Table S1: Definitions of disability groups

Disability Domain	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Physical health						
Mobility	No	Yes*	Yes or no	Yes or no	Yes*	No**
Lifting carrying or moving objects	No	Yes*	Yes or no	Yes or no	Yes*	No**
Manual dexterity	No	Yes*	Yes or no	Yes or no	Yes*	No**
Continence	No	Yes*	Yes or no	Yes or no	Yes*	No**
Communication	No	Yes*	Yes or no	Yes or no	Yes*	No**
Physical co-ordination	No	Yes*	Yes or no	Yes or no	Yes*	No**
Mental health						
Memory of ability to concentrate learning or understand	Yes*	No	Yes*	Yes **	Yes or no	No**
Recognizing when in physical danger	Yes*	No	Yes*	Yes **	Yes or no	No**

* = can or cannot be present, as long as another domain from the broader disability area (i.e. mental or physical health) is present

**= necessarily present for definition

Yellow cells indicate primary domains for group definition

- Group 1: Any (either or both domains) mental disability (no physical disability);
- Group 2: Any physical disability (no mental disability) (group 1 & 2 are mutually exclusive);
- Group 3: Any mental disability (either domains, with or without physical disability);
- Group 4: Both mental disabilities (both domains, with or without physical disability);
- Group 5: Any physical disability (with or without mental disability);
- Group 6: No disability.

Table S2: Living standard questions in the Family Resources Survey

Question	Included	Rationale
Do you (and your family) have a holiday away from home for at least one week a year, whilst not staying with relatives at their home?	YES	
Do you have friends or family around for a drink or meal at least once a month?	NO	Not directly relevant to children's living standards
Do you have two pairs of all-weather shoes for (all members of family)	NO	Depending on disability, might not be applicable to all chidlren
Do you have enough money to keep your home in a decent state of decoration?	YES	
Do you have household contents insurance?	YES	
Do you make regular savings of £10 a month or more for rainy days or retirement?	YES	
Do you replace any worn out furniture?	YES	
Do you replace or repair major electrical goods such as a refrigerator or a washing machine, when broken?	YES	
Do you have a small amount of money to spend each week on yourself (not on your family)	YES	
do you have a hobby or leisure activity	NO	Not directly relevant to children's living standards
In winter, are you able to keep this accommodation warm enough	NO	Not coded as the other variables (yes/no)
Does your child/do your children have a family holiday away from home for at least one week a year?	YES	
And are there enough bedrooms for every child of 10 or over of a different sex to have their own bedroom?	NO	Not applicable to all families
Does your child/do your children have leisure equipment such as sports equipment or a bicycle?	YES	
Does your child/do your children have celebrations on special occasions such as birthdays, Christmas or other religious festivals?	YES	
Does your child/do your children go swimming at least once a month?	NO	Potentially not applicable to children with disabilities affecting mobility
Does your child/do your children do a hobby or leisure activity?	YES	
Does your child/do your children have friends around for tea or a snack once a fortnight?	YES	
Does your child/do your children (if <6 yrs old) go to toddler group / nursery / playgroup at least once a week?	NO	Not applicable to all families (child < 6yo)
Does your child/do your children go on school trips?	NO	Not applicable to all families (child <6yo)
Does your child/do your children have an outdoor space or facilities nearby where they can play safely	NO	Potentially, not applicable/relevant to families with severely disabled children

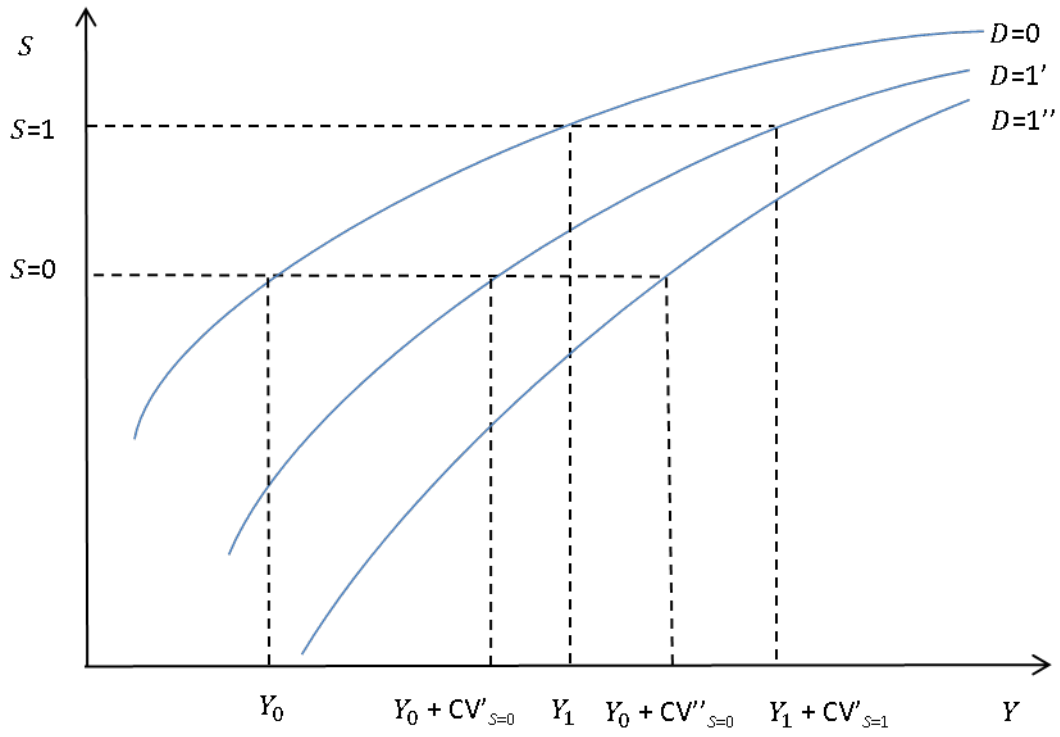
Theoretical approach: Compensating Variation

In Figure S1 we illustrate the concept of CV by plotting curves relating the income (*Y*, on the horizontal axis) and the living standards (*S*, on the vertical axis) of families without a disabled child (*D* =0) and with a disabled child (*D* =1'). We assume that: (i) the curves are upward sloping from left to right and convex, due to diminishing returns to *S* as *Y* increases; and, (ii) *D* =1' lies below *D* =0 though they tend towards one another at higher levels of *Y*. At a given level of living standards such as *S* =0 the CV is the difference between the income that a family with a disabled child (*D* =1') needs to have (= $Y_0 + CV'_{S=0}$) compared to the income of a family without a disabled child (*D* =0) (=Y_0) to achieve the same living standard (*S* =0). Based on our assumptions this difference will decrease at higher levels of living standards. For instance, the CV between *D* =1' and *D* =0 for *S* =1 (where S =1 > *S* =0) will correspond to $Y_1 + CV'_{S=1}$, which is smaller than $Y_0 + CV'_{S=0}$.

We hypothesize that families of children with more severe disabilities incur higher costs to achieve the same living standards as families with less severely disabled children. Suppose *D* =1'' denotes more severe disabilities than *D* = 1'; this is shown in Figure 1 as curve *D* =1" lying below curve *D* =1'. In this case the CV for *S* =0, corresponds to $Y_0 + CV''_{S=0}$, which is greater than $Y_0 + CV'_{S=0}$.

In order to employ this approach to investigate our aims, three measures are needed: 1) a definition of child mental and physical health disability; 2) a measure of living standards (LS); and 3) a measure of income.

Figure S1: Compensating variation



Theoretical Approach: Propensity Score Matching

If we assume that the probability of having a disabled child is adequately explained by the set of observed characteristics X, we can select from the sample of families with non-disabled children a control (i.e. non-treated) group, which is similar to the treated group with respect to X, but different with respect to disability D [27]. We therefore calculated the CV as the average treatment effect on the treated (ATT), as follows:

$$ATT = E[Y_1-Y_0|D=1] = E[Y_1-Y_0|D=1,p(X)] = E[Y_1|D=1,p(X)]-E[Y_0|D=0,p(X)] \quad (1)$$

We matched families using nearest neighbor 1:1 matching within a caliper, defined to be one quarter of the standard deviation of the propensity score [25]. Families are matched based on similar distributions of propensity scores, which might not arise from identical values of X. Since one of our aims is to estimate the income difference for families with and without a disabled child for the same value of living standards (S), we included values of our *LSI* rounded to the first decimal point as external to X and matched on both, so that the CV is given by:

$$ATT = E[Y_1-Y_0|D=1] = E[Y_1-Y_0|D=1,L,p(X)] = E[Y_1|D=1,L,p(X)]-E[Y_0|D=0,L,p(X)] \quad (2)$$

In other words, our procedure was as follows: first, the propensity score was calculated as the predicted probability from the probit model. Then, for each family with a disabled child we selected a match from the pool of families without a disabled child with the same value of living standards (based on the first four digits of the index) and the closest propensity score within the common support area.

Sensitivity analyses

Our results remain largely consistent in sensitivity analyses using 3:1 matching, where we did not observe any substantial differences compared with the results in Table 3 (results not shown).

Results were also similar when we used radius matching, although the magnitude of the CV in analyses not stratified by LS generally decreased. As shown in table S3, we observed that children with any mental health disabilities (Group 3, Comparison C), those both mental health disabilities (Group 4, comparison D), and those with any physical disabilities (Group 5, comparison S) needed an extra £34.20 (95%CI: 23.42; 44.98), £39.21 (95%CI: 14.22; 64.08) and £25.20 (95%CI: 12.71; 37.78), respectively, to achieve the same LS of families with non-disabled children. We also observed that CV for families of disabled children in these three groups and low LS was even greater: children with any mental health disabilities (Group 3, Comparison C), those both mental health disabilities (Group 4, comparison D), and those with any physical disabilities (Group 5, comparison S) needed an extra £60.35 (95CI: 57.38; 63.32), £81.47 (95%CI: 60.15; 102.80) and £42.47 (95%CI: 33.64; 51.29) to meet the same LS of families without a disabled child. These figures were comparable to those presented in our main analyses.

We also found that families in low LS with a child with any mental health disability (Group 3, Comparison F) needed an extra £29.74 (95%CI: 15.92; 43.56) per week to meet the same LS of families with no disabled children or children with any physical health disabilities. In our main analyses we found a figure similar in magnitude (£39.23 (95%CI: -15.67; 94.12)), but for which there was no evidence of a difference.

The only inconsistent findings we observed was that, when we used radius matching, we found that families with high LS and children with any mental health disability (Group 3, comparison F) were over compensated by £77.41 (95%CI: -138.31; -16.50).

All models were balanced.

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97 Table S3: Compensating variation using radius matching

Comparisons	Mean income difference (95%CI) [N]		
	All LS **[cases on common support/ total no. of cases][a]**	**Low Living Standards (LS <1)** **[cases on common support/ total no. of cases][a]**	**High Living Standards (LS=1)** **[cases on common support/ total no. of cases][a]**
(A) Any mental disability (no physical disability)	-1.42 (-32.27; 35.10) [352/352]	13.65 (-7.43; 34.74) [258/258]	-32.16 (-145.43; 81.05) [94/94]
(B) Any physical disability (no mental disability)	5.55 (2.56; 8.53) [1126/1126]	4.93 (2.19; 7.68) [820/820]	7.19 (-2.86; 17.27) [306/306]
(C) Any mental disability (+/- physical disability)	**34.20 (23.42; 44.98)** [1772/1782]**	60.35 (57.38; 63.32)** [1286/1293]	-34.98 (-80.18; 11.04) [486/489]
(D) Both mental disability (+/- physical disability)	**39.21 (14.22; 64.08)** [971/977]**	81.47 (60.15; 102.80)** [703/707]	-71.66 (-142.58; -0.74) [268/270]

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(E) Any physical disability (+/- mental disability)	**25.20 (12.71; 37.78)** [2681/2686]**	42.47 (33.64; 51.29)** [1956/1958]	-21.41 (-61.02; 18.21) [725/728]
(F) Any mental disability (+/- physical disability)	-1.05 (-21.10; 19.01) [1695/1782]	**29.74 (15.92; 43.56)** [1208/1293]**	***-77.41 (-138.31; -16.50)** [487/489]***
(G) Both mental disability (+/- physical disability)	0.09 (-47.17; 47.36) [871/977]	47.06 (17.21; 76.91)** [603/707]	70.40 (-244.19; 33.03) [268/270]
(H) Any physical disability (+/- mental disability)	11.72 (-7.11; 30.55) [2626/ 2686]	3.58 (-12.05; 19.22) [1898/ 1958]	32.94 (-21.45; 87.32) [728/728]

a Total sample size for each model is twice that of cases on common support, due to 1:1 matching.

** p<=0.05 *0.1>p>0.05

Abbreviations: LS = living standards. Numbers in squared brackets are sample sizes.

Highlighted in bold are results whose magnitude and significance differed from those found in the main analyses (Table 3 of the main text), but whose direction of association was unchanged; highlighted in ***bold and italics*** are those whose magnitude, direction, and significance of association changed.