



Public Health
England

Protecting and improving the nation's health

The determinants of health inequities experienced by children with learning disabilities

About Public Health England

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1. Executive summary

1.1. Background

Learning disability refers to a significant general impairment in intellectual functioning that is acquired during childhood.

Approximately one in 50 people in England have learning disabilities.

People with learning

disabilities have significantly poorer health and increased age-

adjusted mortality than their non-disabled peers. It is clear that this difference in health status is, to an extent, preventable and unjust. As such, it represents an example of health inequity.

'The foundations for virtually every aspect of human development – physical, intellectual and emotional – are laid in early childhood. What happens during these early years, starting in the womb, has lifelong effects on many aspects of health and wellbeing.'

The Marmot Review, *Fair Society, Healthy Lives*¹

The primary aim of this report is to summarise current scientific knowledge about the determinants of health inequities experienced by children with learning disabilities in the UK.

It is important to keep in mind that this report focuses on the determinants of health inequities experienced by children with learning disabilities; a difference in health status that is avoidable, unfair and unjust. As such, we will not be addressing determinants of differences in health status associated with learning disabilities that are (at present) unavoidable (eg, health risks associated with specific syndromes associated with learning disabilities).

1.2. The determinants of inequities in child health

There are extensive literatures on the nature and determinants of health inequities experienced by children globally and, more specifically, within high income countries. Most approaches to synthesising this body of knowledge focus on the extent to which **social stratification** leads to: (1) differential rates of **exposure** to material and psychosocial hazards that are detrimental to wellbeing; and (2) differential **vulnerability or resilience** to the impact of such exposures on health and subsequent wellbeing. We use this simple framework to structure this report.

'Health inequities arise from the societal conditions in which people are born, grow, live, work and age, referred to as social determinants of health. These include early years' experiences, education, economic status, employment and decent work, housing and environment, and effective systems of preventing and treating ill health.'

Preamble to the *Rio Political Declaration on Social Determinants of Health*, adopted by UN Member States in October 2011²

1.3. Socio-economic position and health

All societies are hierarchically structured in relation to access to wealth, power and status. These hierarchies result from the interaction between the impact of powerful social institutions (such as the labour market, education and legal systems) in stratifying the social order and people's active involvement in recreating and maintaining the social hierarchy through cultural and social practices. Socioeconomic position (SEP) refers to the position occupied in a social hierarchy by an individual or family.

There is extensive evidence from research undertaken in the UK and elsewhere that children with learning disabilities are significantly more likely than their non-disabled peers to be living in households characterised by low SEP and poverty. They are also more likely to be exposed to recurrent poverty and to become poor and less likely to escape from poverty. Our analysis of data from the first five waves of the UK's Millennium Cohort Study indicated that the majority of UK children without learning disabilities had not been exposed to income poverty at any wave of data collection. In contrast, the majority of children with learning disabilities had been exposed to income poverty at three or more waves of data collection.

The existing literature and new analyses presented in this report indicate that exposure of children with learning disabilities to low family SEP is associated with poorer child mental health and increased engagement with more risky health behaviours (eg, sedentary lifestyle, poorer diet, substance use). These associations are, of course, also evident among children who do not have learning disabilities.

1.4. Differential exposure to specific material and psychosocial hazards

The association between family SEP and the health of children is, in part, attributable to the association between low family SEP and the increased risk of children being exposed to a wide range of material and psychosocial hazards that are detrimental to their health. These hazards include, but are not limited to: inadequate nutrition; poor housing conditions; environmental toxins; family, peer and community violence; poor parenting; and family instability. While none of these hazards are unique to low SEP families, the risk of exposure to all of them is socially patterned, with risk increasing at lower levels of SEP.

The existing evidence and new analyses presented in this report suggests that, when compared with their non-disabled peers, children with learning disabilities are:

- less likely to have been breastfed at all or breastfed exclusively
- more likely to live in rented housing, overcrowded housing, housing in a poor state of repair and housing that was too cold in winter
- more likely to be exposed to tobacco smoke
- at increased risk of exposure to violence, including bullying, physical, sexual, emotional abuse or neglect
- less likely to have a close relationship with their mother
- more likely to be exposed to inconsistent and harsh parenting and more chaotic family environments
- more likely to be exposed to a greater number and wider range of potentially adverse life events

1.5. Differential vulnerability and resilience

The association between family SEP and the health of children is also, in part, attributable to the association between low family SEP and increased vulnerability (or decreased resilience) to the effects of exposure.

‘Resilience is not an innate feature of some people’s personalities. Resilience and adversity are distributed unequally across the population, and are related to broader socioeconomic inequities which have common causes – the inequities in power, money and resources that shape the conditions in which people live and their opportunities, experiences and relationships. Those who face the most adversity are least likely to have the resources necessary to build resilience.

Local action on health inequities: Building children and young people’s resilience in schools, Public Health England³

Few studies have investigated the resilience of children with learning disabilities. They are, however, defined in terms of their impaired intellectual ability, an impairment which is associated with resilient capabilities such as executive functioning, self-regulation and problem solving. As such, they are less likely to be resilient than their non-disabled peers when exposed to adversity.

The available evidence and new analyses presented in this report also suggests that, when compared with their non-disabled peers, children with learning disabilities may be:

- more likely to have few friends, smaller social networks and receive less social support
- less likely to live in families that have access to such resources as wealth and power and positive parenting
- less likely to access timely, effective and appropriate healthcare including health prevention and promotion activities

1.6. Conclusions and Recommendations

Children with learning disabilities in England are at increased risk of exposure to all of the major categories of social determinants of poorer physical and mental health.

They are:

- more likely to live in households characterised by low socio-economic position and poverty; they are also more likely to be exposed to recurrent poverty and to become poor; they are less likely to escape from poverty
- more likely to be exposed to a wide range of material and psychosocial hazards that are detrimental to their health, including inadequate nutrition, poor housing conditions, exposure to environmental toxins, family, peer and community violence, poor parenting and family instability - this increased risk of exposure is likely to result from the combined effects of the link between child learning disability and poverty and systemic and overt discrimination faced by people with learning disabilities in England
- less likely to have access to the resources necessary to build resilience in the face of adversity

Addressing the health inequities faced by children with learning disabilities in England will require action at each of these three levels:

- **reducing child poverty:** as we noted above, most 11-year-old non-disabled children growing up in the UK today had not been exposed to income poverty at any of the five points of data collection. In contrast, the majority of children with learning disabilities had been exposed to income poverty at three or more points in time. Reducing the rates of child poverty in England remains a key public health priority. All national policies that seek to reduce the rates of child poverty should be carefully audited to ensure that they are sensitive to the needs of families bringing up a child with learning disabilities. Local Health and Wellbeing Boards should identify children with learning disabilities in their Joint Strategic Needs Assessment (JSNA) as an important 'at risk' or 'vulnerable' group for poorer health outcomes and develop local strategies for reducing their poverty rate.

- **reducing exposure to specific hazards:** the increased risk of exposure to specific hazards is likely to result from the combined effects of the link between child learning disability and poverty and disability discrimination:
 - consideration should be given (nationally and locally) to developing new and strengthening existing discrimination (or stigma) reduction programmes aimed at reducing systemic and overt discrimination faced by children with learning disabilities (eg, SEN specific anti-bullying programmes in schools, national and local attitude change programmes)
 - local Health and Wellbeing Boards should identify children with learning disabilities as an important ‘at risk’ or ‘vulnerable’ group for poorer health outcomes and carefully scrutinise local child protection and public health activities to ensure that they are sensitive to the needs of families bringing up a child with learning disabilities
- **building resilience:** local action on health inequities: building children and young people’s resilience in schools³ sets out a programme for building the resilience of children. Local Health and Wellbeing Boards should in their JSNA ensure that children with learning disabilities are identified as priority groups for specific resilience-building initiatives (eg, specific early intervention services) and that all general local initiatives (eg, parent training and support interventions) are inclusive of children with learning disabilities. Local health services need to ensure that they fulfil their responsibilities under the 2010 Equality Act to make reasonable adjustments to all health-related activities to ensure that they are inclusive of children with learning disabilities. The replacement of Statements of Special Educational Needs (SEN) with Education, Health and Care Plans also provides an opportunity at an individual level to identify resilience building opportunities for children with learning disabilities.

2. Background

‘The foundations for virtually every aspect of human development – physical, intellectual and emotional – are laid in early childhood. What happens during these early years, starting in the womb, has lifelong effects on many aspects of health and wellbeing.’

The Marmot Review, *Fair Society, Healthy Lives*¹

Learning disability refers to a significant general impairment in intellectual functioning that is acquired during childhood.⁴⁵ Approximately one in 50 people in England have learning disabilities.⁶ People with learning disabilities have significantly poorer health and increased age-adjusted mortality than their non-disabled peers.⁷⁻⁹ It is clear that this difference in health status is, to an extent, preventable and unjust.⁷⁻¹³ As such, it represents an example of health inequity.

The WHO glossary of terms (www.who.int/hia/about/glos/en/index1.html) explains the distinction between health inequalities and health inequity as follows: ‘Some health inequalities are attributable to biological variations or free choice and others are attributable to the external environment and conditions mainly outside the control of the individuals concerned. In the first case it may be impossible or ethically or ideologically unacceptable to change the health determinants and so the health inequalities are unavoidable. In the second, the uneven distribution may be unnecessary and avoidable as well as unjust and unfair, so that the resulting health inequalities also lead to inequity in health’

Current knowledge suggests that while action to address health inequities needs to take place across the life course, intervening during childhood may bring particular benefits.¹⁴⁻¹⁸ The aim of this report, therefore, is to summarise current knowledge about the determinants of health inequities experienced by children with learning disabilities in the UK and recommend key actions to address these inequities.

To do this we will draw on four sources of evidence:

- research reports and policy documents that summarise what is known about the determinants of health inequities among children in general - knowledge from this source will be used to structure the report
- research reports and policy documents that provide information on the extent to which children with learning disabilities in the UK are exposed to these determinants of health inequities
- research reports and policy documents that provide information on the impact of exposure to key determinants of health inequities on the wellbeing of children with learning disabilities

- new analyses of data contained in the first five waves of the UK's Millennium Cohort Study (MCS). Appendix 1 contains information on the MCS and our analytic methods

In reporting the results of research we have prioritised research studies that have been undertaken in the UK and which employ a sampling strategy that allows generalisation to the English, British or UK population. We have clearly specified when research studies have been undertaken in other countries or have employed less robust sampling strategies.

It is important to keep in mind that this report focuses on the determinants of health inequities experienced by children with learning disabilities; a difference in health status that is avoidable, unfair and unjust. As such, we will not be addressing determinants of differences in health status associated with learning disabilities that are (at present) unavoidable or determinants of inequity that relate specifically to adults with learning disabilities (eg, exclusion from the workforce, poor transition between child and adult health care provision).

For example, people with moderate to profound learning disabilities are more likely than the general population to die from congenital abnormalities.¹⁹ A number of syndromes associated with learning disabilities are also associated with some specific health risks.²⁰⁻³¹ For example:

- congenital heart disease is more prevalent among people with Down's syndrome and Williams syndrome
- early onset dementia and immune system disorders are more common in people with Down's syndrome³¹
- hypothalamic disorders are more prevalent among people with Prader-Willi syndrome
- mental health problems and challenging behaviours are more prevalent among people with autism spectrum disorders and a range of specific syndromes
- obesity is more prevalent among people with Prader-Willi syndrome, Cohen syndrome, Down's syndrome and Bardet-Biedl syndrome
- sleep problems are more prevalent among children with Williams Syndrome and Down's Syndrome^{32 33}

The increased health risks associated with specific syndromes cannot, at present, be prevented. As such, they cannot in themselves be considered as determinants of health inequity, however, given that many of these health conditions are treatable, inequity would arise if healthcare systems were less likely to identify and/or treat these health conditions among children with learning disabilities. For example, surgical interventions for congenital heart abnormalities have in some contexts been denied to children with Down's syndrome due to beliefs about the value or the quality of life of living with Down's syndrome.^{34 35} In such a scenario resulting increases in infant and child mortality rates of children with Down's syndrome would constitute a clear example of health inequity.

Similarly, most people with learning disabilities have reduced health literacy, finding it more difficult than others to understand such issues as what it means to be healthy, have a healthy diet, the dangers of substance misuse and the benefits of exercise.³⁶⁻³⁹ Whether this reduced health literacy should be considered a determinant of health inequity would depend on the extent to which (as required under the 2010 Equality Act) 'reasonable adjustments' had been made in educational and health services to provide health promotion information in ways that take account of the cognitive difficulties associated with learning disabilities. We will return to these issues in the following sections.

3. The determinants of inequities in child health

‘Health inequities arise from the societal conditions in which people are born, grow, live, work and age, referred to as social determinants of health. These include early years’ experiences, education, economic status, employment and decent work, housing and environment, and effective systems of preventing and treating ill health.’

Preamble to the *Rio Political Declaration on Social Determinants of Health*, adopted by UN Member States in October 2011²

There are extensive (and at times disparate) literatures on the nature and determinants of health inequities experienced by children globally and, more specifically, within high income countries.^{1 14-18 40-70} Most approaches to synthesising this body of knowledge focus on the extent to which **social stratification** leads to: (1) differential rates of **exposure** to material and psychosocial hazards that are detrimental to wellbeing; and (2) differential **vulnerability or resilience** to the impact of such exposures on health and subsequent wellbeing.^{51 69-74} We will use this simple framework to structure this report.

3.1. Social stratification and socio-economic position

All societies are hierarchically structured in relation to access to wealth, power and status. These hierarchies result from the interaction between the impact of powerful social institutions (such as the labour market, education and legal systems) in stratifying the social order and people’s active involvement in recreating and maintaining the social hierarchy through cultural and social practices.⁵¹ Socioeconomic position (SEP) refers to the position occupied in a social hierarchy by an individual or family. There exists a very extensive literature documenting the association between family SEP and the health of children.^{1 14 15 18 51 57 58 65 67 69 75}

3.2. Differential exposure

The association between family SEP and the health of children appears to be, in part, attributable to the association between low family SEP and the increased risk of children being exposed to a wide range of material and psychosocial hazards that are detrimental to their health. These hazards include, but are not limited to: inadequate nutrition; poor housing conditions; environmental toxins; family, peer and community violence; poor parenting; and family instability.^{40-42 44-47 49-51 53-55 59-62 64 67-69} While none of these hazards are unique to low SEP families, the risk of exposure to all of them is socially patterned, with risk increasing at lower levels of SEP.

3.3. Differential vulnerability and resilience

The association between family SEP and the health of children also appears to be, in part, attributable to the association between low family SEP and increased vulnerability (or decreased resilience) to the effects of exposure. The terms vulnerability and resilience are often misused to refer solely to the attributes and characteristics of individuals (eg, personality or temperament) that may make them more or less susceptible to the impact of exposure to material or psychosocial hazards. However, a contemporary approach to the study of resilience also includes consideration of a wide range of environmental protective factors that make children less susceptible to the impact of such exposures.³
⁷⁶⁻⁸¹ These include access to such resources as wealth, social connections and timely access to appropriate health and welfare services.^{3 76-78 80-87}

4. Socio-economic position and children with learning disabilities

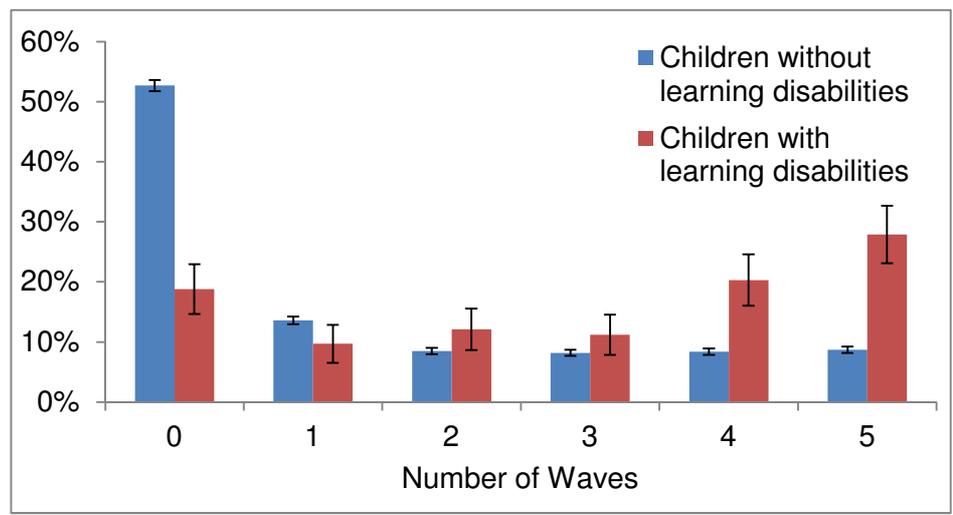
4.1. The association between SEP and learning disabilities

Disabled children in England (and other high income economies) are significantly more likely than their peers to live in low SEP households that are characterised by poverty and material hardship.⁸⁸⁻⁹⁵ The association between low SEP and child disability is particularly strong for children with learning disabilities, especially children with less severe learning disabilities,⁹⁵⁻¹⁰⁸ and is evident from an early age.^{95 109 110} For example, a recent systematic review of the association between SEP and the prevalence of learning disabilities reported pooled estimates of 6.8 (6.3,7.4) for mild learning disabilities and 2.2 (1.9,2.4) for moderate/severe learning disabilities.¹¹¹

In addition to children with learning disabilities being at greater risk of poverty at any particular point in time, they are also, in common with disabled children more generally:¹¹²

- more likely over time to become poor, remain poor and experience longer spells of poverty
- less likely over time to escape from poverty¹¹³

Figure 1 presents the results of new analyses of the association between learning disabilities and exposure to income poverty (a key indicator of SEP) over time using data contained in the first five waves of the UK’s Millennium Cohort Study (MCS). Appendix 1 contains information on the MCS and our analytic methods. Specifically, Figure 1 presents information on the number of waves in which children with and



without learning disabilities were exposed to income poverty. Analyses were restricted to children participating in all five waves of data collection.

The majority (53%) of children without learning disabilities were not exposed to income poverty at any wave of data collection. The

Figure 1: Percentage (with 95% CI) of children with and without learning disabilities exposed to income poverty across five waves of data collection

majority (59%) of children with learning disabilities were exposed to income poverty at three or more waves of data collection.

Figures 2 and 3 present the results of new analyses of the association between learning disabilities and poverty transitions between the first five waves of MCS.

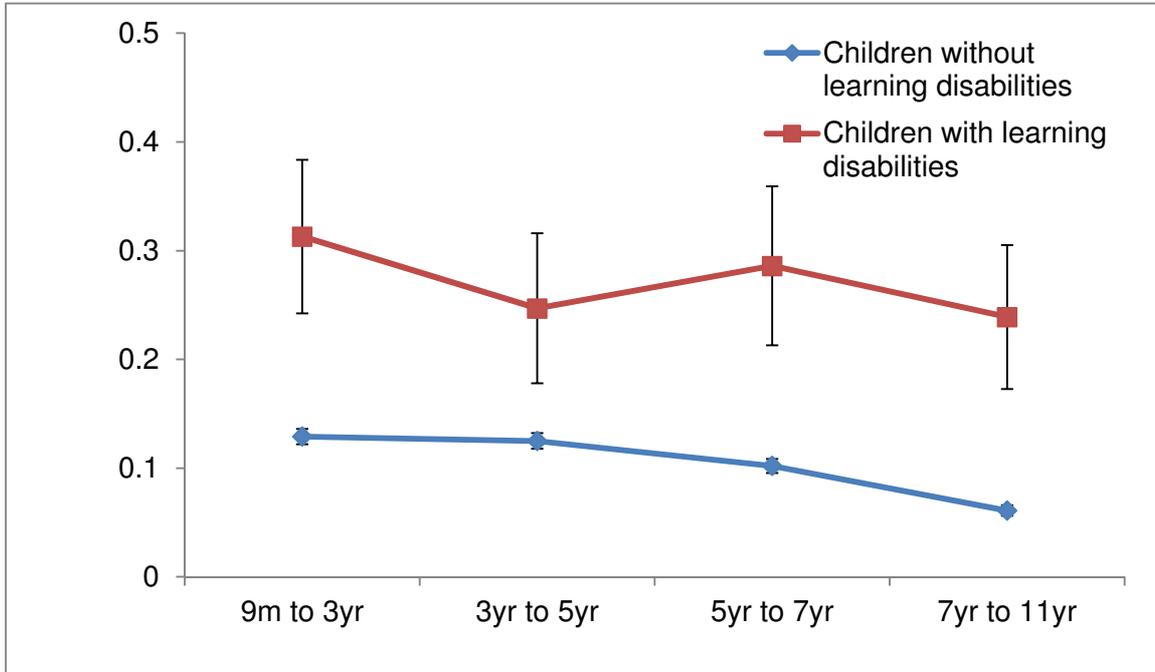


Figure 2: Probability (with 95% CI) of children transitioning into income poverty (becoming poor) between successive waves of MCS

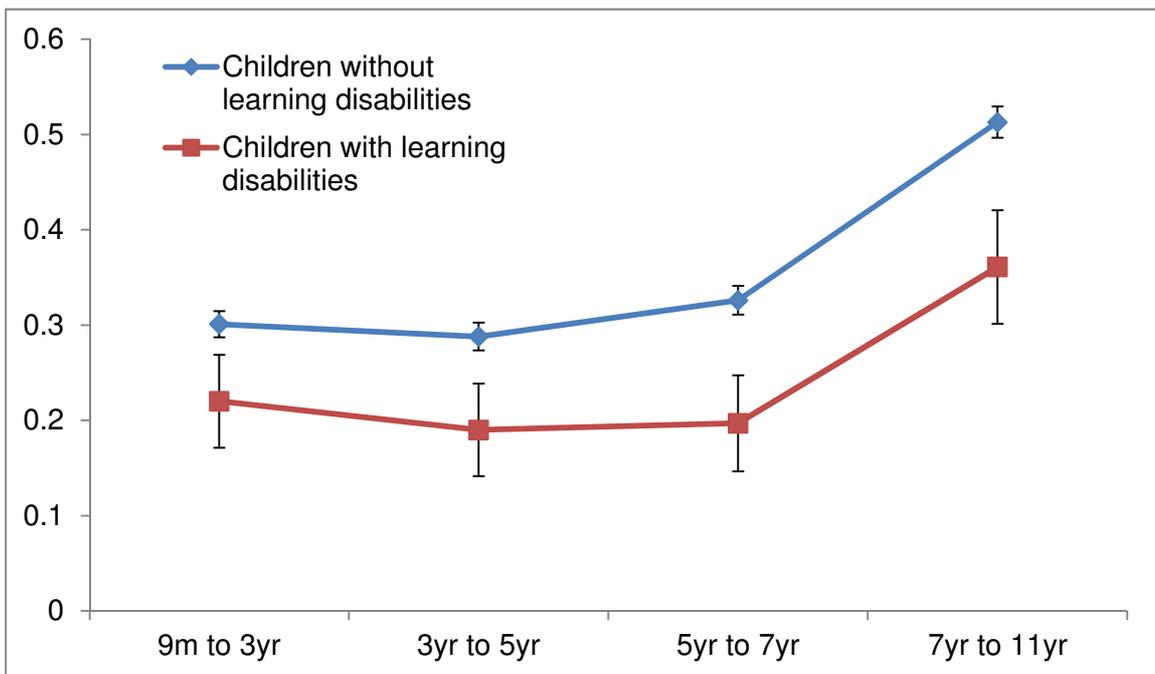


Figure 3: Probability (with 95% CI) of children transitioning out of income poverty (escaping from poverty) between successive waves of MCS

At every transition point children with learning disabilities were significantly ($p < 0.01$) more likely than their peers to become poor and significantly ($p < 0.01$) less likely than their peers to escape from poverty.

4.2. The association between SEP and health among children with learning disabilities

As noted above, there exists an extensive literature documenting the association between family SEP and the health of children generally.^{1 14 15 18 51 57 58 65 67 69} However, few studies have examined the association between family SEP and the health of children with learning disabilities.⁷ Key findings from those studies that have addressed this issue are summarised below.

4.2.1. Physical Health

- analysis of data from Waves 1 to 3 of the MCS indicated no statistically significant relationship between exposure to material hardship or indicators of area level deprivation and risk of obesity at age five. These relationships were significant among children without learning disabilities¹¹⁴
- analysis of data from the *Longitudinal Study of Australian Children* indicated that exposure to income poverty at ages four/five and six/seven were associated with increased risk of obesity at age six/seven - these associations were stronger for children with learning disabilities than other children¹¹⁵

4.2.2. Mental Health

- analysis of the 1999 and 2004 Office for National Statistics (ONS) child and adolescent mental health surveys revealed a cross-sectional dose-dependent relationship between breadth of exposure to indicators of low SEP and the risk of conduct disorders, emotional disorders and ADHD among British children with learning disabilities - for all three disorders the strength of the relationship between exposure and risk was stronger among children with learning disabilities than among other children¹¹⁶
- analysis of the 1999 ONS child and adolescent mental health survey revealed cross-sectional associations between: (1) lower social class and increased rates of conduct disorder and hyperkinesis among children with learning disabilities; and (2) living in lower-income households and increased rates of any diagnosed disorder, emotional disorder, depression and conduct disorder among children with learning disabilities¹¹⁷
- analysis of data from Waves 1 to 4 of the MCS indicated a dose-dependent relationship between breadth of exposure to indicators of low SEP at ages nine months and three years and (1) the risk of conduct difficulties at age three and (2) the persistence of conduct difficulties from age three to ages five and seven. In both

- cases the strength of the relationship between exposure and risk was stronger among children with learning disabilities than among other children¹¹⁸
- analysis of health visitor records in three areas of SW England indicated a significant relationship between low SEP and increased risk of behaviour problems in young children with learning disabilities⁹⁵
 - analysis of data from Waves 1 to 3 of the MCS and the *Longitudinal Study of Australian Children* indicated a cross-sectional dose-dependent relationship between exposure to adverse socio-economic circumstances and risk of mental health problems at age three among UK and Australian children with learning disabilities, however, only the association for UK children was statistically significant - for all comparisons the strength of the associations between exposure and risk was weaker for children with learning disabilities than for other children¹¹⁰
 - analysis of data from the *Longitudinal Study of Australian Children* indicated a dose-dependent relationship between exposure to SEP related adversity at age four/five and the risk of conduct difficulties at that age and the persistence of conduct difficulties to ages six/seven and eight/nine among children with borderline learning disabilities. For prevalence at age four/five the strength of the association between exposure and risk was stronger for children with learning disabilities than for other children¹¹⁹
 - a number of smaller scale studies, often relying on administratively defined convenience samples, have also reported an association between exposure to general indicators of low SEP and poorer mental health among children with learning disabilities¹²⁰⁻¹²²

4.2.3. Health behaviours

- analysis of data from the 1999 ONS survey *The Mental Health of Children and Adolescents in Great Britain* indicated that the odds of 11 to 15 year old children with learning disability being current smokers was 5.2 times greater if they lived in poverty¹²³

4.2.4. Additional analyses using MCS data

Given the paucity of research in this area we have undertaken additional analyses of data collected in Waves 1- to of the MCS to address the question, is there a significant relationship among children with learning disability between exposure to indicators of low SEP and health outcomes? The analyses (presented in Table 1) show the strength of association at age 11 (Wave 5) between 13 indicators of child general/physical health status, six indicators of mental health status, eight indicators of health behaviours and two indicators of low family SEP (exposure in two or more waves of data collection to income poverty, exposure in two or more waves of data collection to material hardship). Unless stated all indicators are based on parental report.

Table 1: The strength of association (odds ratio with 95% CI) between exposure to income poverty and hardship in two or more waves of data collection and indicators of child health at age 11: children with learning disabilities

Indicator	Income poverty in two or more waves	Hardship in two or more waves
General/physical health status		
General health status 'fair' or 'poor'	0.78 (0.40-1.54)	0.71 (0.36-1.40)
Problem with vision (ever)	0.88 (0.54-1.43)	0.84 (0.53-1.36)
Problem with hearing (ever)	0.67 (0.36-1.29)	1.29 (0.66-2.53)
Wheezing (ever)	0.86 (0.50-1.46)	0.89 (0.53-1.49)
Asthma (ever)	2.19* (1.14-3.95)	1.33 (0.77-2.30)
Eczema (ever)	0.91 (0.54-1.52)	0.79 (0.48-1.30)
Hayfever (ever)	0.73 (0.42-1.27)	0.99 (0.57-1.73)
Measles (ever)	1.26 (0.44-3.60)	1.09 (0.40-3.00)
Chickenpox (ever)	0.46 (0.21-1.00)	0.17*** (0.07-0.46)
Overweight or obese (current, measured)	1.19 (0.72-1.97)	1.47 (0.89-2.41)
Obese (current, measured)	1.07 (0.51-2.25)	1.78 (0.77-4.10)
Discomfort/pain with teeth (current)	1.18 (0.66-2.08)	0.98 (0.57-1.69)
3+ accidents needing medical attention (ever)	1.77 (0.49-6.43)	1.55 (0.48-4.98)
Mental health status		
Conduct difficulties ^a (current)	2.46** (1.46-4.13)	1.79* (1.11-2.90)
Emotional difficulties ^a (current)	1.26 (0.76-2.09)	1.42 (0.87-2.32)
Peer problems ^a (current)	1.32 (0.81-2.17)	1.31 (0.82-2.11)
Hyperactivity ^a (current)	1.01 (0.62-1.67)	0.79 (0.49-1.28)
Low pro-social behaviour ^a (current)	1.73 (0.72-4.15)	1.08 (0.49-2.34)
Total problems ^a (current)	1.28 (0.78-2.11)	1.68* (1.04-2.72)

Table 1: The strength of association (odds ratio with 95% CI) between exposure to income poverty and hardship in two or more waves of data collection and indicators of child health at age 11: children with learning disabilities		
Indicator	Income poverty in two or more waves	Hardship in two or more waves
Health behaviours		
Cleans teeth less than twice daily	1.66 (0.99-2.77)	1.39 (0.86-2.26)
Does not eat breakfast every day	2.32* (1.18-4.57)	4.31*** (2.11-8.81)
Has sweetened drinks once or more a day	1.50 (0.84-2.69)	1.08 (0.64-1.85)
Does not eat fruit every day	3.07* (1.16-8.13)	1.11 (0.53-2.31)
Never participates in sport	1.76* (1.06-2.93)	1.28 (0.80-2.06)
Never cycles	2.05** (1.20-3.49)	2.36*** (1.39-3.99)
Has tried cigarettes	6.13** (1.42-26.37)	8.55** (1.98-36.84)
Has had an alcoholic drink	2.37* (1.06-5.33)	1.59 (0.79-3.19)
Notes: * p<.05, ** p<0.01, *** p<0.001		
a measured by parent report SDQ ¹²⁴⁻¹²⁶		
Bold text indicates an odds ratio equivalent to a moderate or greater effect size ¹²⁷		

Exposure to income poverty on two or more occasions was associated with greater risk of poor health for six (46%) of the 13 indicators of child general/physical health, all six (100%) indicators of mental health status and all eight (100%) indicators of more risky health behaviours. Of the nine associations indicative of a moderate or greater effect size or that reached the level of statistical significance, eight (89%) indicated that exposure to poverty was associated with poorer health. With regard to the one exception, a significant inverse gradient between income poverty and the lifetime prevalence of chickenpox was also observed among children without learning disabilities (OR = 0.49, 0.43-0.56, p<0.001).

Exposure to hardship on two or more occasions was associated with greater risk of poor health for six (46%) of the 13 indicators of child general/physical health, five of the six (83%) indicators of mental health status and all eight (100%) indicators of more risky health behaviours. Of the six associations indicative of a moderate or greater effect size or that reached the level of statistical significance, five (83%) indicated that exposure to hardship was associated with poorer health. With regard to the one exception, a

significant inverse gradient between hardship and the lifetime prevalence of chickenpox was also observed among children without learning disabilities (OR = 0.59, 0.52-0.68, $p < 0.001$).

4.3. Summary

There is extensive evidence from research undertaken in the UK and elsewhere that children with learning disabilities are significantly more likely than their non-disabled peers to be living in households characterised by low SEP and poverty. They are also more likely to be exposed to recurrent poverty and to become poor and less likely to escape from poverty.

The existing literature and the new analyses presented above indicate that exposure of children with learning disabilities to low family SEP is associated with poorer child mental health and increased engagement with more risky health behaviours (eg, sedentary lifestyle, poorer diet, substance use). Similar patterns are, of course, evident among children who do not have learning disabilities.

With regard to other aspects of general and physical health, the evidence of an association among children with learning disabilities between exposure to low family SEP and poorer health is much less consistent. This may be due to a masking effect resulting from the association between family SEP and risk of child learning disabilities of different severity. As noted above, while low family SEP is associated with increased risk of learning disabilities in children, this is particularly the case for mild/moderate learning disabilities.^{98 107 108} As a result, children with more severe learning disabilities will be underrepresented in the population of children with learning disabilities living in low SEP families. For example, our analyses of data from the DfE 2011 Spring School Census indicate that the proportion of children with learning disabilities who have severe or profound disabilities rises from 16% in low SEP families (those eligible for free school meals) to 19% in higher SEP families. Given the association between increased severity of learning disabilities and poorer general and physical health,⁷ we would (all other things being equal) expect children with learning disabilities in higher SEP families to have poorer health. Unfortunately, we are not aware of any research on the association between family SEP and the health of children with learning disabilities that has taken differences in severity of learning disabilities into account.

5. Risk of exposure to specific material and psychosocial hazards

As noted in Section 3, the association between family SEP and the health of children appears to be, in part, attributable to the association between low family SEP and the increased risk of children being exposed to a wide range of specific material and psychosocial hazards that are detrimental to their health. These hazards include, but are not limited to: inadequate nutrition; poor housing conditions; environmental toxins; family, peer and community violence; poor parenting; and family instability.¹²⁸⁻¹³⁰ While none of these hazards are unique to low SEP families, the risk of exposure to all of them are socially patterned, with risk increasing at lower levels of SEP. In this section we will review evidence relating to the risk of children with learning disabilities being exposed to specific material and psychosocial hazards and the impact that this may have on their health.

5.1. Nutrition

- analysis of data from Waves 1 to 5 of the MCS has indicated that infants with learning disabilities were less likely than their peers to have been ever breastfed, breastfed exclusively or at all at three months or breastfed at all at six months¹³¹ - similar results have been reported in a US study¹³²

5.2. Housing conditions

- analysis of data from Wave 4 (2012) of the UK's *Families and Children Study* indicated that children with learning disabilities were significantly more likely than their peers to live in rented housing, overcrowded housing, housing in a poor state of repair and housing that was too cold in winter.¹³³ Similar results have been reported for disabled children in general.^{89 134-136}

5.3. Environmental toxins

There exists an extensive literature on the impact of exposure to environmental toxins and teratogens on the health and development of children, including the impact of exposure on cognitive development.^{137 138} We are not aware of any literature that has examined rates of exposure among children with and without learning disabilities beyond the limited literature that has investigated whether exposure to specific agents may cause learning disabilities,^{139 140} however, given the association between poverty and risk of exposure¹⁴¹ and the association between learning disabilities and poverty (see above), it is likely that children with learning disabilities are more likely to be exposed to a range of potentially harmful environmental risks.

5.4. Violence

- a recent systematic review has reported that disabled children, and especially children with learning disabilities, are at increased risk of exposure to violence,¹⁴² including physical, sexual, emotional abuse or neglect,¹⁴³⁻¹⁵⁰ for example, a population-based study undertaken in West Sussex indicated that children with learning disabilities, when compared with their non-disabled peers, were 3.9 times more likely to be registered for physical abuse, 8.0 times more likely to be registered for sexual abuse, 4.0 times more likely to be registered for emotional abuse and 5.9 times more likely to be registered for neglect¹⁵⁰
- analysis of data from the *Longitudinal Study of Young People in England* has indicated that adolescents with mild/moderate learning disabilities were significantly more likely than their non-disabled peers to be bullied,¹⁵¹ other UK and US-based studies have reported similar results¹⁵²⁻¹⁵⁴
- a small-scale study undertaken in Northern Ireland has reported that being bullied and being exposed to community violence was associated with higher rates of behavioural/emotional disorders among young people with learning disabilities¹²²

5.5. Parental wellbeing, parenting and family functioning

There exists an extensive literature on the associations between child health and parental, and especially maternal, wellbeing, parenting and family functioning.^{59 155-159} There also exists a relatively robust evidence base on parental wellbeing, parenting and family functioning in relation to children with learning disabilities:¹⁶⁰

- analysis of data from the MCS has indicated that: (1) mothers, and to a lesser extent, fathers of three and five year old children with learning disabilities were at significantly increased risk of mental health problems when compared to other parents;¹⁶¹ (2) mothers of three year old children with learning disabilities had a less close relationship and more conflict with their child when compared to other mothers and having a less close relationship and more conflict predicted concurrent and future child behaviour problems;¹⁶² (3) at nine months and three years of age mothers of children with learning disabilities showed significantly higher rates of inconsistent and harsh parenting than mothers of 'typically developing' children and that higher rates of inconsistent and harsh parenting were associated with increased rates of conduct difficulties among children with learning disabilities;¹¹⁸ and (4) children with learning disabilities were significantly less likely than other children to be living in households with both biological parents or in households where the mother was married, including at the time of the child's birth, and more likely than families with a typically developing child to experience changes in both family composition and marital status over the first five years of the child's life¹⁶³
- analysis of data from the 1999 ONS child and adolescent mental health survey indicated that among mothers of children with learning disabilities, mental health problems were associated with the child's difficulties having a greater social impact,

the child experiencing more than one potentially stressful life event, poverty, receipt of means-tested welfare benefits and 'unhealthy' family functioning¹⁶⁴

- analysis of data from the combined 1999 and 2004 ONS child and adolescent mental health surveys indicated that mothers of children with learning disabilities were at significantly increased risk of emotional problems when compared to other parents and that this risk was higher among children with learning disabilities with behaviour problems¹⁶⁵
- analysis of data from Wave 4 (2012) of the UK's *Families and Children Study* indicated that mothers of children with learning disabilities reported lower levels of happiness, self-esteem and self-efficacy than mothers of children without learning disabilities¹⁶⁶
- these results are consistent with those from the wider literature which indicates that children with learning disabilities are more likely than other children to be exposed to a wide range of indicators associated with low maternal, and to a lesser extent paternal, wellbeing, less positive parenting practices and family functioning¹⁶⁰

5.6. Life events

There exists an extensive literature on the association between exposure to general 'life events' or 'acute life stresses' (including those discussed above) and the wellbeing of children.¹⁶⁷ Very little of this research has focused on children with learning disabilities.¹⁶⁸

- analysis of the 1999 ONS child and adolescent mental health survey indicated that British children with learning disabilities were more likely to be exposed to a wider range of potentially adverse life events than their peers, and that exposure was related to poorer mental health, especially emotional disorders, among children with learning disabilities^{117 169}
- a small-scale study undertaken in Northern Ireland has reported that exposure to a wider range of potentially adverse life events was associated with higher rates of behavioural/emotional disorders among young people with learning disabilities¹²² - similar results have been reported in a US-based study¹⁷⁰

5.7. Additional analyses using MCS data

Given the limited research in this area we have undertaken additional analyses of data collected in Waves 1 to 5 of the MCS to address the question; are children with learning disabilities at increased risk of exposure to specific material and psychosocial hazards that are likely to be detrimental to their health? We extracted indicators from MCS data of exposure to poorer nutrition, poorer housing conditions, tobacco smoke, violence and less optimal family structure and functioning.

The analyses (presented in Table 2) show that children with learning disabilities in the UK were at greater risk of exposure to specific material and psychosocial hazards than their peers on 74 (99%) of the 75 comparisons made. The difference was statistically significant for 63 (84%) comparisons and indicative of a moderate or large effect size for 47 (63%). Among children with learning disabilities, exposure was greater among those living in income poverty for 68 (91%) of the comparisons.

Within the total sample, exposure to these specific material and psychosocial hazards was associated at age 11 with poorer child mental health, overall parent-rated child health, child obesity, frequency of having accidents requiring medical attention, and experimentation with smoking and alcohol use. We undertook some exploratory analyses (using multivariate logistic regression) within the sample of children with learning disabilities to identify unique associations between exposure to different categories of exposures and these health outcomes. The results are presented in Table 3. As can be seen, poorer health outcomes among children with learning disabilities were associated with exposure to tobacco smoke, poorer housing conditions, being bullied, feeling unsafe in the playground or local area, possible maternal mental health problems, more hostile parenting, low parental stimulation, more chaotic family environment and single parent family.

Table 2: The strength of association (odds ratio with 95% CI) between child learning disabilities and exposure to specific material and psychosocial hazards at ages nine months, three, five, seven and 11 years					
	Age nine months	Age three years	Age five years	Age seven years	Age 11 years
Nutrition					
Does not eat breakfast every day			2.40^{***} (1.75-3.28)	2.73^{***} (1.96-3.79)	1.52^{***} (1.21-1.92)
Does not eat fruit every day			2.20^{***} (1.45-3.35)	2.68^{***} (1.86-3.86)	2.26^{***} (1.73-2.94)
Eats crisps, biscuits, sweets between meals			1.18 (0.87-1.60)	1.45* (1.04-2.00)	
Has sweetened drinks between meals			1.17 (0.92-1.48)	1.47** (1.15-1.86)	
Has one or more sweetened drinks a day					1.82^{***} (1.47-2.25)
Housing					
Child's bedroom cold	1.15 (0.75-1.77)				
Problems with damp	1.22 (0.90-1.66)	2.53^{***} (1.82-3.51)	1.58* (1.09-2.28)	1.51* (1.06-2.15)	1.42* (1.09-1.85)
Homeless (ever)	2.87^{**} (1.32-6.24)	2.02* (1.14-3.57)	2.60^{***} (1.63-4.16)	2.26^{**} (1.38-3.70)	2.08^{***} (1.38-3.14)
Toxins					
Main informant smokes	2.01^{***} (1.62-2.76)	1.93^{***} (1.53-2.43)	2.12^{***} (1.69-2.66)	2.07^{***} (1.64-2.61)	1.93^{***} (1.60-2.32)
Someone smokes near child	2.11^{***} (1.62-2.76)	1.81 ^{***} (1.39-2.34)	1.75 ^{***} (1.33-2.31)	1.43* (1.05-1.94)	
Violence					
Bullied (informant report)		3.70^{***} (1.85-7.42)	2.23* (1.17-4.26)	2.21^{**} (1.34-3.66)	4.62^{***} (3.56-5.99)
Bullied (teacher-report)				1.31 (0.48-3.58)	4.65^{***} (2.90-7.45)
Bullied (self-report)				2.18^{***} (1.53-3.31)	4.13^{***} (3.24-5.25)
Feels unsafe in playground				1.34 (0.80-2.24)	
Feels unsafe in local area					1.90^{***} (1.47-2.45)
Domestic violence in household	2.56^{***} (1.56-4.20)	2.40^{**} (1.44-4.00)	1.43 (0.75-2.73)	1.50 (0.76-2.47)	2.65^{***} (1.69-4.16)
Child smacked if 'naughty'		0.99 (0.71-1.38)	1.80 ^{***} (1.33-2.45)	1.28 (0.84-1.94)	
Child shouted at daily if 'naughty'		1.89^{***} (1.42-2.50)	2.01^{***} (1.35-2.99)	1.59 (0.99-2.57)	
Parental Wellbeing, Parenting & Family Functioning					
Single parent	2.46^{***} (1.92-3.20)	2.17^{***} (1.68-2.80)	2.18^{***} (1.71-2.77)	2.10^{***} (1.66-2.66)	1.89^{***} (1.57-2.28)

Table 2: The strength of association (odds ratio with 95% CI) between child learning disabilities and exposure to specific material and psychosocial hazards at ages nine months, three, five, seven and 11 years

	Age nine months	Age three years	Age five years	Age seven years	Age 11 years
Maternal mental health	2.01 ^{***} (1.59-2.53)	2.32 ^{***} (1.69-3.17)	2.52 ^{***} (1.87-3.41)	2.69 ^{***} (2.00-3.63)	2.24 ^{***} (1.80-2.80)
Chaotic family environment ^a		1.83 ^{**} (1.28-2.61)	1.79 ^{***} (1.30-2.47)		
Low in-home stimulation ^b		1.09 (0.76-1.57)	1.62 ^{**} (1.19-2.22)	1.62 ^{**} (1.18-2.22)	
Low out of home stimulation ^c			4.76 ^{***} (3.75-6.04)	3.58 ^{***} (2.75-4.65)	
Irregular bedtimes		2.82 ^{***} (2.23-3.56)	2.61 ^{***} (1.97-3.46)	2.88 ^{***} (2.17-3.81)	1.76 ^{**} (1.38-2.24)
Irregular mealtimes		2.79 ^{***} (2.09-3.73)	3.11 ^{***} (2.29-4.32)		

Notes: * p<.05, ** p<0.01, *** p<0.001

Bold text indicates an odds ratio equivalent to a moderate or greater effect size¹²⁷

^a Lowest decile of sample distribution on three items (eg, you can't hear yourself think) drawn from the Confusion, Hubbub and Order Scale¹⁷¹

^b Lowest decile of sample distribution on list of parental involvement activities (eg, frequency of reading to child)

^c Lowest decile of sample distribution on list of activities (eg, been to theme park) participated in over the last twelve months

Table 3: Specific material and psychosocial hazards associated with poor health at age 11 among children with learning disabilities	
Health status	Variables uniquely associated (p<0.1, odds ratio with 95% confidence intervals)
Parent rated general health of child 'fair'/'poor'	Low parental stimulation (1.81, 0.93-3.51)
Mental Health Status	
Conduct difficulties ^a (current)	Bullied (1.86, 0.94-3.68) Tobacco smoke (1.85, 1.12-3.08)*
Emotional difficulties ^a (current)	Possible maternal mental health problem (3.17, 1.57-6.37)** Bullied (2.24, 1.36-4.04)** Feels unsafe in playground/area (2.11, 1.03-4.32)* More chaotic home (1.73, 0.99-3.00)
Peer problems ^{a,b} (current)	Hostile parenting (1.96, 1.07-3.58)* Possible maternal mental health problem (1.95, 1.15-3.29)* Low parental stimulation (1.86, 1.04-3.31)
Hyperactivity ^a (current)	Tobacco smoke (2.09, 1.30-3.36)** Bullied (1.77, 1.03-3.06)*
Low pro-social behaviour ^a (current)	No variables associated
Total problems ^{a,b} (current)	Possible maternal mental health problem (2.07, 1.24-3.46)** Feels unsafe in playground/area (1.86, 1.02-3.36)* Tobacco smoke (1.75, 1.05-2.91)* More chaotic home (1.64, 1.00-2.67)*
Child obesity (current, measured)	Single parent family (2.66, 1.43-4.96)** Poorer housing conditions (2.38, 1.22-4.63)*
Three or more accidents requiring medical attention (parent report, ever)	Tobacco smoke (5.23, 2.00-13.69)** Poorer housing conditions (2.52, 0.97-6.54)
Has tried cigarettes	Tobacco smoke (2.57, 1.27-5.20)** Poorer housing conditions

Table 3: Specific material and psychosocial hazards associated with poor health at age 11 among children with learning disabilities

	(2.50, 1.18-5.23)* More chaotic home (0.40, 0.14-1.12)
Has had an alcoholic drink	Hostile parenting (2.32, 1.16-4.63)* Single parent family (2.27, 1.25-3.97)**

Notes: * $p < .05$, ** $p < 0.01$, *** $p < 0.001$
Bold text indicates an odds ratio equivalent to a moderate or greater effect size¹²⁷
^a measured by parent report SDQ¹²⁴⁻¹²⁶
^b bullied not entered as candidate variable as being bullied is an item in the relevant SDQ sub-scale

5.8. Summary

Children with learning disabilities in England are at increased risk of being exposed to a wide range of specific material and psychosocial hazards that are detrimental to health. These include, but are not limited to: inadequate nutrition; poor housing conditions; environmental toxins; family, peer and community violence; poor parenting; and family instability. This increased risk of exposure is likely to result from the combined effects of the link between child learning disability and poverty and systemic and overt discrimination faced by people with learning disabilities in England.

6. Vulnerability and resilience

‘Resilience is not an innate feature of some people’s personalities. Resilience and adversity are distributed unequally across the population, and are related to broader socioeconomic inequities which have common causes – the inequities in power, money and resources that shape the conditions in which people live and their opportunities, experiences and relationships.

Those who face the most adversity are least likely to have the resources necessary to build resilience. This ‘double burden’ means that inequities in resilience are likely to contribute to health inequities.’

Local action on health inequities: Building children and young people’s resilience in schools, Public Health England³

Health inequities also arise due to the inequitable distribution of resources that promote resilience (or decrease vulnerability) in the face of exposure to low family SEP and associated material and psychosocial hazards. Historically, resilience was often used to refer solely to the attributes and characteristics of individuals (eg, temperament) that may make them more or less susceptible to the impact of exposure. A more contemporary approach, however, also includes consideration of a wide range of environmental protective factors that make children less susceptible to the impact of exposure.^{3 76-78 80-84 86 87 172 173} These include:

- individual capabilities such as intelligence, self-regulation and problem-solving skills
- individual characteristics such as faith, hope, spirituality (with associated beliefs that life has meaning), perceived efficacy, having a sense of control, having a sense of belonging
- positive relationships with caring adults, acquaintances and friends
- access to resources such as effective caregiving and parenting, teachers and schools, health and welfare services, social capital, wealth and power

Little research has been undertaken on the resilience of people, and especially children, with learning disabilities.¹⁷⁴⁻¹⁷⁶

6.1. Individual capabilities

- children with learning disabilities are defined in terms of their impaired intellectual ability,⁴ an impairment which is associated with difficulties in such areas as executive functioning, self-regulation and problem solving¹⁷⁷⁻¹⁷⁹ - as such, they are likely to be less resilient than their non-disabled peers when exposed to adversity

6.2. Individual characteristics

- individual characteristics/beliefs such as characteristics such as faith, hope, spirituality (with associated beliefs that life has meaning), perceived efficacy, having a sense of control and having a sense of belonging have been associated with greater resilience among children in general. We are only aware of one small-scale Australian study which has investigated the extent to which children with learning disabilities are more or less likely than their peers to possess such characteristics or hold such beliefs.¹⁸⁰⁻¹⁸² This study reported that while adolescents with mild learning disabilities showed similar levels of optimism and self-esteem to their peers, they reported lower levels of tolerance and higher levels of sensitivity.¹⁷⁶ An additional exploratory US-based study has reported that hope and optimism was associated with greater life satisfaction among adolescents with learning disabilities¹⁸³

6.3. Positive relationships

- the majority of research on the quality of relationships between young people with learning disabilities and their parents and/or peers has collected information from informants other than the child with learning disabilities; for example, as noted above analysis of data from the MCS has indicated that mothers of three year old children with learning disabilities reported that they had a less close relationship with their child when compared to other mothers¹⁶²
- the existing evidence on friendships, social networks and social support indicates that, when compared with their non-disabled peers, people (primarily adults) with learning disabilities: (1) tend to have fewer friends, smaller social networks and receive less social support; (2) show similar patterns of association between having friends, more extensive social networks and social support and more positive indicators of wellbeing;^{176 184 185} for example, a recent US-based study reported that adolescents with learning disabilities had friendships characterised by significantly lower levels of warmth/closeness and positive reciprocity than their typically developing peers and that adolescents with learning disabilities spent less time with friends outside of school and were less likely to have a cohesive group of friends¹⁸⁶

6.4. Access to resources

In Section 4.1 we reviewed the evidence which suggests that families supporting children with learning disabilities are significantly less likely than other families to have access to such resources as wealth and power. In Sections 5.5 and 5.7 we reviewed the evidence which suggests that children with learning disabilities are significantly less likely than other children to have access to such resources as positive parenting. In this section we will review the available evidence on access to a key resource for health; access to healthcare.

A number of reports have highlighted the disadvantages faced by people with learning disabilities in England in accessing timely, effective and appropriate healthcare.^{10-13 187}

¹⁸⁸ All of these reports, and the vast majority of the limited research that has been undertaken in this area, has focused on the situation of adults with learning disabilities.¹⁸⁹⁻¹⁹² As a result, little robust evidence from the UK is available on the extent to which children with learning disabilities are also significantly disadvantaged in accessing timely, effective and appropriate healthcare. Given that consultation with parents of children with learning disabilities commonly elicits concerns about access to healthcare,¹⁹⁰ and the plethora of concerns raised by independent inquiries,^{10 13} it appears reasonable to assume that the discrimination faced by adults with learning disabilities in accessing healthcare systems in England may also extend to children, however analysis of the 2004 ONS child and adolescent mental health survey indicated that British children with learning disabilities who had a diagnosable mental health problem had very similar rates of accessing child and adolescent mental health services and GPs as non-disabled children who had a diagnosable mental health problem.¹⁹³

6.5. Additional analyses using MCS data

Given the limited research in this area we undertook additional analyses of data collected in Waves 1 to 5 of the MCS to address the question; are children with learning disabilities at increased risk of being less resilient when exposed to material and psychosocial hazards that are likely to be detrimental to their health? We extracted indicators from MCS data of friendships and satisfaction with school (Table 4) and uptake of immunisations and health screening (Table 5).

The analyses presented in Table 4 show that children with learning disabilities in the UK were less likely than their non-disabled peers (an odds ratio of less than one) to show characteristics associated with resilience on 18 (95%) of 19 indicators of potential resilience associated with friendships and connection to school. These differences were statistically significant for 15 (79%) indicators and were equivalent to moderate to large effect sizes for 12 (63%) indicators. For four indicators data was available at ages seven and 11. On each of these indicators lower resilience of children with learning disabilities was more pronounced at age 11.

The analyses presented in Table 4 show that children with learning disabilities in the UK were less likely than their non-disabled peers to access preventative health interventions on 15 (65%) of 23 indicators. Of the statistically significant differences in uptake, six (75%) of the eight were associated with reduced uptake among children with learning disabilities. Of the differences of moderate or larger effect sizes, six (85%) of the seven were associated with reduced uptake among children with learning disabilities.

Table 4: The strength of association (odds ratio with 95% CI) between child learning disabilities and indicators of resilience at ages three, five, seven and 11 years				
	Age three years	Age five years	Age seven years	Age 11 years
Parental report				
Has at least one good friend	0.72* (0.56-0.94)	0.44*** (0.33-0.63)	0.40*** (0.30-0.54)	0.38*** (0.30-0.47)
Sees friends outside of school hours at least weekly		0.81 (0.64-1.01)	0.62*** (0.49-0.79)	0.50*** (0.41-0.61)
Child self-report				
Has 'some' or 'lots' of friends			0.91 (0.30-1.36)	
Has a best friend			0.81 (0.47-1.39)	
Likes playing with friends 'a lot'			0.52*** 0.37-0.73	
'Never' feels left out			1.21 (0.93-1.58)	
Spends time with friends outside of school				0.22*** (0.14-0.28)
Spends time with friends after school				0.73** (0.59-0.90)
Spends time with friends at weekends				0.51*** 0.41-0.62
Likes school at least sometimes			0.50*** 0.37-0.67	0.27*** 0.21-0.35
Finds school interesting at least sometimes			0.53*** 0.38-0.73	0.24*** 0.17-0.33
Happy at school				0.52*** 0.42-0.65
Notes: * p<.05, ** p<0.01, *** p<0.001				
Bold text indicates an odds ratio equivalent to a moderate or greater effect size ¹²⁷				

Table 5: The strength of association (odds ratio with 95% CI) between child learning disabilities and uptake of immunisations and health screening at ages nine months, three, five and 11 years

	Age nine months	Age three years	Age five years	Age 11 years
Health screening				
Hearing test	0.68** (0.51-0.91)			
Seen dentist in last 12 months				0.61*** (0.47-0.80)
Immunisations				
Any	0.47* (0.23-0.96)			
All	0.36*** (0.24-0.55)			
Polio complete		0.54 0.23-1.24	0.75 (0.24-2.40)	
Polio booster			1.01 (0.60-1.71)	
Diphtheria complete		0.77 (0.28-2.11)	0.78 (0.25-2.48)	
Diphtheria booster			1.03 (0.58-1.86)	
Tetanus complete		0.49 0.21-1.12		
Whooping cough complete		0.48* (0.25-0.96)		
Hib complete		0.52* (0.27-0.99)		
Additional HIB		0.80 (0.60-1.06)		
Meningitis complete		0.58 (0.30-1.15)		
BCG		1.75** (1.19-2.60)	1.90*** (1.37-2.64)	
Hepatitis B		1.57 (0.92-2.65)	1.30 (0.88-1.91)	
Pneumococcal		0.86 (0.32-2.32)	1.18 (0.87-1.06)	
MMR		0.84 (0.54-1.32)	1.28 (0.63-2.26)	

Notes: * p<.05, ** p<0.01, *** p<0.001

Bold text indicates an odds ratio equivalent to a moderate or greater effect size¹²⁷

6.6. Differential resilience?

The evidence in the preceding sections suggests that children with learning disabilities may be less resilient than their non-disabled peers when exposed to adversity. Very few studies have sought to test this proposition. All of the available evidence relates to mental health and behavioural outcomes and the results of these studies are somewhat mixed:

- analysis of the 1999 and 2004 ONS child and adolescent mental health surveys revealed a cross-sectional dose-dependent relationship between breadth of exposure to indicators of low SEP and the risk of conduct disorders, emotional disorders and ADHD among British children with learning disabilities, for all three disorders the strength of the relationship between exposure and risk was stronger among children with learning disabilities than among other children¹¹⁶
- analysis of data from Waves 1 to 4 of the MCS indicated a dose-dependent relationship between breadth of exposure to indicators of low SEP at ages nine months and three years and (1) the risk of conduct difficulties at age three and (2) the persistence of conduct difficulties from age three to ages five and seven. In both cases the strength of the relationship between exposure and risk was stronger among children with learning disabilities than among typically developing children¹¹⁸
- analysis of data from the *Longitudinal Study of Australian Children* indicated a dose-dependent relationship between exposure to SEP related adversity at age four/five and the risk of conduct difficulties at that age and the persistence of conduct difficulties to ages six/seven and eight/nine among children with borderline learning disabilities, for prevalence at age four/five the strength of the association between exposure and risk was stronger for children with learning disabilities than for other children¹¹⁹
- analysis of data from Waves 1 to 3 of the MCS and the *Longitudinal Study of Australian Children* indicated a cross-sectional dose-dependent relationship between exposure to adverse socio-economic circumstances and risk of mental health problems at age three among UK and Australian children with learning disabilities. For all comparisons the strength of the associations between exposure and risk was weaker for children with learning disabilities than for other children¹¹⁰
- a recent US-based study has reported that maltreatment had a stronger association with subsequent sexual and violent offending among adolescents with learning disabilities than their peers¹⁴³

7. Conclusions and recommendations

Children with learning disabilities in England are at increased risk of exposure to all of the major categories of social determinants of poorer physical and mental health:

- they are more likely to live in households characterised by low socio-economic position and poverty; they are also more likely to be exposed to recurrent poverty and to become poor; they are less likely to escape from poverty
- they are more likely to be exposed to a wide range of material and psychosocial hazards that are detrimental to their health, including inadequate nutrition, poor housing conditions, exposure to environmental toxins, family, peer and community violence, poor parenting and family instability - this increased risk of exposure is likely to result from the combined effects of the link between child learning disability and poverty and systemic and overt discrimination faced by people with learning disabilities in England
- they are less likely to have access to the resources necessary to build resilience in the face of adversity

Addressing the health inequities faced by children with learning disabilities in England will require action at each of these three levels.

- **reducing child poverty:** as we noted above, most 11-year-old non-disabled children growing up in the UK today had not been exposed to income poverty at any of the five points of data collection. In contrast, the majority of children with learning disabilities had been exposed to income poverty at three or more points in time. Reducing the rates of child poverty in England remains a key public health priority.¹⁴
¹⁹⁴⁻¹⁹⁶ All national policies that seek to reduce the rates of child poverty should be carefully audited to ensure that they are sensitive to the needs of families bringing up a child with learning disabilities. Local Health and Wellbeing Boards should identify children with learning disabilities in their JSNA as an important 'at risk' or 'vulnerable' group for poorer health outcomes and develop local strategies for reducing their poverty rate
- **reducing exposure to specific hazards:** the increased risk of exposure to specific hazards is likely to result from the combined effects of the link between child learning disability and poverty and disability discrimination:
 - consideration should be given (nationally and locally) to developing new and strengthening existing discrimination (or stigma) reduction programmes aimed at reducing systemic and overt discrimination faced by children with learning disabilities (eg, SEN specific anti-bullying programmes in schools, national and local attitude change programmes)
 - local Health and Wellbeing Boards should identify children with learning disabilities as an important 'at risk' or 'vulnerable' group for poorer health

outcomes carefully scrutinise local child protection and public health activities to ensure that they are sensitive to the needs of families bringing up a child with learning disabilities

- **building resilience:** local action on health inequities: building children and young people's resilience in schools^{3 173} sets out a programme for building the resilience of children. Local Health and Wellbeing Boards should in their Joint Strategic Needs Assessment ensure that children with learning disabilities are identified as priority groups for specific resilience-building initiatives (eg, specific early intervention services) and that all general local initiatives (eg, parent training and support interventions) are inclusive of children with learning disabilities. Local health services need to ensure that they fulfil their responsibilities under the 2010 Equality Act to make reasonable adjustments to all health-related activities to ensure that they are inclusive of children with learning disabilities. The replacement of Statements of Special Educational Needs with Education, Health and Care Plans also provides an opportunity at an individual level to identify resilience building opportunities for children with learning disabilities.

Appendix 1: The Millennium Cohort Study

The UK's Millennium Cohort Study (MCS) is the fourth in the series of British birth cohort studies. It aims to follow throughout their lives a cohort of over 18,000 children born in the UK between 2000 and 2002. MCS data are managed by the Centre for Longitudinal Studies at the University of London (www.cls.ioe.ac.uk) and are available to researchers registered with the Economic and Social Data Service (www.esds.ac.uk) through its data archive (www.data-archive.ac.uk). Full details of the design of MCS are available in a series of reports and technical papers,¹⁹⁷⁻²⁰³ key aspects of which are summarised below.

Sampling

Participant families were randomly selected from Child Benefit Records, a non means-tested welfare benefit available to all UK children at the time the cohort was established. Sampling was geographically clustered to include all four countries of the UK (England, Wales, Scotland, Northern Ireland), and disproportionately stratified to over-sample children from ethnic minority groups and disadvantaged communities.¹⁹⁹ Children and families were drawn from 398 randomly selected electoral wards in the UK. The first survey (MCS1) took place when children were nine months old and included a total of 18,552 families. Children were followed up at ages three (MCS2; 15,590 families, 84% retention rate from MCS1), five (MCS3; 15,246 families, 82% retention rate from MCS1) and seven (MCS4; 13,857 families, 75% retention rate from MCS1). For each family, information was collected on the target child falling within the designated birth date window. For multiple births (eg, twins, triplets) information was collected on all children. To avoid the statistical problems associated with the clustering of multiple births within households, the present analyses are restricted to the first named target child in multiple birth households. All analyses used sampling weights provided with MCS data to adjust for the initial sampling design and biases in recruitment and retention at specific ages.

Identification of children with learning disability

Child cognitive ability was assessed at age three using the Bracken School Readiness Assessment²⁰⁴ and Naming Subscale of the British Ability Scales (BAS),²⁰⁵ selected subscales of the BAS at ages five and seven, and the NFER Progress in Maths test at age seven. [ENREF_188](#)¹⁹⁷ At age eleven children were given three cognitive tests; verbal similarities (BAS), the Spatial Working Memory task and the Cambridge gambling task, both from the Cambridge neuropsychological test automated battery. Of the age eleven tests, only verbal similarities is closely related to traditional measures of IQ.

For ages five and seven we extracted the first component ('g') from a principle component analysis of all age-standardised subscale/test scores. The first component accounted for 63% of score variance at age seven and 55% of score variance at age five. We identified children as having learning disabilities if they scored two or more standard deviations below the mean on the first principle component at age seven (n=419 [3.3%] of 12,820 children for whom test results were available).

Interviewers did not administer the assessments if the child 'has a learning disability/serious behavioural problem (eg, severe ADHD, autism) which prevents them from carrying out the assessments', 'is unable to respond in the required manner for each assessment, eg, reading, writing, manipulating objects', 'is not able to speak or understand English (or Welsh if applicable)' or if consent and co-operation were not forthcoming. If cognitive test scores were missing at age seven, we identified children as having learning disabilities if they scored two or more standard deviations below the mean on the first principal component at age five (n=146 [6.5%] of 2,250 children). If cognitive test scores were missing at age five and at age seven, we identified children as having learning disabilities if they scored two or more standard deviations below the mean on the Bracken School Readiness Assessment at age three (n=49 [4.4%] of 1105 children). If Bracken scores were not available, we identified children as having learning disabilities if they scored two or more standard deviations below the mean on the BAS Naming Subscale at age three (n=54 [7.6%] of 711 children). This process allowed us to classify learning disabilities on the basis of cognitive test scores for 99.1% of children participating at age seven.

For 125 children no cognitive test results were available at any age. Cognitive testing was not administered for a variety of reasons including lack of parental consent, failure to co-operate with testing and severity of child disability. For these children we identified learning disabilities on the basis of parental report at age seven. A child was identified as having learning disabilities if both of the following two criteria were met: (1) the child was reported to be receiving special education due to their 'learning difficulty' (the term used in educational services in the UK to refer to learning disabilities); (2) the child was reported to have 'great difficulty' in all three areas of reading, writing and maths. This led to the identification of another 11 children as having learning disabilities.

Finally, we used the normalised verbal similarities standard score at age 11 to attempt to address potential errors in classification in the W2-4 variables. Specifically, all children who had been identified as having learning disabilities who scored at or above the population mean on verbal similarities at age 11 were reclassified as not having learning disabilities. Similarly, all children identified as not having learning disabilities but who scored three or more standard deviations below the population mean on verbal similarities at age eleven were reclassified as having learning disabilities.

This procedure led to the identification of 647 of the 18,495 (3.5%) children participating at Wave 1 where the child's mother was the primary informant as having learning disabilities. As expected, boys were significantly more likely than girls to be identified as having learning disabilities (4.3% vs 2.6%; OR=1.67, 95% CI 1.42-1.96).

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