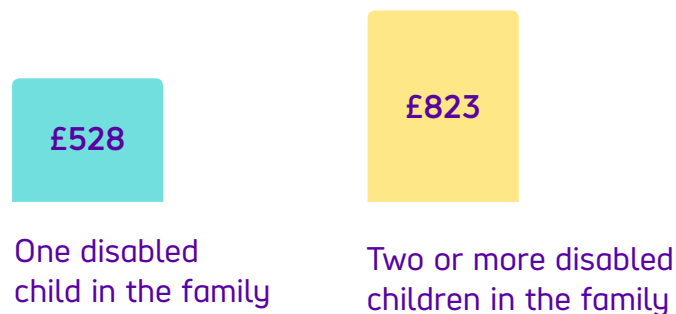


Figure six shows that extra costs for families increase with the number of disabled children in the family. It also shows that extra costs don't increase proportionally with the number of disabled children, which suggests a diminishing marginal extra cost of a disabled child. This indicates that part of the extra costs that come with the second or third disabled child, is already captured by the costs that came with the first disabled child.



**Figure seven:** Monthly average extra costs by age of children



Figure 7 shows the extra costs faced by families with disabled children by the child's age. Extra costs are relatively similar across the age groups, with lower costs for the eldest group.

## Drivers of extra costs for families with disabled children, from qualitative sources

Alongside the Disability Price Tag programme, Scope is conducting a pioneering longitudinal qualitative research study 'Our Lives, Our Journey', following the lives of disabled people over five years.

This research aims to provide a rich qualitative evidence base regarding the life journeys of disabled people, particularly focusing on key transition points in disabled people's lives, and what prevents or supports them or their families to live the life they choose.

The study focuses on four specific cohorts of disabled participants and includes a group of parents with disabled children. Research data was gathered through a series of in-depth semi-structured interviews with each participant, exploring several aspects of their lives in detail, including their financial security.

In year one of the study, parents highlighted the key activities or areas

which incurred extra costs for their family in raising and supporting a disabled child.

- **Transport:** costs associated with car travel and parking extenuated by frequent hospital visits for outpatient appointments and inpatient stays, specialist equipment for traveling with a disabled child, and longer journeys to reach accessible recreation and leisure activities
- **Toys:** purchase of more expensive specialist toys and play equipment for disabled children, such as sensory toys
- **Clothing:** suitable clothes for disabled children are usually more expensive and need to be replaced more frequently due to wear and tear
- **Energy:** as well as heating in the home, the cleaning of bedding and clothes is required on a frequent basis
- **Therapies:** privately purchased therapy for both children (physiotherapy, hydrotherapy, speech and language therapy) and their parents (parent counselling and emotional support)
- **Home adaptations:** changes to living spaces to make them safer and more accessible for disabled children.

# Results: the extra costs disabled adults face

## Key findings

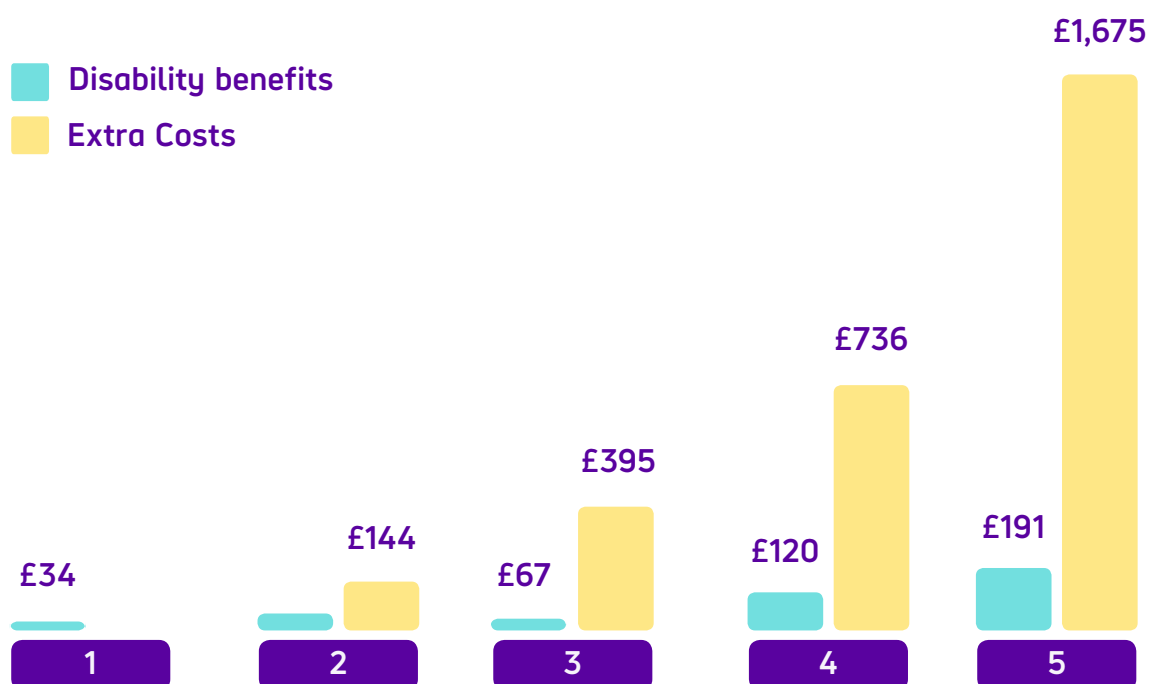
- On average, disabled people face extra costs of £583 a month related to their impairment or condition, even after receiving welfare payments designed to help meet these costs.
- For one in five disabled people, extra costs amount to over £1,000 per month.
- On average, disabled adult's extra costs are equivalent to almost half of their income (after housing costs).

## Extra costs breakdown

Figure eight shows the average adult extra costs in relation to disability benefits, ranked in order of extra costs and split into five groups (quintiles). Although disability benefits increase with extra costs, they are significantly smaller than the extra costs. For this reason, disability benefits cannot be taken as a proxy for extra costs.

Although we welcome the Social Metric Commission's decision to include extra costs associated with disability in their new poverty measure, we would suggest it looks at a standard of living-focused approach to provide a better measure of extra costs.

**Figure 8:** Extra costs faced by disabled adults in relation to disability benefits received, split in order of extra costs (per month)



**Figure nine:**

Monthly average extra costs for families by number of disabled children



Figure nine shows that extra costs increase with the number of children in the family.

Figure nine shows that extra costs for disabled adults increase with the number of children in the family.

This can be explained by the employment situation of adults in families with children: 78.74 per cent are out of work against 86 per cent for families with no children. This obviously translates into levels of income, with an average monthly income 12 per cent below families with no children.

## Extra costs and income distribution

Figure 10 shows average extra costs across income distribution for disabled adults, with the first decile showing those on the lowest income and the tenth showing the highest.

### Figure ten:

Monthly average extra cost of disabled adults and disability benefits by income quintiles.

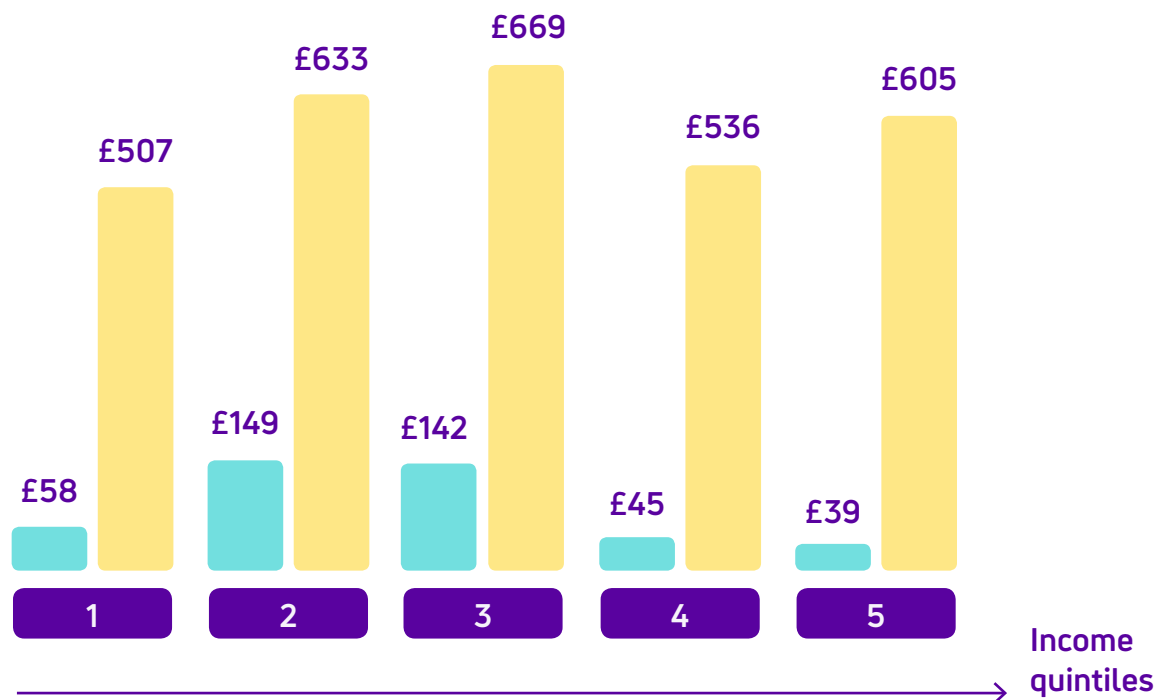


Figure ten shows the average extra costs faced by disabled adults relative to the disability benefits they receive. We have divided people into five groups (or quintiles) based on their average monthly income. Across the whole spectrum of incomes, the extra costs faced by disabled people are high, and disability benefits are nowhere near covering them.

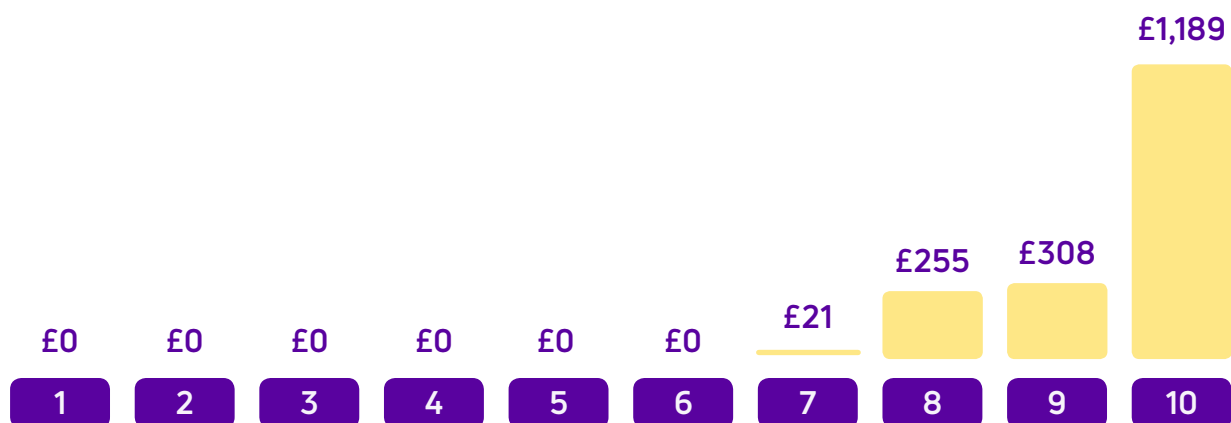
## Disability index breakdown

Our analysis accounts for how different people’s impairments or conditions affect the extra costs they face.

Figure 11 below shows average extra

costs for all disabled adults ordered by the disability index, split into ten groups (deciles). Our analysis shows that families with disabled adults with multiple conditions or impairments face higher extra costs, with the highest decile facing average extra costs of £1189 per month.

**Figure 11:** Monthly average extra costs for disabled adults in order of the adult disability index



## Extra costs by employment status

Disabled adults in work face lower extra costs than those out of work.

**Figure 12:** Average monthly extra costs by employment status



Figure 12 shows higher monthly average extra costs for out of work disabled adults. This is concerning given that 52 per cent of working age disabled adults are out of work (unemployed or economically inactive) [12].

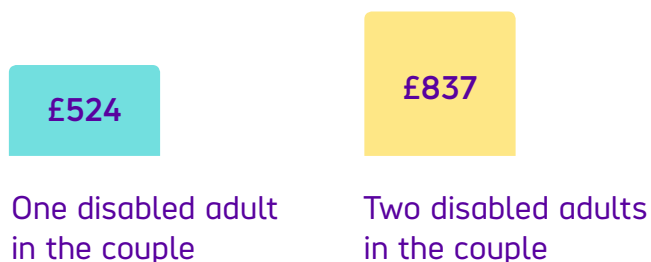
12. Office of National Statistics, Table A08: Economic activity of people with disabilities aged 16-64: rates, UK, October - December 2018.

## Extra costs by family composition

**Figure 13:** Average month extra costs by singles and couples



**Figure 14:** Average monthly extra costs by number of disabled adults in the couple



Extra costs vary depending on the number of disabled adults in the family. The extra costs faced by 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 fact that the non-disabled partner provides informal care to their disabled partner.

## Next steps

Since we began campaigning on extra costs, we have seen some positive steps from government, regulators and businesses. However, as this report demonstrates, disabled people and their families still face a huge financial penalty.

We will continue to report annually on extra costs, assessing developments over time and identifying areas where change is needed.

It's already clear that further action cannot come soon enough. And the government must lead the way, especially given the substantial change to our welfare system just around the corner through the full roll-out of Universal Credit.

There's also more that businesses can do. We will be following up on this report with more detailed work on the role of markets in ending the inequality faced by disabled people and their families, outlining the benefits for both consumers and the businesses themselves.

Only by working together can we end the financial inequality experienced by disabled people and their families.

# Appendix A: Descriptive statistics

## Total number of people in our sample

	Disabled	Non-disabled	Total
Adults	2,846	8,875	11,721
Children	1,492	7,983	9,475
Total	4,338	16,858	21,196

## Disability in the family

	Families <b>with</b> children	Families <b>without</b> children	Total
No disabled people in the family	8,037	6,629	14,666
One disabled person in the family	3,164	2,049	5,213
Two disabled people in the family	520	638	1,158
Three disabled people in the family	0	129	129
Four disabled people in the family	0	30	30
Total	11,721	9,468	21,196
	Families <b>with</b> children	Families <b>without</b> children	Total
No disabled people in the family	68.6%	70.0%	69.2%
One disabled person in the family	27.0%	21.6%	24.6%
Two disabled people in the family	4.4%	6.7%	5.5%
Three disabled people in the family	0.0%	1.4%	0.6%
Four disabled people in the family	0.0%	0.2%	0.1%
Total	100.0%	100.0%	100.0%



<b>Families with disabled children</b>			
	Families with disabled children	Families with non-disabled children	Total
No disabled people in the family	0	8,361	8,361
One disabled person in the family	961	0	961
Two disabled people in the family	135	0	135
Three disabled people in the family	17	0	17
Four disabled people in the family	1	0	1
<b>Total</b>	<b>1,114</b>	<b>8,361</b>	<b>9,475</b>
	Families with disabled children	Families with non-disabled children	Total
No disabled people in the family	0.0%	100.0%	88.2%
One disabled person in the family	86.3%	0.0%	10.1%
Two disabled people in the family	12.1%	0.0%	1.4%
Three disabled people in the family	1.5%	0.0%	0.2%
Four disabled people in the family	0.1%	0.0%	0.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

<b>Parents and children's disability</b>				
	Non-disabled	One disabled	Two disabled	Total
No disabled children in the family	14,666	4,686	730	20,082
One disabled child in the family	527	364	70	961
Two disabled children in the family	64	57	14	135
Three disabled children in the family	2	9	6	17
Four disabled children in the family	-	1	-	1
<b>Total</b>	<b>15,259</b>	<b>5,117</b>	<b>820</b>	<b>21,196</b>

**Parents and children's disability**

	Non-disabled	One disabled	Two disabled	Total
No disabled children in the family	96%	92%	89%	95%
One disabled child in the family	3%	7%	9%	5%
Two disabled children in the family	0%	1%	2%	1%
Three disabled children in the family	0%	0%	1%	0%
Four disabled children in the family	0%	0%	0%	0%
Total	100%	100%	100%	100%

**Adult's disability**

	Families <b>without</b> children	Families <b>with</b> children	Total
No disabled parents in the family	8,037	7,222	15,259
One disabled parent in the family	3,164	1,953	5,117
Both parents in the family are disabled	520	300	820
Total	11,721	9,475	21,196
	Families <b>without</b> children	Families <b>with</b> children	Total
No disabled parents in the family	68.6%	76.2%	72.0%
One disabled parent in the family	27.0%	20.6%	24.1%
Both parents in the family are disabled	4.4%	3.2%	3.9%
Total	100.0%	100.0%	100.0%

<b>Children disability</b>			
	Families <b>without</b> children	Families <b>with</b> children	Total
No disabled child in the family	11,721	8,361	20,082
One disabled child in the family	0	961	961
Two disabled children in the family	0	135	135
Three disabled children in the family	0	17	17
Four disabled children in the family	0	1	1
Total	11,721	9,475	21,196
	Families <b>without</b> children	Families <b>with</b> children	Total
No disabled child in the family	88.2%	100%	94.7%
One disabled children in the family	10.1%	0%	4.5%
Two disabled children in the family	1.4%	0%	0.6%
Three disabled children in the family	0.2%	0%	0.1%
Four disabled children in the family	0%	0%	0%
Total	100%	100%	100%

## Appendix B: extra costs by disability within the family

Percentages out of the total number of people in our sample		
Per cent (%)	Non-disabled adults	Disabled adults
No children	<b>38%</b>	<b>17%</b>
Non-disabled children	<b>31%</b>	<b>8%</b>
Disabled children	<b>3%</b>	<b>2%</b>

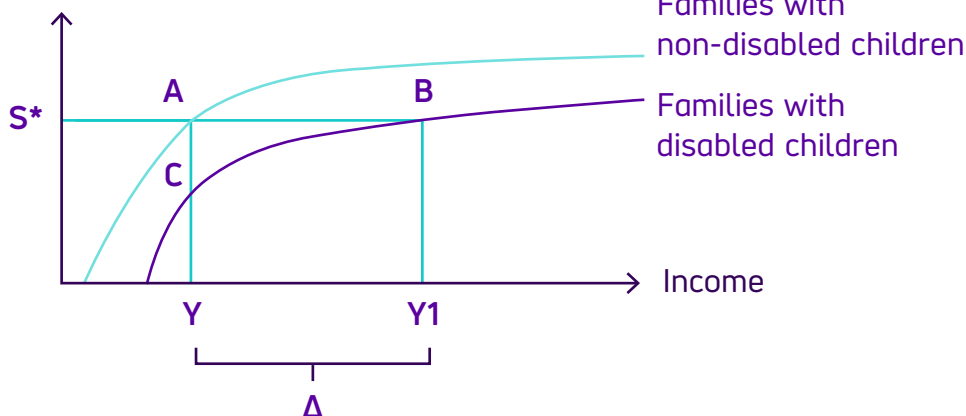
Percentages of the total number of people in the dataset.

Extra costs by family types		
Extra cost per month	Non-disabled adults	Disabled adults
No children	<b>N/A</b>	<b>£567</b>
Non-disabled children	<b>N/A</b>	<b>£575</b>
Disabled children	<b>£581</b>	<b>£668</b>

The tables above show that only 2 per cent of families have both disabled adults and children in the family, with average extra costs of £668 per month.

# Appendix C: extra costs equation

Standard of living of families (SoL)



The horizontal distance AB provides a measure of the extra income ( $\Delta$ ) required to bring the SoL of the disabled person up to the same level as the non-disabled person.

To formalise this idea, consider the following additively separable SoL function:

$$(1) \quad S = f(Y) - g(D) + h(X, \mathcal{E})$$

Where  $S$  is the SoL,  $Y$  is a measure of income,  $D$  is the disability index and  $X$  and  $\mathcal{E}$  represent other observable and unobservable socio-economic factors.

Some individuals may be in receipt of disability benefit ( $B$ ), others may not. To allow for this, we decompose income as:

$$(2) \quad Y = Y_0 + B$$

Where  $Y_0$  excludes disability benefits. We then defined a reference level of disability using the 75th percentile of disability index.

We now pose the following question: what is the smallest amount of additional income, over and above  $Y_0$ , that would be needed for a person with disability level  $D$  to achieve the same SoL as he or she would have with

income  $Y_0$  and disability reduced to the reference level  $D_0$ ?

Given equation (1), this additional income needed,  $\Delta$ , is independent of  $X$  and  $\mathcal{E}$ , and solves the following optimisation problem:

$$\min \Delta \text{ subject to: } f(Y_0 + \Delta) - g(D) \geq f(Y_0) - g(D_0) \quad (3)$$

In general, the total extra costs of disability,  $\Delta$ , depend on the levels of both income  $Y_0$  and disability.

For the extra costs  $\Delta$  to depend only on severity of disability  $D$  (as implied by the design of some benefit systems), the income-SoL profile must have the linear form  $f(Y_0) = \gamma Y_0$ , in which case the extra costs of disability are:

$$\Delta = Y_0 \left\{ e^{\frac{g(D) - g(D_0)}{Y_1}} - 1 \right\} \quad (4)$$

# Appendix D: Structural Equation Model results

**Table four:** Confirmatory factor analysis estimates: Standard of Living index measurement

	Factor loading	P value
Enough money to keep your home in a decent state of decoration?	<b>0.789</b>	<b>0.000</b>
Enough money to get household contents insurance?	<b>0.634</b>	<b>0.000</b>
Enough money to replace any worn out furniture?	<b>0.864</b>	<b>0.000</b>
Regularly participate in a hobby or leisure activity?	<b>0.777</b>	<b>0.000</b>
Two pairs of properly fitting shoes, including a pair of all weather shoes, for yourself and your partner? Or enough to replace worn-out clothes with new ones?	<b>0.799</b>	<b>0.000</b>
Get together with friends or family around for a drink or meal at least once a month?	<b>0.827</b>	<b>0.000</b>
Enough to replace or repair major electrical goods such as a refrigerator or a washing machine, when broken?	<b>0.817</b>	<b>0.000</b>
A small amount of money to spend each week on yourself (not on your family) Internet access for personal use?	<b>0.805</b>	<b>0.000</b>
A holiday away from home for at least one week a year, whilst not staying with relatives at their home?	<b>0.711</b>	<b>0.000</b>

**Table five:** Confirmatory factor analysis estimates: children disability index measurement

	Factor loading	P value
Difficulty with vision	<b>0.621</b>	<b>0.000</b>
Difficulty with hearing/mobility	<b>0.846</b>	<b>0.000</b>
Difficulty with dexterity	<b>0.938</b>	<b>0.000</b>
Difficulty with learning	<b>0.955</b>	<b>0.000</b>
Difficulty with memory	<b>0.900</b>	<b>0.000</b>
Difficulty with mental health	<b>0.902</b>	<b>0.000</b>
Difficulty with stamina or breathing or fatigue	<b>0.463</b>	<b>0.000</b>
Difficulty with social interaction	<b>0.883</b>	<b>0.000</b>
Difficulty with any other area of life	<b>0.386</b>	<b>0.000</b>

**Table six:** Confirmatory factor analysis estimates: Adult disability index measurement

	Factor loading	P value
Difficulty with vision	<b>0.572</b>	<b>0.000</b>
Difficulty with hearing/mobility	<b>0.792</b>	<b>0.000</b>
Difficulty with dexterity	<b>0.843</b>	<b>0.000</b>
Difficulty with learning	<b>0.894</b>	<b>0.000</b>
Difficulty with memory	<b>0.892</b>	<b>0.000</b>
Difficulty with mental health	<b>0.643</b>	<b>0.000</b>
Difficulty with stamina or breathing or fatigue	<b>0.708</b>	<b>0.000</b>
Difficulty with social interaction	<b>0.605</b>	<b>0.000</b>
Difficulty with other area of life	<b>0.256</b>	<b>0.000</b>

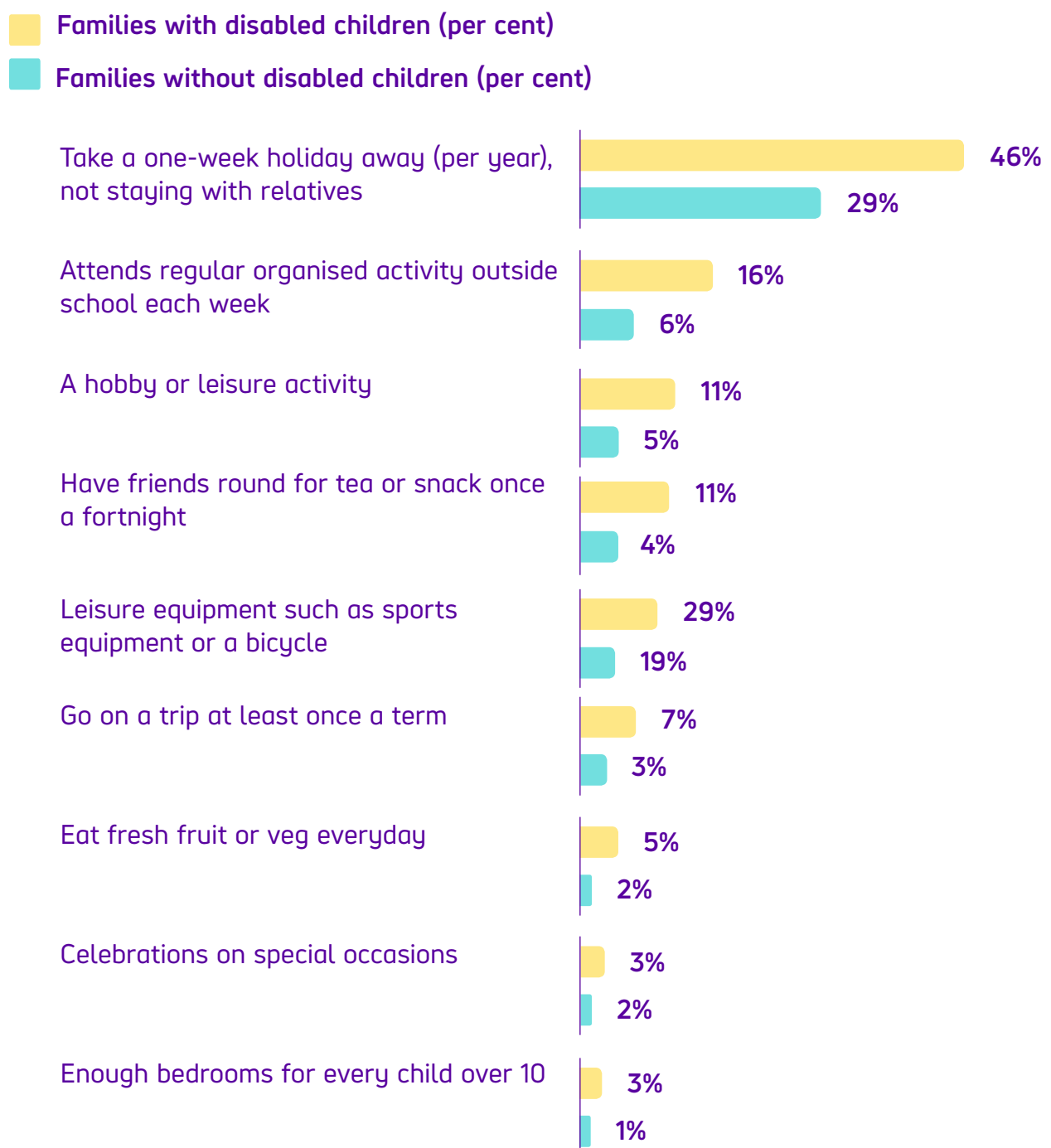
**Table seven:** Regression estimates for the SOL index

	Coefficients	Standard Error	P value
Children disability index	0.111	0.013	0.000
Adult disability index	0.193	0.023	0.000
Monthly total income (mean)	1.681	0.023	0.000
Squared monthly total income (mean)	-0.169	0.003	0.000
Age of respondent (mean)	0.026	0.053	0.000
Squared age of respondent	-0.004	0.006	0.000
University degree	0.306	0.167	0.000
Social renting	0.179	0.039	0.000
Private renting	-0.496	0.070	0.000
Owner	-0.282	0.043	0.000
Children aged 0 to 4	0.101	0.025	0.000
Children aged 5 to 10	0.141	0.021	0.000
Children aged 11 to 15	0.107	0.024	0.000
Children aged 16 to 19	0.208	0.036	0.000
North East	0.080	0.078	0.000
North West	0.017	0.053	0.000
Northern Ireland	-0.218	0.055	0.000
East Midlands	-0.249	0.065	0.000
East of England	-0.234	0.062	0.000
South East	-0.121	0.053	0.000
Yorkshire and the Humber	-0.043	0.058	0.000
South West	-0.034	0.062	0.000
Scotland	-0.114	0.053	0.000
West Midlands	-0.115	0.053	0.000
Wales	-0.103	0.083	0.000
In work	-0.339	0.038	0.000
Partner in work	-0.219	0.035	0.000



# Appendix E: Child deprivation

**Figure 13:** Child deprivation indicators by family types. Would you (and your family or partner) like to, but **cannot** afford to:



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're a strong community of disabled and non-disabled people. We provide practical and emotional information and support when it's needed most. We use our collective power to change attitudes and end injustice.

We campaign relentlessly to create a fairer society. And we won't stop until we achieve a society where all disabled people enjoy equality and fairness.

For more information please contact:  
[research@scope.org.uk](mailto:research@scope.org.uk)

[scope.org.uk](https://www.scope.org.uk)



@scope



@scope



@scopecharity

**SCOPE** = Equality for disabled people