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Income poverty among children with a disability in Belgium: the interplay between parental employment, social background and targeted cash support

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Abstract

Previous research has shown a clear link between childhood disability and child poverty. This is related to the fact that their parents (1) need to provide more care which impedes their employment participation, and (2) more often belong to disadvantaged social categories. However, the adverse relationship between childhood disability and child poverty can be cushioned by cash support systems. Hitherto, the literature lacks insight into how the receipt of different cash support systems is related to parental employment and social background, and what joint role these three factors play in understanding the poverty risk of these children. To fill this gap, a case study on Belgium is performed using unique and large-scale register data. The results show that disabled children have a lower income poverty risk than non-disabled children, even when parental employment and social background are taken into account. This can be explained by the targeted cash support disabled children receive. However, a substantial group of disabled children does not receive the benefit. Hence, more could be achieved if the non-take-up would be addressed, in particular among the most vulnerable children.

Keywords

Child poverty - childhood disability - parental employment - social background - targeted cash support

Introduction

Nowadays, policy strategies to reduce child poverty are often inspired by the social investment paradigm (Hemerijck, 2017) and primarily focus on employment integration of the parents while simultaneous investments are made in the future potential of children to stop the vicious circle. Previous research has shown a clear link between childhood disability and child poverty, but for parents of disabled children, such a work strategy appears to be problematic (Cantillon and Van Lancker, 2013). This is related to the fact that disabled children generally require

additional care that exceeds usual parental care and the time needed for this hampers parental employment, especially for mothers (Brown and Clark, 2017; Stabile and Allin, 2012). Moreover, their families face an extra burden on the household budget as the child's disability commonly also entails higher out-of-pocket costs to cover the child's medical and care needs. Besides, disabled children more often live in households with a disadvantaged social background which independently increases their poverty risk: their households are frequently comprised of single parents, parents holding lower educational qualification, and other disabled household members (e.g. Bauman et al., 2006; Blackburn et al., 2010; Van Landeghem et al., 2007). However, the social policy literature lacks a clear insight into how the receipt of different cash support systems for disabled children is related to their parents' employment participation and social background, and what joint role these three factors play in understanding their poverty risk.

To fill this gap, a case study on Belgium is performed making use of unique and large-scale register data. Therefore, administrative recognitions on the child's disability are linked to information on their family's income, employment and social background. A control group of non-disabled children is also included in the dataset. The central questions studied in this article are whether disabled children face an increased poverty risk in Belgium, and what role parental employment, social background and targeted cash support jointly play in this story. A three-step analytical strategy is applied to tackle these questions. The causal chain of events is disregarded from the analyses.

Previous research, mechanisms and contributions to the literature

Previous research has found a positive correlation between childhood disability and different indicators of child poverty and deprivation (Banks et al., 2017; Di Giulio et al., 2014; Elwan, 1999). This association has been reported in Australia (Leonard et al., 2005), Belgium (Debacker, 2007), Canada (Petrenchik, 2008), China (Guo et al., 2019), France (Delobel-Ayoub et al., 2015), the United Kingdom (Blackburn et al., 2010; Emerson, 2012; Emerson et al, 2010; McKay and Atkinson, 2007), the United States (Bauman et al., 2006; Houtrow et al., 2014; Porterfield and Tracey, 2003; Pulcini et al., 2017), and Vietnam (Mont and Cuong, 2011). However, it is not universally true for all disability types. For children with autism spectrum disorder (ASD), a weaker (Emerson, 2012 for UK), non-existent (Pulcini et al., 2017 for US) or even reversed (Durkin et al., 2017 for US) relationship is found. The latter might be attributed to a diagnosis bias: as already shown by Wing in 1980, parents with an advantaged social

background more often obtain the correct diagnosis for their child with ASD, though this is more recently not necessarily confirmed in countries with universal health care (Rai et al., 2012 for Sweden).

Different mechanisms might explain this adverse relationship, where the causality may run in both directions (Boat and Wu, 2015; Elwan, 1999; Lustig and Strauser, 2007; Mont, 2014; Porterfield and Tracey, 2003). The "health selection" explanation states that childhood disability can cause child poverty since the disability entails higher costs, posing a burden on the household budget (Brown and Clark, 2017; Stabile and Allin, 2012). Families with disabled children are confronted with higher *direct* costs to pay for the child's medical and care needs. Moreover, they face *indirect* costs in terms of forgone labour earnings as caring for disabled children requires more time than for non-disabled children, impeding parental employment, especially of mothers. For Belgium too, the presence of both direct and indirect costs has been reported for disabled children (Van Landeghem et al., 2007; Vinck and Brekke, 2020; Vinck and Van Lancker, 2020). If one would account for the additional direct costs, the already greater poverty risk of disabled children in Flanders would increase substantially (Debacker, 2007). Moreover, it has been shown that child poverty is strongly determined by the level of employment participation of the household children are living in (Gornick and Jäntti, 2012) and that Belgium occupies an exceptional position in this respect (Vandenbroucke and Vinck, 2013). Almost consistently over the last decade, Belgium has the second highest relative share of children living in households where nobody works among the income-poor children in a European comparative perspective, only Ireland performs worse (EUROSTAT, 2020a, 2020b, 2020c). Yet, it is still unclear what role the indirect costs precisely plays in the Belgian poverty estimates among disabled children. That is our first contribution to the literature.

In contrast, the "social causation" explanation implies that poverty during childhood or prior to childbirth may cause disability due to the detrimental health effects that may result from limited access to (preventive) health care, poorer health behaviour, growing up in bad or dangerous living environments, or parenting behaviour that is considered to be less assisting, encouraging or consistent (Bolte et al., 2010; Kiernan and Huerta, 2008; Maggi et al., 2010; Power et al., 2000; Wilkinson and Marmot, 2003). For example, Delobel-Ayoub et al. (2015) show that more deprived areas in south-western France have a higher prevalence of children with ASD or intellectual disabilities than less deprived areas. Blackburn et al. (2013) report for the UK that children who grew up in socioeconomic deprived households in their early years are more likely to have disabling chronic conditions later in childhood than their counterparts from more

privileged households. In fact, the poverty risk of disabled children is strongly tied to processes of social stratification (Rothwell et al., 2019; Shahtahmasebi et al., 2011). Disabled children more often live with parents holding lower educational qualification, single parents, and other disabled household members (e.g. Bauman et al., 2006; Blackburn et al., 2010). This is no different in Belgium (Van Landeghem et al., 2007; Vinck and Van Lancker, 2020). These three factors increase the family's poverty risk *independently* of having a disabled child (Gornick and Jäntti, 2012; Grammenos, 2018; Nieuwenhuis and Maldonado, 2018; Vinck et al., 2017), but, whether and if so, to what extent, they explain the poverty risk of disabled children in Belgium still has to be investigated. That is our second contribution to the literature.

Even though it is challenging to disentangle cause from effect in an empirical way, a mutually reinforcing relationship between childhood disability and child poverty might occur, yielding long-lasting negative consequences for the child's development and opportunities throughout life (Elwan, 1999; McKinley Yoder and Cantrell, 2019; Mont, 2014; Parish and Cloud, 2006). This adverse relationship can be cushioned by welfare programmes that increase the household's income (Boat and Wu, 2015; Luca and Sevak, 2019; Romig, 2017; Stegman Bailey and Hemmeter, 2014), though they have to be evaluated in relation to the costs incurred by the child's disability (Byrne, 2014; Monteith et al., 2009). For Belgium, Van Landeghem et al. (2007) report that the difference in the equivalised *disposable* household income between families with disabled and non-disabled children is smaller than when the difference is investigated on the basis of the household's income from *employment* only, suggesting that the social security system partially eliminates the inequalities. However, the authors do not provide evidence to pinpoint which component of the social security system succeeds in protecting the income of families with a disabled child. Moreover, to get insight into the poverty reducing impact of cash support systems among disabled children, it is crucial to take into account who actually receives the cash support, in particular how the receipt is related to parental employment and social background. To our knowledge, this remains to be unravelled. That is our third contribution to the literature.

Targeted cash support for families with (disabled) children in Belgium

Belgium is a federal state where responsibilities for social policies are (partly) decentralised. Until recently, cash support measures for families with (disabled) children were regulated at the federal level but since 2014, they have mainly been decentralised to the regional level. Here,

we describe the three main targeted cash support systems as they were in place in 2010 (the year of data collection).

The main cash support measure that is targeted at families with children, disabled and non-disabled alike, is the regular child benefit. It is characterised by "targeting within universalism", though the lion's share of the budget is universally allocated (Van Lancker and Van Mechelen, 2015). Children below 18 years and students aged 18 to 24 are eligible. The system is composed of a universal amount with age and rank supplements, and a number of income-tested supplements for vulnerable groups (i.e. social assistance recipients, long-term unemployed, long-term sick and singe parents).

For children with increased care needs, including disabled children, a supplement within the regular child benefit system exists: the supplemental child benefit. It is a non-means-tested cash benefit for children less than 21 years old whose disability is recognised by the Federal Public Service Social Security. Control doctors evaluate the severity of the disability and award a score on a 36-point scale using standardised criteria. The scale is made up of three pillars that intend to capture the consequences of the disability for the child's (1) physical and mental health (maximum 6 points), (2) self-reliance in daily life (maximum 12 points), and (3) family (maximum 18 points). Higher scores correspond to a higher benefit amount, ranging from € 80 to more than € 500 per month. For more information on the recognition procedure, see Vinck et al. (2019).

Within the personal income tax system, a refundable tax credit for dependent children exists. For each dependent child in the household, the tax allowance (amount that is exempt from personal income taxes) of one parent is increased. If the parent's taxable income is lower than the sum of the tax allowances and tax credits (more information in Appendix 1), the unused part of the increased tax allowance becomes refundable, limited to € 390 per dependent child per year. Children who receive the supplemental child benefit and who have at least four points on the first pillar are counted as dependent twice.

Data, variables and methods

A unique and large scale administrative dataset is used to answer two central questions: do disabled children face an increased poverty risk in Belgium, and what role do parental employment, social background and targeted cash support jointly play in this story? The dataset links microdata from the Datawarehouse Labour Market and Social Protection (DWH LM&SP)

from December 31st, 2010 to the Belgian Census of January 1st, 2011. The DWH LM&SP brings together administrative data from Belgian social security agencies and the National Register on individuals' personal and household characteristics, including their place of residence, income received from different sources, employment participation, date and place of birth, disability status, and household composition. Information on the educational level is taken from the Census. Disabled children are operationalised as children receiving the supplemental child benefit (2.1% of Belgian children below 18 years in 2010). A random sample of 50% of children under 21 who lived in Belgium and received the supplemental child benefit on December 31st, 2010 and a randomly drawn control group of children under 21 who did not receive the supplemental child benefit of similar size are acquired.

Child poverty is defined in accordance with the European headline at-risk-of-poverty indicator, as the share of children below 18 years living in a household with an equivalised net disposable household income below a poverty line set at 60% of the national median equivalised net disposable household income. We draw on the Belgian sample of the EU Statistics on Income and Living Conditions for income year 2010 (BE-SILC 2011) to set the 60% poverty threshold. The OECD-modified equivalence scale is used to make incomes comparable across households of different sizes (Hagenaars et al., 1994). Yet, this equivalisation does not correct for other variations in needs, such as the additional costs incurred by families when they are confronted with increased medical and care needs. Unfortunately, neither previous research nor the data at hand allow to take the increased out-of-pocket costs of childhood disability into account, but their potential presence should be kept in mind when interpreting the results. Both a poverty headcount ratio (hereafter income poverty risk) and poverty gap ratio are applied.

A three-phase analytical strategy is performed to investigate the link between child income poverty and childhood disability. First, the household's equivalised net disposable household income and accompanying income poverty risk are estimated for disabled and non-disabled children. Therefore, the gross taxable income information available in the DWH LM&SP is used. This is the income after social security contributions are paid but before taxes are withdrawn, if applicable. Information is available for the income received from employment, self-employment, pensions, unemployment benefits, sickness and invalidity benefits, disability benefits, social assistance and child benefits (the latter are simulated). To go from an individual's gross taxable income to its household's equivalised net disposable income, the withholding tax schedule is employed. These are advance payments to the final personal income

taxation, taking only its essential aspects into consideration. For detailed information on the simulation process, see Appendix 1.

Second, a multivariate logistic regression is used to examine whether the correlations between child poverty on the one hand, and parental employment and social background on the other hand, differ for disabled and non-disabled children, controlling for the region of residence (Flanders/Brussels/Wallonia). To serve that purpose, interaction effects between the child's disability status (0/1, one referring to children who receive the supplemental child benefit) and each of the family characteristics (in terms of parental employment and social background) are included in the model. Parental employment is measured jointly by an indicator labelled "household work intensity". This is the ratio between the total number of months worked (expressed in full-time equivalents) by all working-age household members (18-59 year olds, excluding students 18-24) and the total number of months that they could, in theory, have worked. The ratio goes from zero to one, with zero meaning that none of the working-age household members participated in paid employment, while one indicates that all working-age household members worked full-time for the full year[1]. The indicator is categorised into very low (0-0.2), low (0.2-0.45), medium (0.45-0.55), high (0.55-0.85) and very high (0.85-1) work intensity.

Regarding the family's social background, the role of household composition, parental education, parental migration background and the presence of other household members with a recognised disability is investigated. For the household composition, the household type (single parents versus two parents) as well as the number of children below 18 years present in the household (less than three versus three or more) are included. The International Standard Classification of Education (ISCED) is used to operationalise the parents' educational level, differentiating between parents with low (ISCED 0-2: lower secondary education or less), medium (ISCED 3-4: secondary education) and high educational qualifications (ISCED 5-6: tertiary education). The highest education level of one of the parents is taken as the household value. For the migration background, a distinction is made between parents born in Belgium, other European Union countries (EU27) and non-EU27 countries. When one parent is born in Belgium or in another EU27 country, the household is considered to have a Belgian or EU27 migration background respectively. The household is assigned a non-EU27 migration background if the parents are born in a non-EU27 country. Finally, consistent with the operationalisation of childhood disability, the disability of other household members is identified by the receipt of a disability-specific benefit. A dummy variable indicates whether at

least one other household member receives the supplemental child benefit (for individuals aged less than 21) or a disability benefit for individuals aged over 21. An administrative recognition is needed for the latter too, but, contrary to the supplemental child benefit, the receipt of the benefit is also conditioned on a means test.

The poverty reducing impact of the cash support systems for disabled and non-disabled children is tested in a final step. Therefore, the first and second analytical step are repeated for three alternative scenarios when the main cash support systems are, simultaneously and separately, excluded from the net disposable income. Three components of income protection for families with disabled and non-disabled children are considered: the regular child benefit (CB), the supplemental child benefit (SCB) and the refundable tax credit (TC). The first scenario subtracts all this cash support from the household's income (– CB – SCB – TC), the second includes only the regular child benefit (+ CB – SCB – TC), and the third additionally adds the supplemental child benefit (+ CB + SCB – TC). For all scenarios, it is examined whether the cash support systems alter the income poverty rate and gap as well as the associations that exist between child poverty, childhood disability and the family characteristic (in terms of parental employment and social background) compared to the baseline when all three cash support systems are included (+ CB + SCB + TC).

The analyses focus on children below 18 years in accordance with the child poverty definition. Children whose parents have zero income on any of the income components (excluding child benefits) are disregarded from the analyses as it cannot be assessed with certainty that they truly have no income. They could have no known labour income within the Belgian personal income taxation since they work as outbound workers, are employed at a European or other international organisation, or receive a non-taxable scholarship. Or, they could solely be living off other income sources than the ones related to (current and past) employment (e.g. income from moveable or immovable property). This reduces the sample with 19%[2], resulting in 18,486 disabled and 16,961 non-disabled children. A population weight is applied to both samples. The total samples are used to estimate the overall income poverty rate and gap in the first and third analytical step as well as for the descriptive analyses included in Appendix 2. The logistic regression model in the second and third analytical step omits children who have missing information on any of the variables included (resulting in 17,677 disabled and 16,206 non-disabled children). Sensitivity checks with the 50% and 70% poverty thresholds (Appendix 3) and without applying the population weight (Appendix 4) generally yield the same conclusions.

Results

Income poverty estimates and determinants among disabled and non-disabled children

Table 1 shows that 22.1% of children below 18 years in Belgium live at risk of income poverty with an average depth of poverty of 18.8%[3]. Disabled children face a smaller income poverty risk (15.6%) and gap (14.3%) compared to non-disabled children (22.2% and 18.8% respectively).

Table 1. 60% income poverty estimates, children below 18 years, disabled versus non-disabled, Belgium, 2010

Children <18	Total	Disabled	Non-disabled
60% poverty headcount ratio	22.1%	15.6%	22.2%
Average 60% poverty gap ratio among the poor	18.8%	14.3%	18.8%

Source: own calculations based on DWH LM&SP (2010).
Notes: For poverty headcount ratio, n = 39870. For poverty gap ratio among the poor, n = 7648. Results are population weighted.

Even when their family's employment participation and social background are controlled for, disabled children have a lower income poverty risk compared to non-disabled children (odds ratio smaller than one in Table 2). Moreover, in line with the social policy literature on child poverty, Table 2 shows that the positive correlations that exist between the child's income poverty risk on the one hand, and lower parental employment and a disadvantaged social background on the other, are found for both disabled and non-disabled children (odds ratios of the main effects are larger than one). Children who live in households with lower work intensity (versus very high work intensity), headed by a single parent (versus two parents), with three or more children (versus less than three), with low- or medium-skilled parents (versus high-skilled), and parents who are born outside Belgium (versus within Belgium), experience a higher income poverty risk than their respective reference groups. Only for the presence of other disabled household members the reverse is true (odds ratio smaller than one). Yet, for some of these associations, the strength differs between disabled and non-disabled children. Weaker associations are reported for disabled children with respect to the household's work intensity, the household type and the parental non-EU27 migration background (compared to born in Belgium). This is apparent from the multiplication of the main effects of the family's characteristics and their interaction effects with childhood disability. If this multiplication brings the association closer to the value of one, the correlation is weaker for disabled than for

non-disabled children. For example, the increased income poverty risk of children living with a single parent (compared to two parents) is larger for non-disabled children (among them, the odds are 5.334 times higher) than for disabled children (among them, the odds are 2.119 times as large (5.334 multiplied by 0.397)). For the number of children in the household, the parental educational level, the presence of other disabled household members and the parental EU27 migration background (compared to being born in Belgium), no significant differences between disabled and non-disabled children are found. Figure 1 visualises these results. It presents the relationship between the predicted income poverty risk and each of the family's characteristics as marginal effects, for disabled and non-disabled children separately, keeping all other variables in the logistic regression model at their mean value.

**Table 2. Logistic regression on 60% income poverty risk, children below 18 years, Belgium, 2010**

Children <18	Odds ratio	Robust standard error	Significance level
Constant	0.018	0.001	***
Disabled child (DC)	0.763	0.081	**
Household work intensity			
(very high ref.)			
Very low	20.453	1.847	***
Low	25.760	2.741	***
Medium	8.514	0.692	***
High	2.532	0.179	***
Household type (two parents ref.)			
Single parent	5.334	0.332	***
Number of children (<18) in household			
(less than three ref.)			
Three or more	1.278	0.074	***
Parental education (highest level)			
(high-skilled ref.)			
Low-skilled	2.669	0.212	***
Medium-skilled	2.738	0.170	***
Country of birth parents (Belgium ref.)			
EU27	1.590	0.234	**
Non-EU27	2.572	0.238	***
Other disabled household members (none ref.)			
At least one	0.357	0.059	***
Interaction x DC			
Household work intensity			
(very high ref.)			
Very low x DC	0.478	0.062	***
Low x DC	0.514	0.075	***
Medium x DC	0.489	0.061	***
High x DC	0.728	0.086	**
Household type (two parents ref.)			
Single parent x DC	0.397	0.035	***
Number of children (<18) in household			
(less than three ref.)			
Three or more x DC	1.130	0.088	n.s.
Parental education (highest level)			

Children <18	Odds ratio	Robust standard error	Significance level
(high-skilled ref.)			
Low-skilled x DC	0.898	0.103	n.s.
Medium-skilled x DC	0.864	0.084	n.s.
Country of birth parents (Belgium ref.)			
EU27 x DC	0.887	0.179	n.s.
Non-EU27 x DC	0.609	0.071	***
Other disabled household members (none ref.)			
At least one x DC	1.191	0.213	n.s.
Region of residence (Flanders ref.)			
Brussels	1.525	0.138	***
Wallonia	1.414	0.079	***
Model fit			
Log pseudolikelihood			-499943.92
Pseudo R²			0.4124
Prob > chi²			0.0000
N			33883

Source: own calculations based on DWH LM&SP (2010) and Census (2011).

Notes: not living at-risk-of poverty is the baseline. *p<0.05, **p<0.01, ***p<0.001, n.s. not significant. Results are population weighted.

Figure 1. Marginal effects of family characteristics on predicted 60% income poverty risk, children below 18 years, disabled versus non-disabled, Belgium, 2010
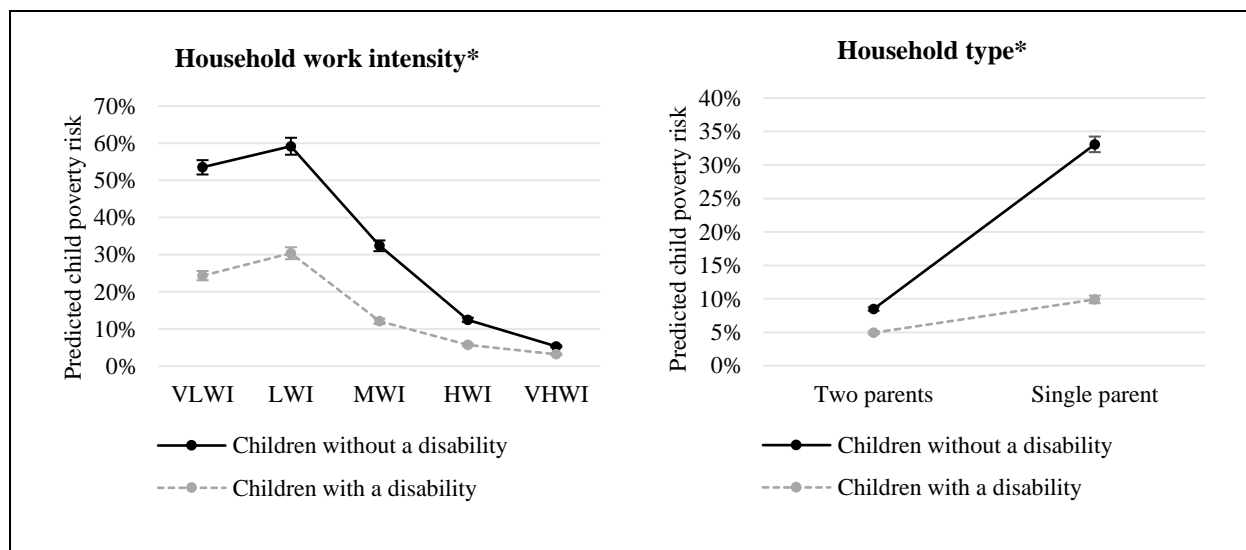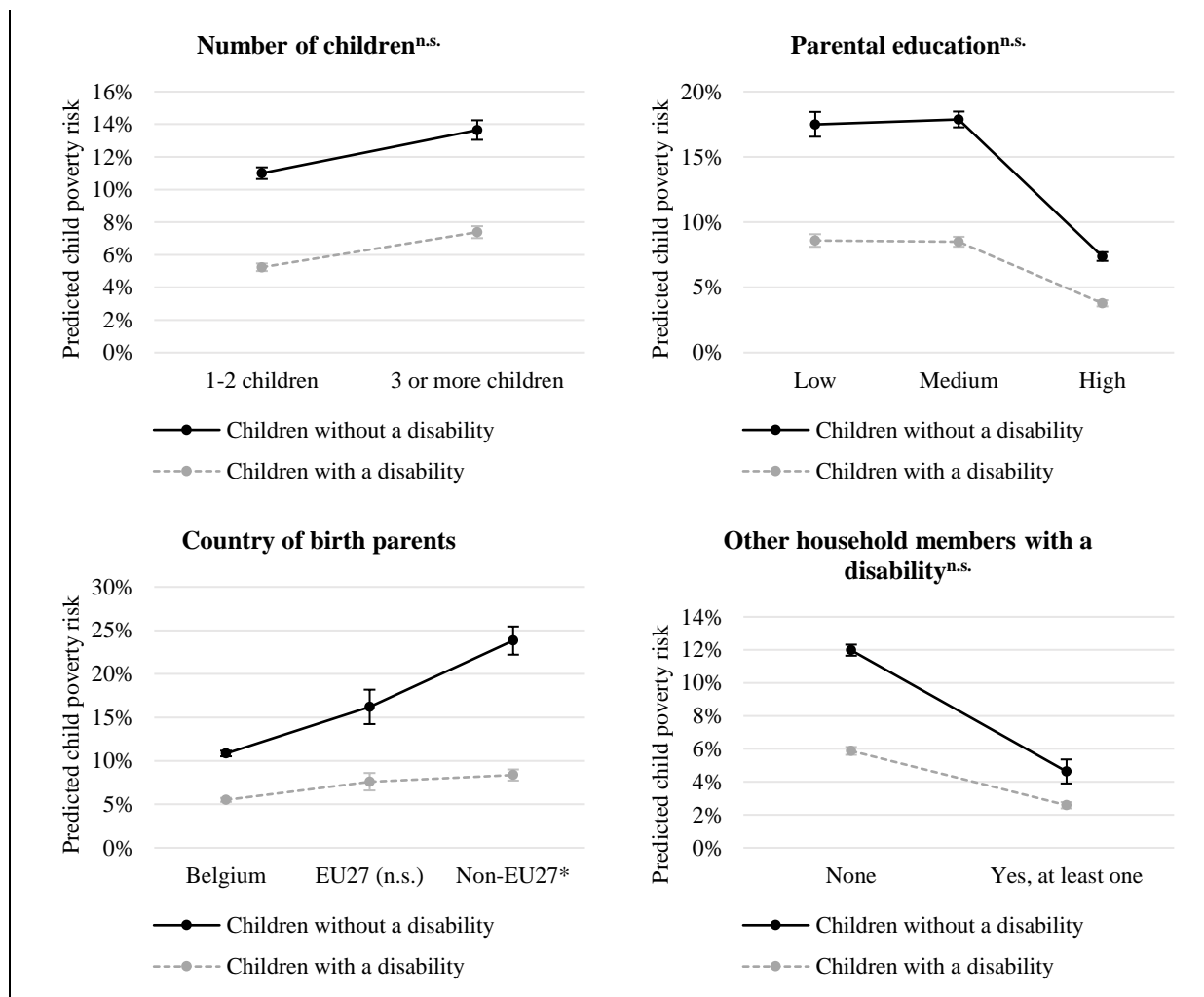
Source: own calculations based on DWH LM&SP (2010) and Census (2011).
Notes: marginal effects are shown for each interaction effect of Table 2, at mean values for the remaining variables. 95% confidence intervals show that, in each situation, disabled children have a lower predicted probability to live in income poverty than non-disabled children. Household work intensity is categorised into very low (0-0.2, VLWI), low (0.2-0.45, LWI), medium (0.45-0.55, MWI), high (0.55-0.85, HWI) and very high (0.85-1, VHWI) subgroups. n.s. the slopes of the lines (w.r.t. the reference) do not differ significantly between disabled children and non-disabled children, * the slopes differ significantly. Results are population weighted.

Poverty reducing impact of cash support systems

Given that parents of disabled children work less, earn less, and have a disadvantaged social background in Belgium (Vinck and Brekke, 2020; Vinck and Van Lancker, 2020), the *lower* income poverty risk of these children compared to non-disabled children is a counterintuitive result. One possible explanation is that the Belgian cash support systems succeed in mitigating the concurrence of childhood disability and child poverty proven in previous case studies in different countries. In this section, we unravel which cash support system(s) provide(s) adequate income protection to families with disabled children, taking into account who actually receives the support. The first order effect is calculated, meaning that no account is taken of

how parents might adjust their labour market participation to compensate for the loss of income in the absence of cash support.

When the income poverty rate and gap are estimated without including the three main cash support systems, the picture changes (Table 3). In the scenario where the regular child benefit, supplemental child benefit and refundable tax credit are simultaneously excluded from the household's income, the overall income poverty risk among children would increase with 60% (from 22.1% in the baseline to 35.3% in scenario 1), but the increase would be stronger among disabled than among non-disabled children (+199% versus +58%). In fact, disabled children would run a higher income poverty risk than non-disabled children (46.7% versus 35.0%). Each cash supplement has a considerable poverty reducing impact for the children who receive them. The regular child benefit is important for disabled and non-disabled children alike: it decreases their poverty rate with 15.2 and 12.1 percentage points (pp) respectively (comparing scenario 1 and 2). However, if that would be the only cash supplement granted, disabled children would still run a higher poverty risk (31.6% versus 23.0%). Only once the supplemental child benefit is taken into account, the poverty risk of disabled children drops below that of non-disabled children (18.7% versus 23.0%). Including the refundable tax credit reduces the poverty risk further (comparing scenario 3 to the baseline), more for disabled than for non-disabled children (-3.1pp versus -0.7pp). The same lessons can be learned from the average poverty gap.

Table 3. 60% income poverty estimates, with and without cash support, children below 18 years, disabled versus non-disabled, Belgium, 2010

Children <18	Total	Disabled	Non-disabled
60% poverty headcount ratio			
– CB – SCB – TC (scenario 1)	35.3%	46.7%	35.0%
+ CB – SCB – TC (scenario 2)	23.1%	31.6%	23.0%
+ CB + SCB – TC (scenario 3)	22.9%	18.7%	23.0%
+ CB + SCB + TC (baseline)	22.1%	15.6%	22.2%
Average 60% poverty gap ratio among the poor			
– CB – SCB – TC (scenario 1)	29.7%	31.5%	29.7%
+ CB – SCB – TC (scenario 2)	20.5%	19.0%	20.6%
+ CB + SCB – TC (scenario 3)	20.5%	15.3%	20.6%
+ CB + SCB + TC (baseline)	18.8%	14.3%	18.8%

Source: own calculations based on DWH LM&SP (2010).
Notes: constant poverty threshold over all scenarios. Average poverty gap among children who are at-risk-of-poverty in each scenario separately. Baseline scenarios are the estimates presented in Table 1. For poverty headcount ratio, n = 38970 in all scenarios. For poverty gap ratio among the poor, n = 16328 (scenario 1), 10967 (scenario 2), 8380 (scenario 3) and 7648 (baseline). Results are population weighted.

Once parental employment and social background are controlled for (Table 4), the income poverty risk would no longer differ significantly between disabled and non-disabled children

when the three main cash support systems are excluded from their household's income (scenario 1) or when only the regular child benefit is included (scenario 2). In other words, their parents' lower employment and disadvantaged social background explain why disabled children would have a higher income poverty risk than non-disabled children in the first and second scenario in Table 3. Moreover, none of the associations between the family's characteristics and the income poverty risk vary in a significant way between disabled and non-disabled children (the interaction effects of scenario 1 and 2 in Table 4).

Table 4. Logistic regression on 60% income poverty risk, with and without cash support, children below 18 years, odds ratios, Belgium, 2010

Children <18	Scenario 1 – CB – SCB – TC	Scenario 2 + CB – SCB – TC	Scenario 3 + CB + SCB – TC	Baseline + CB + SCB + TC
Constant	0.030***	0.018***	0.018***	0.018***
	(0.002)	(0.001)	(0.001)	(0.001)
Disabled child (DC)	0.931[n.s.]	0.987[n.s.]	0.749**	0.763**
	(0.074)	(0.095)	(0.079)	(0.081)
Household work intensity (very high ref.)				
Very low	13.949***	23.831***	23.867***	20.453***
	(1.445)	(2.209)	(2.213)	(1.847)
Low	25.087***	29.435***	29.462***	25.760***
	(3.140)	(3.185)	(3.188)	(2.741)
Medium	9.729***	8.679***	8.689***	8.514***
	(0.740)	(0.709)	(0.710)	(0.692)
High	3.010***	2.621***	2.621***	2.532***
	(0.165)	(0.184)	(0.184)	(0.179)
Household type (two parents ref.)				
Single parent	8.478***	5.783***	5.784***	5.334***
	(0.527)	(0.363)	(0.363)	(0.332)
Number of children (<18) in household (less than three ref.)				
Three or more	3.498***	1.436***	1.436***	1.278***
	(0.176)	(0.082)	(0.082)	(0.074)
Parental education (highest level) (high-skilled ref.)				
Low-skilled	3.755***	2.662***	2.661***	2.669***
	(0.276)	(0.212)	(0.212)	(0.212)
Medium-skilled	3.450***	2.729***	2.728***	2.738***
	(0.177)	(0.169)	(0.169)	(0.170)
Country of birth parents (Belgium ref.)				
EU27	1.472**	1.663***	1.665***	1.590**
	(0.219)	(0.245)	(0.245)	(0.234)
Non-EU27	3.593***	2.701***	2.703***	2.572***
	(0.358)	(0.252)	(0.252)	(0.238)
Other disabled household members (none ref.)				
At least one	0.503***	0.386***	0.387***	0.357***
	(0.079)	(0.064)	(0.064)	(0.059)
Interaction x DC **Household work intensity (very high ref.)**				

| Children <18	Scenario 1 – CB – SCB – TC	Scenario 2 + CB – SCB – TC	Scenario 3 + CB + SCB – TC	Baseline + CB + SCB + TC
Very low x DC	1.099[n.s.]	0.906[n.s.]	0.480***	0.478***
	(0.142)	(0.107)	(0.061)	(0.062)
Low x DC	0.839[n.s.]	0.824[n.s.]	0.505***	0.514***
	(0.137)	(0.117)	(0.073)	(0.075)
Medium x DC	0.794**	0.698***	0.478***	0.489***
	(0.079)	(0.076)	(0.058)	(0.061)
High x DC	0.942[n.s.]	0.928[n.s.]	0.759**	0.728**
	(0.072)	(0.091)	(0.086)	(0.086)
Household type (two parents ref.)				
Single parent x DC	1.081[n.s.]	0.978[n.s.]	0.431***	0.397***
	(0.091)	(0.080)	(0.037)	(0.035)
Number of children (<18) in household (less than three ref.)				
Three or more x DC	1.079[n.s.]	1.126[n.s.]	1.266**	1.130[n.s.]
	(0.074)	(0.084)	(0.097)	(0.088)
Parental education (highest level) (high-skilled ref.)				
Low-skilled x DC	1.103[n.s.]	1.117[n.s.]	1.012[n.s.]	0.898[n.s.]
	(0.107)	(0.117)	(0.113)	(0.103)
Medium-skilled x DC	1.028[n.s.]	0.994[n.s.]	0.922[n.s.]	0.864[n.s.]
	(0.074)	(0.084)	(0.113)	(0.084)
Country of birth parents (Belgium ref.)				
EU27 x DC	1.398[n.s.]	1.061[n.s.]	0.880[n.s.]	0.887[n.s.]
	(0.309)	(0.231)	(0.178)	(0.179)
Non-EU27 x DC	0.774[n.s.]	0.837[n.s.]	0.600***	0.609***
	(0.106)	(0.101)	(0.071)	(0.071)
Other disabled household members (none ref.)				
At least one x DC	1.823***	1.527**	1.161[n.s.]	1.191[n.s.]
	(0.309)	(0.273)	(0.207)	(0.213)
Region of residence (Flanders ref.)				
Brussels	1.514***	1.551***	1.533***	1.525***
	(0.126)	(0.141)	(0.139)	(0.138)
Wallonia	1.486***	1.414***	1.403***	1.414***
	(0.072)	(0.079)	(0.079)	(0.079)
Model fit				
Log pseudolikelihood	-618515.13	-496206.19	-495645.20	-499943.92
Pseudo R²	0.4193	0.4319	0.4288	0.4124
Prob > chi²	0.0000	0.0000	0.0000	0.0000
N	33883	33883	33883	33883

Source: own calculations based on DWH LM&SP (2010) and Census (2011).
Notes: not living at-risk-of poverty is the baseline. *p<0.05, **p<0.01, ***p<0.001, n.s. not significant. Baseline scenario presents the same results as Table 2. Robust standard errors in parentheses. Results are population weighted.

The story changes once the remaining cash support systems are taken into account (scenario 3 and baseline). Table 4 confirms their strong poverty reducing impact for disabled children. After adding the supplemental child benefit, the income poverty risk among disabled children is significantly lower than among non-disabled children (scenario 3), which is slightly further reduced once the refundable tax credit is included too (baseline). This can be explained by the profile of those who receive the supplemental child benefit: they are more likely to live in

poverty due to their lower parental employment and disadvantaged social background (Vinck and Van Lancker, 2020). Here it is evident from the interaction effects. Once the supplemental child benefit and the refundable tax credit are integrated into the household's income the associations between the child's income poverty risk and its family characteristics are mitigated. The correlations with parental employment, household type and parental non-EU27 migration background are now significantly less strong for disabled children.

Figure 2. Marginal effect of child's disability status on predicted 60% income poverty risk (left axis) and mean equivalised cash support among the poor (right axis), with and without cash support, children below 18 years, Belgium, 2010
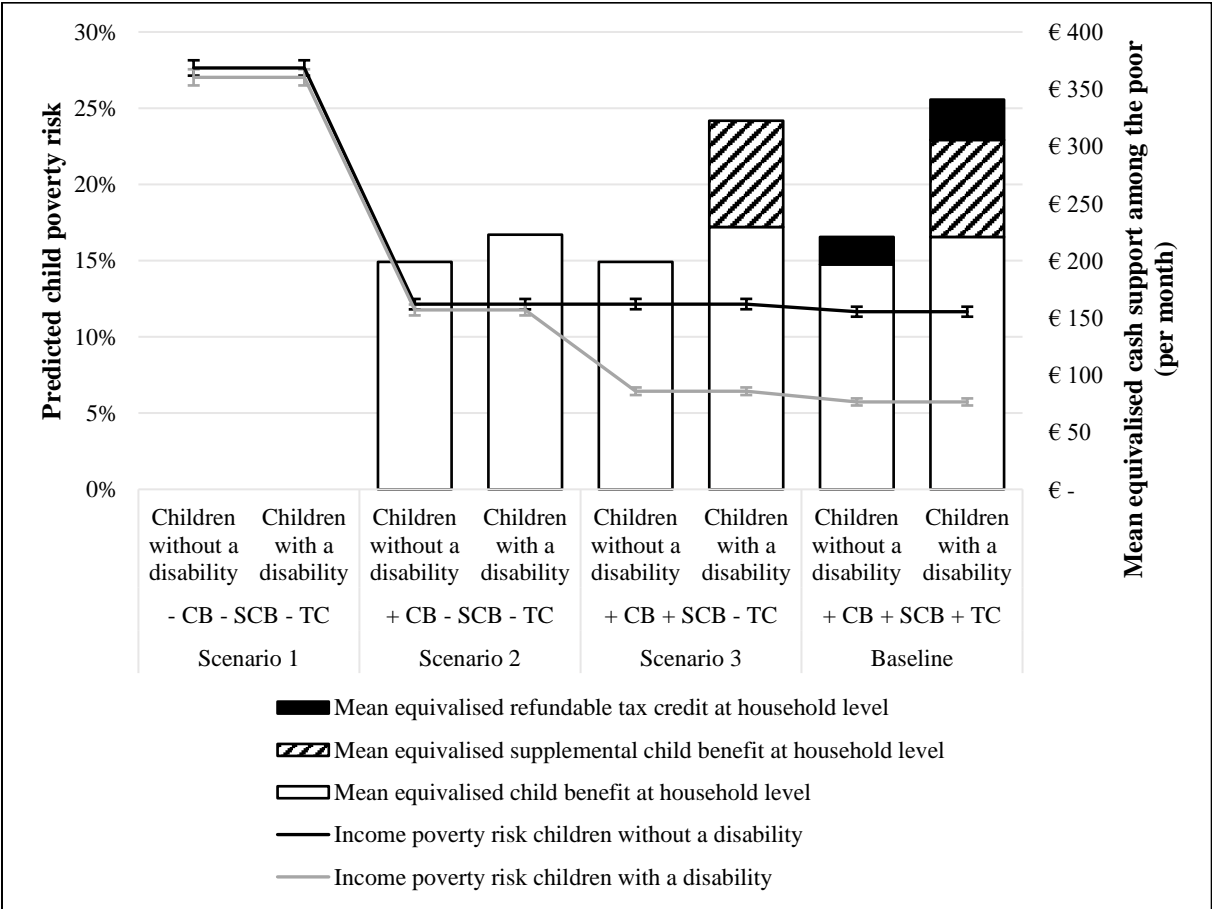
Source: own calculations based on DWH LM&SP (2010) and Census (2011).
Notes: Predicted child poverty risks are shown as marginal effects of child's disability status (left axis), at mean values for the remaining variables of Table 4. Mean equivalised cash support is shown for poor disabled and non-disabled children, by component (right axis). Population of poor children changes in each scenario. Results are population weighted.

Figure 2 visualises the poverty reducing impact of the cash support systems. For each scenario, it presents the relationship between the child's disability status and the predicted income poverty risk as marginal effects, keeping all other variables in the logistic regression at their mean value (black and grey lines, shown on the left axis). Moreover, it shows the weighted

average of the equivalised cash support that income-poor households with children receive in each scenario, differentiating between the cash support systems and between disabled and non-disabled children (bars, shown on the right axis). Three lessons can be learned. First, families with disabled children get, on average, higher regular child benefits than families with non-disabled children. This is because they more often (1) qualify for a social supplement, (2) have older children and therefore receive higher age-related supplements, and (3) have multiple children for which they get rank supplements (detailed analysis in Appendix 5). Second, also the tax credit they get refunded is higher as disabled children are counted as dependent twice. Third, the supplemental child benefit is indispensable in protecting the household's income for disabled children. In fact, it succeeds to halve their income poverty risk.

Discussion and conclusion

This article investigates whether childhood disability coincides with child poverty while the interplay between parental employment, social background and targeted cash support is taken into account. To do so, a case study on Belgium is conducted making use of unique and large-scale register data.

The analyses are limited in three ways. First, the employed income-based poverty indicator disregards the expenditures families have to make. It only takes the family's income into account. Also, by using the OECD-modified equivalence scale to make these incomes comparable across households, it is indirectly supposed that the same standard of living applies to families with the same equivalised income, regardless of whether they have a disabled child or not. Yet, it is likely that an equally high income cannot be converted into an equally high standard of living as families with disabled children face higher out-of-pocket costs to pay for the children's additional medical and care needs. Based on this, it can be expected that the poverty estimates provided in this article are lower-bound estimates of their real standard of living. To properly understand the standard of living among families with a disabled child, additional indicators are needed which take these increased costs incurred by the child's disability into account. Previous studies on disabled adults have attempted to do so and have (1) included the extra costs in poverty estimates and (2) assessed to what extent these costs are covered by (governmental) support (e.g. Loyalka et al., 2014; Mont and Cuong, 2011; Morris and Zaidi, 2020; Palmer et al., 2019; Saunders, 2007; Zaidi and Burchardt, 2005). For disabled children, comparable exercises remain so far unexplored territory.

The presented poverty risks are underestimated in another way too. The data allow to consider only children who receive the supplemental child benefit as disabled. However, this benefit is subject to non-take-up. Vinck et al. (2019) estimate that at least 10% of disabled children are not recognised for the supplemental child benefit and hence do not receive the extra money. Future research should look into the income situation, the corresponding poverty risk and the joint impact of parental employment, social background and receipt of other cash support among disabled children who are missed by the benefit. The available research for Flanders suggests that for this group the income poverty risk would be higher than for non-disabled children (Debacker, 2007), but how it correlates with potential confounding factors and what impact other cash support systems have on their income poverty risk still has to be investigated.

Third, given the cross-sectional nature of the data, it is not possible to discern the causal mechanisms between childhood disability and child poverty. The potential presence of reverse causation between childhood disability and child poverty (i.e. the social causation explanation) could actually overestimate the presented poverty risks, as part of the observed correlation can be explained by previous spells of poverty. Exploring the associations on longitudinal data or employing an instrumental variable approach would allow to get causal purchase on the issue.

Keeping these limitations in mind, the results suggest that disabled children have a lower income poverty risk than non-disabled children, even though their parents often work less and hold a disadvantaged social background. This can be explained by the targeted cash support these families receive. If they would only receive the regular child benefit, disabled children would run an equally high income poverty risk than non-disabled children once their family's employment participation and social background are controlled for. The supplemental child benefit has a strong poverty reducing impact for disabled children. It is indispensable in protecting the household's income, in fact, it succeeds to halve their income poverty risk. This can be explained by the profile of the children who receive the benefit: they initially run an increased poverty risk due to their parents' lower employment and disadvantaged social background (Vinck and Van Lancker, 2020). Hence, the associations between income poverty among children and some of the explanatory factors are significantly weaker for disabled than for non-disabled children. This is true for children who live in households with lower employment, headed by single parents, and where the parents are born outside the EU27 (versus at least one parent born in Belgium). For the number of children in the household, the parental educational level, the presence of other disabled household members and parents with an EU27

migration background (compared to born in Belgium), no significant differences between disabled and non-disabled children are found.

One important policy implication can be derived from this. The supplemental child benefit clearly succeeds in protecting the incomes of families with a disabled child, even when their lower levels of employment and disadvantaged social background are taken into account. In fact, it mitigates the relationship between the income poverty risk among children and the explanatory factors identified in the literature for the families who receive the benefit. However, a substantial group of disabled children does not receive the supplemental child benefit. Hence, more could be achieved if the non-take-up would be addressed, in particular among the most vulnerable children.

Notes

1. If the *actual* employment status differs from the *contractual* situation, the work intensity is recoded to zero (for 3.9% of disabled and 2.6% of non-disabled children below 18 years in the full sample).

2. The dropped children mainly live in Brussels, with two parents, low-skilled parents and/or parents born outside Belgium. Mothers have more often zero incomes than fathers. Among mothers (fathers) with zero income, 90% (80%) does not occur in any social security record (and has therefore no *known* income), the remaining 10% (20%) are almost all self-employed.

3. The corresponding statistics from BE-SILC 2011 yield a lower poverty headcount (18.7%) but a higher poverty gap (26.0%).

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Appendix 1 Equivalised net disposable household income simulation

1.1. Simulation strategy

An equivalised net disposable household income is simulated in six steps using the gross taxable income information available in the DWH LM&SP for income from current and past employment[1] and the non-taxable income received from disability benefits, social assistance and child benefits (the latter are simulated).

In a first step, the professional expenses are simulated and subtracted from gross taxable income to get the net taxable income (i.e. the income on which taxes are calculated). Belgium has two systems which can be used to deduct professional expenses: either the actual expenses are proven or a lump sum amount is deducted depending on the level of income. The assumption is made that all employees make use of the lump sum amount as official statistics show that only 3.7% of them reported actual expenses for income year 2010 (FPS Finance, 2012). The income bands and percentages applied on each band to compute the lump sum professional expenses for income year 2010 are presented in Table A1.1. For income from self-employment, the administrative data already contain a net taxable income concept, hence no professional expenses need to be simulated. People receiving replacement income can only make use of the actual professional expenses system, which is not simulated. Unfortunately, the data does not have sufficient information to simulate other tax deductions which reduce taxable income. Therefore, the tax advantage granted for inter alia paid maintenance allowances, mortgage repayments and used child care services cannot be taken into account.

Table A1.1. Professional expenses: lump sum calculation income year 2010

Minimum gross taxable income limit	Maximum gross taxable income limit (included)	% applied to income band	Cumulative maximum amount to be deducted
€ 0.00	€ 5190.00	28.7%	€ 1489.53
€ 5190.00	€ 10310.00	10.0%	€ 2001.53
€ 10310.00	€ 17170.00	5.0%	€ 2344.53
€ 17170.00	€ 58685.67	3.0%	€ 3590.00
€ 58685.67	max	0.0%	€ 3590.00

Source: FPS Finance (2011).

In a second step, fiscal households are constructed. These consist of the head, his or her partner, dependent children and other dependent persons living at the same address. The dependency of

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[1] Including income from wage employment, self-employment (available at the net taxable income level), pensions, unemployment benefits, sickness and invalidity benefits.

children and other persons depends on their personal income. The yearly income from any source excluding child benefits cannot be higher than € 2,830 in 2010. For children, the income limits to be regarded as dependent are higher when they live in a single parent household (€ 4,080) and when they have a recognised disability of at least 66% (€ 5,180). Only children eligible for the child benefit on December 31st, 2010 are taken into account. If other persons are living at the same address, who do not fulfil the conditions to be considered dependent, they are assumed to form a fiscal household on their own. The head is stepwise identified as the individual who has the highest income from any source (excluding child benefits), is the oldest, or is registered as the reference person in the administrative dataset. Both married and cohabiting individuals are considered as partners with no distinction being made between registered and unregistered cohabiting individuals.

Thirdly, the withholding taxes are simulated on the net taxable income components for each earning individual separately. These withholding taxes are advance payments to the final personal income taxation, taking only its essential aspects into consideration (FPS Finance, 2009b). The withholding tax schedule is applied to the sum of income from employment, self-employment and pensions (see Table A1.2 part A), which has in general narrower bands but higher percentages than the final personal income taxation (see part B for comparison). For fiscal households where a partner is present, it is beforehand checked whether the marital quotient applies. When the couple has only one earner, 30% of the income of the earning partner (from employment, self-employment and pensions) is treated as the income of the non-earning partner, limited to € 9,280. Within the withholding tax system, the non-earning partner may not have any source of taxable income. As the Belgian income taxation system is progressive in nature, the application of the marital quotient will tax the income assigned to the non-earning partner at the lowest marginal tax rate rather than at the higher rate of the band in which the income would fall when it was considered as a unity. For the withholding taxes of replacement incomes, a fixed percentage of unemployment benefits (10.09%), and of sickness and invalidity benefits (11.11%) is taken (FPS Finance, 2009a). For singles living entirely of unemployment benefits or couples in which only one partner receives unemployment benefits without any other source of income being present in the fiscal household, no withholding tax is due.

Table A1.2. Withholding tax schedule and final personal income tax schedule, income year 2010

Minimum net taxable income limit (yearly)	Maximum net taxable income limit (yearly, included)	% applied on income band
Part A: withholding tax schedule		
€ 0	€ 7900	26.75%
€ 7900	€ 10740	32.10%
€ 10740	€ 15560	42.80%
€ 15560	€ 34360	48.15%
€ 34360	max	53.50%
Part B: final personal income tax schedule		
€ 0	€ 7900	25.00%
€ 7900	€ 11240	30.00%
€ 11240	€ 18730	40.00%
€ 18730	€ 34330	45.00%
€ 34330	max	50.00%

Source: FPS Finance (2010, 2011).

The tax allowance and tax credits are simulated in a fourth step. The tax allowance equals € 1,463.23 of non-taxed income for each partner in 2010, irrespective of whether the partner has earned income. Tax credits are tax advantages given according to the composition of the fiscal households. Depending on the source and level of income of the tax payers, the region they are living in, and the number of dependent children, other dependent persons (distinguishing between individuals aged under or over 65 years old), parents, partners, and disabled individuals present in the fiscal household, a specific amount can be subtracted from the simulated withholding tax. All tax credits are non-refundable with two exceptions. If the simulated withholding tax is smaller than the total sum of tax allowance and tax credits, in the first instance, the not used part of the tax credit for dependent children becomes refundable, bounded to € 390 per dependent child per year[2]. Thereafter, the tax credit for the self-employed with low income (€ 4,510 up to € 19,580 net taxable per year), is repayable up to € 610 per year[3]. The sum of the tax allowance and tax credits is subsequently subtracted from the simulated withholding tax on income from employment, self-employment and pensions from step three. For unemployment benefits, sickness and invalidity benefits, no tax allowance and tax credits can be deducted within the withholding tax schedule.

Fifthly, the net disposable income at the individual level is simulated as the difference between net taxable income and the remaining withholding tax, augmented with the non-taxable income

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[2] Children with a recognised disability of at least 66% are counted as dependent twice.
[3] This tax credit ("belastingkrediet op lage activiteitsinkomsten") also applies to tenured civil servants. Unfortunately, the data does not have enough information to distinguish tenured versus non-tenured civil servants, hence this tax credit can only be simulated for the self-employed.

components one receives (i.e. disability benefits, social assistance and simulated child benefits). Summing it together for all members living at the same address, gives us the total net disposable income at the household level.

Finally, the total net disposable household income is equivalised using the OECD-modified equivalence scale (Hagenaars et al., 1994), assigning a weight of 1 to the first adult, 0.5 to all following adults aged 14 or older, and 0.3 to all children below the age of 14. Based on this, the poverty status is determined.

1.2. Income distribution of households with children, DWH LM&SP versus BE-SILC, 2010

Figure A1.1 compares the distribution of the equivalised net disposable household incomes for children minus 18 estimated using the DWH LM&SP to the one observed in BE-SILC 2011 (income year 2010). In general, the share of children at the bottom and at the top of the income distribution is higher according to BE-SILC than as simulated using the DWH LM&SP, while the reverse is true in the middle. In BE-SILC, 17.1% of children under 18 live in a household with an income up to 60% of the median equivalised net disposable income of households with children in the data, whereas this is only 7.5% according to the DWH LM&SP. 60.4% of children in BE-SILC and as much as 75.9% of children in the DWH LM&SP have a household income between 60% and 135% of their median, while the respective shares equal 22.5% and 16.6% for household income exceeding 135% of the median.

Part of the observed differences can be accounted for by the components included in the income concepts of both data sources. The DWH LM&SP contains information on income from current and past employment, supplemented with non-taxable income from disability benefits, social assistance and child benefits. For 19% of children under 18, however, at least one of their parents has no known income on any of these components (see also note 2 in the manuscript). The BE-SILC is not constrained to (in Belgium) taxable income and additionally takes rental income, movable income, income transfers between households, study allowances, housing allowances as well as second and third pillar pension income into account.

Figure A1.1. Income distribution of equivalised net disposable household income for children minus 18, relative to the median, DWH LM&SP versus BE-SILC, incomes 2010
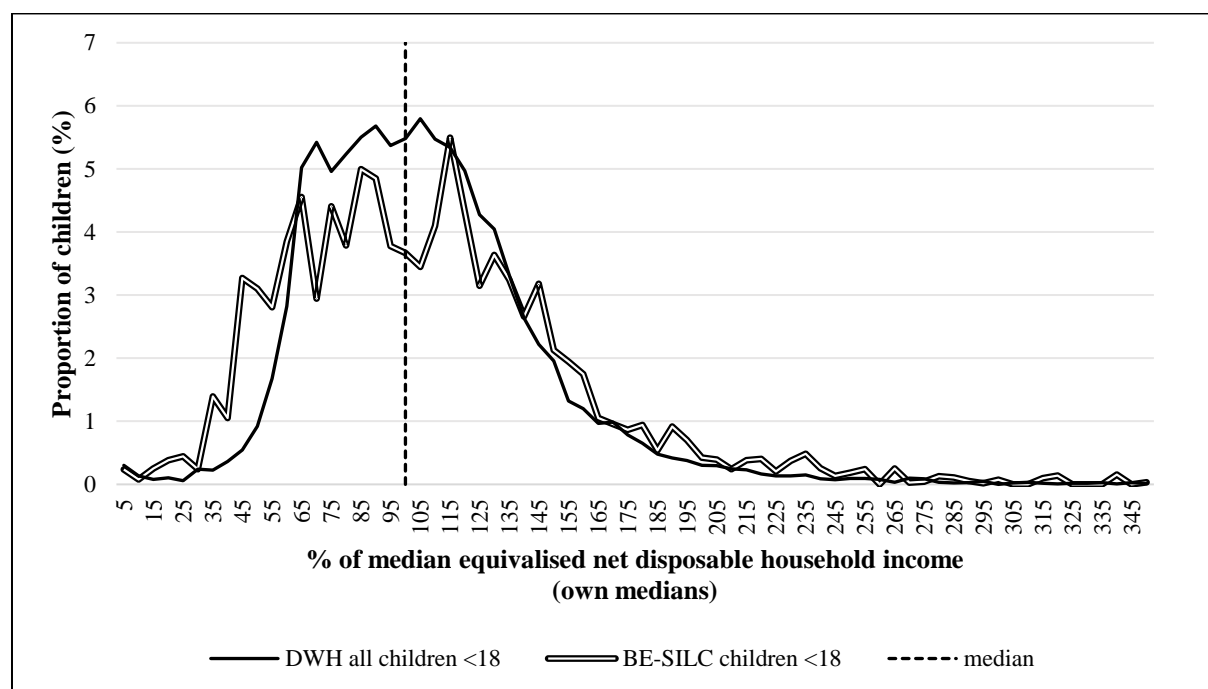
Source: own calculations based on DWH LM&SP (2010) and BE-SILC (2011).
Note: each distribution is compared with its own median equivalised net disposable household income for children minus 18 (DWH LM&SP median = € 16187.57, BE-SILC median = € 19296.15).

Table A1.3 shows the weight of the four taxable income categories (i.e. income from employment (current and past), immovable property, movable property and other sources) in terms of the share of tax returns that declares these income categories as well as the share of the total net taxable income they represent. The figures are for Belgium. Almost all tax returns contain income from employment and 9% of the tax returns (additionally) has income from immovable property. Only a marginal share includes income from movable property (2%) or other sources (1%). Additionally, Table A1.3 shows that the lion's share of net taxable income consists of employment income (98%). The shares of net taxable income from immovable property, movable property or other sources are very small.

Table A1.3. Shares of income categories in tax returns and in total net taxable income, incomes 2010, Belgium

	% of **tax returns**	% of **total net taxable income**
Total net taxable income from **employment**	99.44%	98.42%
Total net taxable income from **immovable property**	9.09%	1.13%
Total net taxable income from **movable property**	1.56%	0.30%
Total net taxable income from **other sources** (e.g. income transfers between households)	1.25%	0.15%

Source: Statistics Belgium (2010).

1.3. Children with a disability versus children without a disability

Figure A1.2 compares the estimated equivalised net disposable household income distributions of children with and without a disability to each other. It shows that children with a disability more often live in the middle of the income distribution whereas children without a disability have a higher share located at the bottom. The differences between the two groups are small at the top of the income distribution.

Figure A1.2. Income distribution of equivalised net disposable household income for children minus 18, with versus without a disability, relative to the median, Belgium, 2010
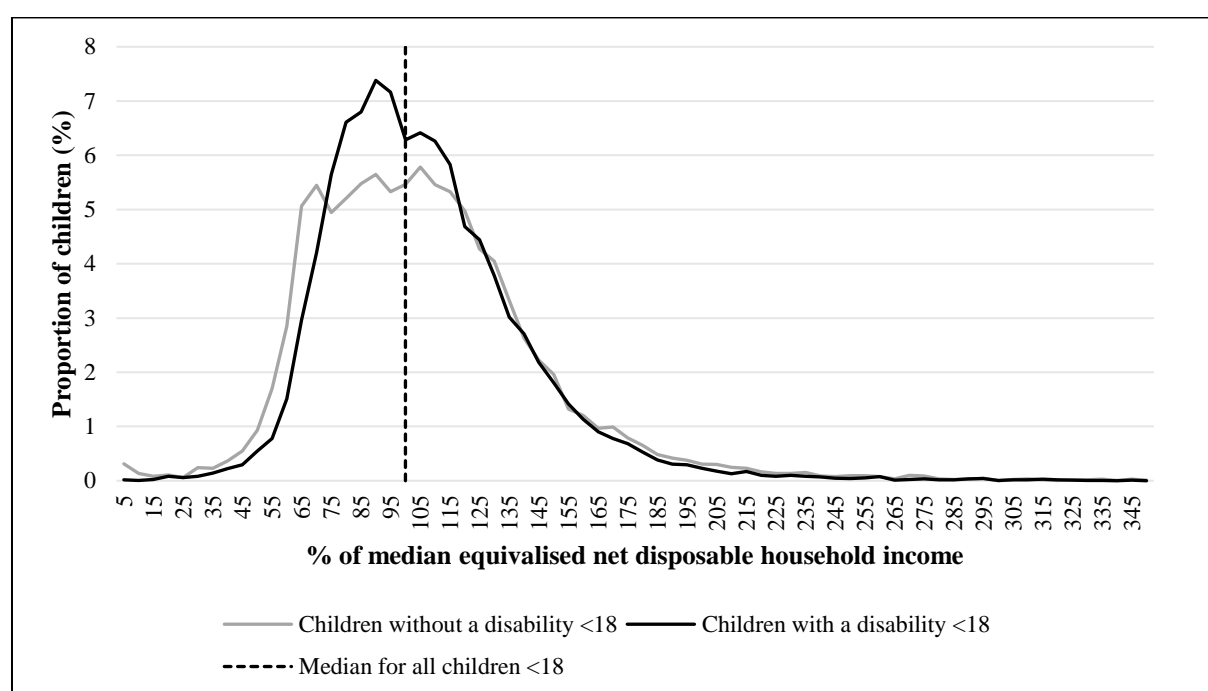
Source: own calculations based on DWH LM&SP (2010).

This is partially the result of the way childhood disability is measured: only children who receive the supplemental child benefit are identified as children with a disability. Figure A1.3 presents the income distributions for children with a disability when the main cash support systems provided to them are excluded, simultaneously and separately, from the net disposable household income (before it is equivalised). When the regular child benefit, the supplemental child benefit, and the refundable tax credit for dependent children are not taken into account, the share of children with a disability living at the bottom (60% or less) increases from 3.8% to 31.6%, while the shares in the middle (65%-135%) and at the top (more than 135%) are reduced by a quarter and by half respectively. When the cash support systems are stepwise included, it is clear that the regular child benefit (comparing the dotted and dashed line) has a great impact,

but also the supplemental child benefit (comparing the dashed and double line) is important for household with children with a disability. The refundable tax credit matters as well (comparing the double to the solid line), especially at the bottom and in the middle of the income distribution.

Figure A1.3. Income distribution for children with a disability, with and without cash support, Belgium, 2010
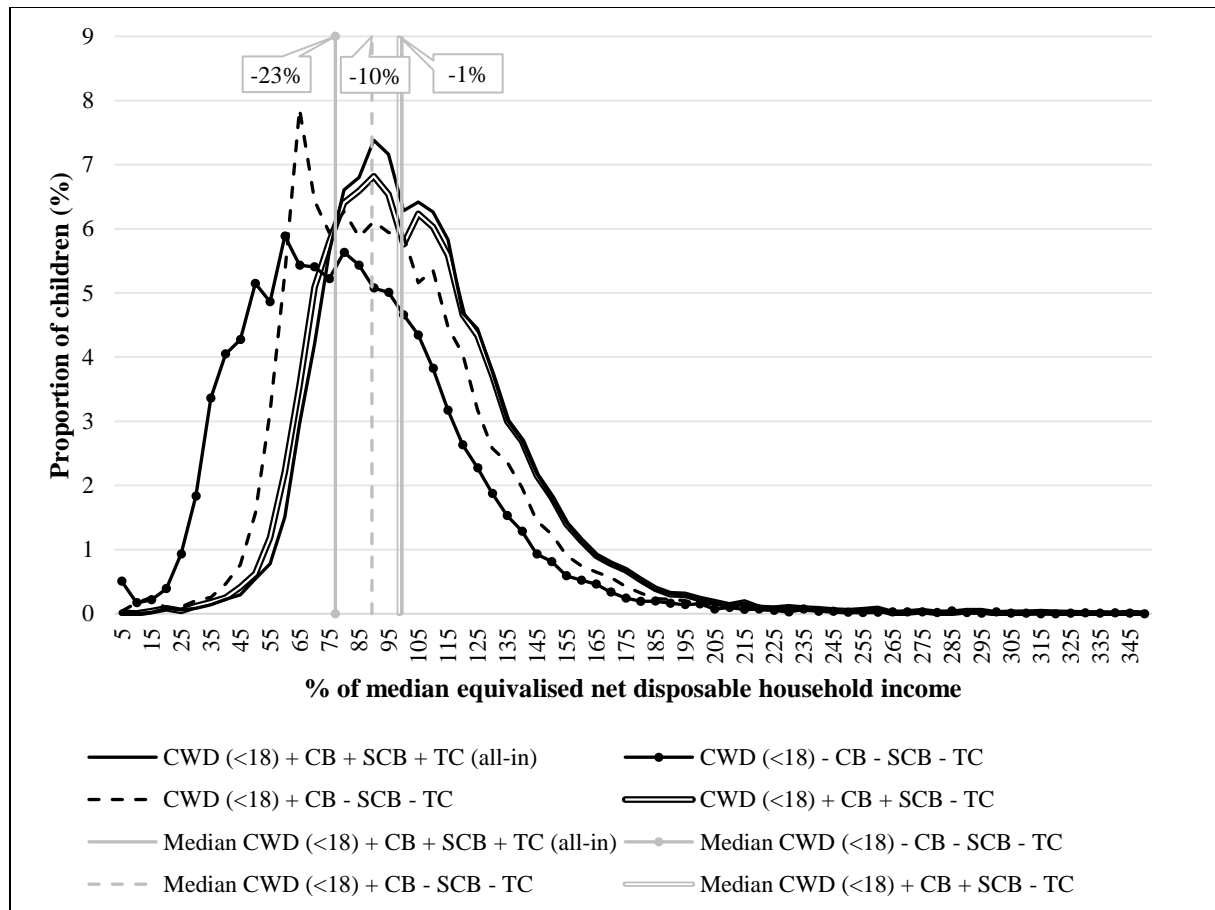
Source: own calculations based on DWH LM&SP (2010).
Note: CWD = children with a disability, CB = regular child benefit, SCB = supplemental child benefit, TC = refundable tax credit for dependent children. Distributions are presented as percentages of the median for all children (including children without a disability) in the data (€16187.57), the medians of each distribution are reported for comparative purposes.

1.4. Additional references

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Statistics Belgium. (2010). *Verdeling (%) van de hoofdbestanddelen van het totaal netto inkomen per totaal netto belastbaar inkomensklasse van €5000*. Retrieved from https://statbel.fgov.be/nl/themas/huishoudens/fiscale-inkomens/plus.

Appendix 2 Descriptive information on variables of interest

Table A2.1. All children, poor versus non-poor children, Belgium, 2010

Children <18	Total	Poor	Non-poor
Prevalence among total		22.1%	77.9%
Household work intensity			
Very low (0-0.2)	12.4%	42.9%	3.7%
Low (0.2-0.45)	4.2%	13.2%	1.7%
Medium (0.45-0.55)	8.5%	14.7%	6.7%
High (0.55-0.85)	21.6%	14.5%	23.6%
Very high (0.85-1)	53.4%	14.7%	64.4%
Household type			
Two parents	77.2%	42.7%	87.0%
Single parent	22.2%	55.1%	12.9%
Other	0.6%	2.2%	0.1%
Number of children (<18) in household			
Less than three	73.7%	67.6%	75.5%
Three or more	26.3%	32.4%	24.5%
Parental education (highest level)			
Low-skilled	15.5%	37.6%	9.7%
Medium-skilled	35.3%	44.4%	32.9%
High-skilled	49.2%	18.0%	57.3%
Country of birth parents			
At least one parent born in Belgium	88.0%	69.8%	93.0%
At least one parent born in other EU27 country	3.5%	7.3%	2.5%
Both parents born in non-EU27 country	8.5%	22.9%	4.5%
Other household members with a disability			
None	96.8%	95.7%	97.1%
At least one	3.2%	4.3%	2.9%

Source: own calculations based on DWH LM&SP (2010) and Census (2011).

Note: the shares in the total child population (column 2) are the weighted averages of the shares within the poor and non-poor subgroups of the total child population (columns 3 and 4 weighted by row 2). Bivariate statistics are shown meaning that the sample size can differ for each indicator. Results are comparable when only children with non-missing information on all variables of interest are taken into account, except for the poverty prevalence (20.7%), and the parents country of birth where the shares of foreign-born parents are smaller (among the total child population (BE 90.1%, EU27 2.7%, non-EU27 7.3%), this is more pronounced for the poor subgroup (BE 74.4%, EU27 5.8%, non-EU27 19.8%) than for the non-poor subgroup (BE 94.2%, EU27 1.9%, non-EU27 4.0%)).

Table A2.2. Children with and without a disability, poor versus non-poor children, Belgium, 2010

Children <18	With a disability			Without a disability		
	Subtotal	**Poor**	**Non-poor**	**Subtotal**	**Poor**	**Non-poor**
Prevalence among subtotal		15.6%	84.4%		22.2%	77.8%
Household work intensity						
Very low (0-0.2)	22.2%	56.5%	15.8%	12.1%	42.7%	3.4%
Low (0.2-0.45)	5.8%	14.6%	4.2%	4.2%	13.2%	1.6%
Medium (0.45-0.55)	12.0%	11.4%	12.1%	8.4%	14.8%	6.5%
High (0.55-0.85)	22.5%	9.4%	25.0%	21.6%	14.5%	23.6%
Very high (0.85-1)	37.5%	8.1%	42.9%	53.7%	14.8%	64.9%
Household type						
Two parents	69.2%	37.5%	75.1%	77.4%	42.7%	87.3%
Single parent	30.2%	59.8%	24.8%	22.1%	55.0%	12.6%
Other	0.6%	2.8%	0.2%	0.6%	2.2%	0.1%
Number of children (<18) in household						
Less than three	70.0%	63.0%	71.3%	73.8%	67.7%	75.6%
Three or more	30.0%	37.0%	28.7%	26.2%	32.3%	24.4%
Parental education (highest level)						
Low-skilled	24.5%	45.8%	20.8%	15.3%	37.4%	9.5%
Medium-skilled	41.6%	44.1%	41.2%	35.2%	44.4%	32.8%
High-skilled	33.9%	10.1%	38.0%	49.5%	18.1%	57.8%
Country of birth parents						
At least one parent born in Belgium	88.4%	74.9%	90.8%	88.0%	69.7%	93.1%
At least one parent born in other EU27 country	2.6%	4.8%	2.2%	3.5%	7.3%	2.5%
Both parents born in non-EU27 country	9.0%	20.3%	7.0%	8.5%	22.9%	4.4%
Other household members with a disability						
None	82.4%	83.8%	82.2%	97.1%	95.9%	97.5%
Yes, at least one	17.6%	16.2%	17.8%	2.9%	4.1%	2.5%

Source: own calculations based on DWH LM&SP (2010) and Census (2011).

Note: shares in the subtotal populations of children with and without a disability (columns 2 and 5) are the weighted averages of the shares within the poor and non-poor subgroups of these subpopulations (columns 3 and 4 for children with a disability, columns 6 and 7 for children without a disability, weighted by row 2). Weighting column 2 and 5 by their prevalence in the total child population (2.1% and 97.9%), will give the total distribution presented in column 2 of Table A2.1. Bivariate statistics are shown meaning that the sample size can differ for each risk factor. Results are comparable when only children with non-missing information on all variables of interest are taken into account, except for the poverty prevalence (14.9% and 20.9% among children with and without a disability respectively), and the parents country of birth where the shares of foreign-born parents are smaller (among children with a disability (BE 89.9%, EU27 2.3%, non-EU27 7.8%), this is more pronounced for the poor subgroup (BE 78.2%, EU27 4.3%, non-EU27 17.5%) than for the non-poor subgroup (BE 91.9%, EU27 1.9%, non-EU27 6.1%). Comparable among children without a disability (BE 90.1%, EU27 2.9%, non-EU27 7.3%), poor subgroup (BE 74.3%, EU27 5.8%, non-EU27 19.9%), non-poor subgroup (BE 94.2%, EU27 1.9%, non-EU27 3.9%)).

Appendix 3 Sensitivity check: applying the 50% and 70% at-risk-of-poverty threshold

3.1. 50% at-risk-of-poverty threshold

Table A3.1. 50% income poverty estimates, with and without cash support, children minus 18, disabled versus non-disabled, Belgium, 2010

Children <18	Total	Disabled	Non-disabled
50% poverty headcount ratio			
– CB – SCB – TC (scenario 1)	23.6%	33.4%	23.4%
+ CB – SCB – TC (scenario 2)	11.4%	15.1%	11.3%
+ CB + SCB – TC (scenario 3)	11.2%	6.5%	11.3%
+ CB + SCB + TC (baseline)	9.1%	4.7%	9.2%
Average 50% poverty gap ratio among the poor			
– CB – SCB – TC (scenario 1)	28.5%	28.8%	28.4%
+ CB – SCB – TC (scenario 2)	19.3%	15.8%	19.4%
+ CB + SCB – TC (scenario 3)	19.3%	15.6%	19.4%
+ CB + SCB + TC (baseline)	20.2%	16.9%	20.2%

Source: own calculations based on DWH LM&SP (2010).
Notes: The poverty threshold is kept constant over all scenarios. The average poverty gap is calculated among those children who are at-risk-of-poverty in each scenario separately.

Table A3.2. Logistic regression on 50% income poverty risk, with and without cash support, odds ratios, Belgium, 2010

Children <18	Scenario 1 – CB – SCB – TC	Scenario 2 + CB – SCB – TC	Scenario 3 + CB + SCB – TC	Baseline + CB + SCB + TC
Constant	0.012***	0.009***	0.009***	0.011***
	(0.001)	(0.001)	(0.001)	(0.001)
Disabled child (DC)	1.019[n.s.]	1.144[n.s.]	0.892[n.s.]	0.691**
	(0.103)	(0.153)	(0.136)	(0.114)
Household work intensity (very high (0.85-1) ref.)				
Very low (0-0.2)	19.955***	23.867***	23.899***	19.377***
	(1.886)	(2.771)	(2.776)	(2.524)
Low (0.2-0.45)	27.567***	25.740***	25.758***	23.148***
	(3.037)	(3.082)	(3.084)	(2.919)
Medium (0.45-0.55)	8.129***	6.568***	6.574***	6.800***
	(0.670)	(0.772)	(0.773)	(0.843)
High (0.55-0.85)	2.699***	2.173***	2.174***	2.182***
	(0.189)	(0.257)	(0.257)	(0.273)
Household type (two parents ref.)				
Single parent	7.998***	2.496***	2.497***	1.710***
	(0.518)	(0.204)	(0.204)	(0.157)
Number of children (<18) in household (less than three ref.)				
Three or more	3.453***	1.293***	1.293***	0.904[n.s.]
	(0.197)	(0.089)	(0.089)	(0.065)
Parental education (highest level) (high-skilled ref.)				
Low-skilled	2.674***	2.062***	2.062***	1.866***
	(0.217)	(0.200)	(0.200)	(0.188)

Children <18	Scenario 1 – CB – SCB – TC	Scenario 2 + CB – SCB – TC	Scenario 3 + CB + SCB – TC	Baseline + CB + SCB + TC
Medium-skilled	2.771***	1.927***	1.927***	1.676***
	(0.173)	(0.165)	(0.165)	(0.149)
Country of birth parents (Belgium ref.)				
EU27	1.294[n.s.]	1.673***	1.673***	1.794***
	(0.194)	(0.256)	(0.256)	(0.270)
Non-EU27	2.859***	1.742***	1.742***	1.738***
	(0.265)	(0.167)	(0.167)	(0.169)
Other disabled household members (none ref.)				
At least one	0.505***	0.332***	0.332***	0.381***
	(0.082)	(0.056)	(0.056)	(0.381)
Interaction x DC				
Household work intensity (very high (0.85-1) ref.)				
Very low (0-0.2) x DC	0.946[n.s.]	0.628**	0.452***	0.524**
	(0.113)	(0.097)	(0.086)	(0.114)
Low (0.2-0.45) x DC	0.720**	0.640**	0.455***	0.464***
	(0.104)	(0.103)	(0.086)	(0.097)
Medium (0.45-0.55) x DC	0.746**	0.639**	0.427***	0.413***
	(0.081)	(0.102)	(0.083)	(0.089)
High (0.55-0.85) x DC	0.861[n.s.]	0.771[n.s.]	0.507***	0.562**
	(0.083)	(0.126)	(0.102)	(0.124)
Household type (two parents ref.)				
Single parent x DC	0.924[n.s.]	1.009[n.s.]	0.471***	0.556***
	(0.078)	(0.106)	(0.060)	(0.083)
Number of children (<18) in household (less than three ref.)				
Three or more x DC	1.192**	1.278**	1.135[n.s.]	1.260**
	(0.089)	(0.112)	(0.112)	(0.140)
Parental education (highest level) (high-skilled ref.)				
Low-skilled x DC	1.183[n.s.]	1.000[n.s.]	0.889[n.s.]	0.948[n.s.]
	(0.126)	(0.130)	(0.141)	(0.167)
Medium-skilled x DC	1.034[n.s.]	1.060[n.s.]	0.985[n.s.]	1.084[n.s.]
	(0.089)	(0.124)	(0.141)	(0.173)
Country of birth parents (Belgium ref.)				
EU27 x DC	1.081[n.s.]	0.712[n.s.]	0.857[n.s.]	0.881[n.s.]
	(0.240)	(0.149)	(0.200)	(0.219)
Non-EU27 x DC	0.833[n.s.]	0.975[n.s.]	0.913[n.s.]	0.912[n.s.]
	(0.102)	(0.116)	(0.119)	(0.128)
Other disabled household members (none ref.)				
At least one x DC	1.555**	1.732**	1.118[n.s.]	0.844[n.s.]
	(0.270)	(0.313)	(0.219)	(0.182)
Region of residence (Flanders ref.)				
Brussels	1.672***	1.169[n.s.]	1.165[n.s.]	1.155[n.s.]
	(0.155)	(0.125)	(0.126)	(0.127)
Wallonia	1.477***	1.233**	1.226**	1.196**
	(0.083)	(0.085)	(0.085)	(0.087)
Model fit				
Log pseudolikelihood	-483864.58	-354594.67	-350858.29	-334645.62
Pseudo R²	0.4523	0.3617	0.3611	0.2893
Prob > chi²	0.0000	0.0000	0.0000	0.0000
N	33883	33883	33883	33883

Source: own calculations based on DWH LM&SP (2010) and Census (2011).

Notes: not living at-risk-of poverty is the baseline. *p<0.05, **p<0.01, ***p<0.001, n.s. not significant. Robust standard errors are in parentheses.

3.2. 70% at-risk-of-poverty threshold

Table A3.3. 70% income poverty estimates, with and without cash support, children minus 18, disabled versus non-disabled, Belgium, 2010

Children <18	Total	Disabled	Non-disabled
70% poverty headcount ratio			
– CB – SCB – TC (scenario 1)	47.7%	60.1%	47.4%
+ CB – SCB – TC (scenario 2)	36.0%	46.6%	35.8%
+ CB + SCB – TC (scenario 3)	35.7%	34.8%	35.8%
+ CB + SCB + TC (baseline, all-in)	35.4%	32.3%	35.5%
Average 70% poverty gap ratio among the poor			
– CB – SCB – TC (scenario 1)	31.3%	33.7%	31.2%
+ CB – SCB – TC (scenario 2)	23.0%	23.0%	23.0%
+ CB + SCB – TC (scenario 3)	22.9%	17.9%	23.0%
+ CB + SCB + TC (baseline, all-in)	21.6%	16.4%	21.7%

Source: own calculations based on DWH LM&SP (2010).
Notes: The poverty threshold is kept constant over all scenarios. The average poverty gap is calculated among those children who are at-risk-of-poverty in each scenario separately.

Table A3.4. Logistic regression on 70% income poverty risk, with and without cash support, odds ratios, Belgium, 2010

Children <18	Scenario 1 – CB – SCB – TC	Scenario 2 + CB – SCB – TC	Scenario 3 + CB + SCB – TC	Baseline + CB + SCB + TC
Constant	0.070***	0.041***	0.041***	0.042***
	(0.003)	(0.002)	(0.002)	(0.002)
Disabled child (DC)	1.045[n.s.]	0.944[n.s.]	0.683***	0.737***
	(0.067)	(0.070)	(0.053)	(0.056)
Household work intensity (very high (0.85-1) ref.)				
Very low (0-0.2)	8.968***	14.862***	14.876***	13.972***
	(1.077)	(1.549)	(1.550)	(1.423)
Low (0.2-0.45)	24.338***	27.110***	27.129***	24.731***
	(3.881)	(3.449)	(3.452)	(3.090)
Medium (0.45-0.55)	9.761***	10.593***	10.600***	10.249***
	(0.804)	(0.791)	(0.791)	(0.761)
High (0.55-0.85)	3.615***	3.324***	3.324***	3.294***
	(0.177)	(0.178)	(0.791)	(0.176)
Household type (two parents ref.)				
Single parent	8.882***	7.426***	7.428***	7.168***
	(0.590)	(0.454)	(0.454)	(0.435)
Number of children (<18) in household (less than three ref.)				
Three or more	3.293***	1.507***	1.507***	1.459***
	(0.157)	(0.076)	(0.076)	(0.073)
Parental education (highest level) (high-skilled ref.)				
Low-skilled	4.816***	3.769***	3.768***	3.782***
	(0.359)	(0.273)	(0.273)	(0.271)
Medium-skilled	4.314***	3.408***	3.407***	3.375***
	(0.477)	(0.168)	(0.168)	(0.166)
Country of birth parents (Belgium ref.)				
EU27	1.747***	1.772***	1.774***	1.750***

Children <18	Scenario 1 – CB – SCB – TC	Scenario 2 + CB – SCB – TC	Scenario 3 + CB + SCB – TC	Baseline + CB + SCB + TC
	(0.280)	(0.259)	(0.259)	(0.255)
Non-EU27	4.137***	3.428***	3.431***	3.304***
	(0.117)	(0.332)	(0.333)	(0.317)
Other disabled household members (none ref.)				
At least one	0.717**	0.561***	0.561***	0.541***
	(0.117)	(0.090)	(0.090)	(0.086)
Interaction x DC				
Household work intensity (very high (0.85-1) ref.)				
Very low (0-0.2) x DC	1.089$^{n.s.}$	1.099$^{n.s.}$	0.848$^{n.s.}$	0.677**
	(0.162)	(0.142)	(0.105)	(0.082)
Low (0.2-0.45) x DC	0.987$^{n.s.}$	0.883$^{n.s.}$	0.618**	0.545***
	(0.211)	(0.145)	(0.096)	(0.083)
Medium (0.45-0.55) x DC	0.800**	0.745**	0.520***	0.495***
	(0.085)	(0.073)	(0.051)	(0.049)
High (0.55-0.85) x DC	0.849**	0.889$^{n.s.}$	0.704***	0.661***
	(0.058)	(0.067)	(0.056)	(0.053)
Household type (two parents ref.)				
Single parent x DC	0.980$^{n.s.}$	1.037$^{n.s.}$	0.519***	0.446***
	(0.089)	(0.085)	(0.041)	(0.035)
Number of children (<18) in household (less than three ref.)				
Three or more x DC	1.118$^{n.s.}$	1.080$^{n.s.}$	1.300***	1.192**
	(0.075)	(0.073)	(0.087)	(0.079)
Parental education (highest level) (high-skilled ref.)				
Low-skilled x DC	1.013$^{n.s.}$	1.073$^{n.s.}$	0.884$^{n.s.}$	0.849$^{n.s.}$
	(0.100)	(0.103)	(0.085)	(0.081)
Medium-skilled x DC	1.026$^{n.s.}$	1.037$^{n.s.}$	0.900$^{n.s.}$	0.888$^{n.s.}$
	(0.067)	(0.072)	(0.066)	(0.065)
Country of birth parents (Belgium ref.)				
EU27 x DC	1.141$^{n.s.}$	1.009$^{n.s.}$	0.782$^{n.s.}$	0.834$^{n.s.}$
	(0.271)	(0.220)	(0.164)	(0.168)
Non-EU27 x DC	0.727**	0.776$^{n.s.}$	0.589***	0.550***
	(0.117)	(0.102)	(0.072)	(0.066)
Other disabled household members (none ref.)				
At least one x DC	1.377$^{n.s.}$	1.476**	0.942$^{n.s.}$	0.914$^{n.s.}$
	(0.241)	(0.254)	(0.161)	(0.155)
Region of residence (Flanders ref.)				
Brussels	1.307**	1.577***	1.564***	1.578***
	(0.108)	(0.131)	(0.130)	(0.130)
Wallonia	1.413***	1.455***	1.450***	1.434***
	(0.064)	(0.069)	(0.069)	(0.068)
Model fit				
Log pseudolikelihood	-706420.20	-642854.89	-643268.14	-648925.71
Pseudo R²	0.3859	0.4004	0.3985	0.3913
Prob > chi²	0.0000	0.0000	0.0000	0.0000
N	33883	33883	33883	33883

Source: own calculations based on DWH LM&SP (2010) and Census (2011).

Notes: not living at-risk-of poverty is the baseline. *p<0.05, **p<0.01, ***p<0.001, n.s. not significant. Robust standard errors are in parentheses.

Appendix 4 Sensitivity check: logistic results without applying the population weight

Table A4.1. Logistic regression on 60% income poverty risk without population weight, with and without cash support, odds ratios, Belgium, 2010

Children <18	Scenario 1 – CB – SCB – TC	Scenario 2 + CB – SCB – TC	Scenario 3 + CB + SCB – TC	Baseline + CB + SCB + TC
Constant	0.031***	0.018***	0.019***	0.020***
	(0.002)	(0.001)	(0.001)	(0.001)
Disabled child (DC)	0.929[n.s.]	0.976[n.s.]	0.734**	0.749**
	(0.074)	(0.094)	(0.077)	(0.079)
Household work intensity (very high (0.85-1) ref.)				
Very low (0-0.2)	14.142***	23.785***	24.735***	21.299***
	(1.456)	(2.189)	(2.285)	(1.918)
Low (0.2-0.45)	25.093***	29.169***	29.986***	26.303***
	(3.127)	(3.148)	(3.238)	(2.795)
Medium (0.45-0.55)	9.778***	8.654***	8.921***	8.766***
	(0.742)	(0.706)	(0.726)	(0.711)
High (0.55-0.85)	3.006***	2.611***	2.622***	2.533***
	(0.164)	(0.183)	(0.183)	(0.178)
Household type (two parents ref.)				
Single parent	8.454***	5.750***	5.803***	5.354***
	(0.523)	(0.360)	(0.363)	(0.333)
Number of children (<18) in household (less than three ref.)				
Three or more	3.499***	1.436***	1.437***	1.279***
	(0.176)	(0.082)	(0.082)	(0.074)
Parental education (highest level) (high-skilled ref.)				
Low-skilled	3.776***	2.652***	2.640***	2.648***
	(0.276)	(0.211)	(0.210)	(0.210)
Medium-skilled	3.450***	2.703***	2.680***	2.690***
	(0.176)	(0.167)	(0.165)	(0.166)
Country of birth parents (Belgium ref.)				
EU27	1.453**	1.657***	1.716***	1.642***
	(0.214)	(0.244)	(0.255)	(0.244)
Non-EU27	3.575***	2.732***	2.792***	2.662***
	(0.354)	(0.252)	(0.258)	(0.244)
Other disabled household members (none ref.)				
At least one	0.503***	0.391***	0.393***	0.362***
	(0.079)	(0.065)	(0.065)	(0.060)
Interaction x DC **Household work intensity** **(very high (0.85-1) ref.)**				
Very low (0-0.2) x DC	1.096[n.s.]	0.908[n.s.]	0.485***	0.483***
	(0.142)	(0.107)	(0.061)	(0.062)
Low (0.2-0.45) x DC	0.841[n.s.]	0.832[n.s.]	0.506***	0.514***
	(0.137)	(0.118)	(0.073)	(0.075)
Medium (0.45-0.55) x DC	0.794**	0.700**	0.477***	0.487***
	(0.079)	(0.076)	(0.058)	(0.060)
High (0.55-0.85) x DC	0.942[n.s.]	0.932[n.s.]	0.759**	0.728**
	(0.072)	(0.091)	(0.085)	(0.086)
Household type (two parents ref.)				
Single parent x DC	1.085[n.s.]	0.981[n.s.]	0.429***	0.396***
	(0.091)	(0.080)	(0.037)	(0.035)

Children <18	Scenario 1 − CB − SCB − TC	Scenario 2 + CB − SCB − TC	Scenario 3 + CB + SCB − TC	Baseline + CB + SCB + TC
Number of children (<18) in household (less than three ref.)				
Three or more x DC	1.079[n.s.]	1.128[n.s.]	1.268**	1.132[n.s.]
	(0.074)	(0.084)	(0.096)	(0.087)
Parental education (highest level) (high-skilled ref.)				
Low-skilled x DC	1.099[n.s.]	1.123[n.s.]	1.022[n.s.]	0.905[n.s.]
	(0.107)	(0.118)	(0.114)	(0.104)
Medium-skilled x DC	1.028[n.s.]	1.005[n.s.]	0.930[n.s.]	0.869[n.s.]
	(0.074)	(0.087)	(0.088)	(0.085)
Country of birth parents (Belgium ref.)				
EU27 x DC	1.418[n.s.]	1.077[n.s.]	0.870[n.s.]	0.877[n.s.]
	(0.312)	(0.235)	(0.176)	(0.178)
Non-EU27 x DC	0.773[n.s.]	0.832[n.s.]	0.599***	0.607***
	(0.105)	(0.100)	(0.070)	(0.071)
Other disabled household members (none ref.)				
At least one x DC	1.818***	1.503**	1.131[n.s.]	1.161[n.s.]
	(0.307)	(0.268)	(0.201)	(0.206)
Region of residence (Flanders ref.)				
Brussels	1.528***	1.539***	1.163**	1.133[n.s.]
	(0.098)	(0.101)	(0.077)	(0.076)
Wallonia	1.406***	1.436***	1.209***	1.196***
	(0.048)	(0.054)	(0.046)	(0.047)
Model fit				
Log pseudolikelihood	-12888.93	-11012.42	-10718.92	-10477.67
Pseudo R²	0.4334	0.4332	0.3603	0.3369
Prob > chi²	0.0000	0.0000	0.0000	0.0000
N	33883	33883	33883	33883

Source: own calculations based on DWH LM&SP (2010) and Census (2011).

Notes: not living at-risk-of poverty is the baseline. *p<0.05, **p<0.01, ***p<0.001, n.s. not significant. Robust standard errors are in parentheses.

Appendix 5 Further exploration of regular child benefit, Belgium, 2010

Figure A5.1. Marginal effect of child's disability status on predicted 60% income poverty risk (left axis) and mean equivalised cash support among the poor by child benefit component (right axis), in different scenarios with and without cash support, children under 18
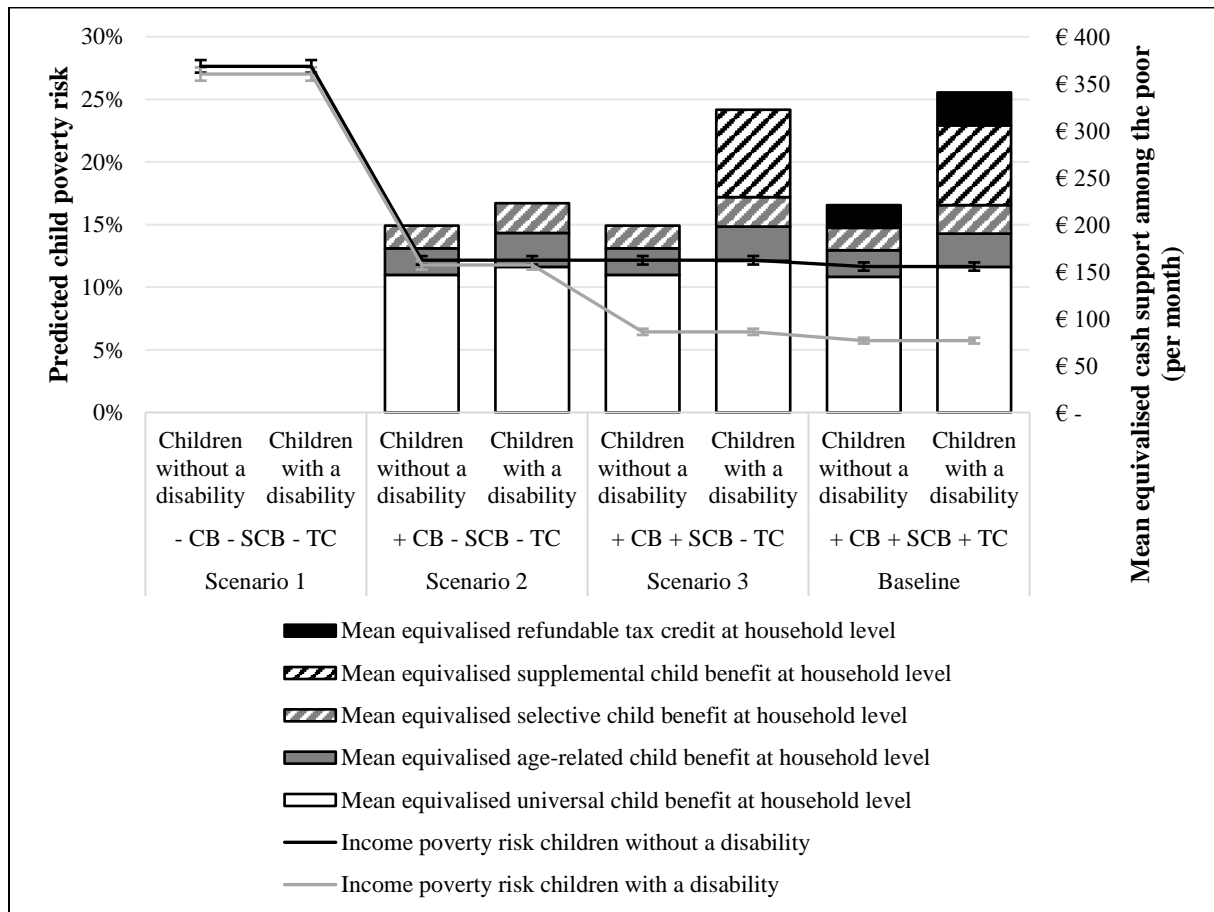
Source: own calculations based on DWH LM&SP (2010) and Census (2011).
Notes: Predicted child poverty risks are shown as marginal effects of the child's disability status (left axis), at mean values for the remaining variables of Table 4. Mean equivalised cash support is shown for poor children with and without a disability, by component (and by component of the regular child benefit) and population weighted (right axis). The population of poor children changes in each scenario.