Hull NHS
Teaching Primary Care Trust

Obesity in Children in Hull 2008/2009

UPDATE ON THE NATIONAL CHILD MEASUREMENT PROGRAMME RESULTS FOR HULL

KEY POINTS

- ***Reception Year had a very high coverage of 99%, well above the 90% target***
- ***Year 6 achieved a coverage of 81%, below the target of 85%***
- ***Obesity levels fell for both Reception Year children (aged 4 or 5) and Year 6 (aged 10 or 11)***
- ***10.4% of Reception year children were Obese, a reduction of 1.4% from last year***
- ***by Year 6 there were 21.4% of children classified as Obese, a reduction of 0.9% from last year***
- ***despite greater falls in Obesity rates for boys than girls there are still higher obesity rates for boys at both age groups***
- ***Hull's childhood obesity levels are slightly above the national average, but are similar to other comparable urban areas***
- ***Obesity levels in 2008/09 do not vary significantly across Hull's localities and areas***

Summary

Heights and weights of primary school children in Hull aged 4 & 5 (Year R) and 10 & 11 (Year 6) were recorded during the 2008/9 academic year as part of the Department of Health's National Child Measurement Programme. Valid figures for Body Mass Index (BMI) were calculated for 99% in Year R, and 81% in Year 6.

The proportion of obese children in Reception year for 2008/09 has fallen for boys and girls, shown in Table 4 For girls 9.7% are obese, a fall of 1 percentage point on the previous year. For boys 10.9% are obese, a sharp fall of 2.5 percentage points on the previous year, but one which still leaves boys with a higher obesity rate than girls.

The proportion of overweight children at Reception year for 2008/09 has stayed virtually the same for both boys and girls, shown in Table 4. For Reception year girls 14.2% are overweight, an increase of 0.7 percentage points on the previous year. For Reception year boys 16% are overweight, an increase of 0.3 percentage points on the previous year.

The proportion of Year 6 children who are obese has fallen for boys but not for girls for 2008/09, shown in Table 6. For Year 6 girls 20.6% are obese, a slight increase of 0.3 percentage points on the previous year. For Year 6 boys 22.9% are obese, a drop of 1.3 percentage points from the previous year.

The proportion of Year 6 girls who are overweight for 2008/09 is 14.4% an increase of 0.7 percentage points on the previous year. The proportion of Year 6 boys who are overweight for 2008/09 is 13.5%, a decrease of 2.3 percentage points on the previous year.

In relation to the national picture, by Year 6 Hull has obesity rates 3 to 4 percentage points higher than the national average. However, once deprivation (measured by the Index of Multiple Deprivation 2007) is taken account of, Hull's obesity prevalence at both Year R and Year 6 is very close to what is expected.

Other conclusions were that the level of deprivation of areas of Hull had very little effect on children's BMI in Year R or Year 6. This is in contrast to national research, which shows higher levels of obesity in more deprived areas. However it is difficult to compare obesity levels in individual small areas, as, even at the Area Committee level, there are relatively wide confidence estimates for the obesity level in a particular Area.

Main Report

Introduction

Rates of obesity and overweight amongst children in England have risen since the mid 1970s. In October 2007, as part of the Government's new commitment to Child Health and Well-being (children under 11) it announced: *"Our ambition is to be the first major nation to reverse the rising tide of obesity and overweight in the population by ensuring that everyone is able to achieve and maintain a healthy weight. Our initial focus will be on children: by 2020, we aim to reduce the proportion of overweight and obese children to 2000 levels."*

The Foresight report "Tackling Obesities" (2007) predicted a "striking" rate of increase in overweight and obesity, in children by 2050. The Foresight project's modelling indicated that around 25% of all children under 16 could be obese[1].

However The National Heart Forum has recently produced evidence that the rate of increase in childhood obesity may be starting to slow. Comparing the data used for the analysis in the Foresight report (1993-2004) with the most recent 8 years of Health survey for England (HSE) data (2000-2007) suggests that by 2020 the proportion of boys aged 2-11 years who will be overweight falls from 22% to 17% and the proportion of obese falls from 20% to 13%. For girls aged 2-11 years the proportion of overweight sharply declines from 34% to 17% and the proportion obese from 14% to 10%. The revised predictions also indicate a big drop in the number of overweight and obese young people aged 12-19 years[2].

[1] Butland B, Jebb S, Kopelman P, Mardell J, McPherson K, Thomas S, Parry V. Government Foresight Programme. Government Office for Science. Foresight Tackling Obesities: Future Choices – Project report, 2007.

[2] McPherson k, Brown M, Marsh T and Byatt T. National Heart Forum Modelling Team. Obesity: Recent Trends in Children Aged 2-11y and 12-19y. Analysis from the Health Survey for England 1993 – 2007, 2009.

Data Submission

Data collected under the National Child Measurement Programme (NCMP) from Hull schools was recorded on the Child Health Module of SystemOne, a Community and Primary Care Information system. An extract of 2008/09 data was submitted to the NHS Information Centre within the required timescale of 4th September. This 2008/09 data will be processed by the NHS Information Centre to pre-populate SHA and PCT monitoring returns; detailed analyses are expected in December 2009, when data will also be released to Public Health Observatories for regional analyses to be carried out.

Data completeness

Height and weight measurements were recorded for children in their first school year (Year R), aged 4¼ years or more but less than six years, by school nurses in Hull schools. For the 2008/9 school year there were 2,614 reception year children eligible for measurement, and of these 2,592 (99.2%) had valid height and weight measurements recorded, well above the target of 90%. For children in Year 6 there were 2,979 10 and 11 year olds eligible for measurement at Hull state schools of which 2,402 (80.6%) had weight and height measurements recorded and submitted. This uptake rate of 81% is below both the target of 85% and last year's 84% rate and may have been affected by the replacement of the former information system with a new one. However there is no reason to believe the data is biased, so results can be generalised to all of Hull's young people.

Classification of overweight and obesity

Body mass index (BMI) indicates overall body mass assessing the height-to-weight relationship. It is calculated as "Weight (in kilograms) divided by Height (in metres) squared". For adults, people with a BMI of over 30 are classified as Obese, and a BMI of over 25 is classed as Overweight. However for children the BMI threshold levels are different, depending on the age of the child. Full details of the BMI ranges used to define obesity in children are given in Appendix A at the end of this paper.

Prevalence of overweight and obesity

Initial prevalence data in this section is from Hull Local Authority schools only (so private schools are excluded – primarily Hymers College and Froebel House). In the most recent year, 2008/09, rates of obesity for reception year (Year R) girls were 9.7%, and 11.0% for boys, see Table 1 below. A further 14.0% of girls and 16.1 % of boys were overweight. However nearly three quarters of both boys' and girls' BMIs were within the desirable weight band. Hull's current obesity rates are slightly above the latest national figure of 9.6% in 2007/08[3].

[3] National Child Measurement Programme: results from the 2007/08 school year. The NHS Information Centre 2008.http://www.ic.nhs.uk/webfiles/publications/ncmp/ncmp0708/NCMP%202007-08%20Report.pdf

Table 1: Numbers and percentages for Year R Hull, by BMI category, 2008/09

		Underweight	Desirable weight	Overweight	Obese	Total
Girls	numbers	8	920	170	118	1,216
	percentage	0.7%	75.7%	14.0%	9.7%	100%
Boys	numbers	7	996	221	152	1,376
	percentage	0.5%	72.4%	16.1%	11.0%	100%

For children in Year 6 aged 10 or 11 rates of obesity in 2007/08 were 19.5% for girls, and 23.9% for boys, see Table 2 below. These rates are considerably higher than Year R. A further 14.0% of girls and 15.9% of boys were overweight. However nearly two thirds of both boys' and girls' BMIs were within the desirable weight band. Hull's current obesity rates are slightly above the latest national figure of 19% for boys and 15.8% for girls in 2006/07[3].

Table 2: Numbers and percentages for Year 6 Hull, by BMI category, 2008/09

		Underweight	Desirable weight	Overweight	Obese	Total
Girls	numbers	11	759	171	242	1,183
	percentage	0.9%	64.2%	14.5%	20.5%	100%
Boys	numbers	9	777	162	271	1,219
	percentage	0.8%	64.0%	13.9%	21.4%	100%

Trends in overweight and obesity – 4 and 5 year olds

For trend purposes and deprivation analyses all children (including those in private schools) are classified according to their area of residence, rather than school as in earlier tables. This makes a small difference to some Hull figures, especially in West Hull where substantial numbers of pupils cross PCT boundaries between home and school. For childhood obesity the national target which the government announced in October 2007 is "*by 2020, we aim to reduce the proportion of overweight and obese children to 2000 levels"*.

Table 4 shows the proportion of obese children in Reception year for 2008/09 has fallen for boys and girls. For girls 9.7% were obese in 2008/09, a fall of 1 percentage point on the previous year. For boys 10.9% were obese, a fall of 2.5 percentage points on the previous year.

However Table 4 shows that the proportion of overweight children at Reception year for 2008/09 has increased for both boys and girls. For Reception year girls 14.2% are overweight, an increase of 0.7 percentage points on the previous year. For Reception year boys 16% are overweight, an increase of 0.3 percentage points on the previous year.

Table 3: Numbers of Year R by BMI category Hull 1999/00 – 2008/09

		Underweight	Healthy Weight	Overweight	Obese	Total
Girls	1999/00	23	657	80	72	832
	2000/01	30	1,011	131	99	1,271
	2001/02	34	1,011	132	117	1,294
	2002/03	25	1,045	165	135	1,370
	2003/04	18	927	154	108	1,207
	2004/05	17	828	133	139	1,117
	2005/06	7	910	170	130	1,217
	2006/07	5	809	167	104	1,085
	2007/08	8	899	161	128	1,196
	2008/09	8	959	181	123	1,271
Boys	1999/00	37	661	102	79	879
	2000/01	43	954	149	124	1,270
	2001/02	64	1,080	178	159	1,481
	2002/03	22	1,083	180	142	1,427
	2003/04	26	958	185	156	1,325
	2004/05	23	843	190	159	1,215
	2005/06	7	920	212	155	1,294
	2006/07	9	896	182	168	1,255
	2007/08	9	823	184	157	1,173
	2008/09	7	1,034	227	155	1,423

Table 4: Percent and numbers of Year R by BMI category Hull 1999/00 – 2008/09

		% Underweight	% Healthy Weight	% Overweight	% Obese	Total (number)
Girls	1999/00	2.8	79.0	9.6	8.7	100
	2000/01	2.4	79.5	10.3	7.8	100
	2001/02	2.6	78.1	10.2	9.0	100
	2002/03	1.8	76.3	12.0	9.9	100
	2003/04	1.5	76.8	12.8	8.9	100
	2004/05	1.5	74.1	11.9	12.4	100
	2005/06	0.6	74.8	14.0	10.7	100
	2006/07	0.5	74.6	15.4	9.6	100
	2007/08	0.7	75.2	13.5	10.7	100
	2008/09	0.6	75.5	14.2	9.7	100
Boys	1999/00	4.2	75.2	11.6	9.0	100
	2000/01	3.4	75.1	11.7	9.8	100
	2001/02	4.3	72.9	12.0	10.7	100
	2002/03	1.5	75.9	12.6	10.0	100
	2003/04	2.0	72.3	14.0	11.8	100
	2004/05	1.9	69.4	15.6	13.1	100
	2005/06	0.5	71.1	16.4	12.0	100
	2006/07	0.7	71.4	14.5	13.4	100
	2007/08	0.8	70.2	15.7	13.4	100
	2008/09	0.5	72.7	16.0	10.9	100

Figure 1 shows the trends over the last ten years in the proportions of Reception Year girls in each of the four BMI categories. It shows that the rise in the proportion who are obese appears to have been halted, with levels in 2008/09 remaining below the peaks of 2004-2006. Similarly for Reception Year boys Figure 2 shows an upward trend over 10 years in the proportion who are obese, with levels reaching their peak in the previous two years 2006-2008 and dropping back in 2008/09; a further year's data will be needed to confirm if this fall really does represent a halt in the rise of obesity levels in Reception year boys.

Figure 1 shows an upward trend over 10 years in the proportion of Reception year girls who are overweight, sustaining a substantial increase since 2003/04. Figure 2 also displays an overall upward trend in the proportion of Reception year boys who are overweight, again from 2003/04 onwards there is a substantial increase.

Figure 1: BMI categories of Year R girls, Hull1999/2000 to 2008/09

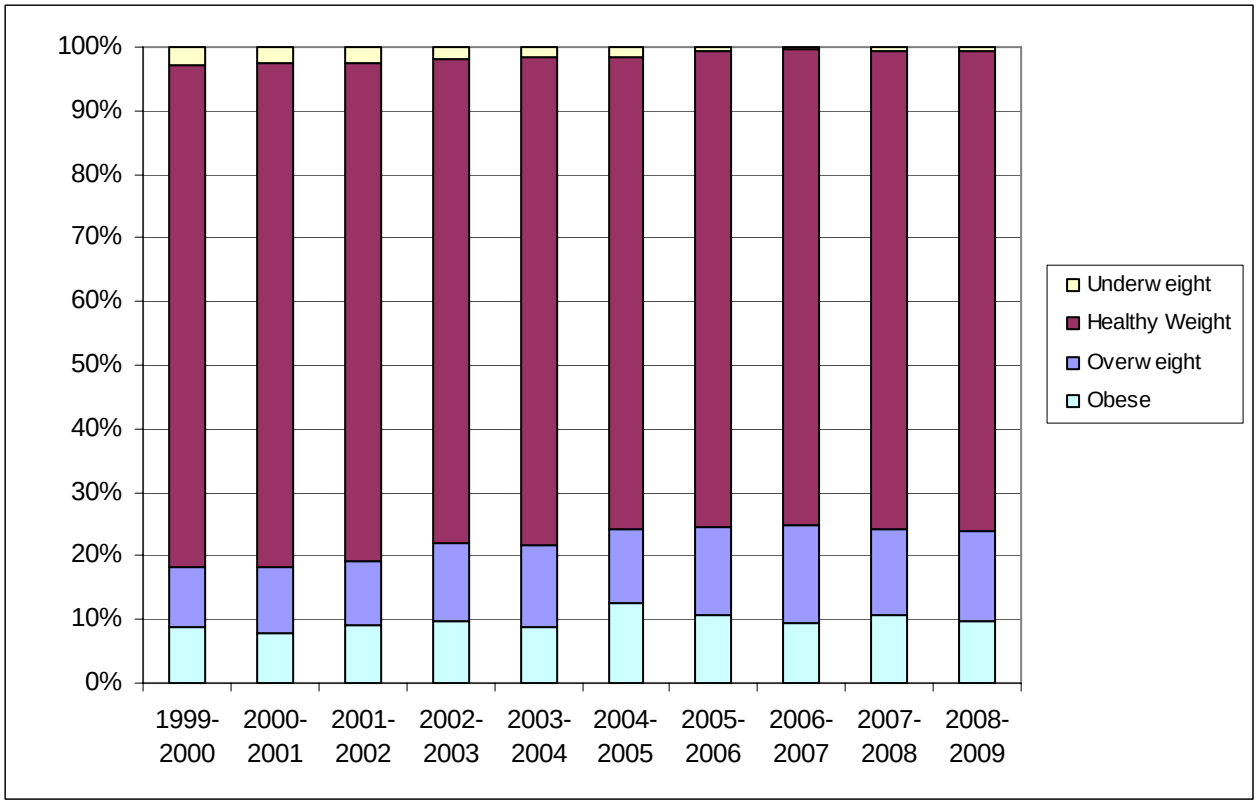
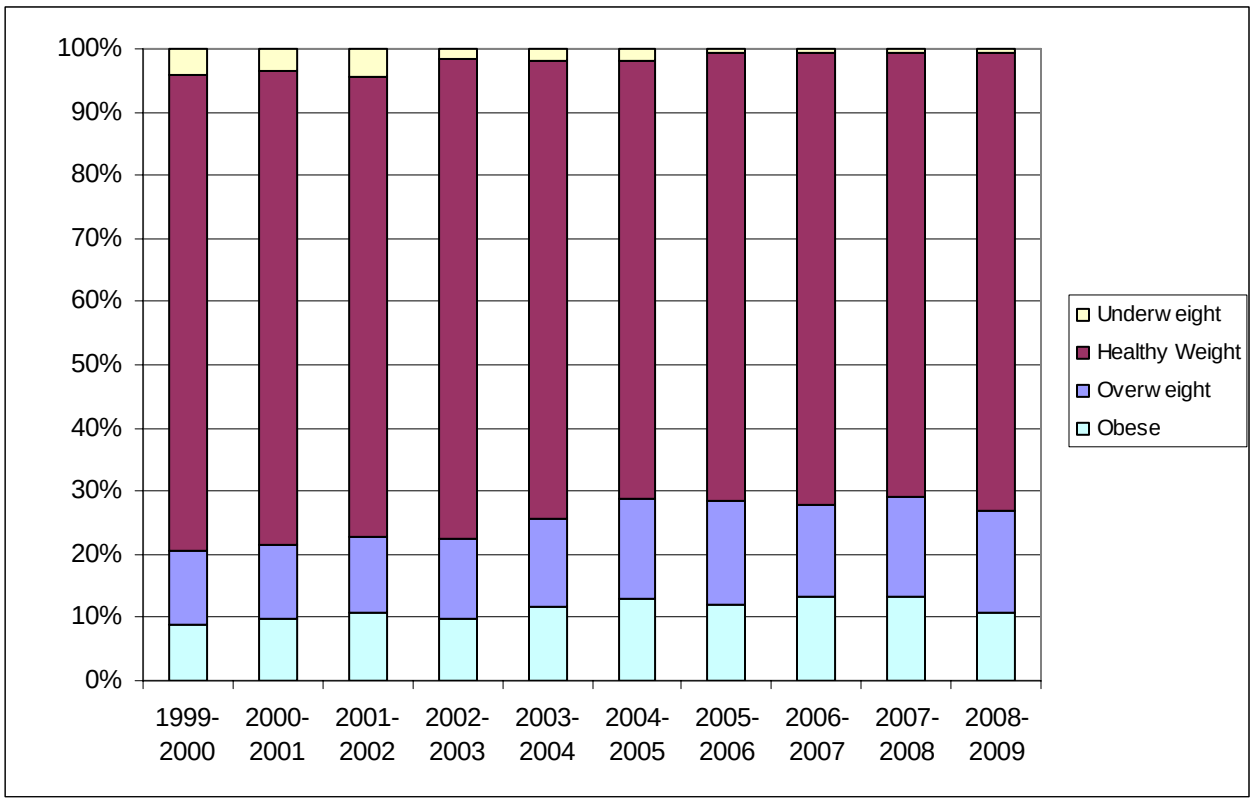


Figure 2: BMI categories of Year R boys, Hull 1999/00 – 2008/09



Trends in overweight and obesity –Year 6 children (10 or 11 year olds)

In Hull the first routine measurements were made for 10 and 11 year olds (Year 6) in the year 2005/06. These figures differ slightly from those in Table 2 because residence in Hull has been assigned on a home postcode rather than a school basis.

Levels of Obesity in Year 6 children for 2008/09 have remained similar to the previous year, and are shown in Table 6. For Year 6 girls 20.6% are obese, a slight increase of 0.3 percentage points on the previous year, while for Year 6 boys 22.9% are obese, a drop of 1.3 percentage points from the previous year.

The proportion of Year 6 girls who are overweight for 2008/09 was 14.4%, an increase of 0.7 percentage points on the previous year. The proportion of Year 6 boys who are overweight for 2008/09 was 13.5%, a decrease of 2.3 percentage points on the previous year.

Table 5: Numbers of Year 6 by BMI category, Hull 2005/06 – 2008/09

		Underweight	Healthy Weight	Overweight	Obese	Total
Girls	2005/06	13	713	184	265	1,175
	2006/07	14	699	171	235	1,119
	2007/08	16	765	162	240	1,183
	2008/09	13	809	182	260	1,264
Boys	2005/06	13	750	207	283	1,253
	2006/07	12	659	165	223	1,059
	2007/08	16	766	206	316	1,304
	2008/09	11	834	180	305	1,330

Table 6: Percent and numbers of Year 6 by BMI category, Hull 2005/06 – 2008/09

		% Underweight	% Healthy Weight	% Overweight	% Obese	Total
Girls	2005/06	1.1	60.7	15.7	22.6	100
	2006/07	1.3	62.5	15.3	21.0	100
	2007/08	1.4	64.7	13.7	20.3	100
	2008/09	1.0	64.0	14.4	20.6	100
Boys	2005/06	1.0	59.9	16.5	22.6	100
	2006/07	1.1	62.2	15.6	21.1	100
	2007/08	1.2	58.7	15.8	24.2	100
	2008/09	0.8	62.7	13.5	22.9	100

Figure 3 shows that the downward trend in the proportion of Year 6 girls who are obese has stopped in 2008/09, however falls over the previous 3 years' observations remain encouraging. For boys Figure 4 shows fluctuating levels of obesity over the last four years, with a rise to 24.2% in 2007/08 and then fall to 22.9% for 2008/09, around the same level as 2005/06.

Figure 3: BMI categories of Year 6 girls, Hull 2005/06 to 2008/09

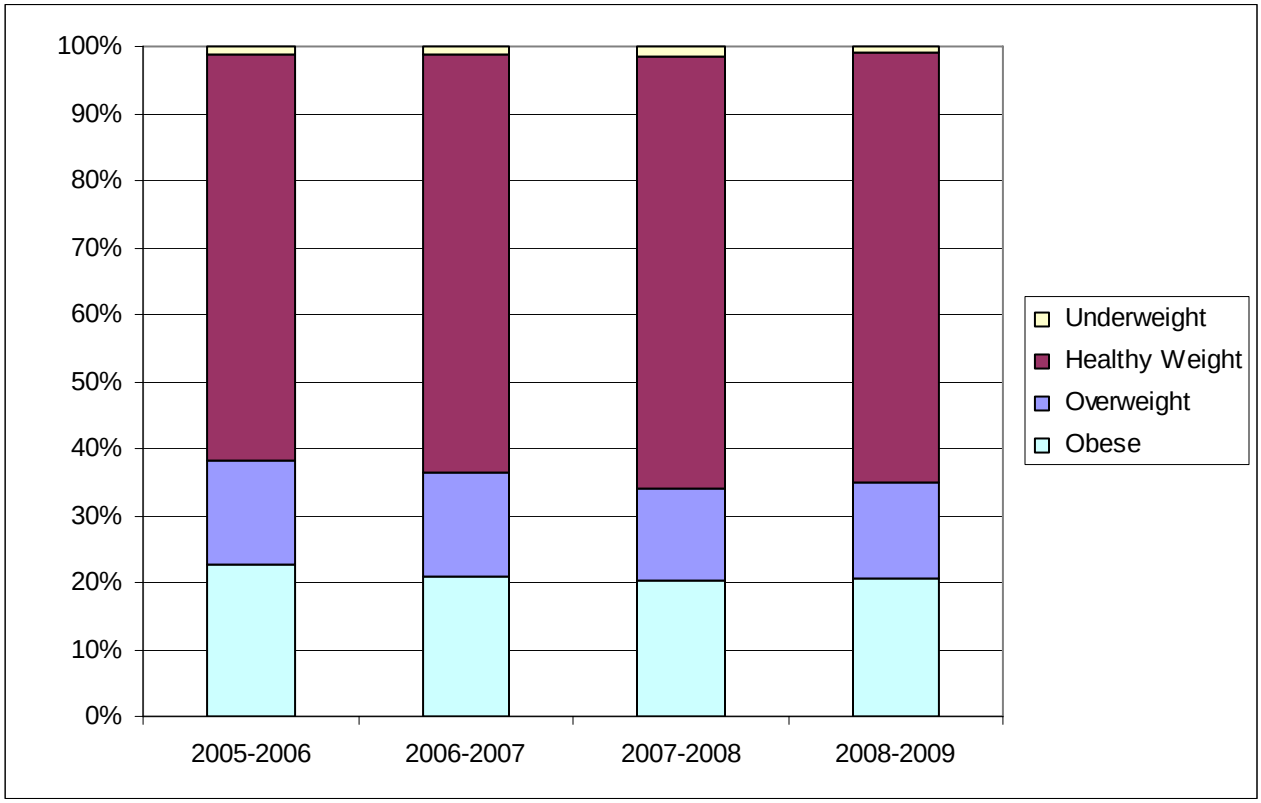
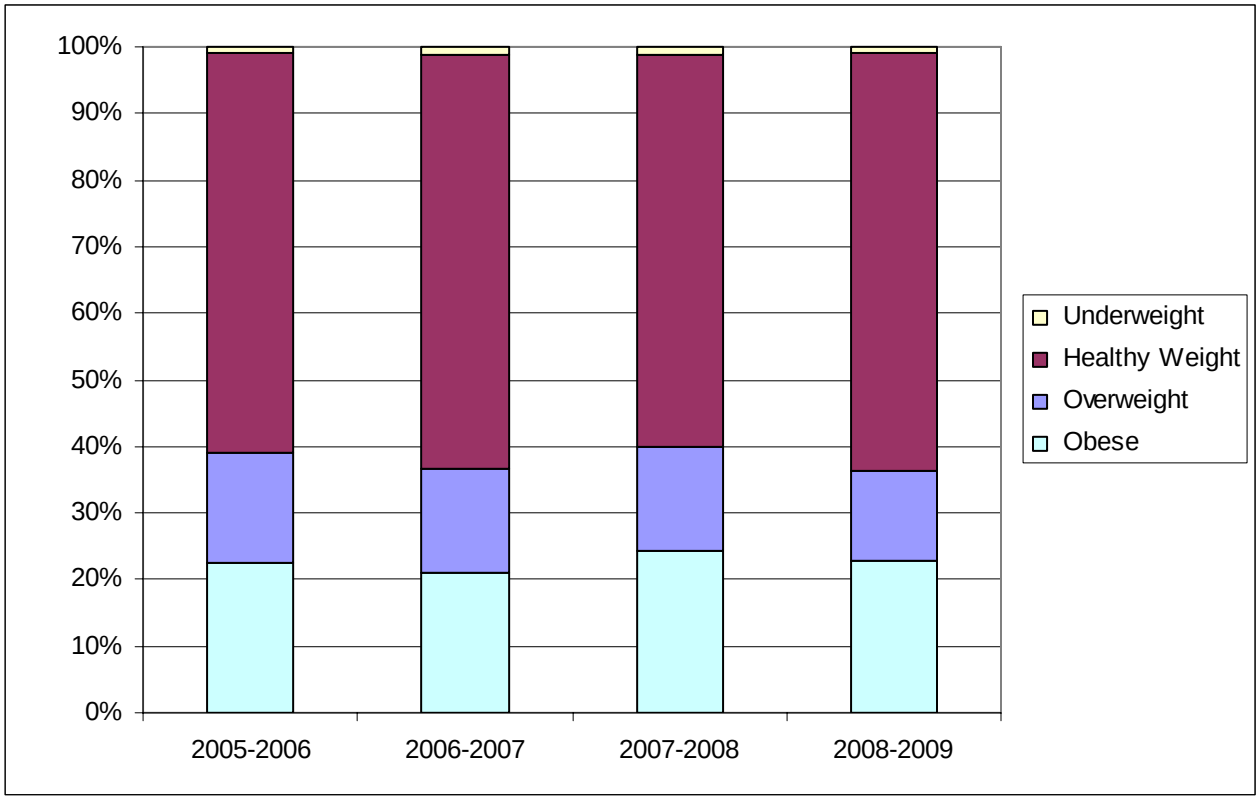


Figure 3 shows a similar picture to obesity in the proportion of overweight Year 6 girls, with a halt in the downward trend for 2008/09, but encouraging falls from the previous three years. For boys Figure 4 shows an overall downward trend over 4 years in the proportion who are overweight.

Figure 4: BMI categories of Year 6 boys, Hull 2005/06 to 2008/09



BMI levels in Hull Localities and Areas

Levels of Obesity for Year R and Year 6 in Hull City Council Area Committee areas are shown in Table 7. For every area Obesity levels are higher in Year 6, by between 7 and 14 percentage points. However variations in Area level rates can occur by chance because of the relatively small numbers of children involved, and only very tentative conclusions can be drawn from Table 7. This can be seen from Figure 5 which shows the Year R Male and Female Combined Obesity Rates 2008/09, with both the rate and the corresponding 95% confidence interval (the range within which we are 95% sure that the true or underlying rate lies). These intervals all overlap, showing that we cannot say any one rate is significantly higher or lower than any other rate, despite differences of up to 8 percentage points between the estimates of the area rates. A similar pattern is shown in Figure 6 for Year 6. Were boys and girls to be charted separately then the confidence intervals would be even longer because of the smaller sample sizes.

Table 7: Prevalence of Obesity in Year R and Year 6 by Hull Area Committee areas within PCT Localities 2008/09

Locality	Area	Obesity level (percent)		Change in obesity percentage from Y R to Y6
		Year R 4 & 5 year olds	Year 6 10 and 11 year olds	
North	North Carr	7.1%	17.7%	10.5%
	Northern	11.7%	24.8%	13.1%
East	East	11.2%	19.2%	7.9%
	Park	9.1%	23.5%	14.4%
	Riverside (East)	7.5%	20.5%	13.0%
West	Riverside (West)	14.9%	25.8%	10.9%
	West	12.0%	19.4%	7.5%
	Wyke	7.5%	20.6%	13.0%
	HULL	10.3%	21.8%	11.5%

Figure 5 Year R Boys and Girls Obesity Rates and 95% Confidence Intervals, Hull Areas 2008/09

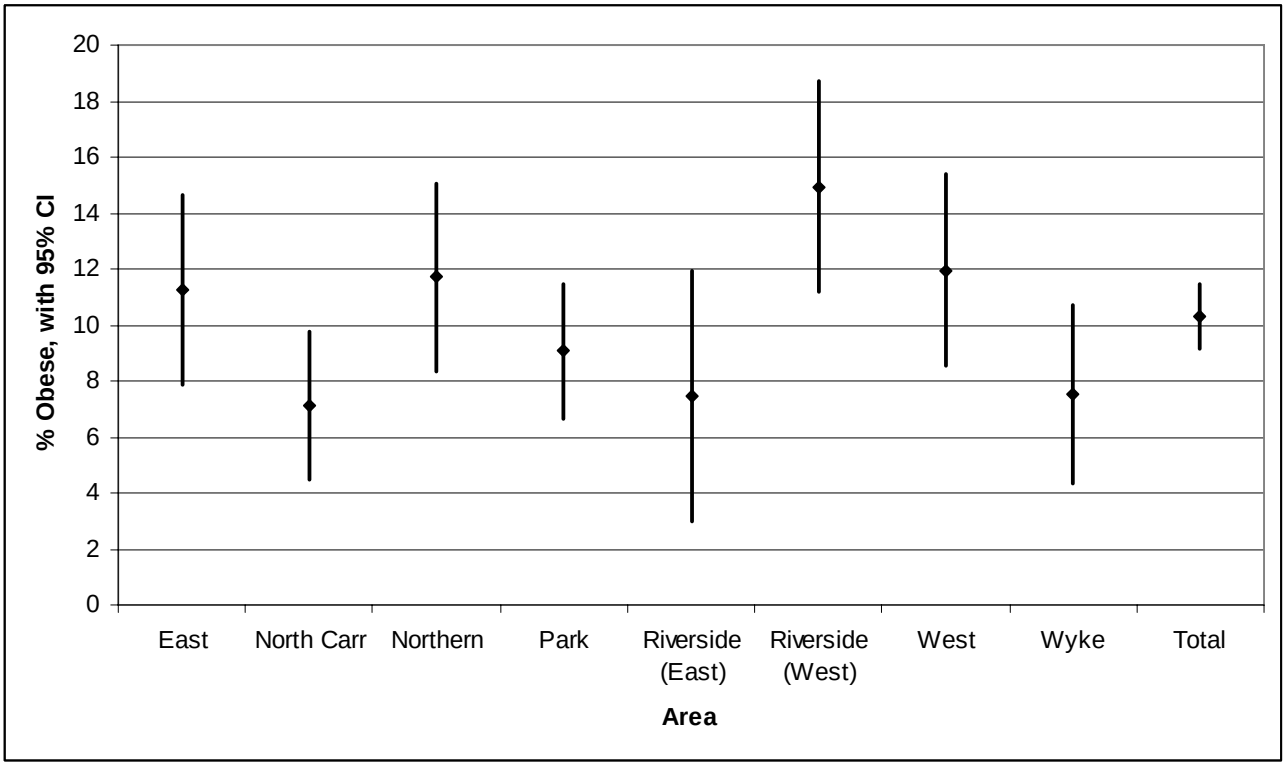
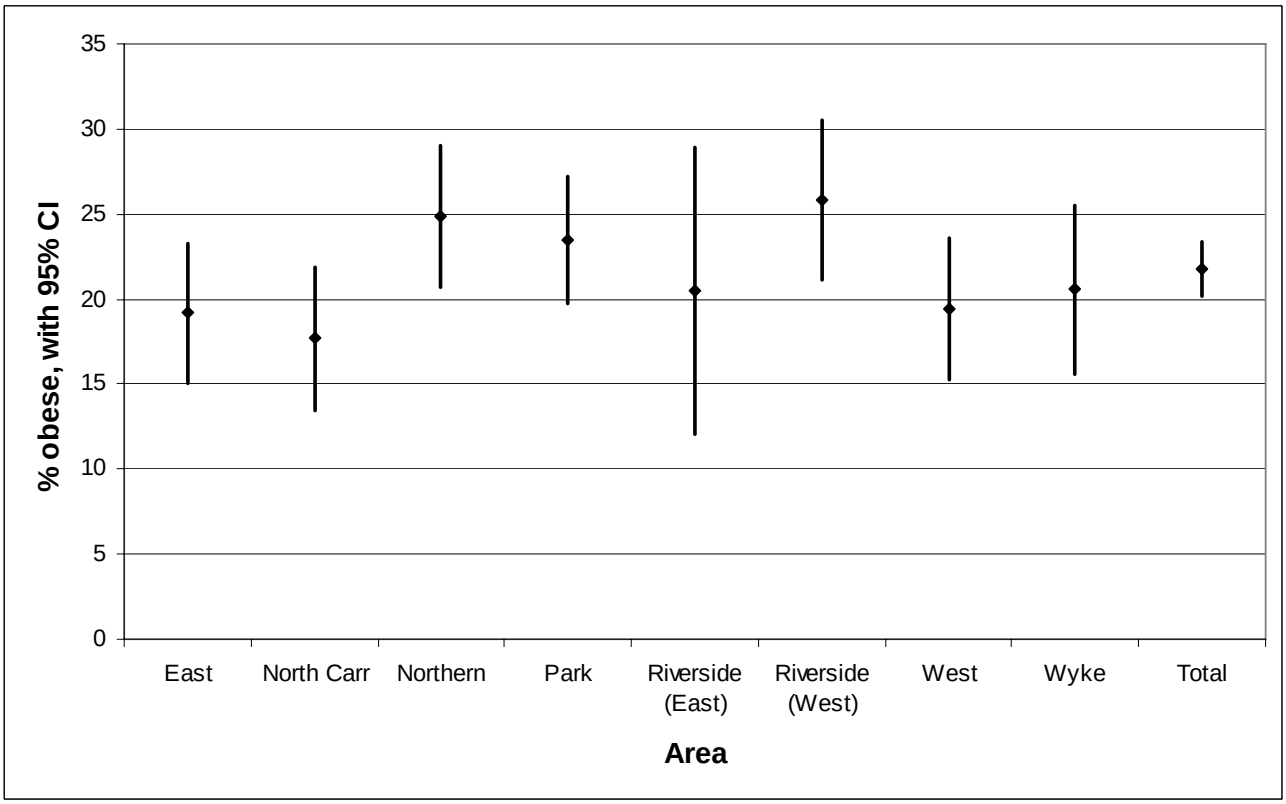


Figure 6: Year 6 Boys and Girls Obesity Rates and 95% Confidence Intervals, Hull Areas 2008/09



Relationship between obesity in children and deprivation

Using 2005-2009 data Obesity levels for Super Output Areas (SOA- a census-based geographical unit of around 1,500 people) were plotted against an average Deprivation Score, measured by the Index of Multiple Deprivation (IMD) 2007. The results for Reception Year pupils and for Year 6 pupils showed that in Hull there is a slight association, with poorer areas tending to have, on average, slightly higher obesity levels. However this association is very weak, so that many of Hull's poorest areas have lower obesity rates than many of the better off areas, and is negligible for most practical purposes. For instance this means there would be no reason to target an anti-obesity campaign at poorer areas within Hull. More detailed work on this topic will be included in the follow-up to this initial report.

National comparison

The 2008/09 levels of obesity and overweight in Hull are higher than the most recent national figures which are for 2007/08, as can be seen from Table 8 and Figure 7 for Reception Year and Table 9 and Figure 8 for Year 6.

However the 2007/08 England report included an analysis of the effect of deprivation on Obesity levels which showed that there was a clear trend for areas with a higher deprivation score to generally have higher levels of obesity for both Year R and Year 6 children. When allowing for this Hull's rates in 2008/09 were roughly as expected in relation to England figure. However since the England figure relates to 2007/08 an updated analysis will be produced after the England 2008/09 become available in December 2009.

Table 8: Percent and numbers of Year R by BMI category, Hull 2008/09, England 2007/08

	% Underweight	% Healthy Weight	% Overweight	% Obese	%Total
Hull Girls	0.6	75.5	14.2	9.7	100
England Girls	1.0	77.9	12.3	8.8	100
Hull Boys	0.5	72.7	16.0	10.9	100
England Boys	1.5	74.5	13.6	10.4	100

Figure 7: BMI categories of Year R girls, Hull 2008/09 and England 2007/08

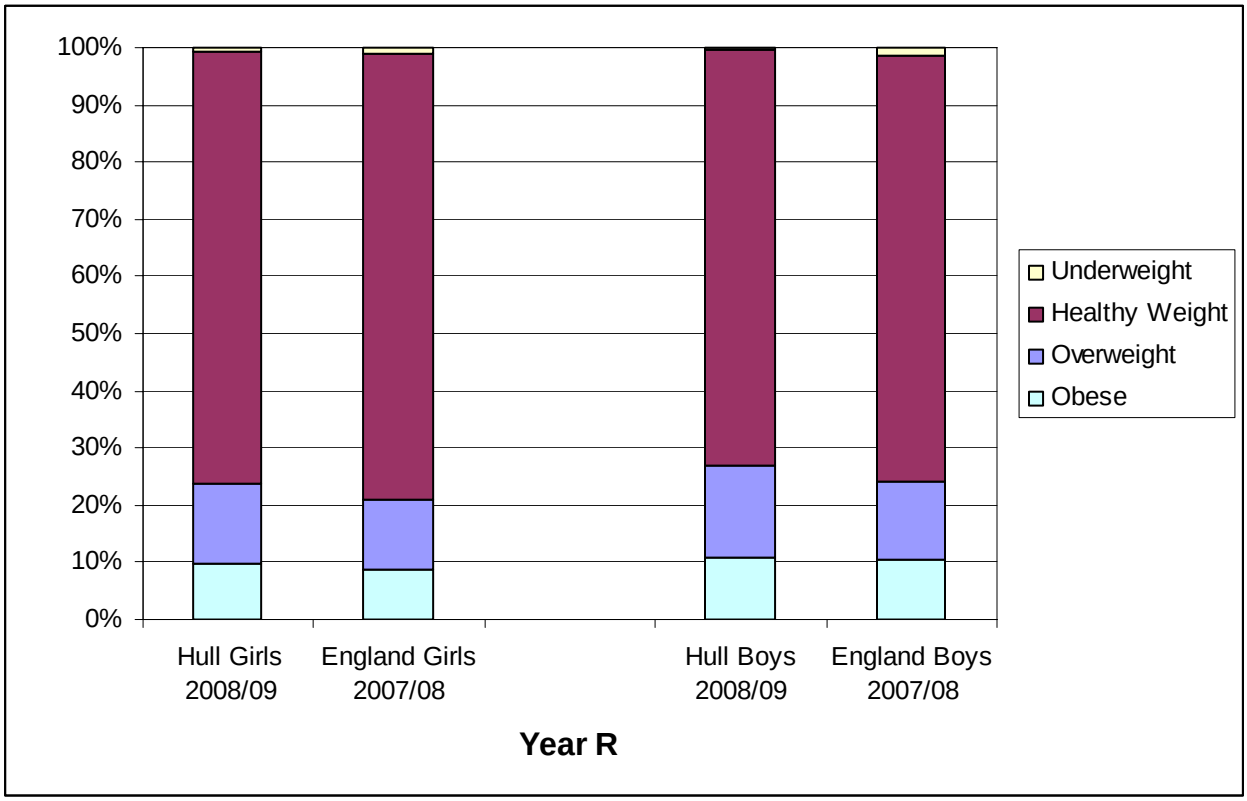
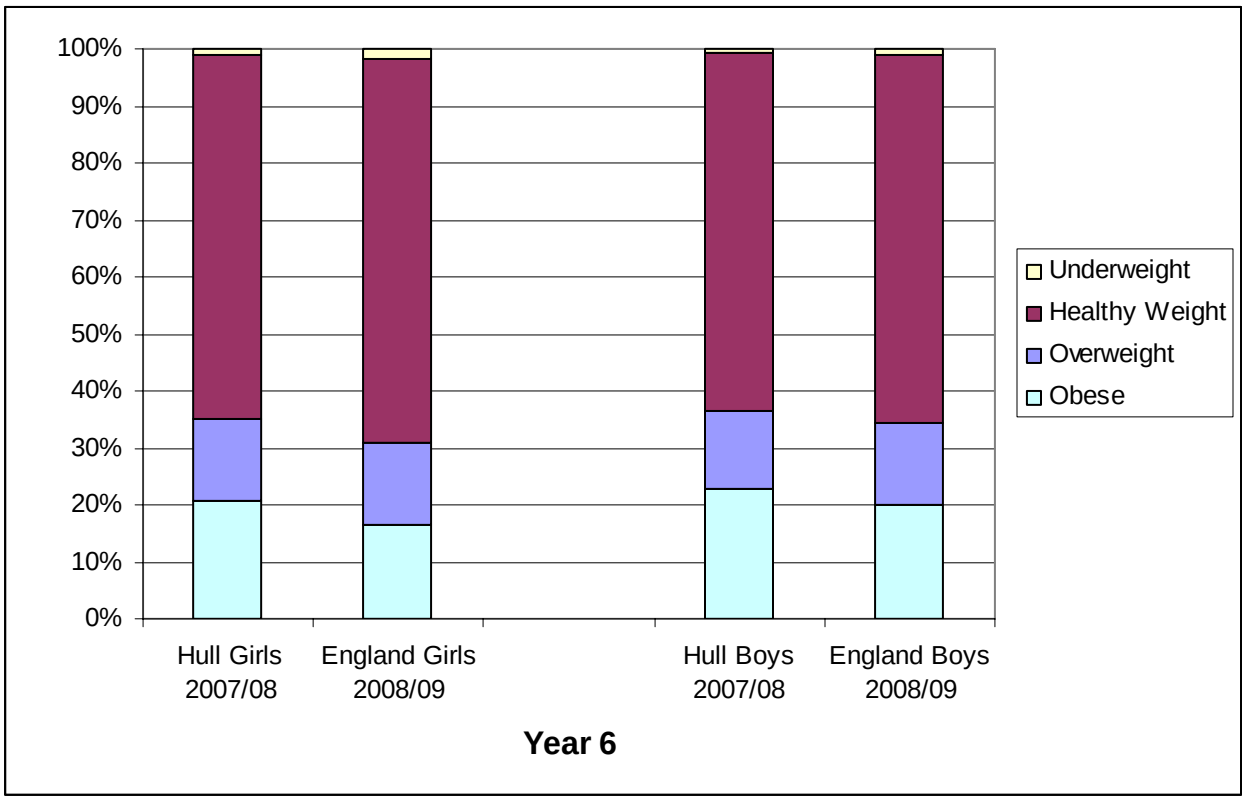


Table 9: Percent and numbers of Year 6 by BMI category, Hull 2008/09, England 2007/08

	% Underweight	% Healthy Weight	% Overweight	% Obese	%Total
Hull Girls	1.0	64.0	14.4	20.6	100
England Girls	1.6	67.6	14.2	16.6	100
Hull Boys	0.8	62.7	13.5	22.9	100
England Boys	1.2	64.5	14.4	20.0	100

Figure 8: BMI categories of Year 6 girls, Hull 2008/09 and England 2007/08



Future Work

Data will continue to be collected from schools to enable further monitoring to continue on an annual basis. This report will be updated and re-issued once 2008/09 national data are released, and will also include further analyses of the effects of deprivation, and pooling data from consecutive years to further examine differences by Area. Further information on Childhood BMI rates in Hull can be found in reports on the Hull Public Health Sciences website at http://www.hullpublichealth.org/Obesity/obesity.htm

TG, JK November 2009

APPENDIX A: Classification of overweight and obesity in children

Body mass index (BMI) indicates overall body mass assessing the height-to-weight relationship. It is calculated as "Weight (in kilograms) divided by Height (in metres) squared". For adults, people with a BMI of over 30 are classified as Obese, and a BMI of over 25 is classed as Overweight. However for children the BMI threshold levels are different, depending on the age of the child. There is little consensus on the "best" definition of childhood obesity in terms of BMI owing to the marked changes of body mass index profile in populations of children across time and countries as well as over age. However, BMI remains the measure of choice in assessing obesity in children. Approximations to the definitions of Obese and Overweight children used by the DoH to produce Local Delivery Plan (LDP) target figures for the childhood obesity indicator PSA10a will be used throughout this report. This means the figures presented here may differ slightly from those for Hull quoted in forthcoming reports from the NHS Information Centre and Public Health Observatories. Children are defined as obese if their BMI is above the 95th centile of the reference curve for their age and sex according to the UK BMI centile classification[4]. Similarly children are classified as Overweight if their BMI is above the 85th centile. Since expected BMI measurements vary over the ages 4½ years to 6 years, and 10 to 12 years, BMI thresholds for weight categories were defined at 6 monthly intervals and used to classify underweight, desirable weight, overweight and obese, as shown in *Table A.1* below.

[4] Cole TJ, Freeman JV, Preece MA. Body mass index reference curves for the UK, 1990. *Arch Dis Child* 1995; **73:** 25-29

This classification is different from the technically superior one that was used in earlier local reports[5], so numbers and percentages within BMI categories will not be directly comparable.

Table A.1: Body Mass Index Thresholds and Categories UK1990 95th & 85th centiles

	Underweight		Desirable Weight		Overweight		Obese
Adults	less than	18.50	to	25.00	to	30.00	and above
Boys aged							
4¼ to 4¾	less than	13.5	to	17.01	to	17.97	and above
4¾ to 5¼	less than	13.5	to	16.96	to	17.95	and above
5¼ to 5¾	less than	13.5	to	16.96	to	17.99	and above
5¾ to 6	less than	13.5	to	17.01	to	18.10	and above
Girls aged							
4¼ to 4¾	less than	13.1	to	17.17	to	18.31	and above
4¾ to 5¼	less than	13.1	to	17.16	to	18.35	and above
5¼ to 5¾	less than	13.1	to	17.21	to	18.46	and above
5¾ to 6	less than	13.1	to	17.32	to	18.65	and above

	Underweight		Desirable Weight		Overweight		Obese
Boys aged							
10 to 10¾	less than	14.0	to	18.94	to	20.79	and above
10¾ to 11¼	less than	14.0	to	19.24	to	21.19	and above
11¼ to 11¾	less than	14.0	to	19.54	to	21.69	and above
11¾ to 12	less than	14.0	to	19.74	to	21.99	and above
Girls aged							
10 to 10¾	less than	14.0	to	19.85	to	21.94	and above
10¾ to 11¼	less than	14.0	to	20.30	to	22.44	and above
11¼ to 11¾	less than	14.0	to	20.70	to	22.94	and above
11¾ to 12	less than	14.0	to	20.90	to	23.24	and above

[5] Chinn S, Rona RJ. Letter to the Editor Re: International definitions of overweight and obesity for children: a lasting solution? *Annals of Human Biology*, 2004;**31**(6):295-296