

Obesity in Children in Hull 2007/2008

UPDATE ON THE NATIONAL CHILD MEASUREMENT PROGRAMME RESULTS FOR HULL

KEY POINTS

- *Hull's childhood obesity levels are similar to other comparable urban areas*
- *13% of Reception year boys (aged 4 and 5 years) are obese compared to 11% of girls*
- *By year 6 (ages 10 and 11) 24% of boys and 20% of girls were obese*
- *Obesity levels in girls have been falling in the last 3 years, whereas boys' levels have remained about the same*
- *Obesity levels do not vary significantly across Hull's localities and areas*

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."

Summary

Heights and weights of primary school children in Hull aged 4 & 5 (Year R) and 10 & 11 (Year 6) were recorded during the 2007/8 academic year as part of the Department of Health's National Child Measurement Programme. Valid figures for Body Mass Index (BMI) were calculated for 93% in Year R, and 84% in Year 6. Information Centre calculations give participation rates of 93.0% and 84.0%.

For Hull, recent trends for girls have been better than for boys. The percentage of obese girls has been falling slightly in the last 3 years, whereas obesity levels for boys have changed little in the last 3 years. Currently levels of both Obesity and Overweight for boys are at least 2 percentage points higher than for girls at both Year R and Year 6.

For Year R girls although obesity levels rose by 1.1% in 2007/8 to 10.7% they remain below the peak levels of 2005/6. The percentage of Overweight Year R girls fell last year by 1.9%. There was a reduction in the percentage of Obese and Overweight combined for the first time for girls in several years.

For Year R boys the level of obesity in 2007/8 remained the same as last year at 13.4 %, higher than any of the previous 7 years. In addition the percentage of Overweight Year R boys rose after last year's fall, so that the combined Obese and Overweight percentage reached a new high of 29.3%

Measurements of Year 6 children have been made for the last 3 years, so for the first time possible trends can be discerned. Obesity in girls fell for the second successive year to reach 20.3 % in 2007/8, whereas for boys obesity rose by 3.1% to 24.2%. For the Overweight category the percentage of girls also fell, to 13.7%, whereas the level of Overweight for boys was similar to the last few years' at 15.8%.

In relation to the national picture, once deprivation (measured by the Index of Multiple Deprivation 2007) is taken account of, Hull's obesity prevalence at Year R is as expected (i.e. at the national average level) at 12%, but by Year 6 Hull is 1.2 percentage points above its expected obesity prevalence (given its high deprivation) at 22.4%.

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

Data Submission

Data collected under the National Child Measurement Programme (NCMP) from Hull was recorded on the local Child Health System. An extract of 2007/8 data has been processed and was uploaded to the NHS Information Centre within the required timescale on 4 September. This 2007/8 data will be processed by the NHS Information Centre to pre-populate SHA and PCT monitoring returns; detailed analyses are expected in December 2008, 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 2007/8 school year in Hull schools there were 2,467 reception year children registered on the Child Health System, and of these 2,294 (93.4%) of children had valid height and weight measurements recorded, well above the target of 90%. For the 2007/8 year the Child Health System had 2,898 records of children at Hull state schools of which 2,422 were weighed and measured. This is a response rate of 83.6%, up from 73% last year, but slightly below the target of 85%.

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

In the most recent year, 2007/08, rates of obesity for reception year (Year R) girls were 10.3%, and 13.2% for boys, see *Table 1* below. A further 13.6% of girls and 16.0 % 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 10% in 2006/07¹.

Table 1: Numbers and percentages for Year R Hull, by BMI category, 2007/08

		Underweight	Desirable weight	Overweight	Obese	Total
Girls	numbers	8	873	158	119	1,158
	percentage	0.7%	75.4%	13.6%	10.3%	100.0%
Boys	numbers	9	795	182	150	1,136
	percentage	0.8%	70.0%	16.0%	13.2%	100.0%

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 2006/07³.

Table 2: Numbers and percentages for Year 6 Hull, by BMI category, 2007/08

		Underweight	Desirable weight	Overweight	Obese	Total
Girls	numbers	18	769	166	231	1,184
	percentage	1.5	64.9%	14.0%	19.5%	100.0%
Boys	numbers	16	773	208	313	1,310
	percentage	1.2%	59.0%	15.9%	23.9%	100.0%

Trends in overweight and obesity – 4 and 5 year olds

For trend purposes and deprivation analyses children 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 3* shows a mixed picture: for both boys and girls the rise in the proportion who are obese appears to have been halted, with levels in 2007/08 remaining below the peaks of 2004-2006

¹ National Child Measurement Programme: results from the 2006/07 school year. The NHS Information Centre 2007.

<http://www.ic.nhs.uk/webfiles/publications/ncmp/ncmp0607/NCMP%202006%2007.%20Bulletin%20Final.pdf>

Table 3: Overweight and obese 4 & 5 year olds, Hull 1999/2000 – 2007/08

School Year when Measured	Girls		Boys	
	% obese	% overweight and obese	% obese	% overweight and obese
1999-2000	8.7	18.3	9.0	20.6
2000-2001	7.8	18.1	9.8	21.5
2001-2002	9.0	19.2	10.7	22.7
2002-2003	9.9	21.8	10.0	22.6
2003-2004	8.9	21.7	11.8	25.7
2004-2005	12.5	24.4	13.1	28.7
2005-2006	10.7	24.7	12.0	28.4
2006-2007	9.6	25.0	13.4	27.9
2007-2008	10.7	24.2	13.4	29.3

However when overweight children are also included, then the percentage of girls who are overweight or obese has fallen for the first time in 3 years owing to a reduction in the proportion who are overweight (see *Figure 1*). The opposite has happened for boys (see *Figure 2*), with an increased proportion being overweight so that the proportion of boys who are overweight or obese has reached its highest ever level of 29.3%. The actual numbers that lie behind *Figures 1* and *2* are shown in *Table A.2 in the Appendix*; the *Figures* show changes in percentages since the total numbers vary each year with different sized cohorts going through school.

Figure 1: BMI categories of Year R girls, Hull 1999/2000 to 2007/08

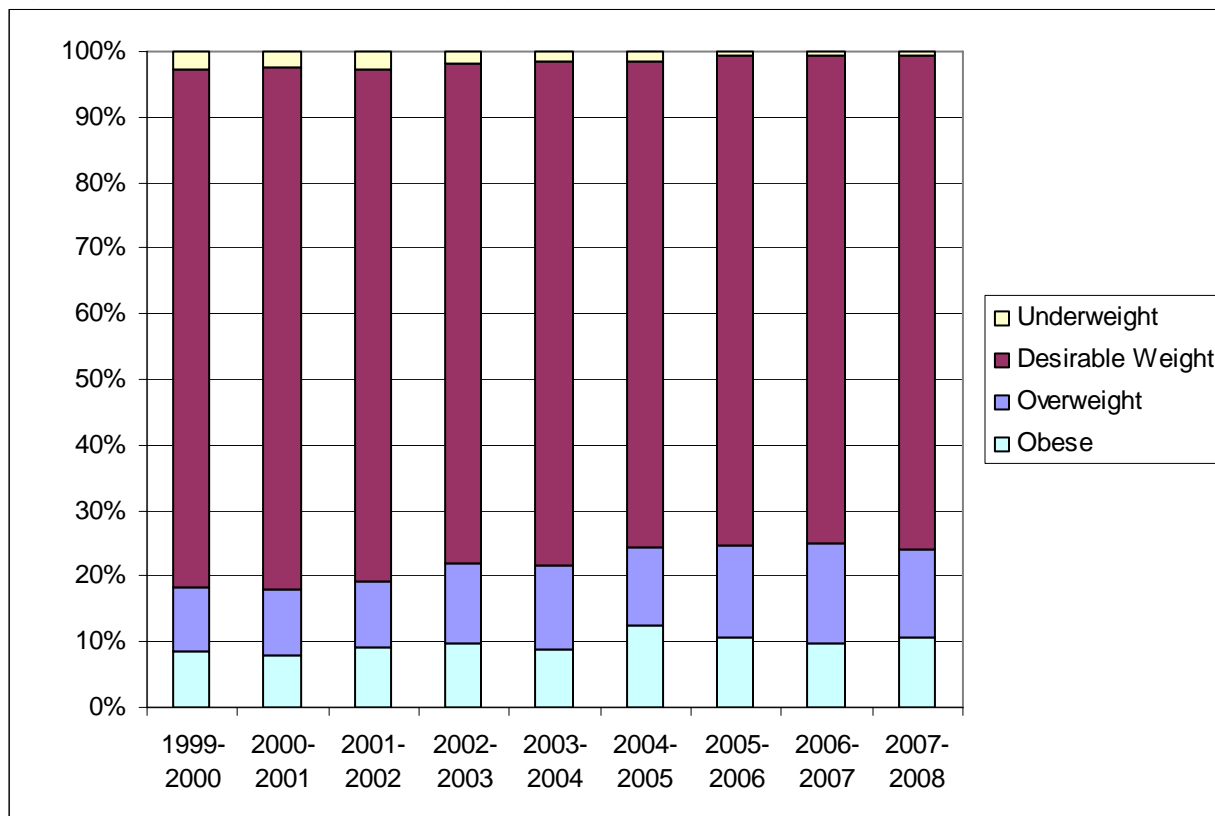
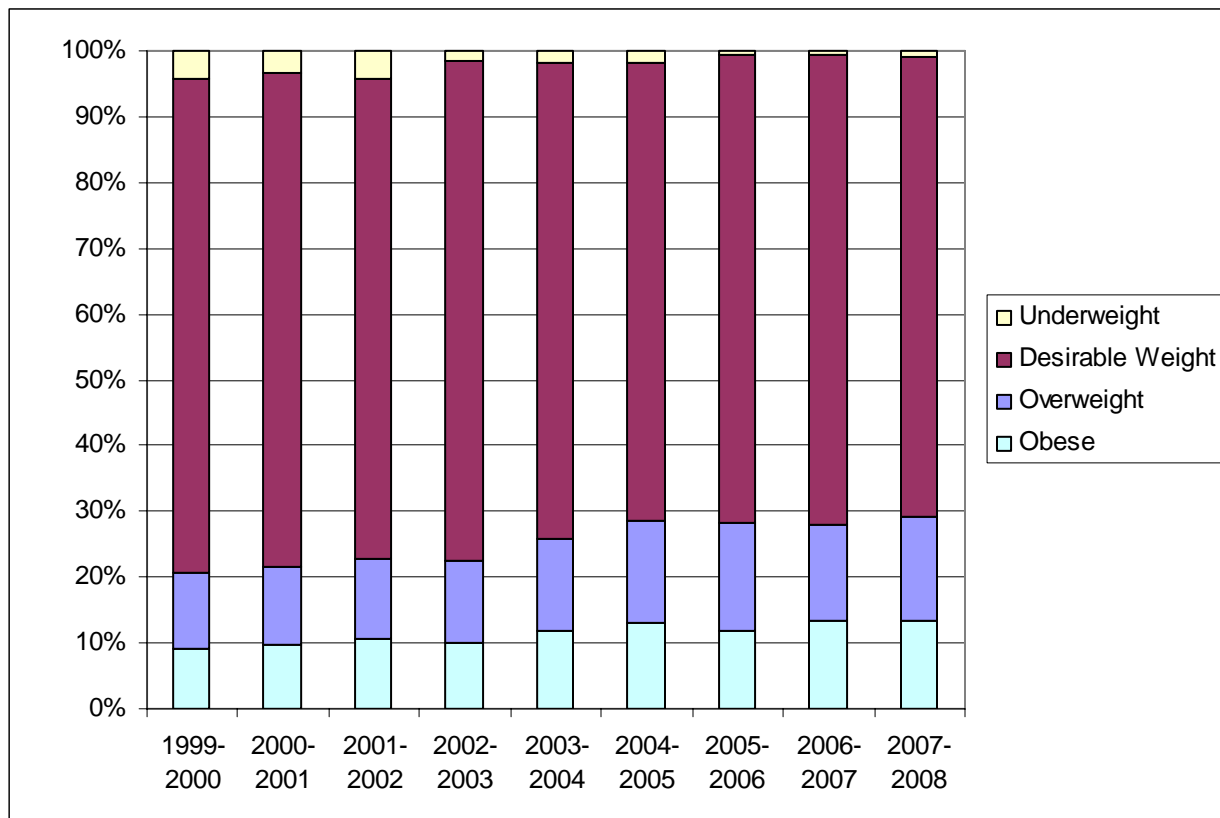


Figure 2: BMI categories of Year R boys, Hull 1999/2000 – 2007/08



Trends in overweight and obesity –Year 6 children

The first measurements were made for large numbers of 10 and 11 year olds (Year 6) in the year 2005/06, so this year's results provide the first indications of current local trends.

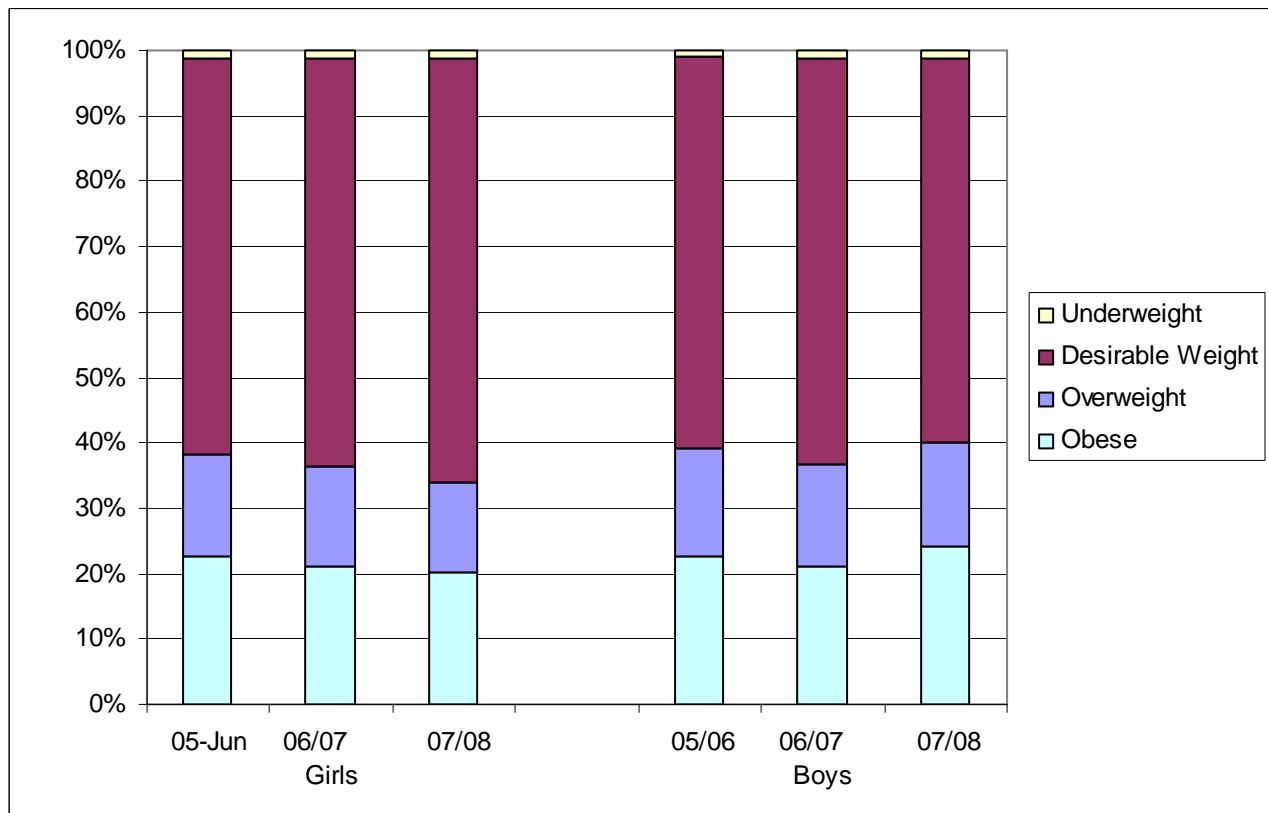
Levels of Obesity in Year 6 children have fallen for girls but not for boys, and are shown in Table 4. The 2006/7 figures differ slightly from those in Table 2 because residence in Hull has been assigned on a home postcode rather than a school basis. In the two years since 2005/6 the percentage of girls who are obese has fallen from 22.6 to 20.3 percent, while the percentage of girls who are overweight has also fallen (from 15.7 to 13.7 percent). However the boys do not show a similar downward trend: after a fall last year obesity levels have now risen beyond their 2005/06 level, while the proportion overweight has remained about the same.

Table 4: Percent and numbers of Year 6 by BMI category, Hull 2005/6 – 2007/8

		% Under weight	% Desirable weight	% Over weight	% Obese	% Total (number)
Girls	2005/2006	1.1	60.7	15.7	22.6	100.0 (1,175)
	2006/2007	1.3	62.5	15.3	20.9	100.0 (1,117)
	2007/2008	1.4	64.7	13.7	20.3	100.0 (1,183)
Boys	2005/2006	1.0	59.9	16.5	22.6	100.0 (1,253)
	2006/2007	1.1	62.2	15.6	21.1	100.0 (1,059)
	2007/2008	1.2	58.7	15.8	24.2	100.0 (1,304)

The fall in the proportions of Obese and Overweight girls in Year 6 can be seen in *Figure 3*, which also shows a corresponding rise in children with a desirable weight for their height. This fall is encouraging and from the 3 years' observations now available shows a downward trend. No such downward trend is evident for boys, although equally there is no clear evidence of a rise in obesity or overweight for boys.

Figure 3: Proportion of BMI categories of pupils in Year 6, Hull 2005/6 - 2007/08



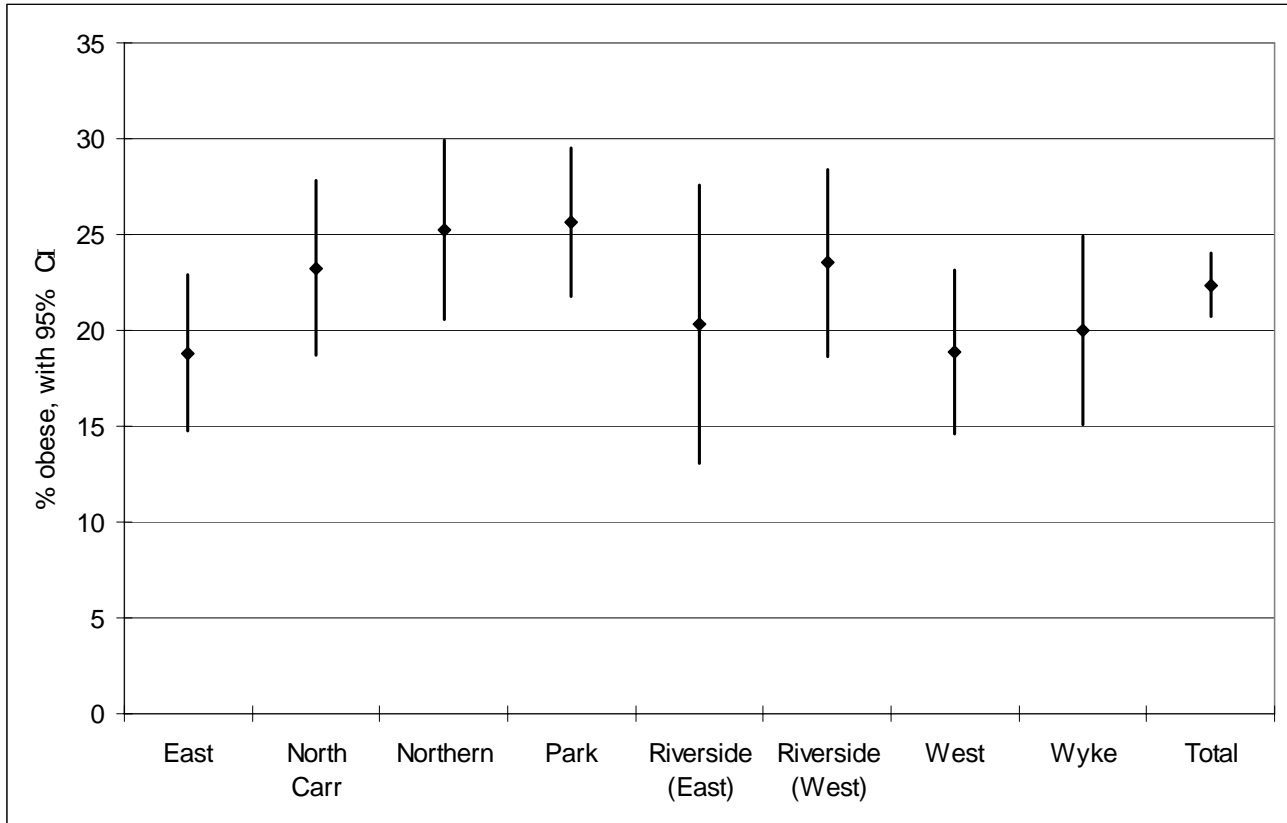
BMI levels in Hull Localities and Areas

Levels of Obesity for Year R and Year 6 in Hull Local Authority Area Committee areas are shown in *Table 5*. For every area Obesity levels are higher in Year 6, by between 6 and 15 percentage points. However variations in Area level rates can occur because of the relatively small numbers of children involved, and only very tentative conclusions can be drawn from *Table 5*. This can be seen from *Figure 4* which shows the Year 6 Male and Female Combined Obesity Rates 2007/8, 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 11 percentage points between the estimates of the area rates. Were boys and girls to be charted separately then the confidence intervals would be even longer because of the smaller sample sizes.

Table 5: Prevalence of Obesity in Year R and Year 6 by Hull Area Committee areas within PCT Localities 2007/8

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	12.7%	23.3%	10.6
	Northern	15.2%	29.9%	14.7
East	East	9.3%	18.8%	9.5
	Park	8.1%	23.6%	15.5
	Riverside (East)	12.3%	20.3%	8.0
West	Riverside (West)	14.0%	28.4%	14.4
	West	12.9%	18.9%	6.0
	Wyke	13.4%	20.0%	6.6
	HULL	12.0%	22.4%	10.6

Figure 4: Year 6 Boys and Girls Female Obesity Rates and 95% Confidence Intervals, Hull Areas 2007/8



Relationship between obesity in children and deprivation

Using 2005/6/7 data Obesity levels for Super Output Areas (SOA- a census-based geographical unit of around 1,500 people) were plotted against Deprivation Score, measured by the Index of Multiple Deprivation (IMD) 2004. The results for Reception Year pupils and for Year 6 pupils were used to assess the link between Deprivation levels and Obesity in children. More recent data will be used once comparable national data becomes available in December 2008.

However both ages' figures show only a very slight association, with increasing levels of deprivation (higher IMD 2004 Scores) being associated with slightly higher Obesity levels. The association is so small as to be 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, although the diverging patterns of Obesity for boys and girls suggests it might be helpful to use gender to make psychographic distinctions for Social Marketing purposes.

National comparison

The 2007/8 levels of obesity and overweight in Hull are higher than the most recent national figures which are for 2006/7. National 2007/8 figures are expected to be published in February 2009. However the 2006/7 England report included an analysis of the effect of deprivation on Obesity levels. This 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. Hull's rates last year were very close to those expected, given its relatively high deprivation levels. This year (2007/08) Hull's Obesity levels have risen for both Year R children (by 0.4 percentage points) and Year 6 (by 1.4 percentage points). This puts Hull's year R obesity at the rate expected if Hull were at the national average (12.0%) *once Hull's higher deprivation level is taken account of*. In a similar fashion, the actual Hull rate for Year 6 for 2007/08 has risen to slightly above the expected rate, based on the England 2006/07 and Hull's deprivation.

Table 6: Prevalence of Obesity in Year R and Year 6 for Hull and England 2007/8

	Year R	Year 6
England 2006/07	9.9	17.5
Expected Hull obesity given deprivation level	12.0	21.2
Hull actual 2006/07	11.6	21.0
Hull actual 2007/08	12.0	22.4

Data will continue to be collected from schools to enable further monitoring to continue on an annual basis. This report will be updated once 2007/8 national data are released.

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 classification². 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.

² 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 reports³, 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

³ 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

Table A.2: Numbers of overweight and obese 4 & 5 year olds, Hull 1999/2000 – 2007/8

		Underweight	Desirable weight	Overweight	Obese	Total
Girls	1999/2000	23	657	80	72	832
	2000/2001	30	1,011	131	99	1,271
	2001/2002	34	1,012	132	117	1,295
	2002/2003	25	1,045	164	135	1,369
	2003/2004	18	927	154	108	1,207
	2004/2005	17	828	133	140	1,118
	2005/2006	7	910	170	130	1,217
	2006/2007	5	806	167	104	1,082
	2007/2008	8	899	161	128	1,196
Boys	1999/2000	37	661	102	79	879
	2000/2001	43	954	149	124	1,270
	2001/2002	64	1,081	178	159	1,482
	2002/2003	22	1,083	180	142	1,427
	2003/2004	26	959	185	156	1,326
	2004/2005	23	844	190	159	1,216
	2005/2006	7	920	212	155	1,294
	2006/2007	9	895	182	168	1,254
	2007/2008	9	822	184	157	1,172