The Association Between Household Wealth and the Prevalence of Child Disability and Specific Functional Limitations: Analysis of Nationally Representative Cross-Sectional Surveys in 40 Low- and Middle-Income Countries

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Declaration of Interest

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Abstract

Background

It is commonly stated that people with disabilities are at significantly greater risk of living in poverty than their non-disabled peers. However, most evidence supporting this assertion is drawn from studies in high-income countries and studies of adults. There is relatively little robust evidence on the association between poverty/wealth and the prevalence of child disability in low- and middle-income countries (LMICs).

Objective/Hypothesis

To estimate the strength of association between an indicator of wealth (household assets) and the prevalence of disability among children in a range of LMICs.

Methods

Secondary analysis of data collected in Round 6 of UNICEF's Multiple Indicator Cluster Surveys. Nationally representative data were available for 40 countries with a total sample size of 473,578 children aged 2-17. Disability was ascertained by responses to the Washington Group for Disability Statistics module on functional limitations.

Results

There were significant dose-dependent relationships between household wealth quintile and the prevalence of disability and 13 of the 15 specific functional difficulties associated with disability. Children living in the poorest 20% of households were 35% more likely to have a disability than children living in the most affluent 20% of households. The strength of the association between household wealth and the prevalence of child disability was markedly lower in low-income countries than in middle-income countries.

Conclusions

Our results provide robust evidence that in LMICs the prevalence of child disability is disproportionately concentrated in poorer households. Further research is required to better understand why this association appears to be weaker in low-income countries.

Introduction

It is commonly stated that people with disabilities are at significantly greater risk of living in poverty than their non-disabled peers.[1, 2] While increasingly robust data is available from high-income countries to support such assertions,[3] credible evidence from low- and middle-income countries (LMICs; where 84% of the world's population live) remains sparse and inconsistent.[1, 2, 4-6] The omission of robust evidence is particularly notable in relation to the relationship between child disability and poverty/wealth.[4]

The evidence available to date suggests that the prevalence of child disability may be higher in poorer households, but that the association may be weak and inconsistent. For example, Filmer in 2008 reported that the prevalence of disability among children aged 6-17 did not significantly vary across household wealth quintiles in 11 of the 13 LMICs for which nationally representative data were available. In the two remaining countries the prevalence of child disability was significantly greater in poorer households.[7] Similarly, UNICEF, in a report published the same year – 2008 – and based on analysis of data collected in Round 3 of their Multiple Indicator Cluster Surveys (MICS), reported that the prevalence of disability in children aged 2-9 was higher in poorer households in 12 of 18 participating LMICs, although this difference was only statistically significant in six countries.[8]

More recent studies that have used sampling frames that are likely to be representative of national populations have reported that: (1) children with disabilities are more likely to experience multiple deprivations (multidimensional poverty) than children without disability;[9, 10] (2) the prevalence of severe functional difficulties among 5-17 year old children was significantly higher among children living in poorer households in two out of

three countries and among 2-4 year old children the prevalence of severe functional difficulties was significantly higher among children living in one of three countries;[11] and (3) in one country children with functional impairments associated with vision, hearing, remembering or concentrating, mobility, self-care, and communication were more likely to live in poorer households, while children with functional impairments in seeing were more likely to live in more affluent households.[12]

There are concerns with the evidence which is limited by the use of methods for ascertaining disability status that have questionable validity. For example, several studies used the Ten Questions Screen (TQS)[13] to identify disability.[8] This measure was subsequently dropped by UNICEF due to concerns about: (1) the over-identification of disability associated with the functional domains included in the (TQS); (2) the omission of items related to key functional domains such as mental health and psychosocial functioning; (3) the TQS's inability to determine severity of disability; (4) the inapplicability of the TQS to older children; and (5) the lack of cognitive testing of TQS items.[14]

The omission of nationally representative data from LMICs in the literature citing an association between disability and poverty for children is important on two counts. First, it cannot be assumed that results can be generalised from high income countries to LMICs. Indeed, Banks and colleagues in their recent systematic review commented that the proportion of country-level analyses which showed a significant association between greater household poverty and increased prevalence of child disability increased from 59% in low-income countries to 67% in lower-middle income countries and 72% of upper-middle income countries. [4] Second, the lack of recent, robust and nationally representative data about children with disabilities and poverty is particularly problematic given the strong

evidence that exposure to poverty during childhood can have a long-lasting detrimental impact of health, educational attainment and social, civic and economic participation.[15-17]

The primary aim of the present study was therefore to estimate the strength of association between household wealth and the prevalence of childhood disability across a range of LMICs using a newly validated measure of disability. The secondary aims were to determine whether the strength of association between household wealth and the prevalence of childhood disability varied by: (1) country economic classification group; and (2) the type of functional limitation associated with disability.

Method

We undertook secondary analysis of nationally representative data collected in Round 6 of UNICEF's MICS.[18] Following approval by UNICEF, MICS data were downloaded from http://mics.unicef.org/. Data used in the present paper were extracted from the household module, the module applied to all children under five living in the household and the module applied to a randomly selected child age 5-17 living in the household.[19] In MICS6 all countries used cluster sampling methods to derive samples representative of the national population of children, women (aged 18-49), and, in most countries, men (aged 18-49).[19] Inverse probability weights we supplied by National Statistical Offices with technical support from UNICEF to ensure that responding participants were representative of the national, population. Specific details of the sampling procedure and the procedures used for ethical review and approval in each country are available at http://mics.unicef.org/. While data collection for Round 6 of MICS is still ongoing, data used in the present paper were collected between 2017 and 2020. At the end of the download period (1 February, 2022), nationally

representative survey data (containing disability data for children) were available for 40 countries (16 upper-middle, 15 lower-middle and 9 low-income countries).

Disability

In Round 6 of MICS new modules (one for 2-4-year-old children, the other for 5-17-year-old children) were introduced to identify children with disabilities. Developed by the Washington Group on Disability Statistics (WGDS: http://www.washingtongroup-disability.com/), they are based on an informant (primarily mothers) reporting whether child has difficulties in nine different functional domains for children aged 2-4 (seeing, hearing, walking, fine motor, understanding, being understood, learning, playing, controlling behavior) and 14 domains for children 5-17 (seeing, hearing, walking, self-care, being understood inside the household, being understood outside the household, learning, remembering, focusing, accepting change, making friends, anxiety, depression, controlling behavior). Four response options were available for all domains other than the anxiety, depression and behavior domain ([1] '*no difficulty*', [2] '*some difficulty*', [3] '*a lot of difficulty*', [4] '*cannot do at all*'). The controlling behavior domain had five response options ([1] '*not at all*', [2] '*less*', [3] '*the same*', [4] '*more*' or {5] '*a lot more*') as did the anxiety and depression domains ([1] '*daily*', [2] '*weekly*', [3] '*monthly*', [4] '*a few times a year*', [5] '*never*').

The cut-off recommended by the WGDS is based on the child having at least '*a lot of difficulty*' in at one or more domains or 'daily' for either anxiety or depression or 'a lot more' for controlling behavior. [11] We used this cut-off to define child disability overall (scoring above the threshold in one or more domains) and child disabilities associated with the specific functional limitations listed above. For all disability measures the reference group

was children without disabilities. Disability data were missing for 1.4% of children (inter-country range 0.2%-3.4%).

Country Characteristics

Given that child wellbeing is related to national wealth in low and middle income countries,[20] we used World Bank 2018 country classification as upper middle income, lower middle income and low income.[21] These classifications are based on per capita Gross National Income adjusted for purchasing power parity (pcGNI; expressed as current US$ rates) using the World Bank's Atlas Method. We downloaded 2018 Atlas Method pcGNI from the World Bank website between May 2020 and December 2021.[22, 23]

Relative Household Wealth

MICS data is released with a within-country relative household wealth index. To construct the wealth index, principal components analysis was performed using information on the ownership of consumer goods, dwelling characteristics, water and sanitation, and other characteristics that are related to the household's wealth, to generate weights for each item. Each household was then assigned a score based on the assets owned weighted by factors scores. The index is assumed to capture underlying long-term wealth through information on the household assets and is generally regarded as a proxy indicator for household consumption.[24-27] The wealth index was used by UNICEF and national statistical offices to create wealth quintiles representative of households in the country in which the survey was undertaken. These data were collected in all countries. Data were missing for <0.1% of children.

Child Demographics

Child age (in one-year age bands) and sex (male/female) were available for all children.

Approach to Analysis

In the first stage of analysis, we used simple bivariate descriptive statistics to estimate the prevalence of child disability (with 95% confidence intervals) for each country and the extent to which prevalence of child disability varied within countries by relative household wealth. Prevalence ratios were estimated using Poisson regression for each household wealth quintile (with the most affluent quintile being the reference category) controlling for possible effects associated with differences in child sex and age.[28, 29] In the second stage of analysis, we aggregated country level estimates using restricted maximum likelihood meta-analysis across all countries and for each country economic classification group (upper-middle income, lower-middle income, low income).

In the third stage of analysis, we used mixed effects multilevel modelling to investigate the extent to which prevalence of specific functional difficulties among children varied within countries by household wealth (again controlling for possible effects associated with child sex and age). Random effects were specified within the models to allow both the intercept and slope of the association between household wealth and functional difficulty to vary across countries. To reduce the number of comparisons we combined: (1) the two speech items from the 5-17-year-old module (speech inside the home, speech outside of the home) with the speech item of the 2-4 year old module; and (2) the two walking items from the 5-17 year old module (walking 100m, walking 500m) with the walking item of the 2-4 year old module. In each instance disability was defined as having at least '*a lot of difficulty*' in at least one domain. Given the use of different age versions of the disability module we provided both overall estimates and estimates separately for children aged 2-4 and children aged 5-17.

All analyses were undertaken using Stata 16. Country prevalence estimates used the svy command to take account of the clustering of observations within sampling strata and primary sampling units. UNICEF's country-specific child-level weights were used to take account of biases in sampling frames and household and individual level non-response. Given the small amount of missing data, complete case analyses were undertaken. All estimates are weighted and all sample sizes are presented unweighted.

Results

Information on the 40 surveys (including sample sizes, response rates and the overall prevalence of child disability) is presented in Table 1. The analytic sample included 491,149 children. Of these, 50.8% were male, 36.8% were age 2-4, 32.1% were aged 5-10 and 31.0% were aged 11-17. The prevalence of disability among children ranged from 1.5% in Turkmenistan, an upper-middle income country, to 27.9% in Central African Republic, a low-income country, with a median country-level prevalence of 10.7%.

Association with Relative Household Wealth

Age- and sex-adjusted prevalence ratios for the risk of disability by household asset quintiles for each participating country are presented in Supplementary Table 1. When compared with the most affluent quintile, the age- and sex-adjusted prevalence of disability in the poorest quintile was greater in 33 of the 40 countries (significantly so in 22). In only two countries (Cuba and Turkmenistan) was the age- and sex-adjusted prevalence of disability in the poorest quintile significantly lower than in the most affluent quintile.

Summary data aggregated using meta-analysis across all countries and for each country economic classification group are presented in Table 2. These results showed a clear and

statistically significant inverse dose dependent relationship between relative household wealth and the prevalence of disability. Children living in the poorest quintile were 35% more likely to have a disability than children living in the most affluent quintile. Stratification by country economic classification group indicated that effect sizes were notably lower in low-income countries. While in middle income countries children living in the poorest quintile were 40% more likely to have a disability than children living in the most affluent quintile, this figure dropped to 19% in low-income countries.

Age- and sex-adjusted prevalence ratios for the risk of each of the 16 functional difficulties measured in the disability module by household wealth quintiles aggregated across countries are presented in Table 3. For all the 16 categories of functional difficulties, age- and sex-adjusted prevalence was greater in the poorest quintile than in the most affluent quintile, significantly so for 14 functional difficulties. When compared to children in the most affluent quintile, children in the poorest quintile were 145% more likely to have difficulties with learning, 121% more likely to have difficulties with fine motor skills, 108% more likely to have difficulties understanding, 99% more likely to have difficulties remembering, 77% more likely to have difficulties with self-care, 70% more likely to have difficulties hearing, 58% more likely to have difficulties concentrating, 56% more likely to have difficulties with depression, 49% more likely to have difficulties communicating, 47% more likely to have difficulties controlling their behavior, 40% more likely to have difficulties dealing with change, 36% more likely to have difficulties communicating, 35% more likely to have difficulties making friends, 26% more likely to have difficulties with anxiety, 23% more likely to have difficulties walking and 6% more likely to have difficulties seeing. While elevated, the differences for communicating and seeing were not statistically significant. Inspection of the median effect sizes for quintiles 1-4 (Q1 1.53, Q2 1.42, Q3 1.33, Q4 1.24)

indicated a clear linear dose dependent relationship between poorer household wealth quintile (when compared with the most affluent quintile) and the risk of functional impairments.

Also presented in Table 3 are estimates derived from mixed effects multilevel modelling for the association between household wealth and disability for the full age rage (2-17) and separately for the two age-relevant disability modules (age 2-4 and age 5-17). For the full age range, these estimates are very close to the estimates derived from meta-analysis. There is, however, a suggestion of stronger effects for the 2-4 year old age group than the 5-17 year old age group (Figure 1). In order to attempt to disentangle the impact of difference in measurement method and possible age/cohort effects, we stratified these analyses by single year age groups. Figure 2 presents age and sex adjusted for risk of disability for the poorest quintile by age. There is little evidence of any systematic age or cohort effects in either group, suggesting that the difference between groups may be due to method of disability ascertainment.

Discussion

Our analyses of the circumstances of nationally representative samples involving a total of 473,578 children aged 2-17 from 40 LMICs indicated that: (1) there were significant dose-dependent relationships between household wealth quintile and the prevalence of disability and 13 of the 15 specific functional difficulties associated with disability; (2) children living in the poorest quintile of households were 35% more likely to have a disability than children living in the most affluent quintile of households; (3) the strength of the association between household wealth and the prevalence of child disability was markedly lower in low-income countries than in middle-income countries.

Our results represent a significant contribution to knowledge in two ways. First, the use of recently collected nationally representative data with high response rates which uses a recently developed validated measure of child disability from 40 LMICs constitutes the most robust investigation of the association between household wealth and the prevalence of child disability in LMICs undertaken to date. Second, using identical surveys across countries, our finding replicating the previously reported differential effects sizes between country economic classification groups[4] suggests that this phenomena cannot be explained by methodological differences between surveys. Indeed, a similar effect (weaker association with household assets in poorer countries) has been reported by Gil et al in relation to relative income inequality and developmental delay (data re-analysed from Table S6).[30]

It is not possible within the existing datasets to determine the reasons for the weaker association between wealth and child disability in low-income countries (when compared to middle-income countries). Two possible avenues for future research on this issue would be investigate the impact of differential rates of child mortality in middle-income and low-income countries and the validity of the household asset-based wealth index in low-income countries.

Under 5 mortality is greater in low-income countries (67.6 deaths per 1,000 live births in 2019) than in middle-income countries (Upper Middle-Income 13.3, Lower Middle-Income 48.9; Data extracted 28/11/2021 from the World Bank website (https://data.worldbank.org/indicator/SH.DYN.MORT?locations=XM-XT-XN). Half of these deaths occur in the two lowest household wealth quintiles.[31] Children with disabilities, perhaps especially so in resource poor settings, are at increased risk of premature death.[32-

[34] As a result, differential mortality in low-income countries could have a stronger effect on prevalence (flattening any SEP-based gradient) than in middle income countries.

The household wealth Index is commonly considered as a proxy measure for consumption (often considered a 'gold standard' measure of wealth). While there are often reasonable/modest associations between the wealth index and independent measures of consumption, these effect sizes tend to be markedly lower in low-income countries than in middle-income countries,[26, 27] suggesting that the validity of the wealth index may be lower in low-income countries. Future research in low-income countries is required to better understand issues of differential validity by comparing the performance of the wealth index with other possible measures of poverty/wealth.[35] In addition, there may be value in investigating the impact of alternative ways of coding the wealth index data in analyses (e.g., by using the wealth index as continuous measure and exploring the possibility of non-linear relationships with disability status).

The results of our study need to be considered in light of two main limitations. First, the identification of child disability in national health and social surveys is a complex process that runs the risk of under-identification of child disability in poorer households/communities.[14] Recent research has suggested that this may be the case with the new WGDS child disability module implemented in MICS in relation to functional limitations in learning.[36] If this risk extends to other functional difficulties it would have the effect of underestimating the strength of association between wealth and the prevalence of disability. Second, the data used are cross-sectional and, as such, cannot be used to determine causal pathways between child disability and household wealth.

The results of our study provide additional empirical support for the importance of redressing inequalities in household wealth to reduce the prevalence of avoidable disability in children. While this is fully consistent with the aims of SDG 1 (no poverty), it should be noted that the data presented in the present paper indicate that there is a dose-dependent relationship between household wealth and risk of disability across a diverse range of countries. As such, while eradicating poverty is clearly a priority, redressing inequalities in wealth among non-poor households would also potentially have benefits in reducing the prevalence of avoidable disability in children.

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Table 1: Survey Details and Prevalence of Child Disabilities by Country					
	Year of survey	pcGNI (2018)	Response rate	Unweighted sample size	Weighted % of children with disabilities (with 95% CI)
Upper-Middle Income					
Argentina	2019/20	$12,370	81.8%	10,305	10.7% (9.5-11.9)
Costa Rica	2018	$11,590	87.0%	8,504	20.8% (18.9-22.9)
Montenegro	2018/19	$8,430	60.6%	2,982	8.5% (5.2-13.7)
Dominican Republic	2019	$7,760	99.0%	18,149	9.6% (8.9-10.4)
Cuba	2019	$7,480	98.5%	7,612	7.7% (6.5-9.0)
Turkmenistan	2019	$6,740	97.1%	8,400	1.5% (1.2-1.9)
Guyana	2019/20	$6,290	89.5%	4,852	14.0% (12.1-16.3)
Belarus	2019	$5,700	95.8%	4,989	3.7% (3.0-4.6)
Serbia	2019	$6,400	85.5%	4,507	7.0% (5.8-8.4)
North Macedonia	2018/19	$5,470	88.5%	3,287	5.8% (4.4-7.5)
Tuvalu	2019/20	$5,430	97.2%	712	11.3% (8.9-14.2)
Suriname	2018	$5,210	82.4%	6,489	10.8% (10.1-11.6)
Iraq	2018	$5,040	99.3%	25,526	14.6% (13.5-15.8)
Georgia	2018	$4,450	84.1%	5,296	7.6% (6.5-8.9)
Kosovo	2019/20	$4,340	79.2%	4,193	6.3% (5.3-7.4)
Tonga	2019	$4,300	96.1%	2,466	10.3% (8.4-12.5)
Lower-Middle Income					
Palestine	2019/20	$4,180	94.4%	8,986	10.3% (9.5-11.2)
Samoa	2019/20	$4,020	93.7%	3,785	16.7% (14.8-18.9)
Algeria	2018	$3,980	95.1%	25,236	14.8% (14.0-15.6)
Mongolia	2018	$3,660	95.6%	11,100	5.7% (5.0-6.5)
Tunisia	2018	$3,500	96.6%	6,998	19.0% (18.1-19.9)
Kiribati	2018/19	$3,140	98.2%	3,502	19.3% (17.5-21.2)
Honduras	2019	$2,320	90.4%	17,008	13.2% (12.6-13.9)
Lao PDR	2017	$2,450	98.5%	7,173	2.0% (1.7-2.4)
Ghana	2017/18	$2,130	99.2%	14,252	17.4% (16.1-18.7)
Sao Tome & Principe	2019	$1,870	97.4%	3,301	15.7% (14.0-17.5)
Zimbabwe	2018/19	$1,790	96.2%	10,766	8.1% (7.4-8.8)
Bangladesh	2019	$1,750	94.7%	53,391	7.4% (7.1-7.7)
Lesotho	2018	$1,390	88.8%	6,985	8.4% (7.6-9.3)
Kyrgyz Republic	2018	$1,220	98.4%	6,035	6.5% (5.9-7.2)
Nepal	2019	$970	98.9%	11,780	10.7% (9.9-11.5)
Low-Income					
Guinea-Bissau	2018/19	$750	99.4%	14,902	9.3% (8.4-10.2)
The Gambia	2018	$710	96.0%	11,766	7.8% (6.9-8.7)
Chad	2019	$680	99.4%	28,554	19.9% (19.0-20.9)
Togo	2017	$660	96.3%	7,865	16.7% (15.5-18.1)
Madagascar	2018	$510	94.1%	19,451	13.0% (12.2-13.8)
DR Congo	2017/18	$490	99.9%	26,604	13.9% (12.5-15.5)
Sierra Leone	2017	$490	99.5%	17,891	17.3% (10.3-27.5)
Central African Republic	2018/19	$490	96.5%	11,230	27.9% (26.3-29.6)
Malawi	2019/20	$350	98.0%	26,748	11.5% (10.9-12.2)
Note: Sample sizes are unweighted and only include children for who valid data on disability status are available. pcGNI = per capital gross national income					

Table 2: Age- and Sex-adjusted Prevalence Ratios for the Risk of Child Disability by Household Wealth Quintile Overall and for Each Country Economic Classification Group	
Overall	
1 (poorest)	1.35*** (1.23-1.49)
2	1.24*** (1.15-1.32)
3	1.26*** (1.18-1.35)
4	1.15*** (1.10-1.21)
5 (most affluent)	1.00 (reference)
Upper Middle-Income	
1 (poorest)	1.40** (1.09-1.79)
2	1.20 (0.98-1.48)
3	1.29** (1.09-1.53)
4	1.13* (1.02-1.27)
5 (most affluent)	1.00 (reference)
Lower Middle-Income	
1 (poorest)	1.41*** (1.23-1.61)
2	1.30*** (1.20-1.41)
3	1.31*** (1.23-1.40)
4	1.21*** (1.13-1.28)
5 (most affluent)	1.00 (reference)
Low-Income	
1 (poorest)	1.19** (1.05-1.36)
2	1.15* (1.02-1.28)
3	1.17* (1.04-1.32)
4	1.10 (0.98-1.22)
5 (most affluent)	1.00 (reference)
Note: * p<0.05, ** p<0.01, *** p<0.001	

Table 3: Overall Prevalence and Age- and Sex-adjusted Prevalence Ratios (with 95% CI) for the Risk of Specific Functional Difficulties Associated with Child Disability by Household Wealth Quintile						
	Overall Prevalence of Functional Difficulty	Q1 (poorest)	Q2	Q3	Q4	Q5 (most affluent)
Age 2-17						
Disability	13.2% (12.8-13.4)	1.31*** (1.28-1.35)	1.24*** (1.21-1.28)	1.21*** (1.18-1.25)	1.13*** (1.09-1.16)	1.00 (ref)
Behavior	2.1% (2.0-2.2)	1.47** (1.17-1.86)	1.36** (1.13-1.63)	1.36*** (1.15-1.62)	1.22** (1.06-1.41)	1.00 (ref)
Hearing	0.3% (0.3-0.4)	1.70** (1.18-2.46)	1.46** (1.11-1.92)	1.80*** (1.48-2.18)	1.54*** (1.30-1.87)	1.00 (ref)
Seeing	0.5% (0.5-0.6)	1.06 (0.76-1.48)	0.97 (0.72-1.29)	1.03 (0.82-1.31)	0.95 (0.73-1.25)	1.00 (ref)
Speech	0.8% (0.7-0.8)	1.49* (1.10-2.01)	1.40* (1.06-1.84)	1.21 (0.97-1.50)	1.02 (0.82-1.27)	1.00 (ref)
Learning	1.7% (1.6-1.8)	2.45*** (3.12)	2.03*** (1.67-2.46)	1.78*** (1.54-2.06)	1.48*** (1.33-1.65)	1.00 (ref)
Walking	1.8% (1.7-2.0)	1.23* (1.05-1.45)	1.14 (0.99-1.33)	1.15 (1.00-1.32)	1.07 (0.93-1.24)	1.00 (ref)
Age 2-4						
Disability	5.1% (4.6-5.5)	1.45*** (1.34-1.55)	1.34*** (1.24-1.44)	1.30*** (1.20-1.40)	1.17*** (1.08-1.27)	1.00 (ref)
Behavior	1.9% (1.7-2.2)	1.16 (0.90-1.49)	1.18 (0.96-1.46)	1.27** (1.08-1.50)	1.12 (0.98-1.29)	1.00 (ref)
Hearing	0.3% (0.2-0.3)	1.75** (1.26-2.43)	1.88*** (1.35-2.62)	2.31*** (1.66-3.21)	1.39 (0.97-2.01)	1.00 (ref)
Seeing	0.3% (0.3-0.4)	1.24 (0.88-1.75)	1.14 (0.81-1.59)	1.08 (0.78-1.50)	1.29 (0.94-1.77)	1.00 (ref)
Speech	1.2% (1.1-1.4)	1.67*** (1.36-2.05)	1.52*** (1.26-1.83)	1.36*** (1.14-1.61)	1.14 (0.96-1.34)	1.00 (ref)
Learning	1.7% (1.5-1.9)	2.89*** (2.16-3.88)	2.32*** (1.82-2.96)	1.96*** (1.60-2.39)	1.49*** (1.26-1.76)	1.00 (ref)
Walking	0.4% (0.3-0.4	1.68* (1.12-2.51)	1.56** (1.12-2.18)	1.81*** (1.35-2.44)	1.36* (1.00-1.84)	1.00 (ref)
Fine Motor	0.2% (0.2-0.3	2.21** (1.38-3.54)	2.73*** (1.78-4.20)	2.47*** (1.67-3.64)	1.42 (0.97-2.09)	1.00 (ref)
Playing	0.4% (0.3-0.4)	1.36 (0.96-1.93)	1.27 (0.87-1.85)	1.28 (0.89-1.84)	1.28 (0.94-1.74)	1.00 (ref)
Understanding	0.6% (0.5-0.6)	2.08*** (1.58-2.73)	1.72*** (1.34-2.22)	1.65*** (1.31-2.09)	1.24 (0.99-1.56)	1.00 (ref)
Age 5-17						
Disability	16.7% (16.0-17.4)	1.28*** (1.24-1.32)	1.22*** (1.18-1.25)	1.19*** (1.16-1.23)	1.12*** (1.09-1.16)	1.00 (ref)

Behavior	2.2% (2.1-2.3)	1.56*** (1.31-1.86)	1.50*** (1.30-1.74)	1.39*** (1.23-1.57)	1.30*** (1.18-1.44)	1.00 (ref)
Hearing	0.4% (0.3-0.4)	2.38*** (1.91-2.97)	1.82*** (1.44-2.29)	1.80*** (1.42-2.27)	1.41** (1.10-1.80)	1.00 (ref)
Seeing	0.6% (0.6-0.7)	1.00 (0.82-1.21)	1.02 (0.85-1.23)	1.07 (0.90-1.27)	0.97 (0.82-1.15)	1.00 (ref)
Speech	0.7% (0.7-0.8)	1.67*** (1.41-1.99)	1.44*** (1.22-1.71)	1.39*** (1.18-1.64)	1.27** (1.08-1.49)	1.00 (ref)
Learning	1.8% (1.7-1.9)	2.17*** (1.73-2.70)	1.84*** (1.53-2.21)	1.67*** (1.44-1.94)	1.46*** (1.29-1.65)	1.00 (ref)
Walking	2.4% (2.2-2.7)	1.17** (1.05-1.30)	1.12* (1.02-1.23)	1.13** (1.04-1.24)	1.05 (0.97-1.15)	1.00 (ref)
Self-care	0.8% (0.7-0.8)	1.77** (1.28-2.46)	1.57** (1.16-2.13)	1.37* (1.04-1.81)	1.31 (0.96-1.76)	1.00 (ref)
Remembering	1.7% (1.6-1.8)	1.99*** (1.47-2.68)	1.85*** (1.44-2.37)	1.53*** (1.26-1.87)	1.42*** (1.17-1.73)	1.00 (ref)
Concentrating	1.-% (0.9-1.0)	1.58** (1.19-2.09)	1.43* (1.06-1.94)	1.23 (0.94-1.60	1.10 (0.86-1.40)	1.00 (ref)
Dealing with change	2.1% (2.0-2.2)	1.40** 1.10-1.78)	1.25* (1.05-1.49)	1.29*** (1.12-1.48)	1.26** (1.08-1.48)	1.00 (ref)
Making friends	1.1% (1.0-1.1)	1.35* (1.04-1.75)	1.16 (0.86-1.54)	1.28 (0.93-1.76)	1.22 (0.89-1.68)	1.00 (ref)
Anxiety	8.2% (7.7-8.7)	1.26*** (1.13-1.41)	1.27*** (1.16-1.38)	1.28*** (1.17-1.39)	1.12** (1.03-1.22)	1.00 (ref)
Depression	4.5% (4.2-4.7)	1.56*** (1.23-1.98)	1.46*** (1.19-1.80)	1.37*** (1.15-1.64)	1.24* (1.02-1.51)	1.00 (ref)
Note: * p<0.05, ** p<0.01, *** p<0.001						

Supplementary Table 1: Age- and Sex-adjusted Prevalence Ratios for the Risk of Child Disability by Household Wealth Quintile					
	Household Wealth Quintile				
	Q1 (poorest)	Q2	Q3	Q4	Q5 (most affluent)
Argentina	1.69** (1.17-2.43)	1.29 (0.87-1.93)	1.42 (0.97-2.07)	1.37 (0.90-2.08)	1.00 (ref)
Costa Rica	1.53* (1.01-2.31)	1.54* (1.02-2.35)	1.40 (0.94-2.11)	1.06 (0.67-1.66)	1.00 (ref)
Montenegro	1.54 (0.79-3.00)	0.82 (0.55-1.22)	1.11 (0.73-1.67)	1.08 (0.73-1.59)	1.00 (ref)
Dominican Republic	1.35* (1.03-1.77)	1.48** (1.11-1.95)	1.59** (1.20-2.10)	1.17 (0.87-1.57)	1.00 (ref)
Cuba	0.49** (0.30-0.80)	0.64 (0.39-1.03)	0.91 (0.57-1.44)	0.84 (0.51-1.38)	1.00 (ref)
Turkmenistan	0.43** (0.23-0.81)	0.21** (0.08-0.55)	0.47* (0.25-0.89)	0.66 (0.39-1.13)	1.00 (ref)
Guyana	1.96*** (1.37-2.79)	1.97** (1.27-3.04)	2.16*** (1.51-3.08)	1.45 (0.95-2.22)	1.00 (ref)
Belarus	0.75 (0.37-1.51)	0.79 (0.40-1.57)	1.04 (0.56-1.91)	0.72 (0.36-1.43)	1.00 (ref)
Serbia	2.43** (1.33-4.43)	1.57 (0.85-2.87)	1.82* (1.04-3.21)	1.44 (0.78-2.64)	1.00 (ref)
North Macedonia	3.04* (1.23-7.51)	1.95 (0.73-5.23)	1.58 (0.61-4.13)	2.09 (0.73-5.98)	1.00 (ref)
Tuvalu	0.98 (0.46-2.07)	0.70 (0.33-1.47)	0.71 (0.34-1.47)	0.97 (0.46-2.03)	1.00 (ref)
Suriname	2.02** (1.36-3.01)	1.48 (0.97-2.26)	1.43 (0.92-2.24)	1.28 (0.79-2.06)	1.00 (ref)
Iraq	1.73*** (1.36-2.20)	1.58** (1.19-2.10)	1.56*** (1.23-1.98)	1.26* (1.02-1.57)	1.00 (ref)
Georgia	1.12 (0.66-1.88)	1.13 (0.67-1.88)	0.93 (0.53-1.64)	0.83 (0.46-1.49)	1.00 (ref)
Kosovo	2.11** (1.35-3.31)	1.68 (0.98-2.86)	1.47 (0.85-2.49)	0.93 (0.46-1.85)	1.00 (ref)
Tonga	1.74* (1.03-2.94)	1.41 (0.73-2.73)	1.21 (0.61-2.38)	0.93 (0.50-1.74)	1.00 (ref)
Palestine	1.31* (1.01-1.68)	1.09 (0.83-1.42)	1.05 (0.83-1.34)	1.29* (1.02-1.63)	1.00 (ref)
Samoa	1.28 (0.94-1.74)	1.30 (0.97-1.73)	1.34* (1.02-1.77)	1.14 (0.87-1.50)	1.00 (ref)
Algeria	1.37*** (1.16-1.61)	1.37*** (1.18-1.58)	1.43*** (1.25-1.64)	1.19* (1.04-1.37)	1.00 (ref)
Mongolia	1.51 (0.89-2.55)	1.41 (0.81-2.45)	1.39 (0.80-2.43)	1.63 (0.89-2.98)	1.00 (ref)
Tunisia	1.63*** (1.35-1.98)	1.62*** (1.34-1.96)	1.45*** (1.19-1.77)	1.29* (1.05-1.58)	1.00 (ref)
Kiribati	1.07 (0.81-1.42)	1.13 (0.85-1.49)	1.13 (0.84-1.53)	1.07 (0.83-1.39)	1.00 (ref)
Honduras	1.07 (0.89-1.29)	1.06 (0.88-1.29)	1.13 (0.93-1.37)	1.25* (1.04-1.51)	1.00 (ref)
Lao PDR	4.21*** (2.08-8.51)	2.56* (1.21-5.38)	1.53 (0.64-3.62)	1.34 (0.57-3.11)	1.00 (ref)
Ghana	1.26* (1.02-1.55)	1.32** (1.09-1.61)	1.39** (1.14-1.69)	1.39** (1.13-1.71)	1.00 (ref)
Sao Tome & Principe	2.20*** (1.62-2.98)	1.50* (1.06-2.11)	1.52* (1.04-2.22)	1.42 (0.97-2.98)	1.00 (ref)
Zimbabwe	2.02*** (1.53-2.66)	1.82*** (1.37-2.43)	1.28 (0.94-1.74)	1.29 (0.95-1.76)	1.00 (ref)
Bangladesh	1.53*** (1.33-1.75)	1.41*** (1.22-1.63)	1.29*** (1.12-1.49)	1.12 (0.97-1.31)	1.00 (ref)

Lesotho	0.95 (0.69-1.32)	1.00 (0.72-1.41)	1.04 (0.73-1.48)	1.11 (0.79-1.55)	1.00 (ref)
Kyrgyz Republic	1.49 (0.95-2.33)	1.30 (0.83-2.03)	1.33 (0.86-2.06)	1.15 (0.75-1.77)	1.00 (ref)
Nepal	1.13 (0.88-1.44)	1.18 (0.91-1.52)	1.32* (1.03-1.70)	0.90 (0.67-1.20)	1.00 (ref)
Guinea-Bissau	1.11 (0.84-1.46)	1.00 (0.75-1.35)	1.21 (0.91-1.61)	1.19 (0.91-1.55)	1.00 (ref)
The Gambia	1.37* (1.00-1.87)	1.18 (0.85-1.64)	1.13 (0.79-1.60)	0.90 (0.62-1.31)	1.00 (ref)
Chad	1.04 (0.91-1.18)	1.03 (0.92-1.16)	0.98 (0.86-1.12)	0.97 (0.86-1.11)	1.00 (ref)
Togo	0.93 (0.74-1.18)	1.05 (0.84-1.32)	1.10 (0.87-1.37)	1.09 (0.86-1.38)	1.00 (ref)
Madagascar	0.94 (0.77-1.14)	0.91 (0.75-1.11)	0.99 (0.84-1.21)	1.05 (0.85-1.28)	1.00 (ref)
DR Congo	1.32 (0.97-1.79)	1.06 (0.81-1.40)	0.94 (0.70-1.27)	0.87 (0.66-1.14)	1.00 (ref)
Sierra Leone	1.25** (1.08-1.44)	1.25** (1.08-1.45)	1.31** (1.12-1.53)	1.24** (1.06-1.46)	1.00 (ref)
Central African Republic	1.35*** (1.14-1.59)	1.30** (1.11-1.53)	1.32** (1.12-1.55)	1.34*** (1.15-1.56)	1.00 (ref)
Malawi	1.69*** (1.39-2.07)	1.55*** (1.29-1.87)	1.61*** (1.34-1.94)	1.41*** (1.17-1.70)	1.00 (ref)
Note: * p<0.05, ** p<0.01, *** p<0.001					

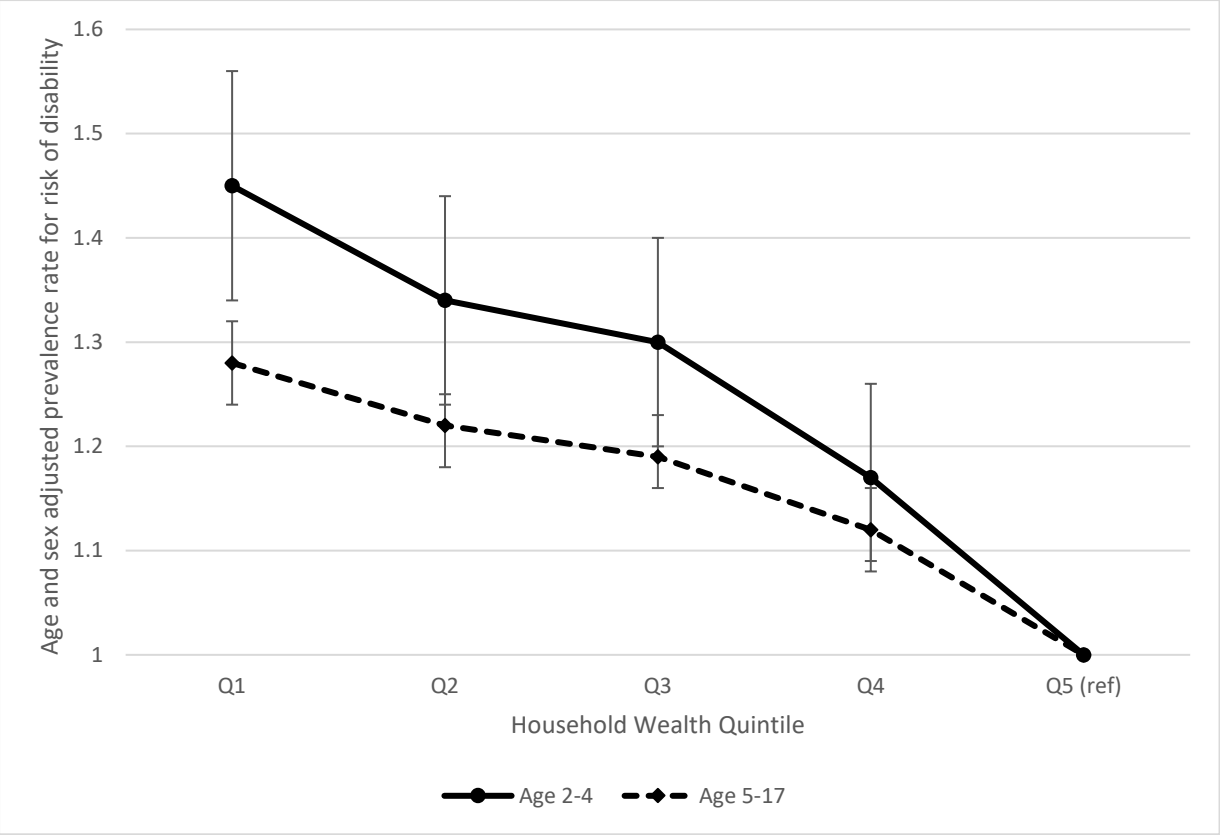

Figure 1: Age and sex adjusted prevalence rate for risk of disability for the two disability modules by household wealth quintiles.

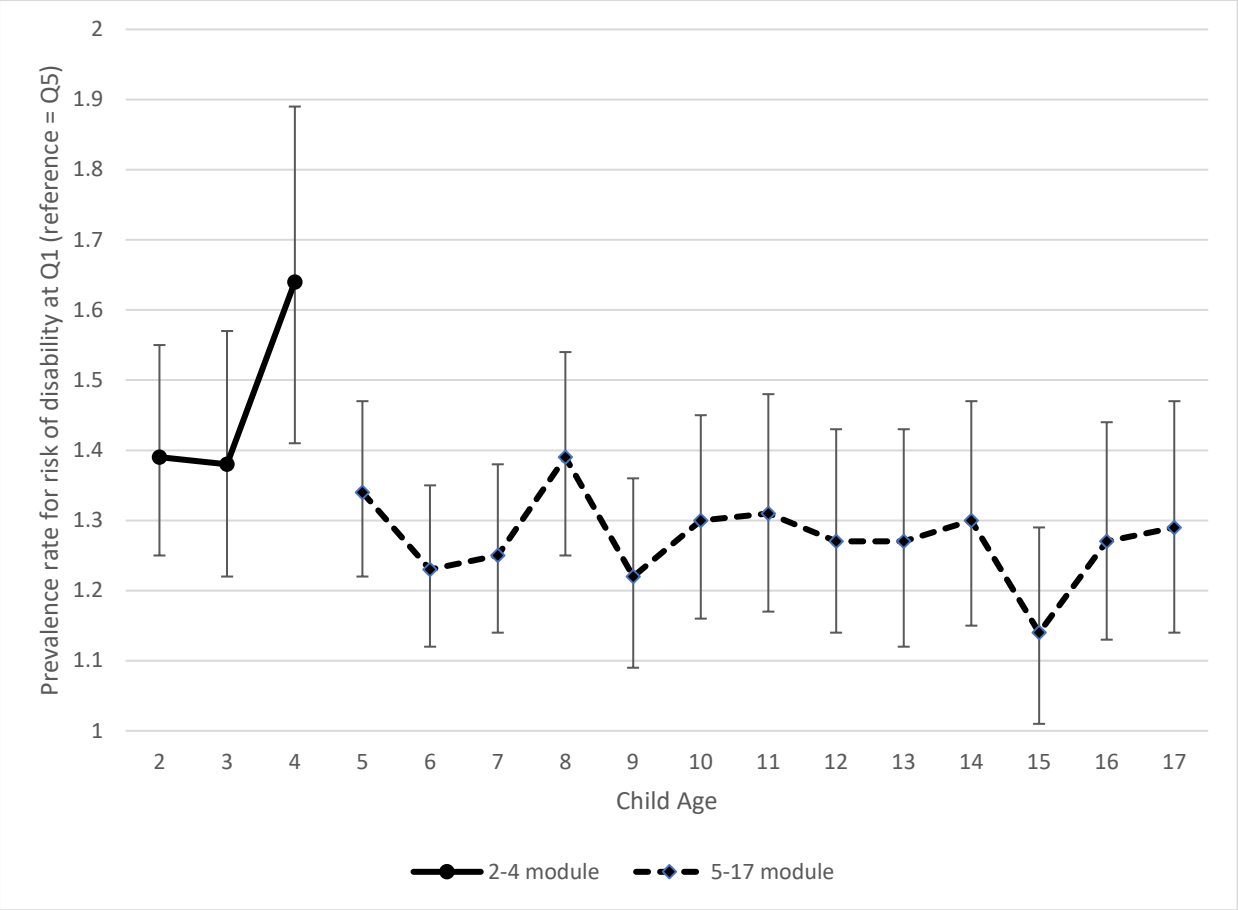

Figure 2: Age and sex adjusted prevalence rate for risk of disability at the poorest household wealth quintile by age (reference = wealthiest household quintile)