Disability and obesity:
the prevalence of obesity in disabled children

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(Department of Health, 2010, p.9).

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This piece of analysis explores the existence of obese and overweight children in a population classified as having a limiting, longstanding illness and learning disability.

Key Messages

Children who have a limiting illness are more likely to be obese or overweight, particularly if they also have a learning disability.

40% of children aged under 8 years old with a limiting illness and learning disability are obese or overweight compared to 22.4% of children who have neither condition.

Contents

1   Executive summary

Being obese or overweight can have a severe impact upon health and it is estimated to cost the NHS £4.2 billion per year (Department of Health, 2011). Prevalent throughout all ages and genders, the Department of Health estimates that 1 in 10 children aged 2 to 10 are obese. While children in Reception Year (aged 4 to 5) and Year 6 (aged 10 to 11) are measured and weighed as part of the National Child Measurement Programme, it is recommended that those children who are not able to stand unaided are excluded (Department of Health, 2010, p.9). While no national disability data collections exist the Office for Disability Issues (ODI) estimates that up to 700,000 children have a longstanding illness, disability or infirmity (2010b).

This piece of analysis explores the existence of obese and overweight children in a population classified as having a limiting, longstanding illness and learning disability.

Participants in the Health Survey for England aged 3 to 18 years old were analysed in four groupings: children with both a limiting illness and learning difficulties, children with a limiting illness but without learning difficulties, children with neither limiting illness nor learning difficulties, and all children.

The analysis shows that:

- The percentage of children who are classified as either overweight or obese is highest where the child has a limiting illness. Where the child also suffers from a learning difficulty, 27% are classified as overweight and a further 15% are classified as obese.
- 40% of children aged under 8 with a limiting illness and learning disability are obese or overweight compared to 22.4% of children who have neither condition.
- The percentage of children classified as overweight or obese in the 8 to 13 years old age category with a limiting illness and a learning disability increased to almost 45%.
- Boys with a limiting illness are more likely to be obese or overweight than girls, particularly where the child also has a learning disability.
- In general, the percentage of obese or overweight children decreases as the family's household income increases. There is no obvious pattern when looking at those children with a limiting illness. Where a child has both a limiting illness and a learning disability the pattern is more erratic, possibly as a result of the population size.

In summary, analysis shows that children who have a limiting illness are more likely to be obese or overweight, particularly if they also have a learning disability. It is important that we begin monitoring the weight and height amongst this population to reduce future health inequalities and the financial costs.

2   Background

Being obese or overweight can have a severe impact on health, increasing the risk of type 2 diabetes, heart and liver disease and some cancers. These avoidable conditions are costly for the NHS. "[The] direct costs caused by obesity are estimated to be £4.2 billion per year and forecast to more than double by 2050 if we carry on as we are" (Department of Health, 2011).

Overweight and obese people are defined as having an "abnormal or excessive fat accumulation that may impair health" (World Health Organisation, 2011) and commonly analysed using a simple weight to height index called the Body Mass Index (BMI).

Prevalent throughout all ages and genders, the Department of Health (2011) estimates that 1 in 10 children aged 2 to 10 are obese.

In England, children in Reception Year (aged 4 to 5) and Year 6 (aged 10 to 11) are measured and weighed as part of the National Child Measurement Programme. The guidance recommends the exclusion of those who are "not able to stand unaided on the scales or under the height measure, for example due to physical disability or injury (for whom alternative arrangements, might be available from the PCT)" (Department of Health, 2010, p. 9).

It is difficult to say exactly how many children this excludes from the programme. Whilst examples of local disability data collections exist, unfortunately disability statistics are not collected on a national level and estimates are generated based upon research findings. The Family Resources Survey (FRS) is one such source and used by the Office for Disability Issues (ODI). The ODI suggests that around one in twenty children are disabled and estimated that in 2008/9 approximately 700,000 children were living with a longstanding illness, disability or infirmity, and who have a significant difficulty with day-to-day activities (Office for Disability Issues, 2010a and 2010b, p.1).

3   Aims of the work

Potentially 700,000 children in England have not been and will not ordinarily be monitored for being overweight or obese.

A lack of physical activity is one of the factors attributed to obesity, perversely the very thing which this population will often be restricted from doing.

This piece of analysis explores the prevalence of obese and overweight children in a population classified as having a limiting, longstanding illness and learning disability.

It forms the basis for a proposal for further research to be carried out by the University of York.

4   Methodology

Data from the Health Survey for England were used for the analysis. The datasets analysed were the 2004 Household Data (hse04ah), 2004 Ethnic Boost Data (hse04etha), 2005 Household Data (hse05ah), 2006 Household Data (hse06ah), 2007 Household Data (hse07ah) and 2008 Household Data (hse08ah). This data are available from www.data-archive.ac.uk the datasets earlier than 2004 did not include the "BMI OK" field which indicates whether there were problems when calculating the BMI scores. Consequently they were excluded for their potential unreliability. Unfortunately the data for 2009 were not available at time of analysis. A full list of the data fields used is presented in Appendix A.

Data were initially obtained for participants aged 2 to 18 years old at the time of the survey and records where the BMI OK field is 'yes'.

The remaining data were categorised into groups, making the datasets a more manageable size.

The groups were as follows:

1. Children with both a limiting illness and learning difficulties
2. Children with a limiting illness but not learning difficulties
3. Children with neither limiting illness nor learning difficulties
4. All children

We wanted to explore beyond the three standard weight categories offered in the Health Survey for England (Normal-weight, Over-weight and Obese). Each of the above groups were analysed using a BMI calculator developed by Dr Rory O'Conor, a Consultant of Public Health Medicine at Yorkshire and Humber Public Health Observatory.

This tool is available from http://www.btinternet.com/~rory.oconor/obesity/index.html .

Unfortunately this tool excludes any child aged less than 3 years old which reduced the analysed population by approximately 1,300 records.

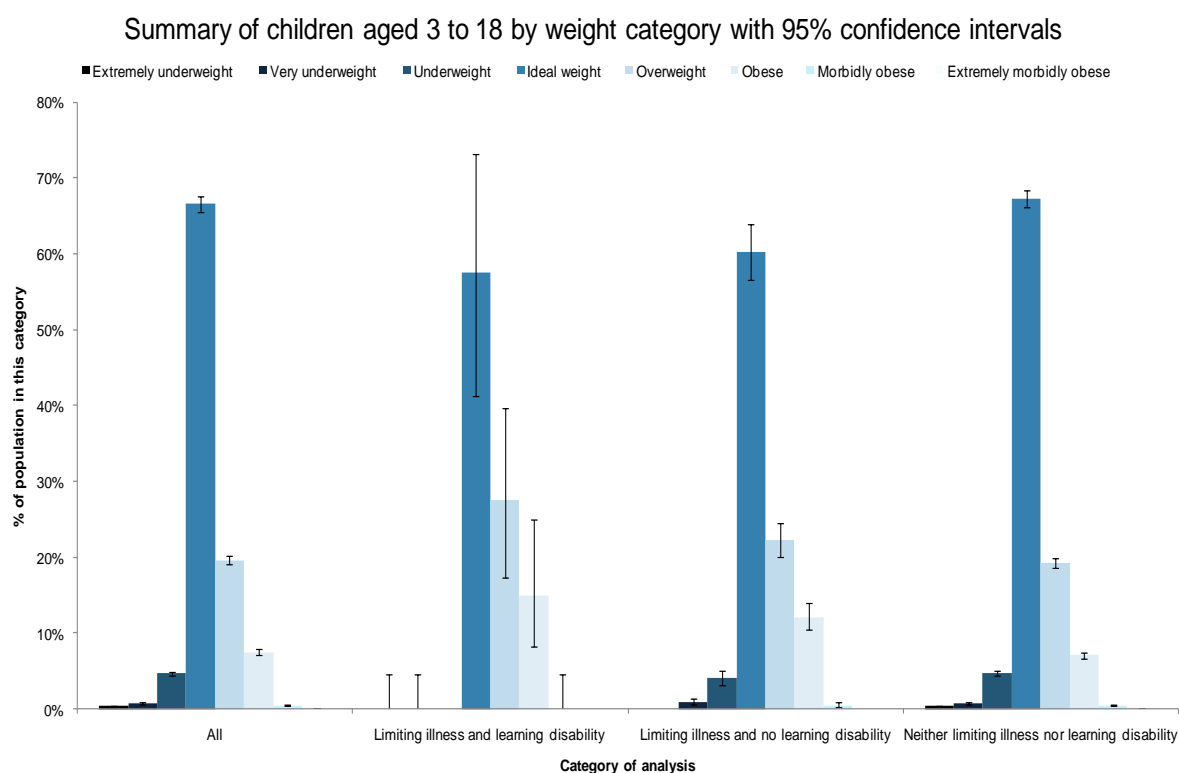Age categories were applied to the data. These are described in Appendix B.

Weight categories were applied to the data. These are described in Appendix C.

Any results of 5 or fewer were suppressed to prevent identification.

95% confidence intervals were calculated using the Wilson score methodology.

5   Results

The following graph compares the percentage of children in each weight category across the four analysis groupings. Each weight category is represented by a coloured bar. The 'I' bars either side of the bar represent the 95% confidence intervals. The large confidence intervals on the 'limited and learning disability' category are as a result of the small sample size.

Summary of children aged 3 to 18 by weight category with 95% confidence intervals

■ Extremely underweight ■ Very underweight ■ Underweight ■ Ideal weight ■ Overweight ■ Obese ■ Morbidly obese ■ Extremely morbidly obese
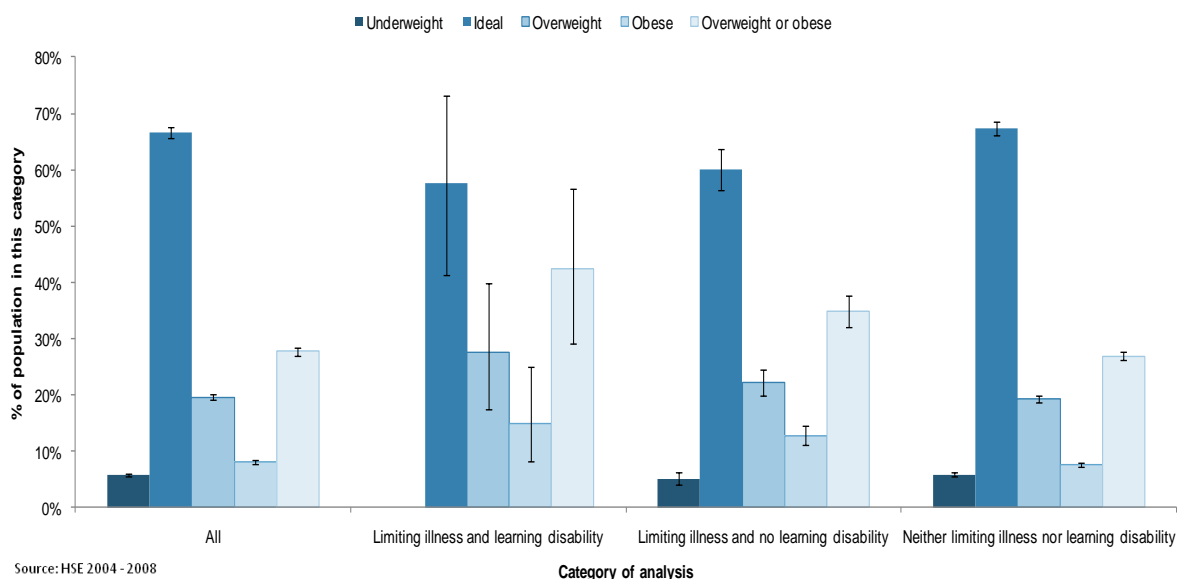

The graph shows the percentage of children by weight classification. Almost 20% of all children are overweight and 7.5% of children are obese. The percentage of children who are classified as either overweight or obese is highest in both groups where the child has a limiting illness. Where the child suffers from both a limiting illness and a learning difficulty, 27% are classified as overweight and a further 15% are classified as obese. Importantly, there are fewer children who were considered to be the ideal weight in both of these categories when comparing both of these groups to all children (67%) and children with neither a limiting illness nor learning disability (67%).

These differences become more apparent when we group weight categories together (see Appendix D); as highlighted in the following bar chart. Again each category is represented by a bar, however there are now fewer weight categories and a further bar combining obese and overweight together. As with the earlier bar chart the 'I' bars either side of the bar represent the 95% confidence interval. Again

the large confidence intervals on the 'limited and learning disability' category are as a result of the sample size.

Summary of children aged 3 to 18 by general weight category with 95% confidence intervals

Source: HSE 2004 - 2008

Obese or overweight children account for 28% of all children, compared to 40% of children with limiting illness and learning disability and 27% of children who have neither condition.
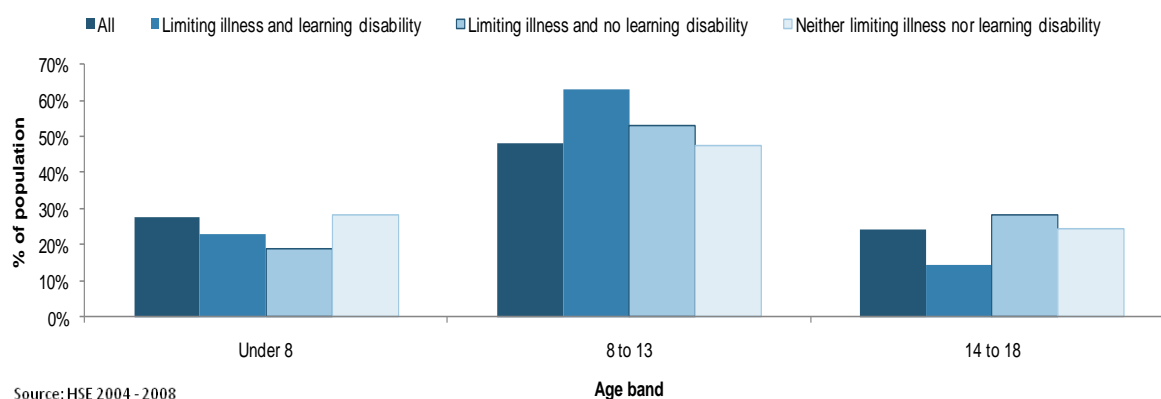
Table 1 below compares weight categories with age groups. The age of the child is that at the time the survey was undertaken. It shows that 40% of children aged under 8 with a limiting illness and learning disability are obese or overweight compared to 22.4% of children who have neither condition.

	Weight Category	Under 8	8 to 13	14 to 18
All children	Ideal	69.8%	63.4%	65.6%
Limiting illness and no learning disability	Ideal	65.7%	57.3%	57.1%
Neither limiting illness nor learning disability	Ideal	70.2%	64.3%	66.3%
Limiting illness and learning disability	Ideal	55.0%	53.1%	60.0%
All children	Obese/ Overweight	22.9%	30.1%	29.2%
Limiting illness and no learning disability	Obese/ Overweight	25.4%	37.9%	37.0%
Neither limiting illness nor learning disability	Obese/ Overweight	22.4%	29.1%	28.2%
Limiting illness and learning disability	Obese/ Overweight	40.0%	44.9%	33.3%
All children	Underweight	5.8%	6.0%	5.0%
Limiting illness and no learning disability	Underweight	5.8%	4.2%	5.6%
Neither limiting illness nor learning disability	Underweight	5.9%	6.0%	5.3%
Limiting illness and learning disability	Underweight	5.0%	2.0%	0.0%

Table1: Weight category by age group

The following bar chart plots obese or overweight children by age band. Each category of analysis is represented by a coloured bar. In general the percentage of children whose BMI score classified them as either obese or overweight increases as the child gets older. The percentage of children classified as overweight or obese in the 8 to 13 years old age category with a limiting illness and a learning disability increases to almost 45%. The largest increase is for those children who have a limiting illness but no learning disability.
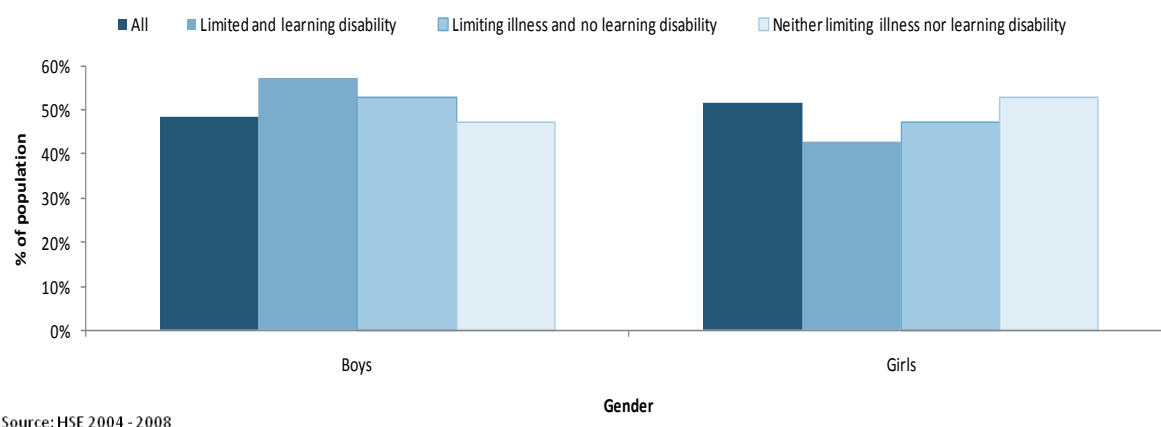
**Summary of children aged 3 to 18 by age band:
Obese or Overweight**

Source: HSE 2004 - 2008

When analysing the weight categories by gender, 50.5% were boys and 49.5% were girls.

The following bar chart shows the percentage of children classified as obese or overweight by gender. Each bar represents a group of analysis.

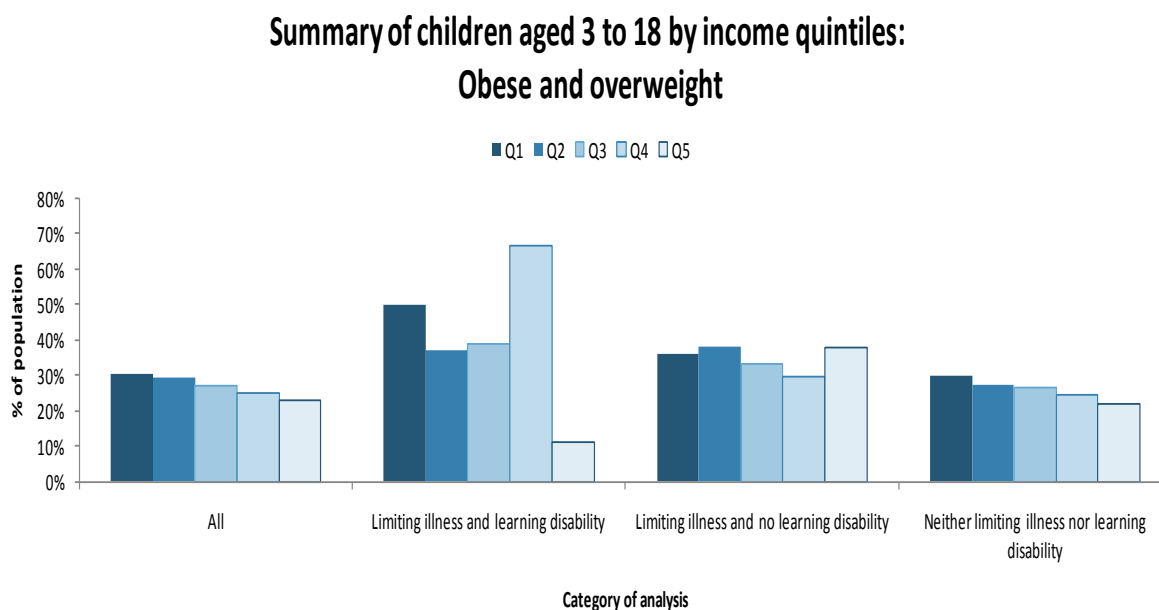**Summary of children aged 3 to 18 by gender: Obese/Overweight**

Source: HSE 2004 - 2008

The findings suggest overall there were more obese or overweight girls (51.4%) than boys (48.6%), as represented in the 'All' group. The bar chart also highlights how

boys with a limiting illness are more likely to be obese or overweight, particularly where the child also has a learning disability (57%).

The following bar chart looks at whether there is a relationship between obese and overweight children and household income. Income is represented by income quintiles where those in quintile 1 have the lowest income and those in quintile 5 the highest income. The data are shown by category of analysis with each bar representing the percentage of obese or overweight children in each quintile.

Summary of children aged 3 to 18 by income quintiles: Obese and overweight

■ Q1 ■ Q2 □ Q3 □ Q4 □ Q5

Source: HSE 2004 - 2008

When looking at all the data the general pattern is for the percentage of obese or overweight children to decrease as the family's income increases. This is also apparent when the child has neither a limiting illness nor a learning disability. The population size of the 'neither' category will influence the pattern of all data.

There is no obvious pattern when looking at those children with a limiting illness. Where the child has a learning disability the percentage of the population who are considered obese or overweight is fairly consistent at around 35% of the population. In those instances where a child has both a limiting illness and a learning disability the pattern is more erratic, possibly as a result of the population size.

6   Conclusions

Analysis shows that children who have a limiting illness are more likely to be obese or overweight, particularly if they also have a learning disability. A child with both a limiting illness and a learning disability is over one and a half times as likely to be obese or overweight as a child with neither. Those children who have a limiting illness are one and a half times as likely to be obese as children with neither, whilst a child who also has a learning disability is twice as likely to be obese.

The likelihood that they will become obese or overweight increases with age with large differences between those children under 8 years old and those 8 years old and over.

Generally, girls were more likely to be obese or overweight than boys; however this pattern is reversed if the child has a limiting illness, particularly when it is coupled with a learning disability.

Whilst in general the percentage of obese or overweight children decreases as income increases, this picture becomes unclear when considering children with a limiting illness and with/ without learning disabilities. Sample size is a consideration.

Overall the analysis shows that it is important that we begin monitoring the weight and height amongst this population. It is a population whose size we cannot be certain of and whose disability will probably mean their quality of life is reduced. To introduce weight measurement and management of this group will not only help to reduce any further future health inequalities but also reduce the huge financial costs placed upon the NHS.

References

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Appendix A: Fields used from Health Survey for England

Field	Description	Comments
age	Age last birthday of participant	Ages 3 to 18 used
bmi	BMI score of participant	Used to check against calculator values
bmiok	Is the BMI measure valid?	Yes or no
eqv5	Equivalised Income Quintiles	Values 1 (lowest income) to 5 (highest income). This field was not used in all collections therefore equivalised income also used to calculate where necessary
eqvinc	Equivalised income	Pounds value to enable calculation of Equivalised Income Quintiles if necessary
height	Height of participant	Used to calculate BMI measure
illsm1	Limiting illness #1	If a '05' in any of these fields the participant was considered to have learning difficulties.
illsm2	Limiting illness #2	
illsm3	Limiting illness #3	
illsm4	Limiting illness #4	
illsm5	Limiting illness #5	
illsm6	Limiting illness #6	
limitill	Limiting illness	Yes or no. See also illsm1 to 6 for description of limiting illness
longill	Long standing illness	Yes or no
sex	Gender	Used to calculate BMI measure
weight	Weight of participant	Used to calculate BMI measure

Appendix B: Age categories

Age	Category applied
2	Under 8
3	Under 8
4	Under 8
5	Under 8
6	Under 8
7	Under 8
8	08 to 13
9	08 to 13
10	08 to 13
11	08 to 13
12	08 to 13
13	08 to 13
14	14 to 18
15	14 to 18
16	14 to 18
17	14 to 18
18	14 to 18

Appendix C: Weight categories

Weight Category as per BMI Calculator	Weight Category 1	Weight Category 2
Extremely morbidly obese	Obese	Obese/ Overweight
Extremely underweight	Underweight	Underweight
Ideal weight	Ideal	Ideal
Morbidly obese	Obese	Obese/ Overweight
Obese	Obese	Obese/ Overweight
Overweight	Overweight	Obese/ Overweight
Underweight	Underweight	Underweight
Very underweight	Underweight	Underweight